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Contents

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Motivating Public Sector Employees: Evidence from Greece

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ABSTRACT

Purpose:
The object of this research is to investigate work motivating factors in the public sector in Greece, as well as to study demographic attributes, placing emphasis on age and gender as determinants of employee motives.

Design/methodology/approach:
To answer our research questions, a questionnaire was distributed at the beginning of 2015 to a public-sector organization in central Greece. A total of 318 anonymous survey responses were collected and analysed with SPSS.

Findings:
In the public organization under survey, the leading employee motives are an increase in salaries, opportunities for hierarchical advancement in the organization, as well as the development of personal skills. Moreover, motivational differences are noted among Baby Boomers, Generation X and Generation Y.

Research limitations/implications:
As the present study has been conducted on a single public organization, awareness should be raised as far as the generalizability of the results providing useful insights for further exploration.

Originality/value:
Limited research has been conducted in the Greek public sector comparing motives among generations.

1. Introduction

Motivation remains one of the major challenges that corporations face today, especially when it must be combined with the efficiency and effectiveness of the organization (Manolopoulos, 2008). Originating from the Latin term "movere" meaning to move, Islam and Zaki Hj. Ismail (2008) indicate that "[m]otivation is what moves us from boredom to interest" (p. 344). The issue of work motivation is fundamental for management not only on theoretical, but also on a practical basis (Steers et al., 2004) as it impacts on employee performance (Mitchell, 1982). According to Wiley (1997), employers should be conscious of the factors that motivate their employees in order to secure corporate success. Besides, attracting and retaining motivated employees in a better way than the rivals do, organizations could have the chance to gain competitive advantage (Kultalahti & Liisa Viitala, 2014; Steers et al., 2004). Despite the importance of work motivation, Steers et al. (2004) noted that theoretical advancements on this issue have diminished in recent years even if serious transformations have occurred in the workplace. Labor diversification, the rise of information technology and team working are some of the changes that corporations face today (Steers et al., 2004) that could have an impact on workforce motivation. The objective of this work is to examine Greece public sector employee motives, as well as to investigate demographic attributes and hierarchical position as determinants of employee incentives.

2. Theoretical background

Motivation is a complex notion to be accurately defined, however Pinder (1998 as cited in Meyer et al., 2004:992) has described it as "a set of energetic forces that originates both within as well as beyond an individual's being, to initiate work-related behavior, and to determine its form, direction, intensity, and duration". A number of studies have been conducted in order to detect the ways in which employees are motivated (Houston, 2000; Wright, 2001), nevertheless the lack of

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research in the public sector has previously been highlighted (Wright, 2001; Manolopoulos 2007). Wiley (1997), reviewing employees motivating preferences, concluded that good salaries, recognition for their work, security, appealing work and chances of promotion and development in the company are the highest work motivators. However, research on private and public sector demonstrates contracting results, especially at managerial positions (Houston, 2000; Wright, 2001). For example, financial rewards are supposed to motivate private workforce more than public sector labor (Houston, 2000). On the other hand, job security is considered to be less important for private sector employees despite the fact that recent studies have found no disparities between the two areas (Lyons et al., 2006).

Anderfuhren-Biget et al. (2010), studying motivation of employees in the public field, have indicated that this has been explored from at least two different viewpoints. The first approach is based on "a canny maximization of self-interest" (Sen, 1995:2) of employees, aiming at the satisfaction of extrinsic requirements. Extrinsic motivation is usually referred to as fulfilling one's needs, mainly through financial rewards (Osterloh & Frey, 2000). The second approach is associated with the Public Service Motivation (PSM) construct, proposing that public sector workforce is prompted by higher-order incentives (Anderfuhren-Biget et al., 2010; Perry & Wise, 1990). In fact, compassion and the sense of duty towards society have been found as some of the intrinsic motives of public workforce (Perry et al., 2010; Manolopoulos, 2008). However, previous research that was carried out in the extended public sector found wages and security to be the driving forces in employee motivation (Manolopoulos, 2007). Another interesting finding is that age is an attribute that impacts on motivation (Manolopoulos, 2007) which is one of the reasons the present study has focused on different motivating preferences among generations.

Indeed, Wong et al (2008) studied the differences in motivating factors among three generational groups - Baby Boomers, Generation X (GenXers) and Generation Y (GenYers) - and found significant variances in power, promotion opportunities and attachment. A generational group can be described as a group of individuals sharing similar years of birth, and as a result, have been acquainted with similar social and historical circumstances (Solnet et al., 2012; Wong et al., 2008). The accurate clarification of these age sets in terms of the years of birth demonstrates some divergence among research (Parry & Urwin, 2011). According to Jurkiewicz (2000), Baby Boomers were born from 1946 to 1962, members of Generation X were born from 1963 to 1981, while members of Generation Y, which are often referred to as Nexters, Millennials, iGeneration, Echo Boom Generation or the Nexus Generation, were born between 1982 and 2000 (Wong et al, 2008; Shaw & Fairhurst, 2008). As Martin (2005) indicates, GenYers often call themselves as the Nothing-Is-Sacred Generation, the Searching-for-an-Identity Generation, the Wannabees and CyberKids. Literature also refers to Generation Z, with members born after 1996 (Montana & Petit, 2008).

Appelbaum et al. (2005) studied 15 motivation factors for Generation X and Baby Boomers, and found that a high salary and security are the most important factors for both groups. Additionally, Jurkiewicz (2000), studying Baby Boomers and Generation X in public organizations found that the members of the two generations have more similarities than differences. On the other hand, Kunreuther (2003) found differences in motivation between Baby Boomers and Generation X regarding their needs for work-life balance, as well as their viewpoints of the future. Tulgan (as cited in Jurkiewicz, 2000) indicates that members of Generation X are motivated by the chances of personal development, team working and the recompense of innovation, among other factors. Bright (2008) mentions that public sector organizations have already started promoting strategies to engage Generation X subsequent to the Baby Boomers retirements, while the understanding of Generation Y is also important in today's business environment, as they already constitute 25% of the worldwide population and will dominate the workplaces in the forthcoming years (Kultalahti & Liisa Viitala, 2014).

In regards to Generation Y, literature highlights that it is characterized by the "want it all" and "want it now" attitude (Ng et al., 2010: 282), including captivating work with good monetary rewards, fast promotion, playing also an important role in the society, and placing emphasis on work/life balance (Ng et al., 2010). According to Kultalahti and Liisa Viitala, (2014) Generation Y is generally motivated by flexibility in their working hours, a good workplace environment, and chances of development at work, as well as by a sympathetic supervisor, highlighting that there are indications that Generation Y differs from the others (Kultalahti & Liisa Viitala, 2014).

According to Montana and Petit (2008), Generations X, Y and Z have distinctive social features. Generations X and Y are alike in many attributes but also diverge in some case; members of Generation Y are more likely to quit their job after 2-3 years, as a result of seeing their parents fail to keep their job, despite their company loyalty. Moreover, Generation Z is likely to quit even faster than Generation Y. This is an important challenge for organizations, and the need to examine their motivational preferences is intense.

Examining motivational attributes in the public sector as well as possible differences among the generation groups, this study will search also for variances among hierarchical position and gender. In terms of hierarchical position, a small proportion of research has been performed, indicating a positive relationship with Public Service Motivation (PSM) (Desmarais & Gamassou, 2014). Indeed, Desmarais and Gamassou (2014) concluded that there are disparities in motivation in relation to hierarchical level, placing emphasis on the division of personnel management policies in public institutions. Moreover, Camilieri's study (2007) found that the more an employee raises in the institution's hierarchy, the more the PSM is reinforced. Hierarchical position has also been found to differentiate work motivation between public and private sector (Buelens & Van den Broeck, 2007) employees.

Camilleri (2007) studied gender, among others, in relation to PSM demonstrating differences between males and females, verifying to a certain degree, Naff and Crum' results (1999 as citied in Camilleri, 2007) that females score higher in PSM. Manolopoulos (2007)

studying work motivation in the extended public sector in Greece suggested that women are motivated more from extrinsic incentives.

The research questions of this work are:

RQ1: What are the motivating factors of employees in the public sector?

RQ2: Are there any divergences in motives among different hierarchical levels and gender?

RQ3: Are there any differences in motivating attributes among Baby Boomers, Generation X and Generation Y?

3. Research Method

The object of this study is to explore the motivating factors in the public sector as well as to investigate demographic attributes and hierarchical position as determinants of employee motives. A questionnaire was developed and distributed at the beginning of 2015 to members of a public-sector organization in central Greece. A total of 318 anonymous survey responses were collected and analyzed with SPSS.

Each participant was requested to rate 18 motivating factors on a Likert scale from one to five; rate 1 corresponds to 'lowest motivating', and five to 'highest motivating'. Furthermore, some demographic questions were also made.

4. Results

Our sample is composed of 42.5% males and 57.5% females with an average age of 42.4 years. In terms of hierarchical position, almost half of the respondents are in the middle level (51.88%) and as expected, employees up in the higher positions are typically older. However, the striking point is that the top managers are on average 40 years old, which is less than the mean age of our sample. In terms of educational level, a large proportion of our respondents had completed higher education (41.19%); 35.22% are holders of postgraduate master's degrees. Moreover, 7.86% of our sample have a Ph.D. Their monthly income varies from €601 to €1000 (30.19%) and from €1001 to €2000 (40.88%), while 10.1% earn €2000 to €3000 per month. There are also 6 respondents with income above €3000, that are expected to be the top managers of the organization.

Using descriptive statistics the mean average of each motivating factor is shown below in table 1. As expected, the highest employee motives are a wage raise (mean=4.03) and promotion opportunities (mean=3.86), as well as the development of personal skills (mean=3.75). On the other hand, praise (mean=2.75), power associated with a job position (mean=2.95), and job rotation (mean=3.09) are ranked lower. The average score for helping one's country is 3.27 which is low compared to the other factors.

In an effort to comprehend if there was a difference between position in hierarchy, a non-parametric test was carried out. Comparing the means among three or more datasets, ANOVA test is usually performed. However, as our data does not follow the normal distribution, the Kruskal-Wallis test was used instead of ANOVA (Elliott & Hynan, 2011). As displayed in table 2, there are differences in factors such as praise (p-value =0.000), additional day off (p-value =0.000), job rotation (p-value =0.000), security (p-value =0.000) and flexible working hours (p-value =0.001). Employees in higher hierarchical position scored lower on such incentives.

Table 1: Frequencies

	N	Mean
Wage raise	318	4.03
Promotion opportunities	318	3.86
Personal skills development	318	3.75
Work environment	318	3.73
Performance assessment	318	3.63
Link Wage - Productivity	318	3.60
Initiatives	318	3.58
Task specification	318	3.58
Security	318	3.55
Flexible working hours	318	3.55
Opportunity to help	318	3.52
Training	318	3.48
Opportunity to help the country	318	3.27
Team-working	318	3.25
Additional day off	318	3.20
Job rotation	318	3.09
Power	318	2.95
Praise	318	2.75

Table 2: Test Statistics [a,b]

	Praise	Additional day off	Job rotation	Security	Flexible working hours
Chi-Square	26.021	36.450	31.694	46.036	21.778
df	6	6	6	6	6
Asymp. Sig.	.000	.000	.000	.000	.001

a. Kruskal Wallis Test
b. Grouping Variable: Hierarchical position

Moreover, in order to examine the differences in motives between the genders, a Mann-Whitney U test was conducted. This test is a non-parametric one and is similar to the *t test* for normally distributed data, ascertaining the significance of deviation between the two categories (Jurkiewicz, 2000). As is demonstrated in table 3, there are differences in incentives such as work environment (p-value =0.001), praise (p-value =0.003), training (p-value =0.039) and flexible working hours (p-value =0.003). Females scored higher on each of these factors.

Finally, searching for disparities among generations, the data were tested based on the generation that the respondents belong to. The variables were transformed according to the age; Generation X includes those that were born from 1963 to 1981, which means that in 2015, when the research was conducted, the participants of this generation were 34 to 52 years old. Similarly, Baby

Boomers were born between 1946 and 1962 and consequently this generation group consists of participants older than 52 years old. Generation Y constitutes the remainder of the employees.

Table 3: Test Statistics[a]

	Work environment	Praise	Training	Flexible working hours
Mann-Whitney U	9901.000	10026.500	10769.500	10110.000
Wilcoxon W	19081.000	19206.500	19949.500	19290.000
Z	-3.271	-2.975	-2.060	-2.922
Asymp. Sig. (2-tailed)	.001	.003	.039	.003

a. Grouping Variable: Gender

The majority of our sample is GenXers (67.6%) while the rest of them are Baby Boomers (16%) and GenYers (16.4%). To test our hypothesis, the Kruskal-Wallis test was performed. Differences are noted in seven motivating factors (table 4); promotion opportunities (p-value =0.008), praise (p-value =0.000), development of personal skills (p-value =0.001), performance assessment (p-value =0.006), training (p-value =0.012), security (p-value =0.000) and flexible working hours (p-value =0.002).

Table 4: Test Statistics [a,b]

	Chi-Square	df	Asymp. Sig.
Promotion opportunities	9.702	2	0.008
Praise	18.819	2	0.000
Personal skills	13.123	2	0.001
Performance assessment	10.165	2	0.006
Training	8.839	2	0.012
Security	26.727	2	0.000
Flexible working hours	12.303	2	0.002

a. Kruskal Wallis Test
b. Grouping Variable: Generation

Looking closer at the results, greater differences are discerned in Baby Boomers and Generation Y in regards to the need for promotion opportunities, with the latter rating it lower (MD =0.50) (table 5). Considering the factor of praise, there are differences among the Baby Boomers and GenXers (MD =0.60), with GenXers rating it higher, as well as between Baby Boomers and GenYers, with the latter rating praise higher (MD = 0.84). Developing personal skills is more important for GenXers than Baby Boomers (MD =0.38) and GenYers (MD =0.27). Moreover, the results indicate that the assessment of performance would motivate GenXers more than GenYers (MD =0.37). Differences in training are noticed between Baby Boomers and GenXers with the first to rate it lower (MD = 0.43). In terms of security, disparity between the answers of the Baby Boomers and GenXers (MD = 0.77) is found, as well as between the Baby Boomers and GenYers (MD =0.66). Finally, flexible working hours are also rated higher by GenXers and GenYers than Baby Boomers, with mean difference of 0.51 for the Generation X and 0.55 for the Generation Y.

Table 5: Report Mean

	Baby Boomers	GenXers	GenYers	Total
Promotion opportunities	4.12	3.87	3.62	3.86
Praise	2.20	2.80	3.04	2.75
Personal skills	3.47	3.85	3.58	3.75
Performance assessment	3.65	3.70	3.33	3.63
Training	3.14	3.57	3.46	3.48
Security	2.92	3.69	3.58	3.55
Flexible working hours	3.12	3.63	3.67	3.55

5. Discussion

Recent studies (Anderfuhren-Biget et al., 2010) recognize the importance of motivation for organizational performance in both the private and the public sector. In the public organization under survey, the highest employee motives are an increase in their salaries, opportunities for advancement in the organization, as well as the development of their personal skills. Moreover, workplace environment is also a top motive. These findings are in line with previous literature (Manolopoulos, 2007; Islam and Zaki Hj. Ismail, 2008; Wiley, 1997) that highlighted a raise in wages and promotion options as important motivating factors. On the other hand, the opportunity to help others, as well as the opportunity to help their country have scored low comparing to others factors, giving the sense that our sample is not highly motivated by intrinsic motives that are often found in public organizations (Wright & Pandey, 2008).

Hierarchical position has an effect on motivation preferences in factors such as praise, additional day off, job rotation, security and flexible working hours; the workforce in higher hierarchical position rate such incentives lower. However, these factors are not associated closely with the PSM construct in which previous research has noted differences (Camilleri, 2007). These variations could yet be explained in combination with generational differences. Indeed, as the older employees in the organization under survey are in higher hierarchical positions, these disparities could be the result of differences among generational groups. Baby Boomers, GenXers and GenYers display differences in promotion opportunities, praise, development of personal skills, performance assessment, training, security and flexible working hours. Results indicate that GenYers place less emphasis on promotion opportunities which is not consistent with literature (Wong et al., 2008). An interpretation of this could be that in public organizations in Greece, Baby Boomers

are obliged to stay longer until their retirement and as result, chances of promotion for the new generations are limited (Benson & Brown, 2011). In terms of praise, younger Generations are motivated more by praise compared to Baby Boomers. This finding is in line with Martin's (2005) review, in which it was note that Generation Y needs praise and recognition for their job, as well as Bradford and Raines' (1991 as cited in Burke, 1994) paper in which Generation X's need for praise is noted. GenXers have also the highest mean in the factor of skills development, which was expected as this group is characterized by the need to attain skills (Jorgensen, 2003). Moreover, performance appraisal seems to motivate GenXers more than GenYers, which was not presumed as work appraisal and feedback are attributes that characterize Generation Y (Beard et al., 2008; Berk, 2009). Training is another aspect that displays variation between Baby Boomers and Generation X, with the latter scoring higher. Previous literature has stressed the fact that GenXers give greater emphasis on training and skill-development, than foregoing generations (Krug, 1998). In terms of security there are differences between GenXers/GenYers with Baby Boomers; the new generations score higher in security as a motivating factor. Jorgensen (2003) has mentioned that members of Generation X desire security in their work, while previous research (Guillot-Soulez, Soulez, 2014) on Generation Y indicates job security as a preference. Flexible working hours display variance among the three generations in line with earlier studies that note GenYers and GenXers motivation by flexibility (Kultalahti & Liisa Viitala, 2014; Rodriguez et al., 2003).

Finally, males and females display differences in motives of work environment, praise, training and flexible working hours; females rate each of these factors higher. Anterior studies have indicated that women are motivated more by recognition, (Kamdron, 2005) and they place emphasis on flexible working hours (Scandura & Lankau, 1997).

6. Limitations – Further Research

The aim of this study was to investigate the motivating factors in the public sector in Greece as well as to study demographic attributes, placing emphasis on age and gender as determinants of employee motives. Managers' understanding of the differences in motivational needs of the different generations can help in engendering effectiveness and efficiency. However, since the present research has been conducted on a single public organization, awareness should be raised as far as the generalizability of the results towards useful insights for further exploration.

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Macroeconomic and industry-specific determinants of Greek bank profitability

Zampara K., Giannopoulos M., Koufopoulos D.N

pp. 13-22

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Macroeconomic and Industry-Specific Determinants of Greek Bank Profitability

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ABSTRACT

Purpose:
The purpose of this paper is to investigate the external factors that influence the profitability of a typical Greek systemic bank over the period 2001–2014.

Design/Methodology/Approach:
A conceptual framework incorporating two fundamental groups of constructs, namely, macroeconomic forces and industry related factors, was developed. Two constructs were examined in the former: GDP growth rate and unemployment rate, whilst two attributes were explored in the latter; the bank's market share, both in terms of deposits and in terms of assets, and the banking market growth, also both in terms of the market's total assets and total deposits. In order to isolate the effects of the ongoing financial crisis, the research was undertaken for two periods, firstly 2001 to 2014 and secondly, the period 2001-2011, which excluded the deep recession. Consequently, multiple regression analysis was conducted and linear models were specified by means of OLS.

Findings:
The empirical analysis revealed that both macroeconomic forces and industry-related factors affect bank profitability. As far as the macroeconomic factors are concerned, unemployment rate has a negative impact, whereas the GDP growth rate has a positive impact on bank profitability. The industry-related factors, rate of growth of the industry's deposits and bank's assets market share have a positive impact on the financial performance of the bank. Finally, the rate of growth of the industry's assets and the bank's deposits market share have a negative effect on bank profitability.

Originality/Value:
This study reveals the mechanism determining bank profitability over a recent period that includes the financial crisis. Moreover, understanding the impact of macroeconomic forces as well as industry related attributes on bank profitability may enable banks to focus on the most critical factors in their decision process.

1. Introduction

The banking sector is considered to be the driving force of the Greek economy. Undoubtedly, banks in Greece serve a crucial role as financial intermediaries by providing stability to the Greek economy, sustaining entrepreneurship and facilitating money flows between the factors of the economy. Over the last decades, a series of important developments resulted in the complete reformation of the Greek banking sector. Specifically, a series of mergers and acquisitions led to an entirely reorganized banking industry, characterized by a highly competitive environment. Moreover, the development of new products and services, the reorganization of their internal structure, along with the modernization of their networks, and the benefits stemming from the common currency European market signaled that Greek banks entered a new era (Chatzoglou *et al.*, 2010; Pasiouras and Sifodaskalakis, 2010; Noulas, 2001). However, after those years of deregulation and financial innovation, the Greek banking sector almost collapsed, due to the financial crisis. Inevitably, the ongoing financial crisis has revived interest into the determinants of bank profitability. Whitten *et al.* (2002) consider profitability as one of the most substantial criteria used in order to evaluate bank financial performance. Furthermore, Athanasoglou *et al.* (2008) aptly argue that a healthy, sound and profitable

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banking sector is able to contribute to the overall stability and soundness of the economy. In the same spirit, Lee *et al.* (2015) regard bank profitability as a crucial factor in a bank's ability to survive a financial crisis. Moreover, for Dietrich and Wanzenried (2011), bank profitability is an indication of how efficiently and effectively a bank is managed. Therefore, the Greek experience of the financial crisis offers a remarkable case for identifying the determinants of bank profitability, under the given financial and macroeconomic environment.

Consequently, this paper aims to examine how the external environment affects bank profitability. Although many studies have explored bank profitability in developed countries, empirical works on factors influencing bank profitability in Greece are relatively scarce. Consequently, this paper will complement and extend the existing literature by exploring the main determinants of bank profitability in Greece, while considering the impact of the financial crisis. Specifically, a conceptual framework capable of capturing the effects of macroeconomic forces and industry-specific factors on bank profitability is developed. A novel feature of this paper is the period over which the conceptual framework is being tested. In contrast with other studies on Greek bank profitability, this paper utilizes data from the Greek banking sector over a relatively long period from 2001 to 2014. Moreover, the study's empirical results may prove to be useful to bank managers.

Bank profitability is an indication of how well a bank is managed (Dietrich and Wanzenried, 2011), whereas it also indicates the financial status of the bank, providing at the same time an insight into future prospects. Besides, understanding the way that the macroeconomic environment, as well as how the structure of the banking industry may affect is undeniably essential for every bank's decision process in terms of strategy formulation and implementation. As such, being aware of the impact a change in a macroeconomic variable may have on bank profitability means that bank management should take the necessary actions in order to tackle any negative effect or even take advantage of a positive effect. Additionally, when an unforeseen change occurs in the external environment the management should be able to design a strategy to overcome the shock with a minimal negative effect on profitability.

The remainder of the paper is structured as follows: *Section 2* gives an overview of the relevant literature on bank profitability, focusing on the selected variables. *Section 3* outlines the model and the variables selected. *Section 4* describes the data sample and the methodology of the study, whereas *Section 5* presents the findings of the empirical analysis. Finally, *Section 6* concludes.

1. Review of the literature

The first remarkable studies on bank profitability were conducted by Short (1979), Bourke (1989) and Molyneux and Thornton (1992). Following them, a large and growing body of literature focused on the determinants of bank profitability, taking also into consideration its importance to bank solvency and the overall banking sector stability (Dietrich and Wanzenried, 2011; Lee and Kim, 2013; Growe *et al.*, 2014; Athanasoglou *et al.*, 2008). Although, a part of the literature on bank profitability determinants examines groups of international banks (Dietrich and Wanzenried, 2014 and Mizraei *et al.*, 2013), the majority of the studies survey bank profitability in specific areas, such as Lee *et al.* (2015), Growe *et al.* (2014) and Kanas *et al.* (2012) for US banks and Pasiouras and Kosmidou (2007), Staikouras and Wood (2003), Molyneux and Thornton (1992), Goddard *et al.* (2004) and Athanasoglou *et al.* (2006) for European banks. Moreover, some studies have explored the determinants of bank profitability in specific countries, such as Kosmidou *et al.* (2004) in UK, Trujillo-Ponce (2013) in Spain, Tan and Floros (2012) in China.

As far as Greece is concerned, bank profitability has only been investigated in a small number of studies. Recently, Kosmidou (2008) examined the determinants of Greek bank profitability from 1990 to 2002, a period encompassing European Union financial integration, whereas, Athanasoglou *et al.* (2008) examined the impact of internal and external factors on Greek bank profitability from 1985 to 2001. Finally, Alexiou and Voyazas (2009) explored the influence of bank-specific as well as macroeconomic determinants on the profitability of Greek banks over the period 2000 to 2007.

Research on bank profitability has mainly focused on two groups of factors as explanatory variables, namely internal and external determinants. Lee *et al.* (2015), Athanasoglou *et al.* (2008) and Staikouras and Wood (2003) define as bank specific determinants of bank profitability those factors that are influenced by the bank's management, whereas Kosmidou (2008) and Staikouras and Wood (2003) define as external environment determinants of bank profitability those external to the bank factors which cannot be influenced by its management. The latter are additionally divided into industry-specific and macroeconomic determinants of bank profitability. In particular, Growe *et al.* (2014), Kosmidou (2008) and Staikouras and Wood (2003) regard as industry-specific determinants of bank profitability these factors related to the external environment of banking institutions which demonstrate industry conditions. In addition, Growe *et al.* (2014) define as macroeconomic determinants of bank profitability, the variables which entail aspects of the overall economic conditions in the country where the bank operates.

A considerable number of studies explore the explanatory power of macroeconomic forces on bank profitability (Athanasoglou *et al.*, 2008; Kosmidou, 2008; Lee and Kim, 2013; Bolt *et al.*, 2012; Tan and Floros, 2012; Pasiouras and Kosmidou, 2007; Alexiou and Voyazas, 2009; Jureviciene and Doftartaite, 2013) whereas a large body of literature investigates how industry-specific factors affect bank performance (Bourke, 1989; Mizraei *et al.*, 2013; Athanasoglou *et al.*, 2006; Goddard *et al.*, 2004; Belkhaoui *et al.*, 2014; Pillof and Rhoades, 2002). Finally, the impact of the recent financial crisis on the determinants of bank profitability has been scarcely examined (Dietrich and Wanzenried, 2011; Lee *et al.*, 2015). The next section describes both the dependent and independent variables considered in this paper.

