



International Journal of
Business and Economic Sciences
Applied Research

Volume 12, Issue 2

International Journal of Business and Economic Sciences Applied Research

IJ BESAR

The logo features the text 'IJ BESAR' in a gold, serif font. The 'IJ' is written in a large, cursive style, while 'BESAR' is in a smaller, all-caps serif font. A decorative, flowing flourish in shades of gold and white extends from the bottom right of the text.

A: Agios Loukas, P.C. 65404, Kavala, Greece
E: <http://ijbesar.ihu.gr>

Contents

The Effects of Structural Shocks on Macroeconomic Fundamentals under Aggressive Monetary Policy: The Case of Turkey	7 – 21
Mahmut Sami Güngör, Bülent Güloğlu	
Relationship between Intellectual Capital and Performance of Small and Medium Manufacturing Enterprises in Kenya	22 – 32
Muturi Moses Murimi, Beatrice Elesani Ombaka, Joseph Muchiri	
Towards a New Approach of Innovation in Less Developed Regional Business Ecosystems	33 – 41
Fotios Katimertzopoulos, Charis Vlahos	
Influence of Emotional Intelligence on Organizational Performance Among Insurance Companies in Kenya	42 – 51
Mwangi Grace Wangari, Gichuhi D. M., Macharia S. M.	
Analysis and critical investigation of the financial statements of food sector companies in Thessaly Region (Greece) that were included in the investment development programs the period 2013-2016	52 – 71
Rigas Ioannis, Theodossiou George, Rigas Nikolaos, Karelakis Christos, Pantos Nikolaos, Goulas Apostolos	
Procurement in Short Supply Chains: Lessons Learned from the Tourism Industry	72 – 80
Argyropoulou Maria, Argyropoulou Rachel, Folinas Dimitris, Misopoulos Fotis, Najacaj Suela	
An Investigation of the Impact of Facebook and Instagram on Consumer Buying Behaviour: The Case of Retail Fashion Consumers in Rhodes, Greece	81 – 87
Phaedra Clarke, Dionisia Tzavara, Fotios Misopoulos	

Editors in **C**hief:

Assis. Prof. Christos Grose, International Hellenic University

Assis. Prof. Persefoni Polychronidou, International Hellenic University

IG BESAR



Honorary Editors

Prof. A. G. (Tassos) Malliaris, Loyola University of Chicago, USA

Prof. Will Bartlett, London School of Economics and Political Science, UK

Editors

Prof. Jean Pierre Allegret, The Université Nice Sophia Antipolis, France

Prof. Simon Grima, University of Malta, Malta

Prof. Ramona Rupeika-Apoga, University of Latvia