1.1 Bank performance measurement

Profitability is a way to identify how efficiently a bank is managed (Kilic, 2011; Dietrich and Wanzenried, 2011). With the purpose of measuring bank profitability various financial indicators have been utilized in the relevant literature on bank performance. In particular, bank profitability is mostly measured by the return on assets and return on equity ratios expressed as functions of various determinants (Bourke, 1989; Staikouras and Wood, 2003; Goddard *et al*., 2004; Kosmidou *et al*., 2004; Athanasoglou *et al*., 2008; Alexiou and Voyazas, 2009; Dietrich and Wanzenried, 2011; Kanas *et al*., 2012; Lee and Kim, 2013; Mizraei *et al*., 2013; Dietrich and Wanzenried, 2014). Those indicators are used because of their obvious advantages; return on equity (ROE) is the ratio of net income for the full fiscal year after taxes to average total equity and reflects how efficiently the bank's equity has been used, while return on assets (ROA) is the ratio of annual net income after taxes to average total assets, and indicates how efficiently the assets have been used to produce the profit achieved by the bank. According to Kosmidou (2008), average total assets and average total equity are used in order to avoid any discrepancies due to variations in the volume of assets and equity, respectively, within the period under examination. Nonetheless, there are only a few studies such as Bolt *et al.* (2012) and Dietrich and Wanzenried (2014) that complementarily use alternative measures of bank performance such as net interest margin.

1.2 Determinants of bank profitability

The external determinants of bank profitability as presented in the extant literature include various macroeconomic factors as well as variables representing market characteristics.

1.2.1 Macroeconomic effects

Indisputably, the macroeconomic environment entails a number of forces which can create either opportunities or critical threats for banks. First of all, the rate of growth of gross domestic product (GDP) is highly considered to positively affect bank profitability. According to Staikouras and Wood (2003), Alexiou and Voyazas (2009), Growe *et al.* (2014) and Dietrich and Wanzenried (2011) a higher GDP growth rate results in higher demand for bank services, on the one hand, and lower loan default probability on the other, whereas banks can also impose higher fees and interest for their services, resulting in higher profitability. Moreover, Karimzadeh *et al.* (2013) and Said and Tumin (2011) argue that GDP growth has a positive effect on the expectations of both the bank and the customers, implying hence that during economic booms not only customers' demand for new loans and financial services rises, but simultaneously banks are also more eager to increase loan supply. On the contrary, in the case of economic depressions the quality of loan portfolio deteriorates, resulting therefore in credit losses, and consequently in lower bank profitability (Albertazzi and Gambacorta, 2009; Lee and Kim, 2013; Apergis, 2009). The literature also provides evidence that the rate of unemployment has a negative effect on bank profitability. The unemployment rate, which directly affects average income, is considered to influence both the ability of consumers to repay undertaken loans and their ability to deposit. Moreover, the overall demand for financial services, including new loans, is negatively affected by unemployment (Bolt *et al*., 2012; Louzis *et al*., 2010). Therefore, banks face augmented losses due to increased loan defaults. In their study on the determinants of non-performing loans Messai and Jouini (2013) highlighted that unemployment negatively affects the profitability of banking institutions due to the negative impact it has on the quality of loan portfolios. In the same vein, Jureviciene and Doftartaite (2013) have also revealed a negative impact of unemployment rate on bank profitability.

1.2.2 Industry related effects

The structure of the banking industry is also a significant determinant of a bank's potential profitability. A number of studies have revealed a positive statistical relationship between variables of industry structure, such as either concentration ratios or market share and profitability (Molyneux and Thornton, 1992; Berger, 1995; Dietrich and Wanzenried, 2011; Dietrich and Wanzenried, 2014). Staikouras and Wood (2003) in their study, however, uncovered a statistically-insignificant negative impact of market structure measures on bank profitability.

The relevant literature suggests that there are two different theoretical approaches that explain such a relationship (Berger, 1995; Goldberg and Rai, 1996; Yildirim and Phlippatos, 2007; Yildirim and Mohanty, 2010). The first viewpoint which is the structure-conduct-performance hypothesis, suggests that banks operating in highly concentrated markets can impose prices and fees less favorable to consumers, as a result of imperfectly competitive markets. More particularly, in a concentrated banking sector, a bank can earn a favorable interest margin that results in monopolistic profits from higher lending interest rates and lower deposit interest rates (Mizraei *et al*., 2013; Athanasoglou *et al*., 2006). Therefore, according to the structure-conduct-performance hypothesis, banks in more concentrated markets will earn higher profits than those operating in less concentrated ones, regardless of their efficiency. A more specific approach of the structure-conduct-performance hypothesis is the relative-market-power hypothesis, which states that banks that include well-differentiated products and services in their portfolio can increase their market share and consequently exercise their market power by setting higher prices, resulting in abnormal profits (Berger, 1995; Athanasoglou *et al*., 2008; Mizraei *et al*., 2013). The second viewpoint concerns the efficient-structure hypothesis, according to which efficient banks grow in terms of size and market share because of their ability to generate higher profits (Staikouras and Wood, 2003; Athanasoglou *et al*., 2006). The market share variable is mostly used to capture the influence of market structure on bank profitability. Karimzadeh *et al.* (2013) and Growe *et al.* (2014) have revealed a positive effect of market share in terms of assets on bank profitability. On the contrary, Growe *et al.* (2014) argue that a high market share in terms of deposits is an indication that the bank funds its assets with more expensive capital sources; therefore, negatively affecting bank profitability. Besides,

Belkhaoui *et al.* (2014) argue that deposit market share has a positive impact on bank profitability suggesting that banks with large market share have the possibility to achieve high profits. They argue that these banking institutions can offer a portfolio of better-differentiated products that can be sold to customers at high prices. Finally, another explanation is given by Kuzma and Shanklin (1992), who argue that customers are usually attracted by companies which possess larger market shares, insinuating additionally that profitability and market share are positively associated.

Another industry-related determinant of bank profitability is the growth of the market. A positive relationship between market growth and bank profitability has been revealed by Mizraei *et al.* (2013), who argue that a fast-growing market tends to promote an environment which enhances higher earnings. Dietrich and Wanzenried (2014), on the contrary, argue that a fast-growing market may possibly attract new probable entrants, meaning that the profitability of the existent market participants could be negatively affected. In line with the above, Bourke (1989) argued that an expanding market improves the capability of generating higher profits, especially if associated with entry barriers. In line with this, market growth has a positive effect on bank profitability, as long as, the consequential increased demand for bank services and product is not accompanied by a simultaneous and equivalent increase in supply (Pillof and Rhoades, 2002). High asset growth rates in the banking industry, are however often related to granting loans to customers with lower credit quality (Dietrich and Wanzenried, 2014; Apergis, 2009), which implies an indirect negative effect on bank profitability. In addition, Dietrich and Wanzenried (2011) argue that the growth rate of deposits negatively influences bank profitability, especially during a crisis, because the banks do not have the ability to convert the increasing amount of deposit liabilities into higher revenue-yielding assets.

Nevertheless, Table 1 summarizes the variables that will be further used in the empirical analysis of the study.

Table 1: The variables of the model

		Variable		Notation	Expected Effect	Related Literature
Dependent variables		Return on assets		*ROA*		(Bourke, 1989; Staikouras and Wood, 2003; Goddard et al., 2004; Kosmidou et al., 2004; Athanasoglou et al., 2008; Alexiou and Voyazas, 2009; Dietrich and Wanzenried, 2011; Kanas et al., 2012; Lee and Kim, 2013; Mizraei et al., 2013; Dietrich and Wanzenried, 2014)
		Return on equity		*ROE*		
Independent variables	macroeconomic variables	Percent growth of gross domestic product		*GDP*	*positive*	(Growe *et al.*, 2014; Alexiou and Voyazas, 2009; Staikouras and Wood, 2003; Dietrich and Wanzenried, 2011; Said and Tumin, 2011; Albertazzi and Gambacorta, 2009; Lee and Kim, 2013; Karimzadeh et al., 2013)
		Unemployment Rate		*UNR*	*negative*	(Bolt *et al*, 2012; Messai and Jouini, 2013; Louzis et al., 2010; Jureviciene and Doftartaite, 2013)
	industry structure related variables	market growth	Growth rate of total assets in the Greek banking industry	*AGR*	*negative*	(Mizraei et al., 2013; Dietrich and Wanzenried, 2014; Bourke, 1989; Pillof and Rhoades, 2002; Apergis, 2009; Dietrich and Wanzenried, 2011)
			Growth rate of total deposits in the Greek banking industry	*DGR*	*positive*	
		Bank's market share	Bank's Assets market share	*AMS*	*positive*	(Mizraei *et al.*, 2013; Molyneux and Thornton, 1992; Berger, 1995; Dietrich and Wanzenried, 2011; Dietrich and Wanzenried, 2014; Staikouras and Wood, 2003; Goldberg and Rai, 1996; Yildirim and Phlippatos, 2007; Yildirim and Mohanty, 2010; Athanasoglou *et al.*, 2006; Athanasoglou *et al.*, 2008; Belkhaoui *et al.*, 2014; Karimzadeh *et al.*, 2013; Growe *et al.*, 2014; Kuzma and Shanklin, 1992)
			Bank's Deposits market share	*DMS*	*negative*	

2. Data and methodology

The next section shortly describes the methodology followed in this study and presents information with regards to the data selection process. Moreover, the

econometric model that was utilized in order to investigate the effects of the various macroeconomic and industry related factors on bank profitability is presented in this section.

2.1 Methodology

In attempting to investigate the external determinants of bank profitability in Greece, a number of issues need to be considered and confronted. The Greek banking sector qualifies as a very interesting context with regards to exploring determinants of bank profitability, however, over the past few years it has experienced severe and significant changes. Following a series of mergers and acquisitions the sector is merely comprised of four systemic banks. The deficiency of an adequate number of bank level observations in order to perform a sound panel data analysis (Ahn and Schmidt, 1995; Kiviet, 1995; Judson and Owen, 1999; Blundell and Bond, 1998; Hedeker *et al.*, 1999) was surpassed by moving beyond the methodology developed in previous studies of bank profitability. First of all, the time dimension of the dataset which was utilized has been long enough to capture the effects of macroeconomic and banking industry related variables on bank profitability. Secondly, following Yin (2012) and Seawright and Gerring (2013), a case study was chosen as the more appropriate research method. For that reason, one of the Greek systemic banks has been selected as the typical representative case and has served as the unit of analysis. Considering the fact that all four Greek systemic banks are essentially similar (Dietrich and Wanzenried, 2011) as they operate under the same regulatory standards, accounting rules and economic environment, within the same country, across the period under investigation, it is reasonable to assume that the one which has been selected qualifies as a unit of analysis.

2.2 Data selection

The study utilized data from the Greek banking sector over a relative long period, from 2001 to 2014. In particular, quarterly accounting data have been obtained through the representative bank's annual, semi-annual, first quarter and third quarter financial results reports, balance sheets and income statements. The particular time period was chosen because it offers recent time-series data, and also includes the financial crisis. Moreover, quarterly data regarding the macroeconomic and industry-related variables have been gathered from databases such as the Organization for Economic Co-operation and Development (OECD), International Monetary Fund (IMF), Bank of Greece, and Hellenic Bank Association (HBA).

2.3 Model formulation

This section describes an econometric model which examines the explanatory power of macroeconomic features and banking industry related attributes on bank profitability. Towards this direction, a multiple regression model is developed. Short (1979), Bourke (1989), Molyneux and Thornton (1992) and Goddard *et al.* (2004) in their studies conclude that linear models are as good as models of other functional forms. Therefore, a linear function of the following form is considered:

$$y = a_{0t} + b_{it} \sum_i^N X_{it} + c_{jt} \sum_j^M Z_{jt} \text{ (1)},$$

where, a_0 is a constant, y is the dependent variable, X_i the explanatory variables regarding the macroeconomic environment, Z_j the explanatory variables regarding the banking industry structure and b_i and c_j their effects respectively on the dependent variable over time t. The model is specified with the means of ordinary least squares. Two approaches for the measurement of profitability are being followed. The first one regards ROA as the dependent variable (eq. 2), and the second one regards ROE as the dependent variable (eq. 3).

$$ROA_t = a_0 + a_1 GDP_t + a_2 UNR_t + a_3 AGR_t + a_4 DGR_t + a_5 AMS_t + a_6 DMS_t + u_t \text{ (eq. 2)}$$

$$ROE_t = b_0 + b_1 GDP_t + b_2 UNR_t + b_3 AGR_t + b_4 DGR_t + b_5 AMS_t + b_6 DMS_t + e_t \text{ (eq. 3)}$$

The models are tested for the existence of heteroscedasticity, autocorrelation and multicollinearity, so that the estimation of reliable - unbiased, efficient and consistent - coefficients can be reassured.

Consequently, this work investigates in a single equation framework the effect of external forces on bank profitability. Figure 1 summarizes the econometric models into a conceptual framework.

3. Empirical results

This section presents the findings of the empirical analysis. A sequence of regressions was performed for each model separately, in order to extrapolate the statistically insignificant explanatory variables, and conclude to the final specification of the models. Moreover, following the pattern of Dietrich and Wanzenried (2011) whose study examined Swiss bank profitability before and during the financial crisis and Lee *et al.* (2015) who examined how the determinants of U.S. bank profitability were influenced by the financial crisis, this research, aiming to isolate the effects of the financial crisis, was also conducted for two periods. The first period was from the 1st quarter of 2001 to the 3rd quarter of 2014 and the second period was from the 1st quarter of 2001 to the 1st quarter of 2011, excluding hence the deep recession period. Table 2, consequently, presents the results for the whole period; column 1 for the case of ROA while column 2 for the case of ROE as dependent variable, whereas Table 3 reports the results for the period before the crisis; column 3 for the case of ROA while column 4 for the case of ROE as dependent variable, respectively. Although there are not any major differences observed between the models in respect to the factors affecting profitability, the explanatory power of the models is significantly improved when excluding the observations of the period during the financial crisis. Tests controlling for the existence of autocorrelation, multicollinearity and heteroscedasticity have also been performed and are reported respectively in Table 2 and

Table 3. Furthermore, the collinearity test controls the degree of correlation between the explanatory variables which were utilized in the multiple regression analysis. The results indicate that the independent variables are not correlated to such a degree that the regression analysis could be distorted. Moreover, White's test for heteroscedasticity indicates that the null hypothesis of heteroscedasticity is rejected, whereas Durbin-Watson test indicates that there is no evidence of autocorrelation. It is reasonable, therefore, to assume that the method of ordinary least squares has generated unbiased, consistent and efficient estimators.

Figure 1: The conceptual framework

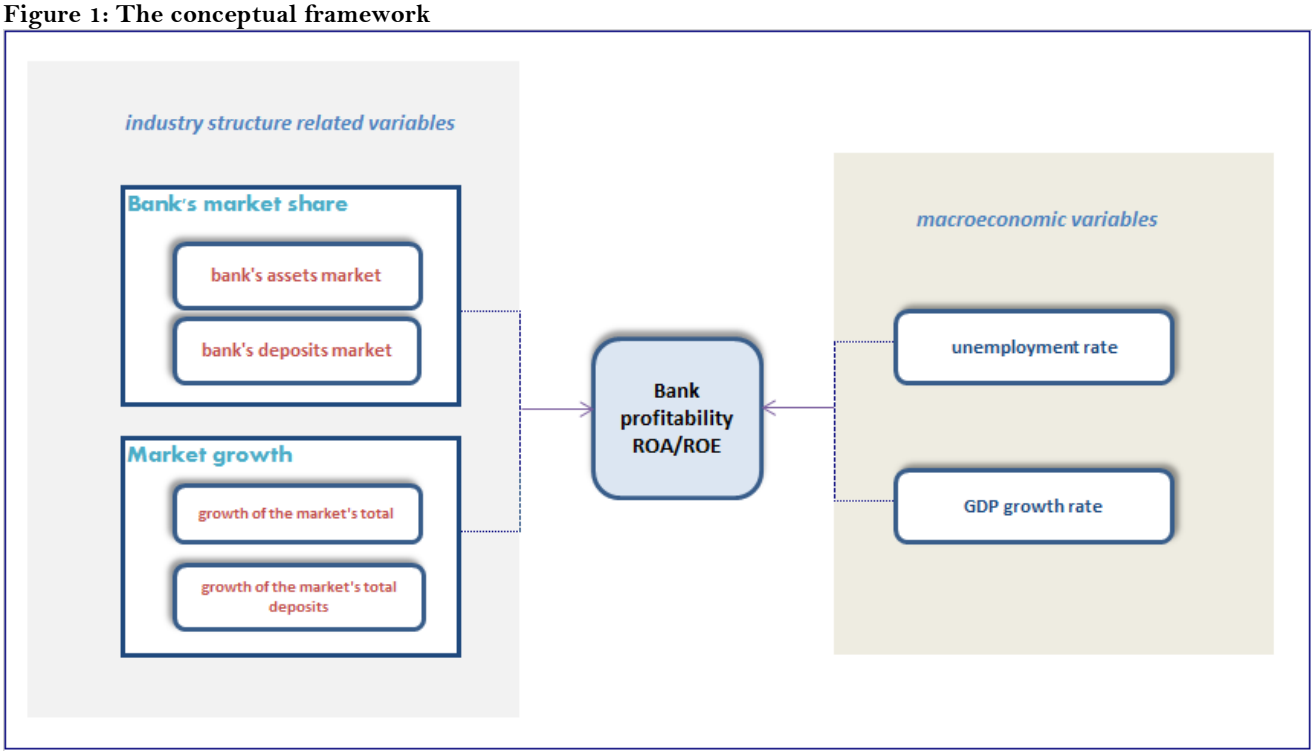

Table 2: Empirical results for the period 2001Q1 – 2014Q3

2001 Q1 - 2014 Q3						
	1			2		
	ROA			ROE		
Independent variable	coefficient	p-value	collinearity - test	coefficient	p-value	collinearity - test
constant	-0.000711	0.9327		0.004955	0.9692	
GDP	0.122334***	0.0781	0.582****	1.858295***	0.0794	0.582****
UNR	-0.201613**	0.0250	0.199****	-3.290836**	0.0169	0.199****
AGR	-0.215405***	0.0772	0.446****	-3.088237***	0.0963	0.446****
DGR	0.227475**	0.0449	0.487****	3.498161**	0.0433	0.487****
AMS	0.304658*	0.0047	0.268****	4.609364*	0.0051	0.268****
Included observations	55			55		
R-squared	0.329592			0.345134		
Durbin-Watson stat	1.735602*****			1.909989*****		
S.E. of regression	0.019420			0.296314		
Sum squared resid	0.018479			4.302292		
F-statistic	4.817960			5.164888		
Prob(F-statistic)	0.001163			0.000696		
White Heteroskedasticity Test						
F-statistic	1.397886			1.467258		
Prob(F-statistic)	0.213011******			0.184128******		

*Statistically significant at 1%

** Statistically significant at 5%

*** Statistically significant at 10%

**** Reject multicollinearity for tolerance above 0.1

***** Reject Ho for autocorrelation

****** Reject Ho for heteroskedasticity

Table 3: Empirical results for the period 2001Q1 – 2011Q1

2001 Q1 - 2011 Q1						
	3			4		
	ROA			ROE		
Independent variable	coefficient	p-value	collinearity - test	coefficient	p-value	collinearity - test
constant	0.018450	0.1486		0.267580	0.2406	
GDP	0.049720***	0.0943	0.249****	0.719186	0.1744	0.249****
UNR	-0.120491***	0.0910	0.339****	-2.000741	0.1168	0.339****
DGR	0.060398**	0.0350	0.801****	1.001610***	0.0503	0.801****
AMS	0.182067*	0.0054	0.242****	3.225712*	0.0060	0.242*****
DMS	-0.185655**	0.0294	0.234****	-3.012424**	0.0476	0.234****
Included observations	41			41		
R-squared	0.596986			0.541423		
Durbin-Watson stat	1.827426*****			1.550128*****		
S.E. of regression	0.004170			0.074824		
Sum squared resid	0.000609			0.195954		
F-statistic	10.36911			8.264617		
Prob(F-statistic)	0.000004			0.000031		
White Heteroskedasticity Test						
F-statistic	0.926922			0.867225		
Prob(F-statistic)	0.522797******			0.572181******		

*Statistically significant at 1%

** Statistically significant at 5%

*** Statistically significant at 10%

**** Reject multicollinearity for tolerance above 0.1

***** Reject Ho for autocorrelation

****** Reject Ho for heteroskedasticity

Turning to the industry-specific determinants, the empirical results provide evidence that they also affect bank profitability. The effect of the bank's market share, on its profitability depends on which independent variable is considered. Firstly, the bank's market share, in terms of assets, has a positive and statistically-significant effect on bank profitability. This result is in line with Mizraei *et al.* (2013), who contend that a higher asset market share implies that the bank can impose higher prices for its products and services, whereas it can also be related to the fact that customers are likely to be more attracted by banks which possess larger market share (Kuzma and Shanklin, 1992). On the contrary, the bank's market share in terms of deposits negatively affects bank profitability. Actually, this outcome is statistically significant merely from the first quarter of 2011 to the first one of 2011, but insignificant (although still negative) for the whole period from the first quarter of 2001 to the third quarter of 2014. Deposits are a costlier way of funding assets in comparison to other forms of funding, such as inter-bank borrowing, borrowing from the European Central Bank or direct funding from sources such as the international monetary and capital markets. However, during the past few years Greek banks, due to Greece's financial situation, were excluded from the financial markets and had to rely more on customer deposits. Therefore, the profitability of a bank which heavily relies on deposits in order to fund its assets is negatively affected by the deposits market share (Lekkos *et al.*, 2010; Growe *et al.*, 2014).

With regards to the market growth of the banking industry, its impact on bank profitability also depends on the feature that is examined. As far as the growth rate of the market's total assets is concerned, the study has revealed a negative and statistically significant impact on bank profitability, when the period under examination was from the first quarter of 2001 to the third one of 2014. The effect was still negative but insignificant when the period of the deep financial distress, from the second quarter of 2011 onwards, was not included. Following Apergis (2009) this result is explained considering that a rapidly growing market might initiate hazardous lending, which means that the quality of assets itself is not able to result into the expected profitability that their increase should otherwise entail. Furthermore, a fast-growing market can inflict increasing labor and building costs and advertising expenses on the individual banks, which consecutively negatively affect bank profitability. Nevertheless, this regression result deviates from the findings of Mizraei *et al.* (2013). Finally, the study has revealed that the growth rate of the market's total deposits positively and significantly influences Greek bank profitability. These results are in accordance with those of Pillof and Rhoades (2002). This can possibly be explained by the bank taking advantage of the growing market, despite the fact that deposits are a more expensive source of funding (Lekkos *et al.*, 2010) due to the Greek banks' restricted access to other forms of funding, it manages to convert deposits into profit-yielding assets (Dietrich and Wanzenried, 2011).

1. Conclusions and further research

This paper specified an empirical framework which investigates how various macroeconomic forces and banking industry-related attributes influence the ability of Greek banks to produce profits. In order to explore the explanatory power of the selected factors on Greek bank profitability over the period 2001 – 2014, one out of the four systemic banks was chosen. With the means of the ordinary least squares method, linear multiple regression models were developed. Firstly, in order to explore the impact of the macroeconomic environment on the profitability of a Greek bank, two fundamental constructs, namely growth rate of gross domestic product and unemployment rate were investigated. Secondly, in order to study the effect of the industry structure on the profitability of a Greek bank four factors, namely the deposits market share, the assets market share, the growth rate of the industry's total deposits and the growth rate of the industry's total assets, were examined. Moreover, to account for the recent financial crisis, two time periods were examined separately; from the first quarter of 2001 to the third quarter of 2014, and from the first quarter of 2001 to the first quarter of 2011.

Overall the empirical results provide evidence regarding the mechanism that determines profitability in the Greek banking sector. The study revealed that Greek bank profitability is shaped by both macroeconomic and industry-specific factors. As far as the macroeconomic factors are concerned, the study provided evidence that unemployment rate has a negative effect on bank profitability, while GDP growth has a positive impact on that profitability. Moving to the industry structure-related factors, on the one hand, the rate of growth of the industry's deposits and the bank's asset market share positively affect bank profitability. On the other hand, the rate of growth of the industry's assets and the bank's deposit market share negatively influence bank profitability.

The conclusions could prove to be useful in the Greek banks decision process regarding strategy formulation and implementation. In addition, the findings of the current study are also of considerable relevance to policymakers. The influence of various external environment factors on bank profitability has been examined over a long period including the recent financial crisis, whereas, the empirical findings confirm the results from previous studies on bank profitability. Understanding how bank profitability is shaped by macroeconomic and industry related variables enables bank managers, bank regulators and monetary authorities to design, develop and impose the necessary buffer instruments towards the stability of the whole financial sector.

Finally, the study has been conducted under certain limitations which could be ground for further future research. A first limitation regards the small sample size, due to the particular peculiarities of the Greek banking sector. Future research can overcome this limitation by utilizing a larger sample which will include more banks from various Eurozone or Balkan countries. Furthermore, this paper has studied how macroeconomic and industry related features determine bank profitability. The inclusion in future studies of bank-specific factors and attributes such as the effect of certain political decisions or interventions, on the one hand, and the impact of mergers and acquisitions or even information regarding the banks' upper management and board members, on the other hand, may result in new paths of bank profitability.

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Employee Engagement Factor for Organizational Excellence

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ABSTRACT

Purpose:
The objective of this publication is to identify ways to increase employee engagement in Bulgarian business organizations and identify how such employee engagement affects employee and company performance.
Design/methodology/approach:
Our research is based on the evaluation of employee engagement methodologies used by well-known companies such as Gallup HCM Advisory Group, Deloitte and Aon Hewitt. Based on these, we derive the factors influencing employee engagement in Bulgarian companies.
Findings:
This work focuses on management, in recent years, aimed at retaining and developing the best employees, and their evolution into reliable potential leaders of the organization. This is undertaken to maintain and increase the number of those engaged in the business of company employees as well. The management of a successful leader is considered key to increasing employee engagement. Employee commitment implies something special, additional or atypical in the performance of tasks and job role. This is a behaviour that involves innovation, demonstrating initiative via proactive seeking of opportunities that contribute to the company and exceeding the expected standard of employee performance. The findings can strengthen the already-significant role of management. There is no universal way to increase employee engagement and motivation towards increased productivity, activity, and creativity.
Research limitations/implications:
The study has been undertaken for employees in Bulgaria.

1. Introduction

Managers need to achieve high-value business results in today's dynamic and rapidly-changing environment. It is important to find a successful business model that combines profitable business strategy with employees that are committed to the objectives of the organization. To achieve this goal, the employees should feel recognized and valued. Globally, employee engagement is increased by providing them with opportunities for career development in the company's recognition that they receive from their work, and the company's reputation. Employees need attention and want to see evidence that someone is thinking of them as individuals. Employees must work with inspiration and feel that they contribute to the development of their organizations. Many studies show that the most preferred reward is personal; timely recognition of supervisors and top managers in the company.

Employee engagement has become a hot topic in the last 25 years; numerous studies have been reported in the literature including those of Kahn (Bagyo, 2014). According to him, employee engagement is expressed in physical, mental and emotional connection with the organization in which they work. For Luthaus (2002) it as the strong desire for the employee to remain part of his organization and to use all his efforts, faith and potential to achieve its goals. Similar is the definition of Macey (2006) who considers engagement a personal sense of purpose and focus of energy, personal initiative and efforts to achieve organizational goals. Newstrom and Davis (2007) define it as the extent to which an employee identifies himself with the organization and wants to continue to be part of it. The most comprehensive is the definition of Wiley (2006): this is the extent to which employees are motivated to contribute to organizational success, and are willing to apply discretionary effort to accomplish tasks important to the achievement of organizational goals. The organization Gallup, probably the most widely recognized name associated with employee engagement, defines engaged employees as people who work with passion and feel very attached to their work. They are also responsible for innovations and they are pushing the

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organizations forward (Krueger and Killham, 2006).

Engagement can be defined as the relation of the employee to the organization and its leader, including: 1) a strong belief in and acceptance of the organization's goals and values, 2) a willingness to exert considerable effort on behalf of the organization, and 3) a strong desire to maintain membership in the organization.

Indicators that determine the level of employee engagement are:

• Availability of inspiring working environment and development;

• Opportunity to participate in decision-making and responsibility;

• Provision of internal and external training for employees of all ages;

• Flexible working hours and teleworking;

• Remuneration and well developed bonus system;

• Additional benefits.

The Institute for Employment Studies' (IES) definition of engagement (Robinson, 2003) is as follows:

- Some emphasize the similarity of engagement to the psychological contract, in that it is unwritten, underpinned by trust, a two-way relationship between employer and employee — and easy to break.
- Others stress the need for engaged employees to identify with the organization — to believe in its products or services, and particularly its values. This view indicates that engagement needs to be at a level beyond the job itself, embracing the whole organization and what it stands for.
- Finally, another strand of opinion highlights the need for engaged employees to understand the context in which the organization operates. It is insufficient for employees to be committed to their organization; they also need an element of business appreciation, so that any changes they make to their jobs could be seen to have business benefits.

W3IES' HR contacts, when consulted during 2003, had clear and reasonably consistent views about the ways in which an engaged employee behaves (these are presented in a summary diagram in Figure 1).

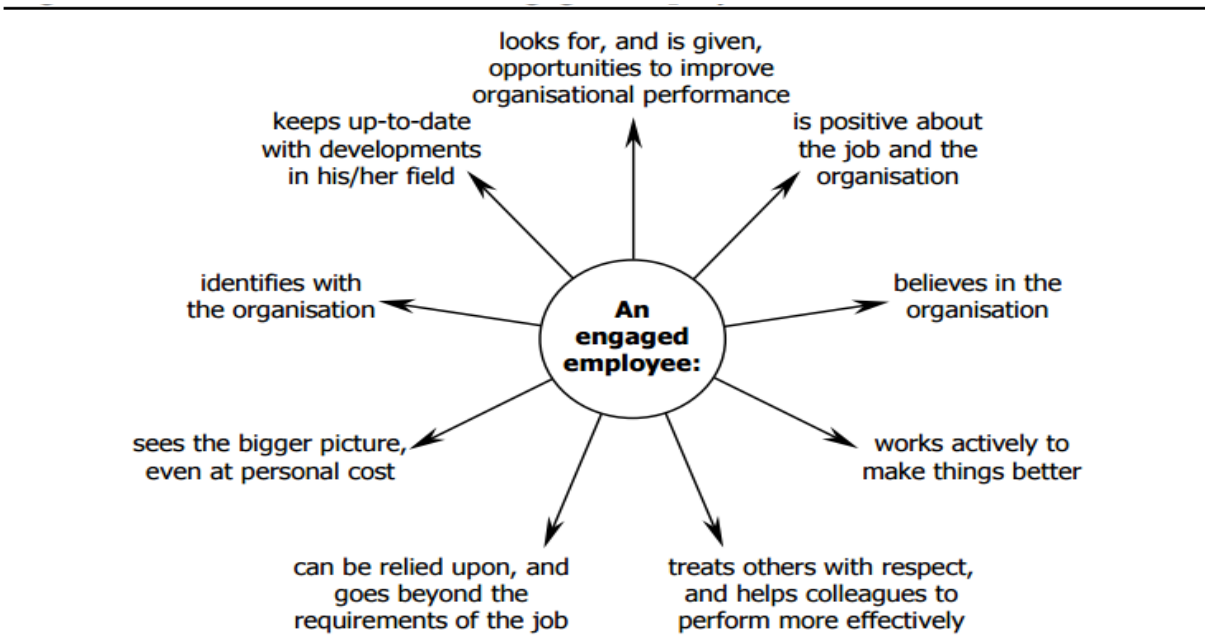

Figure 1: Characteristics of an engaged employee

2. Methodology

The concept for development and involvement of people is aimed at achieving maximum contribution of employees through efforts for their development and involvement in organizational activities. It is closely linked to other fundamental concepts of organizational excellence and plays a crucial role in their implementation. Here it is appropriate to introduce the concept of "human capital". From an economic perspective human capital is reflected in the assessment of the company's capital markets. Dave Ulrich (2010) offers the statement that human capital depends on ability of employees and his engagement. Perfect organization works in both directions to implement organizational policies, strategies, objectives and plans – first to increase the competence of employees and also to increase their engagement. Engagement is associated with the behavior of people in the organization. Engaged employees give emotional, human and physical energy and attention for its success, trying to be more productive, more flexible, and more customer-oriented.

There are numerous studies on the relationship between engagement and organizational excellence. Gallup identifies factors that determine whether employees are engaged in their work, uncommitted or "actively disengaged." The relationship between the results of the study and performance of employees becomes easily visible through these 12 basic questions

that are known as "Q12" of Gallup ("Gallup's Q12"). Here's what every employee should answer:

1. I know what is expected of me at work.
2. I have the materials and equipment I need to do my work right.
3. At work, I have the opportunity to do what I do best every day.
4. In the last seven days, I have received recognition or praise for doing good work.
5. My supervisor, or someone at work, seems to care about me as a person.
6. There is someone at work who encourages my development.
7. At work, my opinions seem to count.
8. The mission or purpose of my company makes me feel my job is important.
9. My associates or fellow employees are committed to doing quality work.
10. I have a best friend at work.
11. In the last six months, someone at work has talked to me about my progress.
12. This last year, I have had opportunities at work to learn and grow.

Usually each study of employee engagement began precisely with a study like the above. This is the base from which the study can continue with secondary research, interviews face to face, focus groups etc. In any case, the feedback gives the HR Manager the required information for building a strategy for managing human resources.

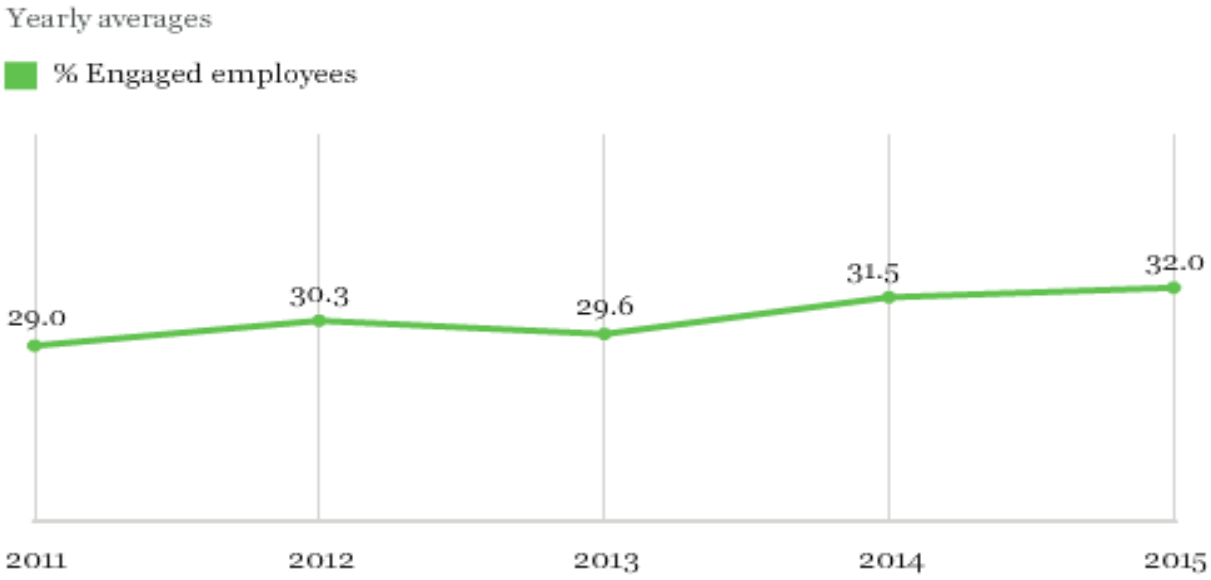

Figure 2: US Employee Engagements, 2011-2015

3. Results and Discussion

Studies on employee engagement show that about one-tenth of employees are strongly engaged and committed to their work. In 2013, for example, the exact number is 13% (according to Gallup). Uncommitted are about 62%. Some analysts divide the group into two parts - "not very engaged" employees and "completely disengaged" (which tend to flee easily). The number of employees engaged in the US seem quite different - 32% for 2015 (according to Gallup, 2016). There is also a tendency towards growth of engaged employees in the last four years (Figure 2). The HR manager needs to assess whether there is a difference and how to approach different groups.

Gallup's data are confirmed by another global study about engagement and satisfaction (The Steelcase Global Report, 2016). The data show that workers that are highly satisfied with various aspects of their workplace also demonstrate higher levels of engagement. Yet, only 13 percent of global workers are highly engaged and highly satisfied with their workplace. The inverse is true as well: 11 percent of employees are highly dissatisfied with their offices and are also highly disengaged (Figure 3).

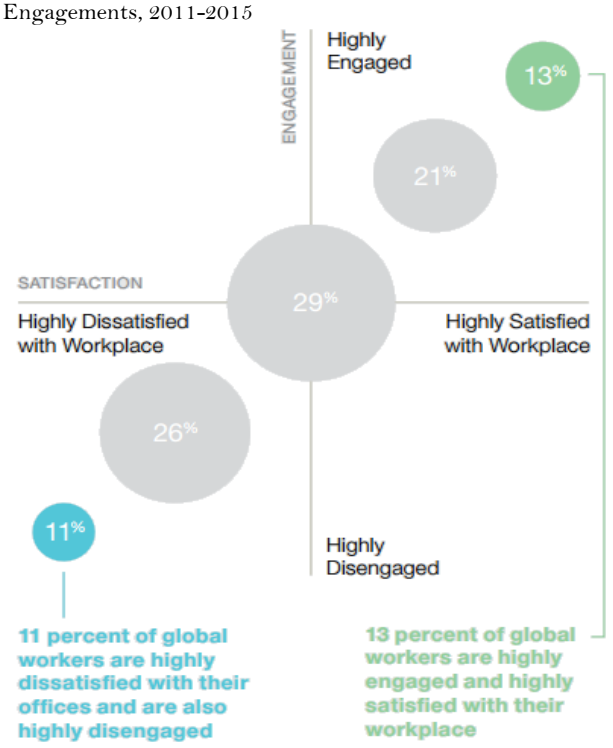

Figure 3: The data reveal high workplace satisfaction positively correlates with high employee engagement.

Globally, this study finds that satisfaction with the workplace directly correlates with higher employee engagement - in other words, the most engaged workers are also the most satisfied with their work environment. This can be an important insight for leaders wanting to improve employee engagement in their organization but have not considered the role the workplace can play. Looking at the detailed findings from each surveyed country reveals distinct differences: cultural diversity, dissimilar work environments and distinct workplace experiences. At the same time, the data make certain commonalities among engaged and satisfied workers throughout the world clearer (Figure 4). Understanding both - differences and similarities - can help point the way for leaders who want to leverage their workplace to help inspire meaningful work and high engagement in their organization.

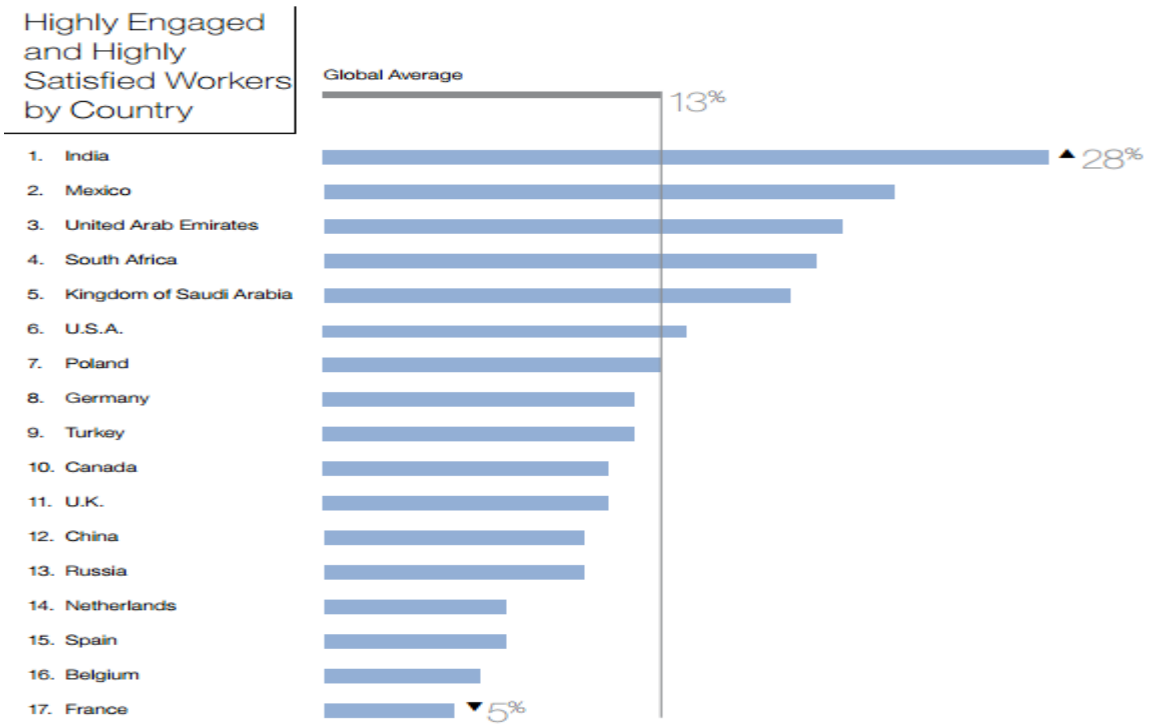

Figure 4: Percentage of workers who are highly engaged and highly satisfied

Other well-known consulting companies, such as HCM Advisory Group, also examined these issues. For example, their study from 2015 questioned the issues relating to programs for employee engagement. Results show that 65% of respondents consider recognition programs as the most important thing, for 56%, wellness programs, and for 53%, having a good balance of work and personal life (Whyte, 2015). Positive corporate image, good relationships with management and colleagues, acquainted with the company's mission and clear personal contribution to the organization are other factors that determine employee engagement.

Another study conducted by Alex Edmans (2014) shows that companies with higher satisfaction of workers usually achieve above-average return on capital.

A survey conducted by Deloitte (2015) among more than 3300 leaders or CEOs in 106 countries shows that participants that consider engagement as "very important" have doubled from 26% in 2014 to 50% this year. While 6% of business leaders who participated in the inquiry have no program to measure and improve engagement, only 12% of respondents have implemented a program to identify and build a strong corporate culture. Seven percent of them think that self-assessment is useful for excellent measurement, improving motivation, and engagement, and retention of employees. The study also shows that employees are becoming more mobile, independent and unpredictable and as a result, more difficult to control and engage with.

A survey conducted in Bulgaria by Aon Hewitt[1] in 2014 shows that employee engagement in Bulgaria is increasing, while the level of dissatisfaction with pay and working conditions remains relatively high. This study found a 10%(total 64%) increase in the level of employee engagement in Bulgaria over the previous year. According to results, the level of employee engagement is inversely proportional to the size of the companies in which they work. For companies with up to 250 employees, the average level of engagement is 66%, companies between 250 and 1,000 employees have 64% of employees engaged whilst 44% of employees in large companies with more than 1,000 employees are engaged.

According to the AON, the involved employees can be found in the pharmaceutical industry, followed by the IT sector and manufacturing. More than half of the employees in these companies speak positively about their employer, whom they want to continue working with in the long term. They also put lots of extra effort

[1] In the study by AON Bulgaria in 2014 are included a total of 56 companies from 12 industries. Nearly 14,500 employees have shared their opinion about their employer and 456 top managers (leaders) have evaluated the companies that manage

into their everyday work, which contributes to business success.

The study also showed that Generational differences and their management are a main issue among top managers in 2014. Employees from 25 to 29 years in Bulgaria for example, have the lowest engagement (52%) compared to the other age groups. The lowest rated factors are remuneration and recognition that people receive from their employer. These are motivating factors that can affect the level of employee engagement. On the other hand, relationships with colleagues in the workplace and support of line managers are among the factors that receive high satisfaction. Young people expect to have open and honest communication with the top-level managers in their companies. That is why they are so critical to them; only 41% see evidence of effective top-level management of the company. On the other hand, only 38% of those surveyed absolutely agree with the statement that "Top management treats employees as the most valuable asset of the company."

Meanwhile, career opportunities that companies provide are the decisive factor in retaining talent and engaging employees. It turns out that every second employee in Bulgaria is not familiar with the opportunities for career development and growth in the company they work at. Currently, managers almost daily have to answer the question: "What could be my growth in this company?". If they don't have a definite and clear answer and don't provide information about the career path of employees, there is a risk of losing their talented employees.

Often existing systems for career development are good only in the form of written procedures and rules. Only half of HR managers of companies surveyed say they have created a clear system for career development for their new employees. Whatever the reason is, when employees do not see their career develop in the company, their commitment is more likely to fall. Only 52% believe that their company develops their talented employees and 50% of them agreed that the company advances those who contribute most to its success. Therefore, employees are left with the feeling that a job well done and achieving goals are not important for professional advancement or better pay.

Dissatisfaction with the pay is linked to disparity with contribution of employees in the company - only 46% of surveyed employees agreed that the payment they receive corresponds to their contribution to the company. Their point of view depends on the extent to which employees are informed on how it can be changed, how is influenced by their contributions and how much they believe that the system for determining the remuneration is clear and fair. Information and communication in these areas have great potential impact on increasing the level of engagement. Efforts made by employers should be aimed at creating a fair remuneration policy - through a transparent system tied to performance, recommended by AON.

They also found that additional benefits play a key role in employee engagement. According to every second employee, additional benefits which the employers provide do not match the employee's needs. More often employees think that quantity and type of benefits offered are not as important as their quality and personalization for their needs. The most frequently-mentioned benefits meeting employee needs are; health insurance, supplementary pension insurance, food vouchers and transportation costs.

The AON study shows an interesting trend in the plans of companies to hire people or reduce staff; only 4% of HR directors are planning staff reduction, while 42% of them plan to increase the staff by up to 10%. Up to 54% of HR managers expect to maintain the same numbers.

Researchers have found positive relationship between employee engagement and organizational excellence outcomes: employee retention, profitability, productivity, safety and customer loyalty. Studies also show that the more engaged employees are, the more likely their employer is to exceed the average industry growth in its revenues. Employee engagement is found to be higher in double-digit growth companies. Research also claims that engagement is positively related to customer satisfaction (Markos 2010). Engaged employee consistently demonstrates 3 general behaviors that improve organizational performance:

- Say – the employee publicly recommends the organization to potential employees and customers
- Stay – despite opportunities to work elsewhere, the employee has a great desire to be a part of the organization
- Strive – the employee uses an additional time.

Organizations with employees that are engaged, have higher level of employee retention as a result of reduced turnover and intention to leave the company, performance, gainfulness, customer satisfaction and growth. Companies with disengaged employees, on the other hand, suffer from waste of effort, earn less commitment from the workers, face raised absenteeism and also have less customer orientation, less labor productivity, and reduced operating and net profit margins.

According to the study the things that most engage employees are opportunities for career advancement, recognition of the work and reputation of the brand. Employees have expectations of the company's leaders - be open and honest in communication and to pay attention on the decisions made by staff members. In addition, the characteristics of a successful leader are clearly indicated as:

- He is concentrated and focused on key areas with the right resources and efforts;
- He is available for employees, giving them the necessary support to perform their daily work tasks;
- He is open and honest in their communications with employees;
- He is an expert in business management and thinks for business success in the long run.

The expectations for the leader are highest because he represents the company and its culture. Employees believe that a good business leader balances their interests with those of the company (64% to 42 % - employees working in companies with strong leaders compared to companies without leaders). They also support and implement successful practices for people management (63% to 42%) and relate to employees as the most valuable asset of the company (55% to 34%).

There is not a universal and generally accepted way to increase employee engagement or their motivation to be more active, more creative and more productive. Based on the results of the reviewed studies concrete actions can be proposed to management to increase employee engagement in Bulgarian business organizations.

- Initially it is better to select the right methods of communication and the right communication channels. There are different possibilities for communication in a corporate environment. In most cases a combination of different channels proved most effective and readily available to employees. That will increase employee awareness of the organization and also its goals.
- Another recommendation is to regularly seek opinions of employees on their work in the company and their satisfaction in different areas of work. There are many ways for doing this and each employer may decide which one to use according to their resources and potential. When managers seek for the employee's point of view this means that they care about staff's opinion and their way of looking at business processes. This inevitably affects how they relate to their duties.
- Managers of the intermediate level of a hierarchical organization have a key role in communicating with employees on a daily basis. Particular attention should be paid to their motivation, because commitment is transmitted from the top to the bottom (top-down) of the organization. The more involved the direct managers are, the more engage will be all other employees in the company.
- Additional benefits should also be mentioned. The needs and the expectations of different groups of employees must be identified. It's possible for management to give the necessary flexibility to decide what to include in personal benefit package and to offer the best options. This demonstrates a personal regard towards the needs of the individual employee.
- Trending approach to engage employees is gamefication. As for the recent development in business' best practices, the concept of gamefication has emerged as a powerful method for encouraging employee engagement. In its essence gamification is transforming the working environment (in a general sense i.e. including corporate culture) into game-like environment (Marchev, Marchev 2011). Gamification leverages design, big data analytics and new research on universal human motivators to influence employee actions. It applies the same principles that inspire people to play games — achievements, status and rewards — and motivates them to put learning and collaboration at the top of their to-do lists. Gamification leads to real, measurable improvements to a wide range of key performance indicators (Bunchball, 2016).
- Aon Hewitt surveys make clear that different generations of employees have different needs and requirements. That's why organizations should have different policies and procedures for their employees. People from the Baby Boom generation (those born between 1945 and 1965) are individualists and are motivated by prestige, status and the privileges that their employers provide. The main factors of the work environment that affect their engagement are attitudes with colleagues, work assignments and a sense of satisfaction from work. Those from Generation X, place an importance on determining their own working hours to achieve a better balance between work and personal life. The employees of this generation in Bulgaria are satisfied with the feedback given from their supervisors, as well as the fact that they encourage them to give ideas and suggestions related to workflow. On the other hand, Generation Y members present the most difficulties to an employer; the representatives of this generation need recognition for their achievements, and also to have good relations with colleagues and their direct superiors.
- The opportunities for career development within the company must be clearly defined. According to the already-quoted study, opportunities for career advancement are among the things that most engage employees.
- Employees of a company are the most valuable asset and they should be made aware of this. Remuneration is only one way to be rewarded for their contribution to the company. There are many other opportunities for doing this, which should be chosen depending on the capabilities and desires of the company's management.

The engaged employee is the one who is ready to make further efforts for the success of the company. He shares with colleagues, clients and friends a positive opinion of his employer. He not only shows its willingness to contribute, but knows exactly how to work effectively because he clearly understands goals and strategy of his employer. He is also aware that his efforts towards quality and efficiency effects the results of his company. The engaged employee perceives organizational success as his own success. In addition, it is easier to keep him in the company because he wants to be part of it.

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Local Support Mechanisms for Entrepreneurship: The Approach of Local Development and Innovation Institutions

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ABSTRACT

Purpose :
The growth potential of SMEs entrepreneurship is examined at regional and local level, initially on a Global scale and then for the case of Greece. Additionally, the possibility of an economic development policy beyond the macroeconomic approach is examined, focusing on business growth and competitiveness in the light of meso and micro-economic policy approach.

Design/methodology/approach:
This research leads to the proposal of building knowledge mechanisms and direct and efficient systematic development and innovation at the local level, particularity during a time of economic crisis. The establishment of Institutes of Local Development and Innovation (ITAK) is primarily geared towards promoting innovative entrepreneurship and extroversion of locally installed businesses. As part of the proposal for the establishment of ITAK, a questionnaire was developed - a tool to initially measure companies' opinions on the need for outside help in the macro, meso and micro environment, in order to demonstrate that ITAK local-level structures could be developed.

Findings:
The survey results were accrued via the analysis of questionnaires distributed to companies. The results of the questionnaires in the micro-environment in relation to those in the macro-environment shows a lower tendency to change business, which may be because managers perceive economics several times more in macroeconomic terms rather than in meso and micro economic (terms).

Research limitations/implications:
The restrictions of this particular research are the small sample of study of businesses in one country (Greece); this is because the approach of study, which is quantitative-qualitative, limits analysis to small data sets in the current phase.

Originality/value:
The results in the micro-environment, in relation to those at macro-environmental, shows a lower tendency to change business, something which may be because managers perceive economics several times more in macroeconomic terms, rather than in meso and micro economic (terms).

1.Introduction

1.1.Articulation of economic policy at the macro, meso and micro level

We examine the possibility of exercising an economic development policy beyond the macroeconomic approach. According to the classic definition of J. Tinbergen: "The economic policy is the deliberate manipulation of a number of instruments to the success of certain goals." (Tinbergen, 1967). "The economic policy is composed by the decisions of (intervention or deliberate abstention from intervention) the state and the organisms that are found in dependence by this, regulation of conditions of production, distribution or utilization of resources" (De Boissieu, 1978).

Often the "abstract approach" to economic policy-making is based on the assumption that the main goal of those practicing it, is the maximization of social prosperity, in the frame of economic system restrictions. In reality, the practicing of the economic policy, usually avoid the strict determination of particular desirable

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prices and commits to a base for strict evaluation. In practice, the formulation of economic policy is never the neoclassical process of "maximization under constraints", but a "landed" process of choice of "satisfactory solution" (Simon, 1947).

To realise an effective economic policy, it is essential to comprehend specific differences between coincidental and structural economic policy. The former includes short-term objectives related to the current economic situation (context), whilst, the latter is based upon long-lasting long-range policy objectives that concern the structural/institutional objectives of economic policy(Clark, 1940; Leon, 1967; Pasinetti, Luigi 1981).

Would it be better, would is sought the "monodimensional purity" in the constitution of economic policy, or to a direction or to the other? Is sought, that is to say, or the absolute "positivism" its or absolute reduction in its ethical optics? Tobe claimed, in other words, or its complete "technical objectivity", from a side, or its absolute integration in a form of "extreme voluntarism", from the other? Galbraith appreciated that this would be an error, mainly because it is unfeasible and ineffective and from both directions. (Galbraith, 1987).

However, in order to better understand the formation of economic policy and the manner of its practice, this research mainly focuses on meso and micro-approaches, rather than on macro-approaches.

Macroeconomics is the study of the economy as a total and the policy that is mainly determined by goals such as high and increasing national product level (i.e. real GDP), high employment with low unemployment and stable or gently rising prices (Samuelson, Nordhaus 2000). Macroeconomic policy however undoubtedly has short-term direct effect on the business world: through monetary policy and in particular, interest rates (Shane, 1996), through taxation (Schuetze & Bruce, 2004), as well as through the consolidation of a climate of stability (Stiglitz, 2000; Parker, 2006).

However, until now macroeconomic policy is a topic of disagreement between economists and politicians. In recent years, macroeconomics is in turmoil. In some fields, such as those relating to the basic elements that influence economic growth, economists widely agree on the forces and trends. In others, especially those relating to cyclical economic fluctuations, the rivaling faculties of macroeconomics compete for the foundation of suitable policies that lower unemployment and inflation (Samuelson, 1998).

Therefore, regard for macroeconomic policy cannot be exhausted, in our opinion, for the achievement of modern innovation-driven economic policy. Micro-economic and meso-economic policy seems to progressively acquires great importance for businesses.

In principle the microeconomic approach relates a specific approach to economic problems, which focuses on the analysis of the behavior/action of the entities operating in the economy (individual and business). It refers to the study of the factors that determine the relative prices of goods and factors of production, focusing on the individual relevant markets (Varian, 2009). The meso-economic assumption concerns mainly the special approach towards economic phenomena in their intermediary, & dynamic evolutionary socio-economic dimension (Yew-Kwang, 1986; Mann, 2011), the factors determining the structural dimensions and the "intermediate" sizes of the tested economic system, as well as the economic activity sectors, their concentration, the localities where they accumulate and penetrate, and the evolving forms of competition and innovation within them (Hamel & Prahalad, 1994; Ruigrok & Van Tulder, 1995).

2. Growth and competitiveness of business in the light of the mesoeconomic and microeconomic policy approach

The macro, meso and micro-approaches can be implemented effectively and efficiently through "visual" socio-economic development and competitiveness. In overall terms, economic growth is linked to the moral and social changes of the population which enable it to cumulatively increase, in duration and, the actual total product (Francois Perroux, 1965). Growth may be intrinsic: each country develops according to its own choice and in proportion to actual values, ambitions and aspirations of its people. Growth also may be global: objectives and problems are fixed in relation to world problems and reflect the general nature of development. The society in which the development occurs is not isolated, but is part of the network of relations and forces around the world, including the most economically-developed societies, as well as those that are more economically-deprived (Iraida, 1982).

Even if differences have been observed in level of statements and accent in the interior of main current of sector of development economy, it should it is said, regarding the developmental policy, from then that was presented the object was also proposed and afterwards was applied the following main strategic ideas: industrialization, rapid capital accumulation, mobilization of underemployed labor and planning, and economic activity of the state. There are of course other central ideas, such as the emphases on creating skills (Amartya, 1983) that seem to timelessly acquire increasing analytical importance.

Substantially as it is clarified by the Vaitsos, the concept of development is not neutral, nor does it express abstract meanings that can easily and unambiguously be visualized in simple and "objective indicators" of socio-economic activity. Instead, growth has evaluative nature and stems from specific social realities to which he refers (1987).

Relatively, with the trend of economic policy approaches towards competitiveness, it could be said that this concept refers to the capacity of an economic unit, enterprise, region or nation to be superior, more efficient, compared to other similar units, in terms of a commonly accepted objective/indicator. For example, an important business goal is profitability, while for nations, it is the high per capita income. Overall, and in a wide perception context, we could say that the competitiveness of each socioeconomic formation and on each level of analysis is linked to survivability, reproduction and development, through the evolving conditions of its external socio-economic environment (Competitiveness Policy Council, 1994; Reve & Mathiesen, 1994; Dunning, 1997).

However, many analysts practice justified criticism in the "narrow" macroeconomic perspective of competitiveness. They call for the more complete approach of questioning, competitiveness, the deepening of study in terms of enterprise (small level) and in terms of sector and region (medium-level). Specifically, competitiveness at the enterprise-level is approached as the capacity of the company to show better performance than its competitors (higher productivity and/or bigger efficiency in the use of her capital and/or bigger share of market and/or higher sales and profits, etc.) In relation to the micro-approach, "the industrial competitiveness of a country or of a wider economic space is simply a matter of how competitive are his/her business." Reve & Mathiesen (1994)

They characterized macro-approaches of competitiveness as "traditional" and exceeded, as they are exhausted in the analysis of "macro-terms" competitiveness, mainly in the relative prices of productive factors and, same, work, capital and energy) and neglect an in-depth examination of what's going on in the interior businesses sectors. With that in mind, the authors consider that the macro-approaches try to boost industrial competitiveness, simply through macroeconomic policy focusing on low inflation, low interest rates to low tax businesses, etc. This, however, is apparently not sufficient anymore. They counter-propose a policy that initialises small-scale competitiveness in operational and sector-based level, in other words simultaneously in small and medium level according to the optics of present research. In their approach, they place particular importance on the quality of products and the organizational knowledge of businesses. They concretely propose the study of three teams of defining factors that, usually pass the "traditional" regard: The existence of persons with enterprising faculties, the creation of aggressive, customer-driven businesses and the constitution of dynamic industrial networkings between businesses (clusters) (Reve & Mathiesen, 1994).

In turn, Best (1990) in the article "Reaching New Competition", on the study of modern American economy considers the relative deterioration of productivity as being more important than insufficient savings in the interior or exterior debt. His approach focuses on the sphere of production, and the role of the business' internal organization. His analysis therefore has a clear micro and strategic orientation. The dominant contemporary phenomenon according to Best is the emergence of the "New Competition", which differs from the old one, in four points: The organization of the company, in the forms of coordination in the various stages of the production chain, the organization of the industry and the types of followed industrial policy. In the background, identifies the overthrow of the axioms of "old competition." The "New Competition", in its perspective, proposes strategic interventions at four levels above and characterized by market making activities as opposed to simply reacting to market developments.

In the case of states and national economies, the strategy refers to the whole State: Human resources in education and entrepreneurship, in infrastructure, innovativeness and cost, the economic territory of the nation and / or to specific regions and localities. The structure and record of sectors plays a very important role, as does the existence of geographic concentrations of economic activity and the "social chapter" (as the degree of collaboration and confidence of economic units.) (Delapierre & Milelli, 1995; Storper, 1997; Michalet, 1999).

3. Development of economic policies and approaches for Small and Intermediate Enterprises (SME) at regional local level

One of the most diachronic guidelines for structuring enterprises economic policy includes and analytically absorbs the dimension of locality in the search for reinforcement of competitiveness and growth of modern enterprises. First, in total terms, the approach of "industrial districts" (industrial districts) contributes to this. The industrial district describes a social entity that includes a number of characteristics, such as: a) the existence of a variety of specialized small and intermediate enterprises organized round a locally-dominant industrial sector, b) a dynamic collaboration and synergy between the local community and the region's enterprises, particularly with regard to the sharing of common values and culture, c) an industrial organization founded in a mixture of competition and collaboration d) an "industrial atmosphere" that emanates from the training and the accumulation of skills(Marshall, 1920).

According to G. Becattini (1973), the industrial district can become perceptible as a territorial concentration of mainly small to medium-sized enterprises that function in an industrial sector and which are specialized in the different phases of productive process of this sector. In "Italian Faculty" (1970, 1980), a "local prism of" approach of competitiveness is proposed. The economists of this faculty see a model of endogenous growth behind the significance of "industrial district" that can, at least partially, be interpreted as coming from certain characteristics of sociological or socio-economic order. In parallel, analyses of the located productive system (système productif localisé) in the French and American area of local growth have been undertaken. Based on Courlet (2008), in the corresponding "French Faculty", the "located productive system" can be determined as a concrete incorporation of enterprises grouped in the territorial neighborhood and, simultaneously, is activated around one or more relevant "industrial" profession. These enterprises maintain relations with each other for a common social-cultural environment of innovation. These relations are not simply market/freight, but are also informal and produce "positive externalities" on their total (Becattini, 1973).

The concept of "innovation environment" (Milieu Innovateur) out of this conceptual basis emerges. Concretely, as an environment of innovation can be defined as a localised total of multiple enterprising action and knowledge, which is open to its abroad and incorporates know-how, rules and "relational chapter" (relational capital). That is to say, the concept of "environment of innovation" attempts, in this way, a synthetic and evolutionary socio-economic explanation of dynamic territorial growth. Significantly, territorial

growth becomes perceptible as a result of such innovative processes, and territorial socio-economic synergies having local scope. The basic components of local innovative system are mainly its reported know-how in the management of productive process with a wide significance; commercial, the organizational and, in general, relational sides of materialized productive process. Rules also determine the behaviors of institutions, decisions of perpetrators, as well as the relations that these elicit from each other - the beginnings of confidence, reciprocity, solidarity, collaboration and competition - and its relational capital that corresponds to the knowledge that each "environment" member allocates to other members. Aydalot, who is considered the founder of this current developmental thought, supports that in reality, it is not the enterprise that innovates but the "environments of innovation" surrounding it, since the accumulated knowledge in the "local environments" always constitutes the base of progress (Aydalot (éd.), 1984,1986a).

Based on these precedents it is understood that the approach of "environment of innovation" via systematic local innovation support faculties is one of the most appropriate ways to enhance the adaptability and engenders competitiveness of individual socio-economic formations for broader global socio-economic development.

At the same time, the "business ecosystem" (Moore, 1996) is a well-known and useful modern approach that in substance incorporates the basic priorities of topical developmental phenomenon that is examined in the present research. which simultaneously focuses on dynamics startups. The relative new significance of the business ecosystem has its roots in the natural ecosystem and ecology. It uses the natural ecosystem and studies various observed phenomena related to businesses. Firstly, the ecosystem is constituted by different organisms that "live" in the same region. The organisms can interact with each other, as well as with the environment in which they are found (Peto, 2008).

Based on the above consideration, Hannon declared the existence of a multitude of common characteristics between the economic science, and ecology; both sciences dynamically study organisms-system having methods of production, exchange, resources and storage, where the total output of the ecosystem can be considered to parallel the GNP (gross national product) of an economy (Hannon, 1997).

Moore (1996) considers a business ecosystem that provides an economic community supported by interacting organizations and individuals as the organisms of the business-enterprising world. In his opinion, a business ecosystem consists of basic producers, competitors, customers and other interested parties. The key of a powerful business ecosystem is found in the leading "fundamental type", as he characterizes them, businesses, that play a major role in the process of co-evolution. Additionally, Moore formulated a second supplementary definition in which the business ecosystem is an extended system of reciprocal supported organisms (e.g. trade unions of workers, communities of consumers, suppliers, governmental institutes etc.) that participate in a partially-deliberate self-organized, but coincidentally shaped environment.

Moore's initial definition places substantial emphasis on the interaction with the environment, and self-organization and decentralized decision-making in the second definition. According to Moore the business ecosystem cycle is comprised of four stages. The first stage, birth, should made more efficacious energies beyond those which lead to the satisfaction of the customers. In the second stage, of extension, the possibility of expansion of the business of tested. The third stage, of leadership, strives for stability in the business environment and the creation of profit. The fourth and final stage of renewal or the death results from the appearance of new ecosystems (Moore, 1993).

Obviously, there are major differences between nature and business-related ecosystems. Originally the perpetrators of business ecosystems were characterized by astuteness and ability of planning and forecasting. In business ecosystems, there is significant competition for the conquest of potential members and aims at innovation, while natural ecosystems only target survival. Moore has identified the conscious choice as the main difference between business and natural ecosystems (Moore, 1996).

Focusing on creating value for customers by the additional provision of information, products and services, Gossain and Kandiah (1998) attempted to extend Moore's theory. The benefit of this business system as a whole is that it is orientated towards helping a company survive. The collaborators and the suppliers are only included in this business ecosystem since the connectivity between them is considered as the motive force of the entire system. The survival of each company is considered to be based on the profit of the entire business ecosystem.

The business ecosystem, therefore, essentially functions as a corporate network where each entity operates in a field, and each field interacts with several other fields. Thus, the changes that occur in a company's field immediately spread to other areas, where other companies can benefit as members of the ecosystem (Lewin; Regine, 1999). However, failure of a member also has an effect of the ecosystem. Companies mainly aim at knowledge-creation, innovation and success, and hope to dominate others and to exploit their potential. This presents a significant challenge in the unpredictable and every-changing business ecosystem environment. The business ecosystem is a dynamic structure that is evolving with the aim of its development and improvement in the passage of time (Peltoniemi, 2004).

Iansiti and Levien (2004) argued that the success of the ecosystem is based on productivity, which affects the success and robustness of any business. The ecosystem survival capacity in light of various (internal and external) shocks, accepts the risk of destruction, as well as the possibility of creating opportunities and new contacts through cooperation and not protectionism.

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4. Economic policy of countries and organizations for the support of entrepreneurship in SMEs (cases: US and EU)

Economic policy, as a necessary ingredient for the support of businesses 'at source' in the 'cell', could present a multifaceted and long-lasting past in many countries around the world. This research examines some important directions and examples of such orientation policies in the US in the EU, before the final formulation of its proposal.

The US adopted formal entrepreneurship support policies much earlier than any other country; as early as 1932 they founded the Organism of Economic Reformation which loaned to American small to medium-sized enterprises in the frame of the "New Deal" of the then President Roosevelt (Jackson, 1941).

Diachronically, the US's economic policy appears to manage, to maintain, and to effectively replicate the force of competitiveness of the US economy, adapting particularly effectively to the priorities and the means of policy.

The reports of the US's Council of Competitiveness from the beginning of the 90s have already captured and effectively answered the big issues of competitiveness for a country in the frame of globalization, in a way that appears particularly "advanced" even until today (Competitiveness Policy Council, 1992, p.2,p.11). Combined thematics and sectors-key in this total policy are rendered in an absolutely explicit way, the creation of favorable enterprising environment, the policy of education and training, the maintenance of technological avant-garde and long-lasting, structural targeting (Competitiveness Policy Council, 1992, p.35-36).

The US provides direct support to entrepreneurs and small businesses via a body of policy acts guiding the Small Business Administration governmental service. The SBA's mission is the maintenance and the intensification of the national economy, facilitating the establishment and viability of small enterprises. The activities of service are summarized with "3C": capital, contracts and consulting, from the use of the English terms capital, contracts and consulting. One of the important functions of the Small Business Administration is the offering of loans that are made through banks, credit unions and other lenders collaborating with the SBA. Borrowing by SBA is supported by governmental guarantee. Following the financial freeze in 2008, mediation of the Recovery Act (Recovery Act) and the Small Business Job Act (Small Business Jobs Act), the SBA has increased its loans in order to be able to provide up to 90% guarantee on a loan to strengthen small businesses' effective access to capital. As a result, the service at the end of 2008 recorded the highest historical volumes of borrowing. The SBA has at least one office in every US state. Additionally, the service provides licenses to participate in counseling programs, including 900 Small Business Development Centers (Small Businesses Development Centers), which are usually in colleges and universities, 110 Women's Entrepreneurship Centers and a specialized organization, SCORE, which includes approximately 350 separate parts, and which is a voluntary network of consultants, of retired and experienced business executives. These advisory services are provided annually to more than a million entrepreneurs and small business owners (Markiewicz, 2011).

Respectively, and in the frame of the European Union,in the past, in the space of articulation policy to boost the competitiveness in Europe was already wide.

We also briefly examine some important aspects starting from the 'viewpoint' of the 90s; as early as the middle of the critical decade of the 90s, according to the highly advanced for the era, visual of Jacquemin, the debate on the European approach of competitiveness must, always start from three key findings: First, the European approach for competitiveness should not consider international trade as a game of "zero-sum", unlike some harsh neo-interventionist, protectionist views. The White Paper on "Growth, Competitiveness and Employment" (1993) considers the opening of international trade - with low paid - countries as beneficial for the EU. Secondly, competitiveness is not a concept that mobilizes public opinion in Europe. It needs a clarification of the relationship between the boosting of competitiveness and the economic and social objectives that it serves. Thirdly, in global terms, EU competitiveness is used as a tool for creating an attractive Europe, in terms of activities and employment, leading to sustainable/ conservable development. To this end, it needs improvements in the efficiency of individual national economies by the strengthening of basic factors of competitiveness such as material infrastructure, research, education and training (Jacquemin, 2001).

Jacquemin supports, in particular, that the effort to enhance competitiveness cannot "be exhausted" in the effort of labor productivity growth (i.e. growth in value added per man-hour), even when it is perceived "one-dimensionally" and is implemented by reducing labor participation in production: in quantitative and/or qualitative terms. According to his view, apart from the importance of "low-cost" rate of work in the effort to increase production efficiency, three additional factors play an important role: Initially the factors of reinforcement of competitiveness that are connected with the "non- price competition" and which, with difficulty, are impressed quantitatively (quality of product, efficiency of commercial networks, variety of types of production, sectorial and geographic specializations, etc.). This provides the ability to integrate innovations in the overall business strategy and finally, establish an efficient internal organizational structure, capable of implementing innovative marketing strategies (Jacquemin, 2001).

In particular, at least twenty-five years ago, Jacquemin estimates that the "European company" should reconcile productivity with the flexibility and should increase the potential for cooperation between all workers, in order to target "new productivity"; a subject which to this day maintains enormous importance. At the same time, he proposes the overtaking of traditional "industrial policy" by proposing exposures into a logical "closer" to individual firms. He clarifies that the conventional approach of strengthening "national champions" and particular sectors should be progressively replaced by encouraging the dissemination of information, the effort of assimilation of "best practices", incentives for innovation, promotion of joint E&A networks (public and private research institutions), facilitating 'new entrepreneurship ' and improvement of access to foreign markets (Jacquemin, 2001).

Nowadays, the EU utilises the "Small Business Act for Europe" policy, the purpose of which is to provide stimulus towards the development of small and medium-sized European companies. The "Small Business Act" is the EU policy framework which is specifically designed to help SMEs grow and stimulate job-growth. In the "Small Business Act", EU Member States and the Commission implemented actions between 2008 and 2010 to reduce administrative burdens, facilitate SMEs' access to finance and support their access to new markets (European Commission, 2011).

The "Small Business Act" represents the first coherent policy framework for SMEs, both in the EU and its Member States. Following its adoption in June 2008, important progress has been made via actions to strengthen SMEs in various sectors. Firstly, 100,000 SMEs have benefited from the financial instruments provided by the framework program for competitiveness and innovation, and which has led to the creation of more than 100,000 jobs. Secondly, due to the late payments directive, public authorities are now required to repay their suppliers within 30 days, thereby improving business' cash-flow. Thirdly, in most EU Member States the time and costs of establishing a company has greatly reduced; the average time for setting up a private limited company in 2010 came to be seven days and the average cost of EUR 399; whereas in 2007 this took 12 days and cost EUR 485 . Fourthly, simplified online procedures and opportunities for joint bidding have facilitated SME's the access to public procurement. Finally, the new center for EU SMEs in China helps EU SMEs access the Chinese market (European Commission, 2011).

Although all Member States have recognized the importance of a rapid implementation of the "Small Business Act", the approach and the results achieved vary considerably from one Member State to another.

According to statements made by the European Commission, it is determined to continue giving priority to SMEs. However, it is clear that it should take further measures in many sectors of priority, to adjust the "Small Business Act" according to recent economic developments, to improve the business environment for SMEs and particularly, in countries with significant disabilities such as Greece (European Commission, 2011), and to align it with the priorities of the "Europe 2020" strategy.

It can achieve better SME access to investment and growth finance, to loan guarantees through the aid system, with plan of action for the better access of SME in the financing; providing among others, access to venture capital markets, as well as targeted measures to inform investors about the opportunities offered by SMEs, and with the creation of easy access EIB loans via mechanisms of European Union from the all banks, independent of size.

Also, anti-bureaucratic "smart regulation" should be diffused and fully implemented to enable SMEs to concentrate on their core activity and partake of the full benefits of the single market structures (European Commission, 2011).

Overall, the European environment and the corresponding political will of the EU institutions is absolutely ripe for strengthening specialized small and medium entrepreneurship support mechanisms in the Member States, assimilating optics structural, flexible, that are locally focused and dedicated to the diffusion of innovation and development.

5. Institutes of Local Development and Innovation

This research thus leads to the proposal of building mechanisms of systematic development, knowledge and innovation at local level. These dimensions, we feel, could prove the most critical aspect of overall crisis extraction process for the country today.

In particular, it is proposed that the constitution of local mechanisms of developmental co-ordination, pumping and diffusion of information and modern operational know-how, is achieved by focusing on the promotion of innovative entrepreneurship and the extraversion of our locally-installed businesses. The Institutes of Local Development and Innovation (ITAK) are mechanisms of developmental co-ordination, pumping and diffusion of information and modern operational knowledge, that focus on the promotion of innovative entrepreneurship and the extraversion of our locally-installed businesses. In this context, economic policy could be refocused to target the following: i) stimulate competitiveness of our local operating SMEs, ii) increase the attractiveness for new investment, iii) the systematic strengthening of the local production grid, for a large number of regions in Greece (Vlados 2007, 2014).

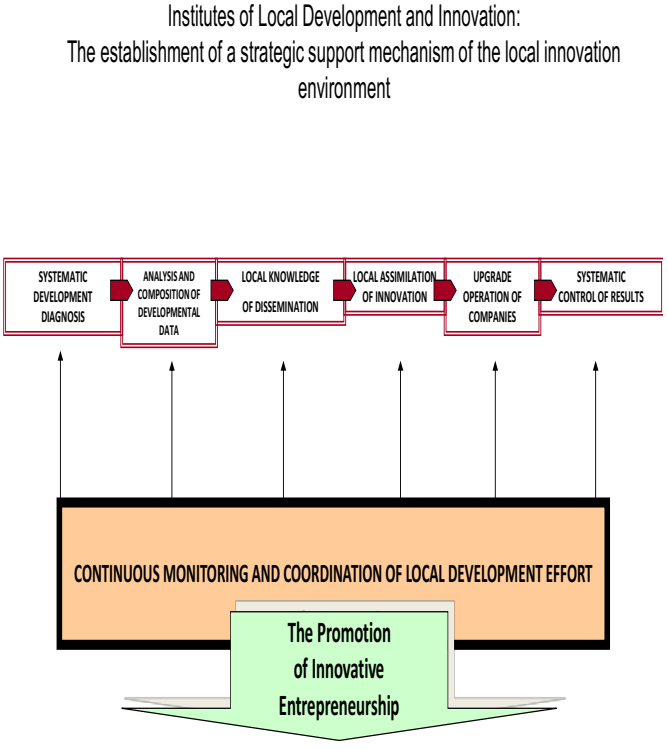

Figure 1: Institutes of local development and innovation: The establishment of strategic support mechanism of the local innovation environment

The center of gravity and the sovereign claim of this interventionist mechanism (ITAK) should be the direct aid of local enterprise and business agility via their enrichment with sufficient resources, tangible and intangible, with facilities, equipment and specialists that are mostly scattered and uncoordinated in various state institutions and agencies, to manage essential local development actions. The intervention could include an integrated support cycle of our SMEs (European Commission, 2011).

With such thoughtful in the center of action it can, henceforth, be placed something that would compose, all that become and that should become in the forehead of overcoming the crisis today. To facilitate imagine, something like developmental "Citizens Service Centers" with focus, however, on the area of business and production. That is, a mechanism with a regional and local focus, which will succeeds in giving a "point of contact" of coordination of all actors, organizations and services related to the innovative and developmental reality of various regions of a country (European Commission, 2011).

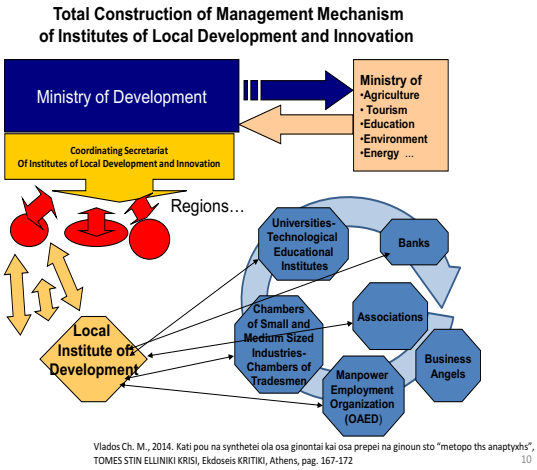

Figure 2:Total Construction of Management Mechanism of Institutes of local development and Innovation

In practice this constitutes a new frame of composition of actions and developmental initiatives. However, to be proved truly effective, it must from the outset "be endowed" with a special institutional framework of operation that ensures it can actually be proved quickly, reliably, focused on the cooperation, based on complementarity of resources and needs, as well as the increase of added value of all structural interventions (European Commission, 2011).

6. Methodology

In the frame of the ITAK proposal, a questionnaire was created to determine if local business were interested in the approach of creating such a local level structure in Greece.

Initially, the questionnaire is divided into four sections, the first category includes questions of macro-economic nature and more specifically, the needs of businessmen in national context in terms of political stability, economic balance, technological competence and social cohesion.

The second section again includes such questions of macro-environment. In this category, we questioned the businessmen's opinion on tax reduction , lower lending interest-rates, more flexible conventions of work and lower wage, facilitation of banking financing, reinforcement of domestic demand.

The third unit includes questions of sectoral business agility (mesa-economic approach), substantially the businessmen answer questions on how much they would wish for: i) exercise of concrete sector-based policies that would strengthen the businesses of sector, ii) concrete meters of aid for investment in the sector, through the new Community programs, iii) concrete meters of aid for exports.

The fourth and final section essentially focuses on micro-environment. Specifically, the businessmen were asked how much they would want for their businesses: advice for financing, more and improved training for their staff, consulting, cooperation with universities and research centers. An open type question was placed at the end of each section; the businessman must answer how important he considers the factors combined together (i.e. on questions of each section) for his business, and why.

The remaining questions in all categories are scored based on the scale, from 0 (that corresponds to not important) - 5 (very important). In each question, the businessman replies to two measuring tables, one for what he wants today and one for what he wanted five years ago. This time-comparison margin arises as a parameter in order to measure what "today's" entrepreneur thought he wanted five years ago in order to consider the segment diversified-influenced by way of perception, action and whether the business of culture was impacted.

In this research, the sample is small and medium-sized enterprises in the tourism industry, operating in Greece.

7. Discussion and Conclusion

Concerning the above results, in this research, it could be said that:

The macro level shows the behavior of firms has a high tendency to change in five years ago. In particular, almost all the businesses would like economic balance (at national level), technological competence and social cohesion.

The specific macro-environment seems to be one area, that compared to five years ago, that show the need for drastic changes to proper functioning, in particular through measures such as reducing tax and lending rates, and facilitate their bank financing.

The results in these two sectors may be high because of the difficult economic crisis prevailing in Greece.

The results also show that desire for change in business is much higher than five years ago. This propensity to aid enterprises appears to exist more in the need for measures that concern investments in the sector, and the application of sector-based policies for the aid of business agility.

Finally, in the micro level, companies want partial implementation of microeconomic measures. Sixty percent of businesses (30% increase compared with five years ago) would like much more funding advice. In relation to business cooperation with universities and research centers, approximately 30-50% of businesses directly ask for such support.

The results of the questionnaires in the micro-environment in relation to those macro-environmental show a lower tendency to change business, something which may be because businesses perceive economics (several times more) in macroeconomic terms rather than in meso and micro economic (terms). The one-sided perspective of many businesses several times is owed to the lack of comprehensive business culture, education and knowledge on what changes are needed at local level to evolve and innovate, because they give more attention to macroeconomic terms.

7.1 Limitation

The small sample of study of enterprises in Greece constitutes the main limitation of this particular research; this is because the approach of study is quantitative-qualitative which cannot be undertaken on a larger-scale in the present phase.

However, the present research is not one long-lasting (longitudinal) study that could be used to temporally compare the answers for today and five years ago. In this way, we attempted to determine his enterprising culture - perception and viewpoint, how much these were influenced, and are influenced today in combination with what he believes and what he acted upon in the past.

7.2 Future research

A future study will be undertaken using a larger sample. It will also examine how the Institutes of Local Development and Innovation are developed locally and in what form, as well as determining the feasibility of such structures.

We will also consider the perspective of regional level cooperation, and comparisons with various mechanisms and structures such as ITAK that exist in other EU countries.

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Appendix/Questionnaire

Questionnaire: How much interesting appears the approach of Institutes of Local Development and Innovation (ITAK) in Greece?

Way of Marking:

0	1	2	3	4	5
Not Important					Very Important

1st Section:

1) I wish political stability at the national environment.

5 YEARS AGO:

0	1	2	3	4	5

TODAY:

0	1	2	3	4	5

I wish economic balance in national environment.

5 YEARS AGO:

0	1	2	3	4	5

TODAY:

0	1	2	3	4	5

3) I wish technological sufficiency in the economic environment.

5 YEARS AGO:

0	1	2	3	4	5

TODAY:

0	1	2	3	4	5

4) I wish social cohesion in the national environment.

5 YEARS AGO:

0	1	2	3	4	5

TODAY:

0	1	2	3	4	5

5) Overall how do you think that these factors together are important for your business and why (describe in short)?

2ndSection:

1) I would like a reduction of taxation.

5 YEARS AGO:

0	1	2	3	4	5

TODAY:

0	1	2	3	4	5

2) I would like lower interest-rates of lending.

5 YEARS AGO:

0	1	2	3	4	5

TODAY:

0	1	2	3	4	5

3) I would like more flexible conventions of work and lower wages

5 YEARS AGO:

0	1	2	3	4	5

TODAY:

0	1	2	3	4	5

4) I would like facilitation of banking financing.

5 YEARS AGO:

0	1	2	3	4	5

TODAY:

0	1	2	3	4	5

5) I would like reinforcement of domestic demand

5 YEARS AGO:

0	1	2	3	4	5

TODAY:

0	1	2	3	4	5

6) Overall how do you think that these factors together are important for your business and why (describe in short)?

3rd Section:

1) I would like exercise of concrete sector-based policies that would strengthen the businesses of my sector.

5 YEARS AGO:

0	1	2	3	4	5

TODAY:

0	1	2	3	4	5

2) I would like concrete measures of aid for the investments in my sector, through the new Community programs.

5 YEARS AGO:

0	1	2	3	4	5

TODAY:

0	1	2	3	4	5

3) I would like concrete measures of aid of exports for the businesses of my sector.

5 YEARS AGO:

0	1	2	3	4	5

TODAY:

0	1	2	3	4	5

4) Overall how do you think that these factors together are important for your business and why (describe in short)?

4th Section:

1) I would like advice for financing of my business.

5 YEARS AGO:

0	1	2	3	4	5

TODAY:

0	1	2	3	4	5

2) I would like better - more professional training for the persons of my business.

5 YEARS AGO:

0	1	2	3	4	5

TODAY:

0	1	2	3	4	5

3) I would like advisory services for my business.

5 YEARS AGO:

0	1	2	3	4	5

TODAY:

0	1	2	3	4	5

4) I would like collaboration with universities and inquiring centers for my business.

5 YEARS AGO:

0	1	2	3	4	5

TODAY:

0	1	2	3	4	5

5) Overall how do you think that these factors together are important for your business and why (describe in short)?

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On Risk Induced by Technical Change

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ABSTRACT

Purpose:
The purpose of this paper is to analyze the efficiency loss due to incomplete financial markets when risk is induced by technological uncertainty.
Design/methodology/approach:
A worker-capitalist general equilibrium model is developed. It is assumed that future technical change is a stochastic event, causing uncertainty in future relative prices. Then the model is calibrated to the US data.
Findings:
Our first finding is theoretical: the competitive equilibrium is Pareto-inefficient. Then we numerically calculate the taxes that make all individuals better-off at the calibrated parameter values. The results clearly show how the burden of taxation should be shared among workers and capitalists when the government uses redistribution of income as a tool of mitigating the loss of efficiency due to technological shocks.
Research limitations/implications:
The model is obviously a stripped-down version of reality, and hence, the results should be taken with a grain of salt as the numerical computations would be definitely sensitive to certain rich details of real life that are neglected in this study.
Originality/value:
The results show that the total amount of employment, and production are not affected by optimal taxation, which is a surprising result. Indeed, the inefficiency is primarily caused by the distribution of labor supply among individuals. The optimal taxes are also numerically computed.

1. Introduction

Innovation ensures the feasibility of improving the welfare of all individuals in a given society. Nevertheless, technical change is seldom unanimously supported. For example, labor saving technology poses a serious risk to the welfare of blue collar workers since they often cannot insure themselves against the possibility of lower wages caused by changes in technology. That is why, a labor saving technical change can be resisted by manual workers due to the possibility of a fall in wages.

This study considers a similar scenario in a general equilibrium setup. We assume technical progress is a stochastic event causing uncertainty in future relative prices. To the best of our knowledge, no market economy offers an insurance against unfavorable relative prices caused by future technical change. Lack of insurance is known as incomplete markets in economic theory.

The most fundamental problem inflicted by market incompleteness is that competitive equilibrium may fail to be Pareto-efficient. Of course, this does not immediately command government intervention. Economic policies, regardless of how genuinely designed they may be, can also fail to bring about efficiency if the government is also subject to the same incompleteness of markets that all other agents face. Indeed, Diamond (1967) proves that is exactly the case when there is a single good in every possible state of the economy.
Interestingly, Diamond's result does not generalize to economies with multiple goods. For example, assuming there are multiple goods, Citanna *et. al.* (1998, 2006) show that competitive equilibria are generically constrained Pareto-inefficient, which means government intervention subject to the same constraints that individuals face almost certainly brings about higher utility for some individuals without hurting anyone in equilibrium.

In this study, we study a two-period production economy with workers and capitalists who are otherwise identical. The second period involves the possibility of a labor-saving technological progress with a given probability. This potential of labor-saving technology poses the risk of lower employment and wages for workers. Since there is no insurance for the possibility of lower real wages in real life, we also assume that individuals cannot insure themselves against the risk of

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possible changes in relative prices in the future. Our first result theoretically shows that under these conditions the competitive equilibrium is not Pareto-efficient. Then we numerically analyze, by calibrating the model parameters to the US data, whether the redistribution of income can ensure higher utility for workers without hurting the capitalists.

The simulation results suggest that the redistribution of income is capable of restoring full Pareto-efficiency. Furthermore, we also show that this can be achieved via two different methods which yield identical results. According to the first approach, workers should be taxed in the first period to finance the subsidies that they would get in case the labor saving technological progress actually takes place. The second approach stipulates taxing the capitalists in the first period to finance their subsidies in the second period if no technological progress takes place.

It is noteworthy that the results also show that the employment, and thus production, with redistribution of income is identical to the case of no intervention Indeed, the difference between two polar cases is the labor supply decisions of workers and capitalists while total employment is the same. Workers supply more and capitalists supply less labor when there is no government intervention (implying inefficiency) compared to the case of optimally designed redistribution of income.

The next section introduces the model. Calibration results are presented in Section 3. Section 4 is the conclusion.

2. The Model

Consider a two-period economy with n individuals and m firms. Individuals enjoy consuming a produced good and leisure in each period. In the first period there is no uncertainty. However, in the second period, there are two possible states of the world that can be realized. The uncertainty is due to an exogenous technical change.

More formally, there are three states denoted by $s = 0,1,2$. The state 0 denotes the first period where there is no uncertainty. The states 1 and 2 are two possible states of the world in the second period. Suppose that state s will occur with probability θ_s. Since the first period (i.e. state 0) involves no uncertainty, it follows that $\theta_0 = 1$. It is also certain that either state 1 or 2 occurs in the second period, implying $\theta_1 + \theta_2 = 1$. Write $\theta = (\theta_0, \theta_1, \theta_2)$.

The only exogenous of the model depending on s is the production function

$$f_s(L_{j,s})$$

where $L_j = (L_{j,0}, L_{j,1}, L_{j,2})$ is a vector denoting the labor demand by firm j for all possible states of the economy. Assume that $f_s(\cdot)$ is concave and smooth. Observe that the production technology $f_s(\cdot)$ depends on the state of the world s, whose details will be made explicit in the sequel.

Write p_s for the price of the produced consumption good, and w_s for the wage of labor in state $s = 0,1,2$. Then, given the production technology, prices, wages, and the probability distribution of possible states, each firm j maximizes expected total profits by solving

$$\max_{L_j} \sum_{s=0,1,2} \theta_s \pi_{j,s} \tag{1}$$

where

$$\pi_{j,s} = p_s f_s(L_{j,s}) - w_s L_{j,s}$$

is the profit generated by firm j in state $s = 0,1,2$.

Profits of the firms are distributed to their shareholders. The sum of profit income that individual i receives is denoted by $\pi_{i,s}$ for each state $s = 0,1,2$. There are two types of individuals. Workers, the first type of individuals, have no profit share, and thus, finance their consumption only by supplying labor as we shall see soon. Property owners (i.e. capitalists), the second type of individuals, own strictly positive amounts of profit shares. Assume that all property owners own equal profit shares.

All workers and property owners are endowed with preferences represented by a concave and smooth utility function $U_i(c_i, l_i)$ where $c_i = (c_{i,0}, c_{i,1}, c_{i,2})$ and $l_i = (l_{i,0}, l_{i,1}, l_{i,2})$ represent the consumption good and leisure enjoyed by the individual i in states $(0,1,2)$.

The preferences of the individual can be represented in expected utility form:

$$U_i(c_i, l_i) = \sum_{s=0,1,2} \theta_s u_i(c_{i,s}, l_{i,s}) \tag{2}$$

where u_i is the instantaneous utility function. Suppose that

$$u_i(c_{i,s}, l_{i,s}) = \frac{c_{i,s}^{1-\sigma}}{1-\sigma} + \mu \frac{l_{i,s}^{1-\sigma}}{1-\sigma}$$

implying the elasticity of substitution between consumption and leisure $1/\sigma$ is constant. The parameter μ gives the relative weight of utility derived from leisure with respect to utility derived from consumption.

The asset markets are assumed to be incomplete. This means there is no way to insure consumption between possible states 1 and 2 in the second period. Therefore, the budget constraint is given by

$$\beta_i(p, w, q) = \left\{ (c_i, l_i, z_i): \begin{array}{c} p_0 c_{i,0} + w_0 l_{i,0} + q z_i = w_0 + \pi_{i,0} \\ p_s c_{i,s} + w_s l_{i,s} = z_i + w_s + \pi_{i,s} \\ for\ each\ s = 1,2 \end{array} \right\}$$

where q is the price of financial assets, and z_i is the amount of financial assets bought by individual i.

Under these conditions, the individual i maximizes expected utility by solving

$$\max_{(c_i, l_i, z_i)} U_i(c_i, l_i) \ s.t. (c_i, l_i) \in \beta_i(p, w, q)$$

where $\beta_i(p, w, q)$ is the budget of individual i.

Notice that all exogenous of the model except the production technology (e.g. preferences, endowments, etc.) are certain. The markets are incomplete since there is no insurance against the uncertainty inherent in the production technology.

Now the definition of competitive equilibrium with incomplete markets (CEI) can be presented:

Definition 1: CEI is a vector $\langle (c_i, l_i, z_i)_{i=1}^n, (L_j)_{j=1}^n, q, (p_s, w_s)_{s=0,1,2} \rangle$ such that

(c_i, l_i, z_i) solves (1) for each i, and L_j solves (2) for each j, and product, labor, and asset markets clear:

$$\sum_i c_{i,s} - \sum_j f_s(L_{j,s}) = 0$$
$$\sum_i l_{i,s} + \sum_j L_{j,s} - n = 0$$
$$\sum_i z_{i,s} = 0$$

for each $s = 0,1,2$.

This equilibrium definition captures the notion of competitiveness in the sense that consumers and firms are price takers, and markets clear. However, competitiveness does not suffice for Pareto-efficiency in the present context in contrast to the competitive equilibrium *à la* Arrow-Debreu-McKenzie. That is to say, CEI may not be Pareto-efficient. Now let us see that this is actually the case.

Theorem 1: CEI is not Pareto-efficient.

Proof: Let

$$\langle (c_i, l_i, z_i)_{i=1}^n, (L_j)_{j=1}^n, q, (p_s, w_s)_{s=0,1,2} \rangle$$

denote the CEI. First note that there are 3 Walras' Laws in this economy implying we need to normalize prices three times. Let $p_s = 1$ for all $s = 0,1,2$ without loss of generality.

The first order conditions of individual optimality are

$$\begin{aligned} \frac{du_i}{dc_{i,s}} - \lambda_{i,s} &= 0 \\ \frac{du_i}{dl_{i,s}} - \lambda_{i,s} w_s &= 0 \\ q\lambda_{i,0} - \lambda_{i,1} - \lambda_{i,2} &= 0 \end{aligned} \tag{3}$$

for each $s = 0,1,2$, and

$$\begin{aligned} c_{i,0} + w_0 l_{i,0} + q z_i &= w_0 + \pi_{i,0} \\ c_{i,1} + w_1 l_{i,1} &= z_i + w_1 + \pi_{i,1} \\ c_{i,2} + w_2 l_{i,2} &= z_i + w_2 + \pi_{i,2} \end{aligned} \tag{4}$$

at the CEI since (c_i, l_i, z_i) solves individual i's optimization problem. As usual, $\lambda_{i,s}$ is the Lagrange multiplier associated with the budget constraint of individual i at state s.

Had the CEI been Pareto-efficient, the equilibrium allocation $(c_i, l_i)_{i=1}^n$ and $(L_j)_{j=1}^m$ would also solve

$$\max \sum_i \rho_i U_i(c_i, l_i)$$
s.t.
$$\sum_i c_{i,s} - \sum_j f_s(L_{j,\square}) = 0$$
$$\sum_i l_{i,s} + \sum_j L_{j,s} - n = 0$$

for some positive welfare weight $\rho = (\rho_1, \dots, \rho_n)$. The first order conditions are

$$\begin{aligned} \rho_i \frac{du_i}{dc_{i,s}} - \gamma_s &= 0 \\ \rho_i \frac{du_i}{dl_{i,s}} - \delta_s &= 0 \end{aligned} \tag{5}$$

$$\delta_s - \gamma_s f_s'(L_{j,s}) = 0$$

First let us see that $\rho = (\rho_1, \dots, \rho_n)$ is proportional to

$$\left(\frac{1}{\lambda_{1,s}}, \cdots, \frac{1}{\lambda_{n,s}}\right).$$

To see that, first note that if $\rho = (\rho_1, \dots, \rho_n)$ is a vector of welfare weights solving the Pareto-efficiency conditions (3-4), then $a\rho = (a\rho_1, \dots, a\rho_n)$ is also an admissible vector of welfare weights for any $a > 0$. This means one of the welfare weights, say ρ_1, can be set to any arbitrary positive number.

Hence, let

$$\rho_1 = 1$$

which implies

$$\gamma_s = \lambda_{1,s}, s = 0,1,2.$$

As a consequence,

$$\delta_s = w_s \lambda_{1,s}$$

and

$$(\rho_1, \dots, \rho_n) = \left(1, \frac{\lambda_{1,s}}{\lambda_{2,s}}, \cdots, \frac{\lambda_{1,s}}{\lambda_{n,s}}\right).$$

due to (3-5). Deduce that the marginal rates of substitution between any two goods at any states are equal for all individuals. This is the standard condition of equal marginal rates of substitution among individuals for Pareto-efficiency.

It follows that

$$\frac{\frac{du_1}{dc_{1,1}}}{\frac{du_1}{dc_{1,s}}} = \frac{\frac{du_i}{dc_{i,1}}}{\frac{du_i}{dc_{i,s}}}$$

and

$$\frac{\frac{du_1}{dc_{1,1}}}{\frac{du_1}{dl_{1,s}}} = \frac{\frac{du_i}{dc_{i,1}}}{\frac{du_i}{dl_{i,s}}}$$

for all i and s. In open form,

$$\left(\frac{c_{1,1}}{c_{1,s}}\right)^{-\sigma} = \left(\frac{c_{i,1}}{c_{i,s}}\right)^{-\sigma} \text{ and } \left(\frac{c_{1,1}}{l_{1,s}}\right)^{-\sigma} = \left(\frac{c_{i,1}}{l_{i,s}}\right)^{-\sigma}$$

which is equivalent to

$$\frac{c_{1,1}}{c_{1,s}} = \frac{c_{i,1}}{c_{i,s}} \text{ and } \frac{c_{1,1}}{l_{1,s}} = \frac{c_{i,1}}{l_{i,s}}.$$

In other words, k is such that $(c_1, l_1) = k \times (c_i, l_i)$. Assume, without loss of generality, individual 1 is a worker, and individual i is a property owner. This implies

$$\begin{aligned} c_{1,0} + w_0 l_{1,0} + q z_1 &= w_0 \\ c_{1,1} + w_1 l_{1,1} &= z_1 + w_1 \\ c_{1,2} + w_2 l_{1,2} &= z_1 + w_2 \end{aligned}$$

and

$$\begin{aligned} k(c_{1,0} + w_0 l_{1,0}) + q z_i &= w_0 + \pi_{i,0} \\ k(c_{1,1} + w_1 l_{1,1}) &= z_i + w_1 + \pi_{i,1} \\ k(c_{1,2} + w_2 l_{1,2}) &= z_i + w_2 + \pi_{i,2}. \end{aligned}$$

However, the first order conditions of individual 1 given by (3) yields

$$c_{1,s} = (w_s)^{\frac{1}{\sigma}} l_{1,s}$$

for all s. Therefore

$$l_{1,0}\left(w_0 + (w_0)^{\frac{1}{\sigma}}\right) + q z_1 = w_0$$
$$l_{1,1}\left(w_1 + (w_1)^{\frac{1}{\sigma}}\right) = z_1 + w_1$$

$$l_{1,2}\left(w_2+(w_2)^{\frac{1}{\sigma}}\right)=z_1+w_2$$

and

$$kl_{1,0}\left(w_0+(w_0)^{\frac{1}{\sigma}}\right)+qz_i=w_0+\pi_{i,0}$$
$$kl_{1,1}\left(w_1+(w_1)^{\frac{1}{\sigma}}\right)=z_i+w_1+\pi_{i,1}$$
$$kl_{1,2}\left(w_2+(w_2)^{\frac{1}{\sigma}}\right)=z_i+w_2+\pi_{i,2}.$$

As a consequence, observe that

$$q=\frac{w_0-l_{1,0}\left(w_0+(w_0)^{\frac{1}{\sigma}}\right)}{l_{1,1}\left(w_1+(w_1)^{\frac{1}{\sigma}}\right)-w_1}$$
$$z_1=l_{1,1}\left(w_1+(w_1)^{\frac{1}{\sigma}}\right)-w_1$$
$$l_{1,2}\left(w_2+(w_2)^{\frac{1}{\sigma}}\right)=l_{1,1}\left(w_1+(w_1)^{\frac{1}{\sigma}}\right)-w_1+w_2.$$

Since

$$z_i=-\frac{W}{K}z_1$$

due to market clearing in the financial market,

$$kl_{1,0}\left(w_0+(w_0)^{\frac{1}{\sigma}}\right)-\frac{W}{K}\left(w_0-l_{1,0}\left(w_0+(w_0)^{\frac{1}{\sigma}}\right)\right)=w_0+\pi_{i,0}$$

$$kl_{1,1}\left(w_1+(w_1)^{\frac{1}{\sigma}}\right)=-\frac{W}{K}\left(l_{1,1}\left(w_1+(w_1)^{\frac{1}{\sigma}}\right)-w_1\right)+w_1+\pi_{i,1}$$

$$kl_{1,2}\left(w_2+(w_2)^{\frac{1}{\sigma}}\right)=-\frac{W}{K}\left(l_{1,1}\left(w_1+(w_1)^{\frac{1}{\sigma}}\right)-w_1\right)+w_2+\pi_{i,2}.$$

It follows that

$$k(w_1-w_2)=(w_1-w_2)+\pi_{i,1}-\pi_{i,2}$$

giving

$$k=1+\frac{\pi_{1,1}-\pi_{i,2}}{w_1-w_2}$$
$$=1+\frac{\sum_j\left(f_1\left(L_{j,1}\right)-w_1L_{j,1}\right)-\sum_j\left(f_2\left(L_{j,2}\right)-w_2L_{j,2}\right)}{w_1-w_2}$$
$$=1+\frac{\sum_i c_{i,1}-\sum_j\left(w_1L_{j,1}\right)-\sum_i c_{i,2}+\sum_j\left(w_2L_{j,2}\right)}{w_1-w_2}$$
$$=1+\frac{\sum_i c_{i,1}-\sum_i\left(w_1\left(1-l_{i,1}\right)\right)-\sum_i c_{i,2}+\sum_i\left(w_2\left(1-l_{i,2}\right)\right)}{w_1-w_2}$$
$$=1+\frac{(W+kK)\left(c_{1,1}+l_{1,1}-c_{1,2}-l_{1,2}\right)-(w_1-w_2)n}{w_1-w_2}$$
$$=1+\frac{(W+kK)(w_1-w_2)-(w_1-w_2)n}{w_1-w_2}$$
$$=1+W+kK-n=1+(k-1)K$$

Conclude that $k=1$ which can happen only if the property owners' income is equal to those of workers.

3. Calibration

In this section, we numerically analyze a certain tax/subsidy policy designed to reduce the inefficiency discussed above. The particular method of achieving an increase in efficiency in this paper is redistribution of income among workers and capitalists. To this end, we need to take three steps: formally introduce the tax/subsidy scheme, specify a production technology in open form, and finally calibrate the parameters of preferences and technology.

3.1 Taxation Policy

Now let us define the redistribution policy which only consists of generalizing the budget set. In particular, let

$$\beta_i(p,w,q)=\begin{cases}(c_i,l_i,z_i):\ p_0c_{i,0}+w_0l_{i,0}+qz_i+t_{i,0}=w_0+\\ p_sc_{i,s}+w_sl_{i,s}+t_{i,s}=z_i+w_s+\\ for\ each\ s=1,2\end{cases} \quad (6)$$

where $t_i=\left(t_{i,0},t_{i,1},t_{i,2}\right)$ is the vector of tax/subsidy that individual i pays/receives at each possible state of the world. If $t_{i,s}>0$ then individual i pays a tax in state s while she receives a subsidy otherwise. The budget balancedness condition for the government requires

$$\sum_{i=1}^n t_{i,s}=0 \text{ for all } s.$$

After writing $t=(t_1,\dots,t_n)$ the same condition becomes

$$\sum_{i=1}^n t_i=0.$$

Now we can define competitive equilibrium with incomplete markets and taxation.

Definition 1: CEI with Taxation is a vector $\langle(c_i,l_i,z_i)_{i=1}^n,\left(L_j\right)_{j=1}^n,q,(p_s,w_s)_{s=0,1,2}\rangle$ such that (c_i,l_i,z_i) solves (2) for each i with the budget constraint in (6), and L_j solves (1) for each j, and product, labor, and asset markets clear:

$$\sum_i c_{i,s}-\sum_j f_s\left(L_{j,s}\right)=0$$
$$\sum_i l_{i,s}+\sum_j L_{j,s}-n=0$$
$$\sum_i z_{i,s}=0$$
$$\sum_{i=1}^n t_{i,s}=0$$

for each $s=0,1,2$ where the vector of taxation t is fixed.

In equilibrium, the utility of individual i is

$$U_i^*(t)$$

which is a function of the taxation policy t. Note that $U_i^*(0)$ corresponds to utility when there is no taxation, i.e. *laissez-faire*. That the laissez-faire equilibrium is Pareto-inefficient is proved in the previous section. Motivated by this observation, we will study taxation policies that satisfy $U_i^*(t)\geq U_i^*(0)$ for all i with strict inequality for some i. Hence, by definition, these policies induce a Pareto-improvement and reduce the inefficiency.

Since all individuals are either identical workers or identical capitalists, let us proceed with a representative worker, and a representative capitalist. The utility of the representative worker and capitalist are $U_W^*(t)$ and $U_K^*(t)$, respectively. In a similar vein, the tax that the representative worker and capitalist pay are t_W and t_K,

respectively, implying the budget balancedness condition for the government is

$$Wt_W + Kt_K = 0$$

where W and K are the numbers of workers and capitalists, respectively.

Assume that the objective of the government is to increase the expected equilibrium utility of the workers as much as possible without harming the capitalists. In other words, the government solves

$$\max_{t_W, t_K} U_W^*(t) \quad (7)$$

s.t.

$$U_K^*(t) \geq U_K^*(0)$$
$$Wt_W + Kt_K = 0$$

The first constraint means that when there is taxation the expected utility of the capitalists do not fall short of their expected utility when there is no taxation. The second constraint is the budget balanced condition as discussed above.

3.2 Technology

Let us start with specifying the production technology in open form. Assume that output by firm j which employs L_j amount of labor at states s is

$$f_s(L_j) = \left(A_s^v + L_j^v\right)^{1/v}$$

where $A_s > 0$ is a state-dependent productivity parameter and $1/v$ is the elasticity of substitution between employment and the state dependent parameter. Write $A = (A_0, A_1, A_2)$ for the vector of all possible technological parameters.

The technology exhibits constant elasticity of substitution between the productivity parameter A_s and labor L_s. This constant elasticity of substitution is $1/(1-v)$. Therefore, v cannot be higher than 1. If $0 < v < 1$ then an increase in A_s reduces the marginal productivity of labor at state s. Otherwise, i.e. when $v < 0$, the marginal productivity of labor increases when A_s increases. Hence, we call an increase in A_s as a labor-saving technological progress, and capital saving if $0 < v < 1$.

3.3 Calibration

Now we can discuss the calibration of the parameters of the model. The vector of exogenous parameters of the model is

$$\xi = (v, A, \theta, \sigma, \mu).$$

The baseline values of these parameters are in the table below.

Table 1: Parameters' baseline values

v	$A = (A_0, A_1, A_2)$	$\theta = (\theta_0, \theta_1, \theta_2)$	σ	μ
-0,136	(70,84,70)	$\left(1, \frac{1}{2}, \frac{1}{2}\right)$	1,4	6,5

The mean of elasticity of substitution estimates by Antras (2004) is $1/(1-v) = 0.88$. Therefore, the calibration value is chosen as $v = -0{,}136$.

As for the state-dependent productivity vector, we set $A_0 = 70$ to ensure that the labor share in income is 2/3 when $t = 0$, i.e laissez-faire. $A_1 = 84$ implies that the potential increase in this technological parameter is 20% while $A_2 = 70$ means state 2 corresponds to no technological progress in the future. According to the discussion above, this is a labor saving technological progress since $v = -0{,}136 < 0$.

As for $\theta = (\theta_0, \theta_1, \theta_2)$ which gives the probability of each state, by definition, $\theta_0 = 1$. We set $\theta_1 = 1/2$ following the estimates of Frey and Osborne (2017) implying $\theta_2 = 1/2$. Finally, σ and μ are set to 0,85 and 3,65, respectively to ensure that Frisch elasticity of labor supply is 0,4 and average labor supply is 20% of labor endowment. See (Reichling and Whalen (2012)) for the estimates of Frisch elasticity of labor supply. According to the US Bureau of Statistics, the annual per capita working hour in the US is approximately 1800 hours implying

$$\frac{1800}{365 \times 24} = 0{,}2.$$

Table 2: Results of the calibration at baseline parameter values

Case	$t_W = (t_{W,0}, t_{W,1}, t_W$	$t_K = (t_{K,0}, t_{K,1}, t_K$	U_W^*	U_K^*
1	$(+,-,0)$	$(-,+,0)$	-98.3742	-81.382
2	$(-,0,+)$	$(+,0,-)$	-98.3742	-81.382
Laissez-faire	$(0,0,0)$	$(0,0,0)$	-98.3789	-81.382

3.4 Results

This section discusses the solution in t_W and t_K to the government's problem given in (7) when the parameters of the model are set to their baseline values in Table 1. Two separate cases are considered: $t_{W,1} = 0$ (which also implies $t_{K,1} = 0$) and $t_{W,2} = 0$ (which implies $t_{K,2} = 0$). As we shall soon see, these constraints are immaterial to the welfare of individuals.

In Case 1, workers are taxed in the initial state to be subsidized if labor saving technological progress takes place. In Case 2, workers are subsidized to be taxed in case labor saving technological progress does not occur. As can also be seen Table 2 above, utility in equilibrium is the same for both workers and capitalists in Case 1 and 2. This implies there is no impact of imposing one of the tax rates to zero on welfare. The increase in utility by taxation can be seen by comparing U_W^* in laissez-faire to that in Case1 (or, Case2).

The table below shows the equilibrium wages with and without government intervention. It is surprising that equilibrium wages are the same regardless of whether there is taxation or not. This implies that equilibrium level of employment and outputs are identical in Case 1 and 2 and laissez-faire. As a matter of fact, the difference between equilibrium with and without taxation stems from the difference in leisure between capitalists and workers.

Table 3: Equilibrium wages

Case	$w = (w_0, w_1, w_2)$
1	$(0.018, 0.01, 0.18)$

2	$(0.018, 0.01, 0.18)$
Laissez-faire	$(0.018, 0.01, 0.18)$

Table 4 clearly shows that the solution to the inefficiency of the laissez-faire equilibrium by taxation causes the workers to enjoy more leisure at the initial state, and the state in which there is labor saving technological progress, while capitalists enjoy more leisure at the future state without any technological progress.

Note that the values of taxes are derived by solving an optimization problem: maximizing workers' utility in equilibrium such that capitalists are not worse-off. But this outcome may or may not be Pareto-efficient. To see, the Pareto-efficiency properties of the taxation problem, let us seek the solution to

$$\max U_W(c_W, l_W)$$
s.t.
$$U_W(c_K, l_K) \geq U_K^*(0)$$
$$\langle (c_i, l_i, z_i)_{i=W,K}, (L_j)_{j=1}^{n} \rangle \; is \; feasible.$$

Again, surprisingly, the solutions to this Pareto-efficiency problem are identical to those of Case 1 and Case 2. Therefore, the taxation policy that we analyze in this study fully achieves Pareto-efficiency. This also explains why Case 1 and Case 2 induce identical outcomes. The reason is that they correspond to the unique solution of the Pareto-efficiency problem above.

Table 4: Equilibrium leisure

Case	$l_W = (l_{W,0}, l_{W,1}, l_{W,2})$	$l_K = (l_{K,0}, l_{K,1}, l_{K,2})$
1	$(0.7, 0.7, 0.7)$	$(1.65, 1.7, 1.57)$
2	$(0.7, 0.7, 0.7)$	$(1.65, 1.7, 1.57)$
Laissez -faire	$(0.698, 0.69, 0.71)$	$(1.66, 1.71, 1.56)$

3.5 Robustness

In this subsection, the numerical simulations are repeated by adding perturbation to the baseline parameter values. The most crucial parameters are v and σ. Recall that v gives the elasticity of substitution between labor and technology while σ corresponds to elasticity of substitution between leisure and consumption.

Table 5: Perturbing elasticity of substitution in technology

v	$t_W = (t_{W,0}, t_{W,1}, t_{W,2})$	$t_K = (t_{K,0}, t_{K,1}, t_{K,2})$
-0.12	(0.0006, -0.0002, 0)	(-0.005, 0.002, 0)
-0.11	(0.0003, -0.0001, 0)	(-0.003, 0.001, 0)
-0.1	(0.0001, -0.00007, 0)	(-0.0017, 0.0006, 0)
-0.09	(0.00009, -0.00003, 0)	(-0.0008, 0.0002, 0)
-0.08	(0.00003, -0.00001, 0)	(-0.0003, 0.0001, 0)

Let us start with v whose base value is -0,136. As can be seen in Table 5 when v increases and all other parameters remain fixed, the absolute value of taxes that restore efficient allocations in equilibrium get smaller. In other words, taxes that ensure efficiency are higher when inputs are complements in a stronger fashion. However, signs of t_W and t_K are persevered despite changes in v.

Table 6: Perturbing elasticity of substitution in utility

σ	$t_W = (t_{W,0}, t_{W,1}, t_{W,2})$	$t_K = (t_{K,0}, t_{K,1}, t_{K,2})$
0,83	(0.0077, -0.0033, 0)	(-0.007, 0.003, 0)
0,84	(0.0073, -0.0031, 0)	(-0.0065, 0.0028, 0)
0,85	(0.0069, -0.003, 0)	(-0.0062, 0.0027, 0)
0,86	(0.0065, -0.0028, 0)	(-0.0058, 0.0025, 0)
0,87	(0.0061, -0.0027, 0)	(-0.0055, 0.0024, 0)

Finally, we can focus on perturbing σ, which gives the elasticity of substitution between leisure and consumption, $\sigma/(\sigma - 1)$. Recall that the baseline value for σ is 0.85. The results in Table 6 show that, as σ increases inducing lower elasticity of substitution, the absolute value of taxes decrease. In other words, complementarity between leisure and consumption causes taxes that restore efficient outcomes are smaller. Note that this relation between complementarity and taxation is the opposite of the relation that we see in case of perturbing v.

4. Conclusion

Motivated by the high possibility of widespread substitution of labor by robots and computers, this study asks "What are the policy implications of replacing humans with machines in the production process?" This question is typically asked in the context of equality of income. Yet our concern is not equity, but efficiency.
The paucity of an insurance against the adverse effects of a possible change in future technology due changes in relative prices ensures that the competitive equilibrium is inefficient. However, our numerical simulations show that redistribution of income can solve this problem. The results can be summarized as follows. Either workers should be taxed today to finance their subsidies in case of a labor saving technological progress in the future in order to cover their losses, or capitalists should be taxed today to finance their subsidies in case of no technological progress in the future, in order to cover their losses.

These results can be useful in guiding future economic policies of redistribution of income to prevent the negative impacts of uncertainty in technological change. Of course, the fact that the model is a stripped-down version of reality evokes the obvious need for further research in this area.

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Does Business Cycle Have an Impact on Entrants and Exits?

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ABSTRACT

Purpose:
The role of entrants and exits has enlarged indisputably over recent years. The basic explanation is connected to the deepening of innovation's influence on industrial growth. Furthermore, new businesses have to be more effective, and based on products, technological or organizational innovations, and exits have to be ineffective (respectively unprofitable), based on denoted products or technology.

Design/methodology/approach:
According to the above-mentioned prerequisites, policymakers need to manage the role (respectively the impact) that entrants (new start-up companies) and exits play in industrial growth. Nevertheless, this impact is not a cornerstone of the Bulgarian National Strategy, or the Europe 2020 Strategy.

Findings:
The paper tries to answer the following two questions: 1) Do new start-up companies and exits have any role and influence on economic growth in Bulgaria?, and 2) Does the role (respectively the impact) of entrants and exits in industrial growth change according to economic cycle?

Research limitations/implications:
In addition, according to the Lisbon Strategy, as well as the European Union's (EU) Strategy 2020, the current economic policy supports entrepreneurship and innovations. Thus, the establishment of innovative companies, as well as the development of innovative, incumbent business are core issues of EU economic policy for the past decade.

Originality/value:
The paper builds on the industrial dynamic methodology and on the understanding of how business decisions (entrepreneurship, innovations, and R&D) on micro level correspond to macro level (GDP growth and innovation policy).

1. Introduction

Over the past 70 years, various methods have been utilised in understanding the economic impact of entrepreneurship. However, the answer to the question: *Do new start-up companies and exits have any role and influence on economic growth*? is still unanswered because of the ever-changing economic conditions.

Understanding start-ups has recently been based on the concepts of innovation and competitiveness, and focused on start-up companies with growth potential.

Thus, start-ups were identified recently as one of the effective pillars supporting the growth and development of a modern economic system. Not surprisingly, such companies receive special status; they have been placed at the centre of developed EU countries' strategic objectives via appropriate economic and social policy mechanisms in the EU's 'Europe 2020' growth strategy.

Moreover, these companies are nowadays defined as those entering the 21st century's highly competitive globalized market. Investigations so far indicate that over 90% of these companies went bankrupt in the first year of their operation. So, *what is the relationship between start-ups and real economic growth?*

Answering this question could help establish the role (respectively, the impact) start-ups play in economic growth. Some preliminary observations show insufficient evidence of real impact on economic growth in Europe, and Bulgaria. Additionally, the effect of start-ups on the growth of the Bulgarian economy is slightly exaggerated.

Our preliminary considerations are based on some characteristics of the economic environment in Bulgaria that make it difficult for start-ups entering the economy:

- it is difficult for new start-ups to access financing, especially for innovation;
- the also encounter very high initial insurance premiums;
- they enter into a highly competitive EU market, and

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a declining domestic market;
- many Bulgarian start-ups lack specialization as a result of ongoing educational reform.

2. State-of-the-art

Our analysis is based on three key problems:

- How do we inspire **economic growth**?
- What role do **entrants** and **exits play** in economic growth?
- How do we **measure the impact of entrants** on economic growth and respectively, **understand the role of the start-up?**

2.1. Start-ups and Economic Growth

Start-up companies are part of the contemporary economic system that contribute to economic growth. Recently, they have become of increased economic importance because of their growing participation and influence in the gross domestic product. This is a result of the specificity of start-ups, since part of their core function is to produce innovative and, in most cases, high-technology products and services with high added-value, which in turn leads to growth in gross domestic product.

Analysis of the role start-ups and their ability to innovate leads to the following preliminary findings:

- In **developing countries,** industrial growth is linked to shifts in the factors of production (resp. labour, capital, materials, and resources) from low- to high-productivity sectors. So, growth and development are **limited by the economy's capacity** to generate new dynamic production activities (Ocampo, 2005).
- **Free-market economies** attempt to develop industries that are expected to offer better prospects for economic growth (Pack H. and K. Saggi, 2003) by **encouraging investments,** especially in R&D, education and training (Sharp M., 2003)
- Industrial growth is **blocked by "entrepreneurial governance"** that attempts to change the industry from the inside (Krafft 2006). However, in this approach, entrepreneurial behaviour collides with government institutions (March and Olsen, 1989).

A large number of publications on existing economic studies that explore the influence (resp. Effects) of participants (start-ups) and economic growth give different answers to the posed problems. In general, these studies primarily evaluated economic growth based on the total output growth (resp. Productivity growth). In summary, the state-of-the-art Sekkat K. (2010) describes three types of effect, as follows (see also: Foster, Haltiwanger and Krizan (1998), Aw, Chen and Roberts (1997), Hahn (2000), Griliches and Regev (1995), Baily, Hulten, and Campbel (1992)):

- **the structural effect** between productivity factors, which is expressed by changing the intensity of labour and capital;
- **the innovative effect** is expressed by the proportion of surviving entrepreneurial business;
- **the market effect,** which results in a change in market shares.

These effects are not of equal impact on the different economic sectors; Scarpetta, Phillip, Thierry, and Jaejoon (2002) found that high-tech entrepreneurial companies contribute between 20% and 40% of overall productivity growth. In addition, these effects depend on the stage of economic business cycle (Disney, Haskel, and Heden, 2003).

2.2. Newcomers vs. Existing Business

Since the effect of start-ups on growth is explained well enough, we could summarize their basic advantages:

- Existing businesses **are known for their goals, strategies, and policies**. From this perspective, a new start-up is an unknown quantity, which makes it an **extremely quiet and invisible competitor.** Undoubtedly, very rarely an established company retains its market position upon the emergence of a successful start-up business.
- For existing companies, failure would be painful and for start-up companies, success would be painful.
- A start-up business focuses on the medium of a new idea, and does everything to realize it. It delivers extra added-value for the user. In contrast, existing companies are focused on their existence: end revenue, financial results and growth potential. This makes them less-responsive to changes in values and attitudes of consumers.

$$TFP = Y = A.K^{\alpha}.L^{\beta},\ where\ (\alpha + \beta = 1)$$

- start-up entities aid in employment and competition networking.

However, these do not explain why highly-innovative entrants really have a direct link to economic growth. Our analysis shows three reasons for the impact:

- New start-up companies represent a high-risk profile, chasing rapid initial growth of profit and quick return on investment.
- When the growth rate, which defines them as start-up companies, and expectations of a quick return on the initial investment are not

3. Methodology

Preliminary methodological preview shows the next three effects that explain the mechanism of impact of start-ups on economic growth:

- entrepreneurs are not sufficient enough for short-term growth but they are key to sustaining long-term growth;

new businesses are procyclical, as they have a positive short-term economic impact;

achieved in the planned short timeframe, the company is restructured.

- The goal of the investor is an increase in profit in the first months/years of activity, and return on investment within 2-3 years from the start of operations.

In addition, to measure the impact of start-up on economic growth, we propose the following methodological steps of improvement:

1. Traditionally, industrial growth is presented by the following indicators: Total factor productivity (TFP) or labour productivity (LP) measured by labour (L) and Capital (K).

2. Solow-Swan's model enriched the classical Cobb-Douglas function, adding two new elements: inputs (R) and additional factors (M). To measure the impact of innovations, additional factors could be given by Innovation costs (see Kopeva at al., 2011 and 2012):

$$Y = A.K.L.R.e^{M}$$

3. The TPF model could be transformed by expanding additional factors and adding: a number of entrants (EN), a number of exits (EX), and competition (CON) measured by the Herfindahl–Hirschman Index (HHI), as follows:

- $Y = A.K.L.R.E_{EN}.E_{EX}.CON$

1. The impact of any of the single factors, resp. entrants and exits role, the change of the TFP function is measured by its log-transformation (Sekkat 2010):

$$\log Y_t = a_0 + a_1.\log K_t + a_2.\log L_t + a_3.\log R_t + a_4.\log CON_t + a_5.E_{EN_t} + a_6.\log E_{EX_t} + \varepsilon$$

2. Further transformation could help understand the dynamic change of productivity function via the second derivate:

$$ln\Delta Y = \frac{\sum_{i\epsilon C}\theta_{it-1}(y_{it-k}-\bar{Y}) + \sum_{i\epsilon E}\theta_{it}(y_{it}-\bar{Y})}{\sum_{i\epsilon C}\theta_{it}(y_{it}-\bar{Y}) - \sum_{i\epsilon X}\theta_{it-k}(y_{it-k}-\bar{Y})}$$

4. Analysis of Bulgarian case

The data used and represented in the analysis are given by the figures that aggregate micro data at mezzo (resp. Sectoral) level. The EUROSTAT database on SBS is the main source of data.

The main indicators are: value of sales, number of active (current) companies, number of start-ups, and number of closed companies. The figures for Bulgaria are provided for the period 2004-2013.

The database covers the following statistics available on the Eurostat website section SBS:

- Production value (P) (code "V12120"): this is defined as turnover, plus or minus the changes in stocks of finished products, work in progress, and goods and services purchased for resale, minus the purchases of goods and services for resale, plus capitalized production, plus other operating income (excluding subsidies).
- Number of economically-active companies (ACT) (code "V11910"): this determines the number of companies that are active in terms of employment of staff and/or turnover in the year of their creation and the following year/s.
- Number of entrants (EN) (code "V11920"): determines the number of start-up and covers mergers, acquisitions, separation, and restructuring of groups of companies.
- Number of exits (EX) (code "V11930"): determines the number of businesses that were not economically active in two consecutive years. To activate them in terms of economic activity is not recognized as their re-establishment.

The analysis is based on the consistent implementation of these steps that are given in the methodology, and the results represent the key moments explaining Formulae 4 and 5.

Step 1, identification of the dependency ratio between the dependent (production value) and its variables (business demography factors). (Table 1)

Table 1: Correlation parameters between demographic factors and the production function

		Y_t	y_t^C	y_{t-1}^C	y_t^E	y_{t-1}^X
Y_t	Pearson Correlation	1,000	,964**	,955**	,829**	,871**
	Sig. (2-tailed)		0,000	0,000	0,000	0,000
y_t^C	Pearson Correlation	,964**	1,000	,988**	,788**	,902**
	Sig. (2-tailed)	0,000		0,000	0,000	0,000
y_{t-1}^C	Pearson Correlation	,955**	,988**	1,000	,777**	,895**
	Sig. (2-tailed)	0,000	0,000		0,000	0,000
y_t^E	Pearson Correlation	,829**	,788**	,777**	1,000	,717**
	Sig. (2-tailed)	0,000	0,000	0,000		0,000
y_{t-1}^X	Pearson Correlation	,871**	,902**	,895**	,717**	1,000

	Sig. (2-tailed)	0,000	0,000	0,000	0,000	

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Own calculations

The correlation test proves that all demographic parameters were significantly correlated with the dependent (resp. Production function). The degree of correlation is remarkably high (between 0.717 and 0.993), confirming the relationship between all production variables.

Step 2 is to estimate the dependency ratio between the effects of new start-up business and TFP. For the elucidation of these effects, two additional calculations are undertaken.

3. Calculating the influence of the surviving companies (y_{SRV}) and start-ups (y_{BRD}) on the production function:

$$\Delta Y_t = \sum_t y_{SRV} + \sum_t y_{BRD}$$

Where, $y_{SRV} = y_t^C + y_{t-1}^C$ and $y_{BRD} = y_t^E - y_{t-1}^X$

4. Calculating the expected effect of start-ups ($\hat{y}_{BRD}$) and exits ($\hat{y}_{EX}$) on the production function:

$$ln\Delta Y_t = \frac{\sum_t \hat{y}_{BRD}}{\sum_t \hat{y}_{EX}}$$

Where, $\hat{y}_{BRD} = y_{t-1}^C + y_t^E$ and $\hat{y}_{EX} = y_t^C + y_{t-1}^X$

Table 2: Correlation coefficients of parametric correlation test the impact of new businesses on the production function

		ΔY_t	y_{SRV}	y_{BRD}	$ln\Delta Y_t$	$\hat{y}_{BRD}$	$\hat{y}_{EX}$
ΔY_t	Pearson Correlation	1	,213**	-0,063			
	Sig. (2-tailed)		0,009	0,451			
y_{SRV}	Pearson Correlation	,213**	1	-0,059			
	Sig. (2-tailed)	0,009		0,477			
y_{BRD}	Pearson Correlation	**-0,063**	-0,059	1			
	Sig. (2-tailed)	0,451	0,477				
$ln\Delta Y_t$	Pearson Correlation				1	,582**	,588**
	Sig. (2-tailed)					0,000	0,000
$\hat{y}_{BRD}$	Pearson Correlation				,582**	1	,988**
	Sig. (2-tailed)				0,000		0,000
$\hat{y}_{EX}$	Pearson Correlation				,588**	,988**	1
	Sig. (2-tailed)				0,000	0,000	

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Source: Own calculations

Data from table confirm two important theses:

- The role of newly established companies in the growth of production function is relatively weak, but is significant for its growth expressed in dynamics.
- Although the effect of start-ups on the production function is not important, the important thing is that the degree of correlation is negative (-0.063).

Step 3 is to estimate the impact of demographic variables on the growth of TFP. A regression analysis is applied (Figure 1):

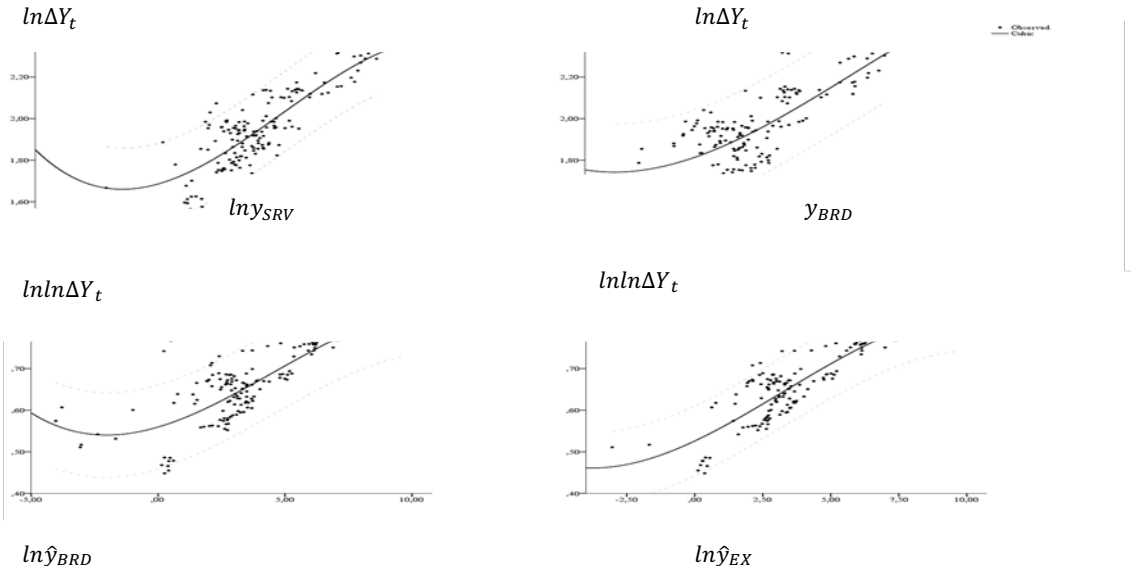

Figure 1. Graphic expression of cubic regression of change in the production function and demographic parameters

Data from Figure confirm that:

- The model explains the S-curve and introduces the need of start-ups to affect growth, additionally, there is a point after which the start-up business is not effective enough.
- The impact (effect) of start-up companies on growth is insufficient and this impact is lower than the effect of the survival and exits on growth.

Step 4, to find out the parameter estimates of the production function and its derivate, we use a two-stage least squares analysis as an extension of the OLS method (Figure 2):

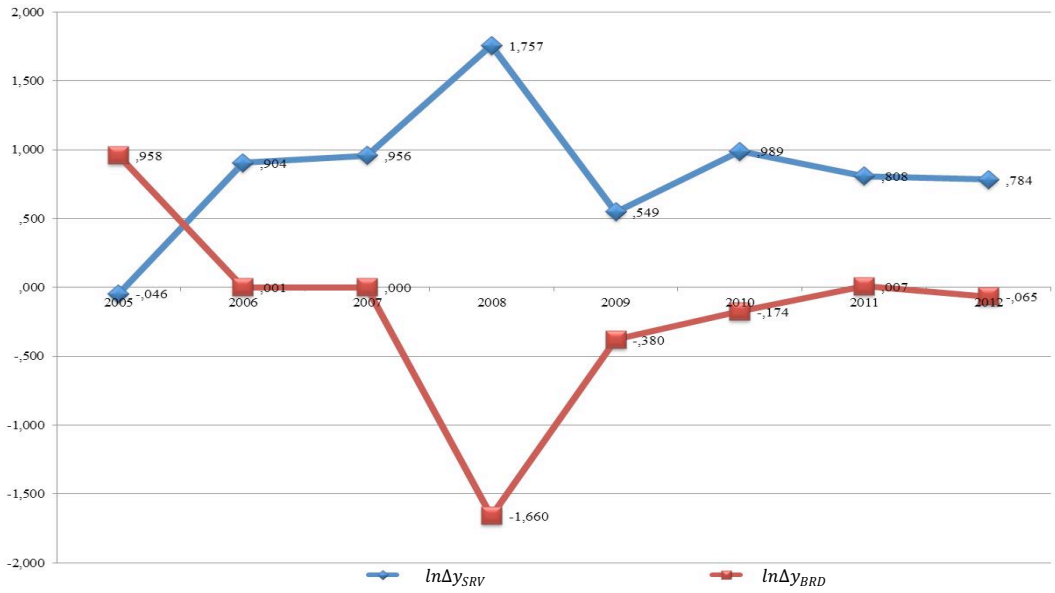

Figure 2. Annual change of the evaluated parameters of the business demographics that affect the production function

Figure 2 confirms that increasing the number of newly-established companies does not lead to significant industrial growth in Bulgaria; growth however is achieved due to an increase in the number and importance of existing companies.

Moreover, the contribution of new businesses to the growth of the production function is 5 to 10 times lower than the contribution of existing and already-established

companies. In addition, the number of exits negatively affects economic growth in Bulgaria for the analyzed period.

An additional conclusion is that the effect of start-ups is positive in the years of economic growth, and opposite - strongly negative - in the years of economic recession (2008-2010).

5. Conclusions

Finally, economic growth in Bulgaria, based on the establishment and development of high-tech start-up business should be based on the use of appropriate industrial policy. The main reasons are summarized in the next three paragraphs:

1. The importance of new businesses is undoubtable for Bulgarian economic growth. However, nowadays Bulgaria does not make best use of these opportunities. Problems, basically, are summarized as; a range of key constraints and barriers to the creation of businesses by innovative and creative people.
2. Considering the importance of new-established businesses, as well as the barriers to their creation, contemporary industrial policy could use a mix of measurements that offers finance and provide help to businesses in the form of advice and vocational training.
3. Industrial policy should not be standardized, but appropriate support of new start-ups should be provided by existing institutional and regional structure, and based on established science and production support.

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Risk Management and Viability of Public Organizations. Development of a Risk Measurement Tool: The Case of Greece.

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ABSTRACT

Purpose:
This paper provides an important contribution towards the development of a valid, reliable and cost-effective instrument that reduces operational and economic risk levels in public sector organizations.
Design/methodology/approach:
A quantitative methodology based on the collection of primary data via a questionnaire has been adopted in this research.
Findings:
The research results showed that the measurement tool selected, applied, presented and proposed is comprised of three (3) scales. The reliability analysis proved that all three scales are reliable; therefore, they are suitable for use as a risk measurement instrument.
Research limitations/implications:
The study's academic contribution is the application and testing of the aforementioned measurement instruments, which can now be utilised by researchers in the field of risk management, to further advance the study of risk management in public organizations in Greece. On the empirical level, the implementation of these three measurement instruments can assist public organizations in Greece via an easy and fast assessment of economic and operational risks.
Originality/value :
This tool can help public organizations gain insight into the level of risk they face at any given point in time in order plan their actions accordingly. At the same time, central state administration will have the necessary tools to monitor and support the organizations it evaluates.

1. Introduction

Some years ago, Osborne and Gaebler gave their supported for the modification and re-invention of public administration, rather than its abolishment, in order to remove bureaucracy and to create structures that will enable it to adjust quickly and effectively to change. (Osborne and Gaebler, 1992).

This transformation, which should be achieved through a change in aims, incentives, responsibility, structure and culture (Osborne and Plastrik,1997), will thereby lead to the creation of an entrepreneurial spirit and mindset.

Greece is among those countries where the dissemination and the adoption of New Public Management (NPM) methods in the Public Sector is still slow. Through a review of the relevant literature, one can see that the attempted reform efforts in the Greek Public Sector are still ongoing, while previous attempts to apply the NPM principles were only moderately successful or not at all (Philippidou et al., 2004; Zeppou and Sotirakou, 2003; GIPA, 2014).

In this context, this article contains the following sections: In the first section, the Greek Public Sector is described. The second section of the article presents the literature review on risk. The third section, *Method*, includes an outline of the present study's aims, its contribution to current research, the description of the questionnaire development methodology, the design of the measuring instrument, and a description of the research sample. The two final sections of the article are: the *Findings* where the reliability analysis is presented, and the conclusions.

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2. The Greek Public Sector and the Need of Instilling a Culture of Risk

The Greek public administration presents a strong bureaucratic dysfunction, the characteristics of which can be broken down into two main categories:

First, the trend of concentration of decisive force and influence in the political system and secondly, structural or structural failure, inadequacy or reduced ability of the administrative machinery of the country. Specifically, with respect to the first set of characteristics of administrative dysfunction a tendency towards concentration of the decisive power, influence and power grows in multiple successive levels (Ioannou, 2013):

a) the executive administration, inside of the political system
b) the Prime Minister and the government, within the executive administration
c) the political leadership within the public administration
d) the leading managerial levels, in public services and organizations

Among the immediate consequences and effects of the trend of centralization include limiting the transfer and devolution of responsibilities and powers, the politicization of almost all administrative decisions and actions, the reduction of functional differentiation and relative autonomy of the administrative system. The concentration, moreover, of the decisive power and influence at the top of the executive political leadership is positively associated with increasing trends politicization of the leading tier in the administrative pyramid.

Another facet of the leading party management is the transfer of the target. Any reform, in theory and in practice, can only proceed to the extent that is affects the required party. The reform objectives of universally identified purposes (promotion of general interest) are converted into instruments to promote party interests.

3. Risk Management

Risk management is a central core of each organization's strategic management. It is the process whereby organizations methodically approach the risks associated with their activities, in order to achieve sustainable benefits..

The focus of successful risk management is the identification and handling of these risks. The objective is to add maximum sustainable value to all the body's activities. The scope is the understanding of the potential benefits (upside) and threats (downside) of all those factors that can affect the organization. It increases the likelihood of success, and reduces both the probability of failure and the uncertainty of achieving the overall objectives of the organization (Drennan et al., 2014).

The definitions of the term 'risk' vary, mostly due to the multiple techniques used to approach and overcome risk. However, a common denominator is the notion that risk is a combination of the probability of an event occurring, and its consequences. According to Borge (2008), risk is finding oneself exposed to the possibility of an unfavourable outcome. A more comprehensive approach to the term maintains that risk is the potential variation of an event that could result in either a positive or a negative outcome (ICE, 2002). Alternatively, risk can be defined as a state in which every alternative aspect of the activity of an organization or business leads to a cluster of consequences, each of which is, in all probability, known to the person making that specific decision (Kiohos et al.,2003).

An effective risk measurement system, working in tandem with an effective policy and the managers' operation programme, risk management, can serve as a valuable tool in defining and supplementing the operation of a public organization. Although it would be impossible for managers to monitor every possible risk factor, they do try to contain risk effectively; the latter target could be reached through adaptation and modification of organizational culture, through internal processes, and the use of technology (Eleftheriadis, 2011).

Therefore, these models are not suitable for the needs of measuring risk in a public-sector organization. Instead, a social science approach that measures risk perceptions of public organization managers can measure financial or operational risk without the need for hard financial data, and can provide comparable results among the diverse types of public organizations. As the study of international theoretical literature and research reveals, one can safely assume that risk measurement through the use of questionnaires is a well-documented practice and yields reliable results (Akerboom and Maes, 2007; Bell et al., 2000; Eilifsen et al., 2001; Knechel, 2007; Mitchell,1995; Ciavarelli et al., 2001). Specifically, the aforementioned researchers utilised quantitative questionnaires to measure perceived risk in a variety of contexts. The results of these studies indicated that the collected data exhibited good reliability and validity. Therefore, one can safely assume that the closed type questionnaire can be a reliable instrument to measure risk perceptions.

4, Method

A quantitative methodology undertaken via the collection of primary data through a questionnaire is utilized. The questionnaire was chosen for two reasons: firstly, the questionnaire is characterized by an exceptional balance between cost, validity and effectiveness in data collection. Secondly, experiments and observation have important limitations. In the field of management, the scientific questionnaire is clearly dominant in frequency, as well as in effectiveness (Saunders et.al., 2003).

In this context, and according to the literature on the issue under investigation, it follows that the most suitable research methodology for the measurement and management of risk in the Greek Public Sector is the quantitative method for the following reasons: a) the large data bank that can be accessed, b) possibility for standardization of the data, c) the suitability of the data for statistical processing, d) the objectivity and generalizability of the conclusions and e) the potential for further analysis by other researchers.

The respondents are called to rate the course of these organizational variables two times: one during the recent years and a second one on how they expect these variables

to evolve (increase, decrease or remain as they were) in the years to come. Therefore, there are two operational risk scales; the first that measures "present risk" by recording how key organizational variables have evolved during recent years, and the second, that measures "future risk" by recording how the managers think those variables will evolve in the future.

The initial concept of the operational risk scale included 17 organizational variables, which were selected after studying Akerboom and Maes's (2007) work, as well as a series of other publications focusing on organizational risk perceptions (Bell et al., 2000; Eilifsen et al., 2001; Knechel, 2007; Mitchell, 1995; Ciavarelli et al., 2001).

The Organizational Risk Factor Questionnaire (ORFQ) of Akerboom and Maes (2007) includes 52 items split into 6 factors: Staffing Resources, Communication, Social Hindrance, Job Skills, Training Opportunities, and Material Resources. Because these factors were designed to fit the private business sector, they would not be suitable for measuring risk factors in public sector organizations without large-scale adaptation and customization. It was therefore deemed as more productive to use Akerboom and Maes (2007) scale as a general basis upon which to base a largely prototypical scale. In order to create the measurement instrument, the following process was followed:

- A group of 5 Greek Public sector managers with good knowledge of English was drafted via random sampling from a list of 30 Greek Public Sector managers.
- The managers received a copy of Akerboom and Maes (2007) publication as well as summaries of other relevant publications, (Bell et al.,2000; Eilifsen et al.,2001; Knechel, 2007; Mitchell, 1995; Ciavarelli et al., 2001) and were given one week to study the material.
- An open discussion session ensued in which each manager was free to report variables that he/she thought were indicative of a public organization's operational risk. All variables on which more than 50% of the participants agreed were included in the new instrument.
- The final list included 17 items. The exact wording of each was agreed upon by all participants.

More specifically, the 17 variables the respondents were asked to rate are:

Table 1: Perceived operational Risk scale. Akerboom and Maes (2007): Modified

The number of citizens served by the organization.
The importance of the operation / services provided by the organization for the general public administration
The importance of operations / services for the general public.
The likelihood of outsourcing some operations / services to a private organization or reassigning operations / services to another state organization.
The range of operations / services provided by the organization.
The total number of people employed by the organization.
The adequacy of the comprehensive income of the organization to cover its running costs
The debt of the organization to a third party (reverse coding)
The adequacy and quality of the capital equipment (machinery, computers, etc.)
The availability of consumables (stationery, medicine, etc.)
The adequacy of available facilities.
The amount of state funding.
The degree to which aims and targets set for the organization are met.
The quality (education, training, efficiency) of the members of staff.
The promptness with which managerial decisions are met and the speed with which they are executed. The efficiency and operational adequacy of administrative organization.
General Public opinion of the organization i.e whether the public feels that the organization is useful, beneficial and efficient

Economic risk: The questionnaire uses the scale proposed by the AGA (Association of Government Accountants in the United States of America) to measure economic risk. AGA is an official body which established the Partnership for Intergovernmental Management and Accountability, with the purpose of detecting and prioritising critical economic issues or threats, and suggesting measures or actions to approach these issues (AGA, 2009). Because the AGA scale was specifically tailored for the US public sector, it was again deemed necessary, as in the case of operational risk, to develop a new instrument specifically modified so as to fit the Greek public sector. In order to do so, the same methodology was followed as in the case of operational risk. The resulting economic risk assessment scale comprised of the following fifteen (15) questions:

Table 2: Economic Scale. AGA (2007)

Annual state funding is sufficient to cover the running costs of the organization (reverse coding).
Expenses exceed the budget.
Expenditures exceed tolerable rates.
The organization has resorted to other funding programmes or loans to cover its needs for cash.
The organization's financial reports reveal that cash flow is problematic.

The organization's financial reports (e.g. budget) has undergone a series of corrections, reforms or changes.
The organization has failed to meet set goals as far as collecting revenue needed to cover its running costs. (e.g. fees, taxes, deposits)
The income of the organization is less than that predicted in the budget.
The debt of the organization to third parties has grown.
The organization's fixed assets performance has decreased.
The value and performance of the organization's intangible assets (shares, bonds, income on interest) has decreased.
At the end of the fiscal year, there is an amount of budget carryover, with funds and resources returned to the State, or transferred for utilisation in the next year.
The organization's ability to raise funds through borrowing or loans has grown.
The funding of the organization is below tolerance levels.
The organization is timely in submitting its financial statements.

The answers range from 1 (= never) to 7 (= always) (seven-point scale). Following a reliability analysis, and in order to increase reliability, a number of questions were reduced to eleven (11) questions.

5. Sampling

In the final stage of the evaluation of the questionnaire, twenty-three (23) questionnaires were distributed to managers of Greek state organizations, and other public or parastatal bodies. Of the twenty-three (23) questionnaires, fifteen (15) were answered and returned (ten after a face-to-face interview and five via e-mail), constituting a percentage of 65%. The sample is considered sufficient for the statistical processing and reliability analysis of the measurement scale used in the present survey. More specifically, the statistical analysis of the pilot test included:

- Missing Values Analysis
- Reliability Analysis-Cronbach's alpha (α)

6. Results

Operational Risk Scale

General Operational Risk Scale (Present)

The general operational risk measurement scale (present) contains 17 questions. The reliability analysis was conducted through calculation of Cronbach's α coefficient and, as is evident in the following table, the score was high (α = 0.869). This score shows that the validity level of the scale is acceptable, and as a consequence, the initial 17-question scale can be used for the purposes of this survey.

General Operational Risk Scale (Future). The general operational risk measurement scale (future) contains 17 questions. The reliability analysis was again based on the calculation of Cronbach's α coefficient and, as is evident in the following table, the score (α = 0.821) indicates that the validity level of the scale is acceptable. As a result, the initial 17-question scale can be safely implemented to serve the purposes of this survey.

Economic risk scale

Table 4: Reliability Analysis-Scale 1

N of Items	Cronbach's Alpha[a]	Reliability
15	-1.005	Unacceptable
14	0.162	Unacceptable
13	0.494	Unacceptable
12	0.668	Inconclusive
11	0.808	Very Good

As outlined above the initial economic risk measurement scale consisted of 15 questions. Reliability analysis of this scale was conducted using Cronbach's α coefficient, however, with α = -1.005, the reliability of the 15-question scale was considered unacceptable. In light of this score, further analysis was conducted, to ensure that the format and formulation of the questions did not contain any errors. As explained above, the next step would be to determine Cronbach's α scores when one omits one of the questions in the questionnaire, and the same process was followed for each of the questions. Of the 15 α scores calculated, the best results were obtained by the omission of the question 'The organization is timely in submitting its financial statements' (α = 0.162), which was however, still not acceptable. As a result, the process of calculating α was replicated, in order to spot the question whose omission would improve questionnaire reliability. Out of the 14 different scores calculated, the most optimal was obtained by the exclusion of the question 'The funding of the organization is below tolerance levels' (α = 0.494), which in turn was lower than the minimum requirement of 0.7. Therefore, this question was also omitted and the new, 13-question questionnaire was put up for further analysis. This step revealed that, if the question 'the organization's ability to raise funds through borrowing or loans has grown' were to be edited out, the α score would be significantly better (α = 0.668), a fact which indicated, however, that the scale would still be unreliable. For this reason, we considered that the analysis process would have to be repeated, omitting yet another question from the scale. The ensuing 12 α scores showed that the exclusion of the question 'At the end of the fiscal year, there is an amount of budget carryover, with funds and resources returned to the State, or transferred for utilisation in the next year', produced an alpha score of 0.808 (α = 0.808). After the omission of four questions, this score of 0.808 clearly indicates that the scale can be regarded as reliable, and as a result, the final version of the economic risk scale, comprising 11 questions, can be safely implemented for the purposes of the survey.

Comprehensive Reliability Report

Table 5: Original Research Tool: Reliability Analysis

SCALE	Cronbach'sAlpha	EVALUATION

ECONOMIC RISK-11 QUESTIONS	0,808	GOOD RELIABILITY
OPERATIONAL RISK-PRESENT	0,869	GOOD RELIABILITY
OPERATIONAL RISK-FUTURE	0,821	GOOD RELIABILITY

7. Conlusions

The measurement tool presented and proposed in this work comprises three (3) scales: The economic risk scale, which after analysis and due amendments, consists of eleven (11) questions, and the operational risk measurement scale, both present and future, which contains seventeen (17) items.

The study's academic contribution is the development and testing of the aforementioned measurement instruments, which can now be utilised by researchers in the field of risk management to further advance the study of risk management in public organizations. On the empirical level, the implementation of these three measurement instruments can assist public organizations in undertaking and quick and easy assessment of economic and operational risks. This tool can help public organizations gain insight into the level of risk they face at any given point in time in order to plan their actions accordingly. At the same time, central state administration will have the necessary tools to monitor and support the organizations it evaluates.

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Credit Risk Determinants in the Vulnerable Economies of Europe: Evidence from the Spanish Banking System

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ABSTRACT

Purpose:
The purpose of this paper is to investigate the determinants of non-performing loans in the Spanish banking system over the period 1997Q4–2015Q3. This timeframe includes not only the booming period for the Spanish economy but also an extended post-crises interval which is missing from other studies for Spain.

Design/methodology/approach:
Using quarterly data from the Central Bank of Spain and from the European Central Bank, the paper employs the ARDL approach to cointegration to identify the existence of a long or short-run relationship between NPLs and a set of macroeconomic, bank-related and country-specific indicators.

Findings:
Findings from the ARDL model indicate that macroeconomic, bank-specific variables and interest rates are important determinants of non-performing loans in the Spanish banking system. Specifically, the real GDP, the Spanish long-term government bond yield, the return on equity, the total credit granted by the Spanish banks and their capital to assets ratio, explain credit risk in Spain both in the short and the long run.

Research limitations/implications:
Data on the bank-specific variables are for the whole banking industry, and not for individual banks. If such data were available, a comparison of the credit risk determinants between small/ big banks, private/public or domestic/foreign could be possibly made.

Originality/value:
These findings provide useful evidence to bank managers and policymakers in dealing with loans' defaults in Spain and in undertaking crucial reforms to stabilize the economy.

1. Introduction

The strong belief that financial distress may contract economic growth, has inspired academics to investigate those factors that may trigger a banking crisis (Agnello et al 2011; Chaibi and Ftiti 2015; Islami and Kurz-Kim, 2014). According to Chaibi and Ftiti (2015), academics have considered various indicators for measuring uncertainty or stress in financial markets such as structural weaknesses in the financial systems and moral hazard. However, the authors claim that: "It seems that a banking crisis is primarily caused by banks' incapacity to satisfy their payment obligations, a situation that is essentially triggered by impaired loans on their balance sheet" (Chaibi and Ftiti, 2015, p. 2). Therefore, bringing bank credit risk problems to the forefront exceeds any other attempt to examine bank crises and their causes (Castro, 2013). Indeed, identifying those factors that influence credit risk has been at the centre of the relevant literature over the last years. Europe is among the regions that have mostly attracted academics' attention on the issue as it was hit stunningly fast by the recent global financial crisis and since 2010 is swimming in its own Eurozone debt crisis.

This paper focuses on one of the most vulnerable economies of Europe, namely, Spain and investigates the credit risk determinants in the Spanish banking system. The choice of the focal country is not random: the 2008 collapse of the housing bubble in Spain was associated with huge defaults on loans granted to this sector and massive losses reported by banks (BS, 2014). Moreover, despite being a core EU country, the very high budget deficits and the unsustainable sovereign debt levels of Spain characterize it as a peripheral economy of Europe currently, along with other peripheral economies that were affected by the global financial crisis. Therefore, the risk of further banking distress in Spain remains

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high.

The key objective of this study is to determine whether a wide range of variables, commonly accepted by the relevant literature, affect credit risk in Spain, by employing the ARDL approach to cointegration over the period 1997Q4-2015Q3.

It adds to the existing literature, since to date similar studies on the Spanish economy have used other estimation techniques and no other investigation has covered such an extended timeframe. Empirical findings from this study generate useful insights and offer recommendations for bank managers and policymakers in the country.

The paper is organized as follows: The following section discusses the academic literature on credit risk determinants whereas Section 3 provides a brief overview of the Spanish economy and banking sector. Section 4, then, describes the dataset and the methodology employed while Section 5 discusses the empirical findings. The paper concludes with Section 6.

2. Literature review

Although investigation of the determinants of credit risk has always been an inspiring topic for researchers, the recent global financial crisis has brought renewed interest in the topic. Various financial systems have undergone several shocks and instabilities during their growth process, reflected mainly in the decreased quality of their loans, namely non-performing loans (NPLs). Thus, credit risk analysis is essential in signalling potential shocks and aiding policymakers in taking the necessary measures to prevent a possible crisis (Castro, 2013).

In the literature, there are two distinctive sets of factors that explain credit risk: macroeconomic-cyclical factors affecting systematic credit risk and bank-specific or institutional factors affecting unsystematic risk. The first set of factors concerns the macroeconomic environment and the impact that certain economic conditions have on the borrowers' ability to service their loans. An economy in growth boosts income and therefore reduces bad debts since more money is available in the borrowers' hands. Given this, NPLs are negatively affected by GDP growth and monetary aggregates that proxy GDP (M1, M2, M3) whereas the contrary can be assumed for their relation to unemployment (Messai and Jouini, 2013). The positive effect of the latter is significant and reflected in the deteriorated ability of not only individuals to service their debts but also corporates that suffer low cash-flows due to a drop in the demand for their products (Chaibi and Ftiti, 2015). Other factors considered in the theoretical models that explain credit risk, are: the real interest rate, the inflation rate and the real exchange rate. High interest rates mean a higher debt burden; thus, they have a direct effect on increasing NPLs (Nkusu, 2011). As far as the inflation rate is concerned, its effect on credit risk is ambiguous. Higher inflation rates can make debt servicing easier by reducing the real value of outstanding loans (Castro, 2013). In contrast, in countries with variable interest rates, lenders adjust rates to maintain their real returns, thus, debt servicing becomes more difficult since reduced-income customers have to pay higher interest rates. To this extent, the relationship between inflation and credit risk can be positive or negative. The same uncertainty is also observed in the exchange rate implications for NPLs. According to Fofack (2005), a currency appreciation may directly affect the debt servicing capacity of individuals by making local products more expensive, whereas the reduced profit-margins in export-oriented industries may delay their ability to meet credit commitments. Foreign currency loans though, are aided by the local currency appreciations which make them cheaper for borrowers (Mishkin, 1996; Nkusu, 2011). Such effect is more significant in those countries with the highest percentage of foreign currency loans (e.x. South Eastern Europe). Therefore, it becomes obvious that, depending on the debt's currency, the effect of exchange rates on NPLs can be positive or negative.

Despite the heavy reliance upon macroeconomic developments to explain credit risk, recent studies also focus on banking industry-specific variables. In good times, both individuals and banks are enthusiastic to engage in excessive risk-taking projects and therefore underestimate their ability to service or collect their loans (Jimenez and Saurina, 2006). Hence, credit risk is built up during periods of economic booms when individuals have more money available to pay their debts whereas banks apply looser credit standards but it is only materialized during recessions. Given this, bank-specific features are also considered as significant contributors to credit risk. Such factors are usually captured by credit growth, bank liquidity, the leverage ratio as well as the bank's profitability. Rapid credit growth is often associated with a parallel increase of impaired loans (Castro, 2013). The moral hazard hypothesis indicates that banks with low capital tend to be riskier by undertaking excessive lending, thus, face higher loan losses (Gavin and Haussmann, 1996; Berger and DeYoung, 1997). However, Makri et al (2014), argue that both theoretical and empirical evidence have shown that the capital-credit risk relation is ambiguous. Specifically, even banks with adequate capital ratios may create tiny but high-risk portfolios and therefore report considerable stocks of bad loans. Based on the moral hazard hypothesis, banks with low liquidity will also report higher NPLs (Vogiazas and Nikolaidou, 2011). The effect of the profitability ratios such as ROA and ROE is ambiguous and is clearly explained by Louzis et al (2012) through the bad management and procyclical credit policy hypotheses. According to the first one, banks' performance is negatively associated to future NPLs since bad management related to low profitability means poor skills in credit scoring and monitoring and therefore a higher probability of default. The procyclical credit policy hypothesis though, claims that good performance is positively associated with future increases in NPLs since often, bank managers are interested not only in maximizing profit, but also in improving their reputation. Specifically, managers may attempt to boost the bank's profitability in the eyes of the market by relying on a liberal credit policy at the expense of future problem loans. Hence, current earnings may help create bigger NPLs stocks in the future.

The empirical literature that estimates credit risk (NPLs) drivers varies according to the countries

investigated, methodologies applied and variables considered. A vast majority of studies focus on a group of countries instead of analyzing individual cases. Some of them consider only macroeconomic variables, whereas others rely on both macro and microeconomic indicators for an accurate credit risk modeling. Castro (2013) concluded that GDP growth, unemployment rate, interest rates, share price indices, credit growth and the real exchange rate are crucial in determining credit risk when five countries of Europe where analyzed for the period 1997Q1-2011Q3. Ali and Daly (2010) confirmed the relevance of the macroeconomic environment to credit risk when Australia and the U.S. were investigated. GDP growth and the short term-interest rates are crucial to NPLs, although not on the same scale in each country. Similarly, Pesola (2005) found that sudden shocks on income and real interest rates contribute to the distress in the banking sector when a panel of industrial countries was analyzed whereas Kakvler and Festic (2012) unfold the importance of current account deficits on NPLs when Bulgaria and Romania were investigated over the 1997-2008 period. As the authors claim, large current account deficits caused by structural dependence on external financing may trigger financial instability. Demirguc-Kunt and Detragiache (1997) argue that a weak macroeconomic environment characterized by slow GDP growth and high inflation as well as banks' low liquidity and a high share of credit to the private sector, are at the core of the banking crises that certain developed and emerging economies experienced over the period 1980-94. According to Gavin and Hausmann (1995), excessive credit growth lay at the heart of the banking crises in Latin America, since it is was accompanied by waved loan restrictions and covenants. Makri et al (2014) investigated 14 Eurozone countries over the pre-crisis period 2000-2008; they found strong correlations between NPLs and various macroeconomic (public debt, unemployment, GDP growth) and bank-specific (capital adequacy ratio and return on equity) factors. Similar results were achieved by Mesai and Jouini (2013) for Greece, Italy, and Spain and by Louzis et al (2012) when a panel of Greek banks was analyzed.

The main body of the empirical literature uses VAR models instead of cointegration analysis, although several methods are available for conducting cointegration tests such as the Engle-Granger approach, the maximum likelihood based Johansen test and the Autoregressive Distributed Lag approach to cointegration (ARDL) (Nikolaidou and Vogiazas, 2014). Through the use of VAR, Nkusu (2011) concludes that slow GDP growth and unemployment positively affected credit risk in a large group of advanced economies from 1998 to 2009. Using the same approach, Marcucci and Quagliariello (2008) conclude that macroeconomic cyclical indicators affect NPLs in Italy over the period 1990-2004. However, no strong evidence of a feedback effect between the two was found. Bofondi and Ropele (2011) found that over the period 1990-2010, NPLs in Italy are explained by a small number of macroeconomic variables such as economic growth, the cost of borrowing and the burden of debt,. Berger and DeYoung (1997) studied the causal relationship between loan quality, cost efficiency and bank capital. They found a negative feedback relationship between cost efficiency and problematic loans and that capital reduction in low capitalized banks causes problematic loans. Similarly, Diamond and Rajan (2005) suggest that liquidity and solvency problems interact and can cause each other. By applying the VAR approach, Klein (2013) found that the level of NPLs in Central, Eastern and South-Eastern Europe (CESEE) is influenced by GDP growth, unemployment and inflation as well as from the profitability, level of equity and excessive risk taking of the banks. Moreover, a feedback relationship between NPLs and macroeconomic downturns was noted, meaning that countries that face loan crisis are condemned to economic recessions. A Monokroussos et al (2016) study concluded a negative bi-directional causality between GDP growth and NPLs and employment and NPLs in Greece over the period 2005-2015.

Among the few studies that apply cointegration techniques to study the short-term and long-term relationship between a set of macro and microeconomic variables and NPLs, Yurdakul (2014) applied the Engle-Granger approach to investigate Turkey over the period 1998-2012. Findings suggest that GDP growth and the Istanbul Stock Exchange index reduce credit risk in the long run, whereas money supply, the foreign exchange rate, unemployment, the inflation rate and the interest rate have the adverse effect. Similar results were also achieved by Delgado and Saurina (2004) for Spain. The ARDL approach to cointegration is relatively new in the credit risk determinants literature and therefore studies applying it are limited in number. Greenidge and Grosvenor (2009) employed the ARDL approach to investigate NPLs in Barbados over the period 1996-2008 and conclude that they are significantly affected by interest rates in the long run while Nikolaidou and Vogiazas (2013) following the same approach concluded that lending growth, jointly with money supply and unemployment, have a significant long-run impact on Romania's credit risk over the period 2001-2010. Consistently, Nikolaidou and Vogiazas (2014) found that NPLs in the Bulgarian banking system are explained by both macroeconomic and industry-specific variables as well as by exogenous factors such as the recent global financial crisis.

As far as Spain is concerned, Salas and Saurina (2002) compared credit risk determinants among savings and commercial banks in the country over the period 1985-1997. Their findings suggest that credit growth, inefficiency, the portfolio composition, the net interest margin and the capital ratio jointly with GDP growth, explain credit risk of savings and commercial banks - although not in the same scale - confirming the relevance of the institutional form in credit risk management. Jimenez and Saurina (2004) focus on a loan by loan basis, analyzing more than 3 million loans granted by all Spanish banks during the period 1988-2000. Findings suggest that collateralized loans and a good bank-customer relationship increase the probability of default. Blanco and Gimeno (2012) explained the dynamic behavior of the default rates of loans granted to households by using a dynamic panel data model (50 provinces) for the period 1984-2009. They found that unemployment, credit growth and the interest debt burden affect loan default rates in Spain. The effect of unemployment though, is asymmetric since

an increase in the unemployment rate has a sharper effect on defaults than its decrease. Messai and Juini (2013) investigated the credit risk determinants of 85 banks of Italy, Greece and Spain over the period 2004-2008. They found that NPLs are negatively affected by GDP growth and the profitability of banks' assets, whereas NPLs are positively related to the unemployment rate, the loan loss reserves to total loans and the real interest rate. Castro (2013) confirmed as well the role of GDP growth, unemployment rate, and real interest rates on credit risk when Spain was investigated along with four other European countries.

The surveyed literature on credit risk determinants highlights the most common finding in the literature: the negative relationship between credit risk and economic growth. Other than that, diverse interactions between other macroeconomic/bank-specific factors and NPLs are found. The main body of the literature consists of panel data/cross-country studies, and thus, lacks the incorporation of country - specific features. Moreover, the single country analyses are limited in terms of the variety of credit risk drivers estimated or the short time intervals investigated. To this extent, the proposed study for Spain contributes to the international debate on credit risk by covering a longer post-crisis interval, considering a variety of macroeconomic and banking-industry specific variables and using the ARDL approach to cointegration, which explained later, has certain advantages in comparison to other approaches applied in the relevant literature. A brief overview of the Spanish economy and banking system is outlined in the next session.

3. Overview of the Spanish economy and banking system

Located in southwestern Europe, Spain is a core EU member since 1986. Following 35 years of social and economic isolation under the dictatorship of General Franco, in the beginning of the 1980s Spain became more involved with European integration. As such, during the 1980s several reforms were undertaken to soothe the high unemployment rate of 18% and to bring the Spanish economy up to the standards of Western neighbours.

Table 1. Key Economic indicators

	1991-2000	2001-2010	2008	2009	2010	2011	2012	2013	2014
GDP growth (%)	2.81	2.25	1.10	-3.6	0.0	-1.0	-2.6	-1.7	1.40
Inflation (%)	3.89	2.80	4.10	-0.3	1.80	3.20	2.40	1.40	-0.1
Investment (% of GDP)	23.5	28.2	30	25	24	22	20	19	20
Unemployment (%)	19.77	12.11	11.5	18.1	20.2	21.7	25.2	24.6	25.1
GG debt (% of GDP)	51.48	41.54	33.9	46.1	53.6	61.8	83.5	96.5	98.06

Source: World Bank

Note: GDP and investment growth rates are calculated from constant 2005 USD.

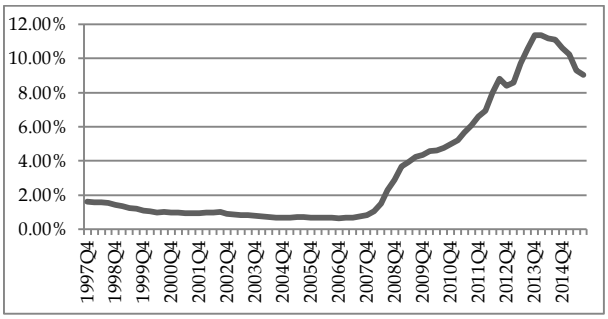
As outlined in Table 1, economic recovery was achieved during the period 1991-2000 with an average GDP growth of 2.8% and an average inflation rate of 3.9%. However, a decade of healthy economic upturn began during the 2000s, characterized mostly by a real estate boom and massive flows of foreign investment. The average GDP growth of the decade was 2.3% while the average inflation rate was further reduced to 2.8% and unemployment dropped from 19.8% in the 1990s to 12.1%. Compared to that of the other core EU countries, it was among the highest-performing economies. The initiation of the global financial crisis in conjunction with the Spanish property crash, accelerated extreme unemployment levels in the country over the last seven years, with a peak of 25% in 2012 and 2014, the second highest in the EU after Greece. As the economic growth switched to negative digits, and banks reported huge losses due to the collapse of the construction industry, in June 2012 Spain received a bail-out package of Euro 100 billion, following Ireland, Greece and Portugal. Consequently, government debt rose rapidly almost equalling the country's GDP by the end of year 2014. According to the BS (2015) stability report, a positive growth rate (1.4%) was seen in 2014, following tough austerity measures and major reforms. Besides, the financial position of the Spanish economy has improved in structure and is expected to last over time as a result of the application of a highly expansionary monetary policy by the ECB, as well as domestic reforms. However, the country's external debt still remains high and far exceeds that of the core Euro area nations.

As far as the Spanish banking system is concerned, up till the death of Dictator Franco in 1975, it was dominated by seven privately owned banks with an extensive equity stake in the Spanish industry (Dymski, 2013). In 1977, financial deregulation initiated along with other measures that intended to free the monetary authority from interference with other branches of the state (Deeg and Perez, 2000). However, it took more than a decade after the 1977 reforms for the modernization of the Spanish stock market to entice foreign banks into the Spanish credit market. Despite the increased competition accelerated by the foreign banks entry and the relaxation of the geographic restrictions on Spanish banks expansions, various large banks strengthened their positions by merging domestically (Dymski, 2013). As a result of such consolidation, the big seven commercial banks of the Franco's era, were reduced to three large banks and a smaller one in the 1990s. As reflected in the pie charts on Figure 1, domestic banks still own the crucial stake in the Spanish banking system.

Source: Bank of Spain

Figure 1: Structure of credit institutions' ownership and asset size in 2014

The following years up to the spark of the global financial crisis, witnessed rapid credit growth. Indeed, the private sector's indebtedness grew aggressively during the pre-crisis period as a result of extraordinary demand for housing in Spain between 1997 and 2007 (Carballo-Cruz, 2011). The latter was accelerated by the economic boom of those years, flat interest rates in the post- Euro integration era and the growth in the number of households due to the massive immigrant flux. Such aggressive demand for housing was associated with a rise of 115% in the average housing price in Spain between 1997 and 2007, compared to a 40% average in the Eurozone (Carballo-Cruz, 2011). To this extent, the sharp decrease of real estate prices that began in 2008 had a significant effect not only in shrinking further housing but also in expanding the bad loans' stock.



Source: Bank of Spain

Figure 2: NPLs ratio in the Spanish banking system

At the time, the BS (2002) financial stability report had warned of the possibility of credit risk problems in the Spanish banking system. It appeared that despite the low level of interest rates, the number of non-performing loans had increased slightly in 2002 due to the uncontrolled credit appetite of banks and their massive expansion in the real estate sector. However, as observed in Figure 2, the non-performing loans ratio saw a sharp rise at the beginning of 2008, thus, in parallel with the outbreak of the global financial crisis. Despite a short stabilization in the first quarter of 2010, the loans' quality further deteriorated as the European sovereign debt crisis emerged. Several domestic reforms undertaken by the Spanish Government taken effect in the year 2014, since the non-performing loans ratio finally started to drop. Indeed, the BS (2016) stability report highlights that credit risk in Spain improved significantly during 2015, sustained by the growth of economic activity. Specifically, the NPLs ratio fell below 10% in December 2015, from 10.6% in the same month of the previous year. Such improvement was observed among all types of loans granted to the private sector. However, further structural reforms are needed to boost investor confidence in the financial stability of the Spanish economy.

The following section presents the data used and the methodological framework employed.

4. Data and methodology

4.1. Data

A survey of the literature on credit risk clearly highlights the relevance of the macroeconomic environment, financial markets and bank-specific variables in explaining credit risk. Using data spanning from the last quarter of 1997, to the third quarter of 2015, the purpose of this study is to investigate the relationship between a wide range of the above-mentioned variables and a selected proxy of credit risk for the Spanish banking system. Specifically, to measure the latter, this paper has chosen the ratio of doubtful loans[1] to total loans (NPL) whereas the used explanatory variables are specified below.

In line with relevant academic literature, the main macroeconomic variables selected in this study are: the real GDP, the unemployment rate, the consumer price index, the trade balance, the current account, the General Government debt and the foreign direct investment stock. Furthermore, gross fixed capital formation, total consumption and monetary aggregates (M1, M2 and M3) are included in this study to enable some flexibility in estimating the GDP effect on the NPL ratio. The above-mentioned variables are expected to negatively affect credit risk in Spain except for the

[1] According to the BS (2004) doubtful loans include: 1) exposures with arrears of more than 90 days on payments of interest or capital on which arrears of +/- 90 days exceed 25% of the outstanding loan (unless already written off) and 2) exposure which, while not falling into the above category or that of written-off loans, presents reasonable doubt as to respect for the terms of the loan contract (deterioration of the borrower's solvency). Loans falling into the previous category but not reaching the 25% threshold.

unemployment rate, whose effect is expected to be positive.

Interest rates such as the Spanish 10-year bond and the 3-month Euribor are introduced in this study considering the positive effect that they may have on non-performing loans due to the increased debt burden associated to their rise. The real effective exchange rate (REER), with reference to the 27 EU members, is also included in the equation. Its effect on NPLs is expected to be positive since an increase in this variable means an appreciation of the local currency, making the goods and services produced in that country relatively more expensive. The volatility of the oil price significantly influences economies of the world whereas the dramatic decrease of property prices in Spain in the year 2008 negatively affected the demand for housing as well as the bad loans' stock. To this extent, the oil price and the property prices in Spain have joined the dataset. On the other hand, the S&P 500 Chicago Board Options Exchange Market Volatility Index (VIX) has gained acceptance as an indicator of global uncertainty or financial stress and as such is considered also in this study. It is expected to have a negative impact on the quality of the Spanish bank loans.

The bank-specific variables considered in the study include: credit growth, the loans to deposits ratio, the capital to assets ratio, profitability ratios such as the return on assets (ROA) and the return on equity (ROE), the ratio of loans granted for house purchase and renovation to total loans and the ratio of loans granted to the construction sector to total loans. The overall credit growth is among the widely used indicators since its high levels usually indicate that more risky loans are approved thus, its effect on NPLs is expected to be positive. The loans to deposits ratio measures the portion of deposits which is utilized in loans by the bank, thus, is an important indicator of the latter's liquidity as well as risk undertaking. Consistently, a low capital to assets ratio indicates excessive risk-taking. However, as supported also by the relevant literature, its effect on NPLs may be either positive or negative, since adequately capitalized banks may also engage in high-risk activities. ROA and ROE are introduced in the study as measures of profitability which, in accordance with the literature, are expected to positively or negatively affect NPLs. Lastly, considering that bank credit in Spain ended badly following a decade of massive flow to housing and the construction sector, it is believed that the ratio of loans granted for house purchase and renovation to total loans and the ratio of loans granted to the construction sector to total loans may play an important role in explaining credit risk in the Spanish banking system.

A summary of the explanatory variables considered in this study is outlined in the Appendix, Table A1. Quarterly observations that span from the year 1997 to 2015 are used. This timeframe covers the stable economic period, the big crush as well as an extended post-crisis time interval compared to that analysed in previous studies. This is particularly important considering the ongoing economic and financial disturbances in Spain, as well as the recent challenges to the European integration. The deepening of the debt crisis in the Eurozone peripheral countries since 2010 has accelerated the interaction between banking and the sovereign debt crisis, and therefore provides a suitable environment for further financial distress in the area.

4.2. Methodology

This study has chosen the ARDL bounds approach to identify the existence of a long-term relationship between NPLs and the set of macroeconomic, bank-related and country-specific indicators. In contrast to other cointegration techniques, the ARDL approach to cointegration can be applied irrespective of the order I(0) or I(1) of the variables' integration and corrects for residual serial correlation and the problem of endogenous variables (Shahbaz and Islam, 2011). Therefore, the first step of the empirical work is to verify that no variable included in the dataset is of order I(2), using the ADF and Philip Perron (1988) tests but also the test that allows for an endogenous determination of a break, namely, Perron (1997). Despite being relatively new in the credit risk determinants literature, the ARDL approach to cointegration was firstly introduced by Pesaran and Smith (1998) and Pesaran and Shin (1999) and holds other advantages as well over typical cointegration techniques. Specifically, the ARDL approach allows using a sufficient number of optimal lags, on the basis of standard criterion such as Akaike Information Criteria (AIC) and Schwarz Bayesian Criteria (SBC) (Mallick and Agarwal, 2007). Specifically, in our study, a maximum order of 4 lags is selected based on quarterly observations usage whereas the Schwarz Bayesian Criterion determines the optimal lag length of each variable. Furthermore, the error correction version of the ARDL equation determines both the short and the long-run relationship between the variables in the model since it uses both the variables' differences and the lagged long-run solution. Based on the above, the following equation is proposed to explain credit risk:

$$NPL = f(NPL_{-t}, \text{Macro, Banking, Other, Crisis}),$$

where NPL is the ratio of non-performing (doubtful) loans to total loans, NPL_{-t} is the lagged value of NPL, Macro stands for the macroeconomic cyclical indicators explained above, Banking stands for the banking industry-specific indicators explained above, Other comprises interest rates or other country-specific factors which as explained above are considered relevant in determining credit risk in Spain whereas Crisis is a dummy variable that captures the effect of the global financial crisis on the NPLs of Spain; this takes the value of 1 for the period 2008Q1 to 2013Q4 and 0 elsewhere.

5. Empirical results

The standard ADF tests for unit roots suggest that all variables appear to be I(0) or I(1) (see Table A2 in the Appendix). The estimates of the ARDL regression are outlined in Tables 2 and 3 along with the respective diagnostic tests whereas Figure A4 in the Appendix provides both the CUSUM and CUSUM square test results which suggest that the model is stable.

It appears that credit risk in the Spanish banking system is affected by the macroeconomic environment as well as by bank-specific variables and interest rates. Specifically, among all variables included in the model,

the real GDP (LGDP), the Spanish long-term government bond yield (LTGB), the total credit granted by the Spanish banks (LCRE), the return on equity (ROE) and the capital to assets ratio (CAP) affect non-performing loans in the Spanish banking system. As observed in Table 3, such effect is significant in the long-term at the 5% and 1% level of significance. Consistently, the error correction model of the ARDL regression outlined in Table 3, confirms that all the above-mentioned variables determine credit risk also in the short-term. As observed, the error correction coefficient (Ecm) is highly significant and bears the correct sign. Specifically, it shows that approx. 16.2% of deviation of the non-performing loans ratio from its equilibrium in the previous period gets corrected in the current one.

Table 2. The long-run estimates of the ARDL regression. NPL is the dependent variable

Regressors	Coefficient	t-ratio
LGDP	-0.091	-2.93
LTGB	0.005	2.17
ROE	0.002	2.24
LCRE	0.065	3.85
CAP	1.549	17.26
C	-0.376	-3.12
D08	0.024	3.74

Table 3. The error correction model of the ARDL regression. NPL is the dependent variable

Regressor	Coefficient	t-ratio
dNPL1	0.271	3.16
dLGDP	-0.014	-2.64
dLTGB	0.001	2.60
dROE	0.001	5.55
dROE1	0.001	2.74
dLCRE	0.010	3.31
dCAP	0.250	4.93
C	-0.061	-2.98
D08	0.003	4.13
Ecm(-1)	-0.162	-4.90
R^2=0.828; F(9,58)= 30.54		

Diagnostic Tests

Test Statistics	LM Version	F Version
A: Serial Correlation	CHSQ(4)= 2.2762[.685]	F(4, 53)= 0.4588[.766]
B: Heteroscedasticity	CHSQ(1)= 2.7112[.100]	F(1, 66)= 2.7407[.103]

All coefficients bear the expected sign; the global financial crisis (captured by the dummy) has a negative effect in the credit quality of the Spanish banking system. The real GDP has the expected negative effect on non-performing loans, indicating that economic booms stimulate sustainable debt services. The finding is in consensus with the study by Salas and Saurina (2002) performed for several Spanish commercial and savings banks. The Spanish long-term government bond yield seems to be the sole interest rate (among the ones considered in the dataset) that significantly affects credit risk. Specifically, the latter increases in line with the rising bond yield, confirming the link that exists between higher risk associated to heavily indebted countries and the asset quality of their banking system. As suspected, the actual sovereign debt crisis in Spain adversely affects the stability of the financial system by particularly hitting its Achilles heel: the non-performing loans. The effect of the return on equity on credit risk is positive and in line with the procyclical credit policy hypothesis, showing that the most profitable banks are the riskier ones. Credit expansion is associated with more neglected and less restricted loan granting processes and therefore has a positive effect on the non-performing loans ratio. Such effect was also suggested in two other studies performed for Spain (Salas and Saurina 2002; Blanco and Gimeno 2012). The capital to assets ratio has a positive effect on NPLs implying that high capitalized banks report high NPLs in Spain. Indeed, Godlewski (2006) argues that minimum capital requirements can be costly for banks and put pressure on their profits therefore they are incited to generate additional revenues by increasing risk taking. Specifically, for Spain, Oliver et al (2012) found that high capital ratios are associated with an increase in the cost of bank loans which causes a contraction in the demand for credit. It may be assumed that higher lending rates will also negatively impact the existing borrowers' capacity to service their debts.

To summarize, it may be concluded that a positive economic performance improves credit quality in Spain whereas the high risk associated with the country's considerable level of indebtedness has the adverse impact. On the other hand, extreme banking-industry regulation incentives may increase credit risk. Inadequate risk policy and insufficient supervision aid

massive credit expansion and thus positively affect the accumulation of bad loans among Spanish banks; an extreme discipline in capital adequacy though, may have the same accelerating effect considering that it drives banks to seek higher profits from excess risk incentives.

6. Conclusions

The recent global financial crisis unfolded the fragility of certain financial systems towards shocks, mostly reflected in the liquidity and insolvency problems that banks incurred as a result of an increased default rate of their loans. Spain was among the core European countries whose banking system reported huge stocks of non-performing loans immediately after the start of the crisis, a phenomenon that jointly, with the extremely high unemployment rate in the country, brought economic stagnation and classified Spain among the peripheral countries of Europe. Despite the fact that since 2014, credit quality started to improve and economic growth moved into positive digits, the extremely high indebtedness in the country may become the means of sovereign debt crisis transmission to the banking sector and the whole financial system of Spain. This paper investigated the factors that lie behind the bad credit quality in the Spanish banking system over the period 1997Q4-2015Q3 by employing the ARDL approach to cointegration. In accordance with the main body of literature, a wide range of variables from the macroeconomic and the banking-industry environment are considered in the study so as to capture any potential effect that the latter's may have on credit risk.

The results suggest that Spanish non-performing loans are significantly affected by the global financial crises, the real GDP, the Spanish long-term government bond, the return on equity, the total credit granted by the Spanish banks and their capital to assets ratio, both in the short and the long term. In other words, the loan portfolio quality in the Spanish banking system appears to be strongly affected by the economic outlook, the actual debt crisis in the country as well as bank-specific variables. The latter may be used by bank managers and regulators as early warning indicators of credit default. The levels of indebtedness though, along with the overall economic performance represent challenges for policymaking, not only in Spain but in other Eurozone countries considering that they are part of a major debt crisis that sparked among the peripheral counties of the region in 2010.

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APPENDIX

A1. The dataset

Indicators		
NPL	Non-performing loans/Total loans	Bank of Spain
CPI	Consumer Price Index annual rate (%)	Bank of Spain
UNE	Unemployment rate (%)	CBOE
CA	Current Account	Bank of Spain
GD	Total General Government Debt	Bank of Spain
GDGDP	General Government Debt as % of GDP	Bank of Spain
FDI	Foreign direct investment, quarterly flow	Bank of Spain
TB	Trade Balance	Bank of Spain
GDP	GDP at constant terms	Bank of Spain
GFCF	Gross fixed capital formation at constant terms	Bank of Spain
TCONS	Total consumption at constant prices	Bank of Spain
REER	Real effective exchange rate	Bank of Spain
PROP	Property prices in Spain, in Euro/sqm	Bank of Spain
M1	Narrow money. Comprises currency in circulation plus overnight deposits	Bank of Spain
M2	Intermediate money. Comprises M1 plus highly liquid deposits	Bank of Spain
M3	Broad money	Bank of Spain
OIL	Brent crude oil price fob in Euro per barrel	Bank of Spain
VIX	The CBOE Volatility Index	CBOE
LTGB	Spanish long term government bond rate	CBOE
EURI	Euribor 3-month rate	CBOE
CRE	Gross loans granted by the Spanish banks	Bank of Spain
ROA	Return on Assets	Bank of Spain
ROE	Return on Equity	Bank of Spain
Cap	Capital to Assets ratio	Bank of Spain
LDEP	Loans to deposits ratio	Bank of Spain
LASS	Loans to assets ratio	Bank of Spain
MORT	Mortgage loans/Total loans	Bank of Spain
CONST	Loans granted to the construction sector/ Total loans	Bank of Spain

A 2. Unit root tests

	ADF		PP	
Indicators	**Level**	**First difference**	**Level**	**First difference**
NPL	0.848	-3.740*	-0.144	-3.470**
CPI	-1.923	-10.480*	-1.638	-10.634*
UNE	0.689	-3.540*	-0.893	-3.416**
CA	-1.425	-9.290*	-1.769	-9.743*
LGD	2.566	-3.848*	1.235	-3.988*
GDGDP	2.506	-3.050**	0.474	-2.914**
FDI	-6.393*		-6.625*	
TB	-1.889	-8.561*	-1.895	-9.146*
LGDP	-2.223	-33.225*	-3.814	-17.784*
LGFCF	-2.817	-23.723*	-2.719	-18.279*
LTCONS	-2.058	-17.044*	-3.877	-15.883*
REER	-1.449	-10.190*	-1.552	-10.679*
LPROP	-4.518*		-2.464	-3.433**
LM1	-1.459	-8.511*	-1.637	-8.957*
LM2	-3.121	-6.545*	-2.148	-7.875*
LM3	-3.588	-6.172*	-1.916	-7.226*
OIL	-1.887	-6.595*	-1.568	-6.770*
VIX	-4.041*		-4.389*	
LTGB	-1.189	-8.868*	-1.372	-9.052*
EURI	-0.710	-4.418*	-1.450	-4.468*
LCRE	-3.870	-3.740*	-2.147	-3.627*
ROA	-6.110*		-6.381*	
ROE	-5.460*		-5,648*	
CAP	0.707	-5.915*	-0.297	-6.044*
LDEP	-0.429	-6.602*	-1.257	-6.908*
LASS	0.413	-6.284*	-0.084	-7.149*
MORT	-2.242	-3.763*	-2.240	-3.846*
CONST	-0.329	-9.873*	0.365	-9.981*

1) ** and * denote stationary of the residuals at 5% and 1% level of significance.
2) The respective critical values are 2.9048 and 3.53 at 5% and 1% level of significance
3) ADF stands for the Augmented Dickey-Fuller test, PP for the Phillips-Perron test

A 3. ARDL (2,0,0,2,0,0) selected based on Schwarz Bayesian Criterion

Regressor	Coefficient	t-ratio
NPL(-1)	1.109	11.27
NPL(-2)	-0.271	-3.16
LGDP	-0.015	-2.64
LTGB	0.001	2.60
ROE	0.001	5.55
ROE(-1)	0.002	1.51
ROE(-2)	-0.001	-2.74
LCRE	0.010	3.31
CAP	0.250	4.93
C	-0.061	-2.98
D08	0.003	4.13
R^2=0.996; F(10,57)= 3611.4		

*All variables are significant at 5% and 1% significance level.

A 4. Structural stability tests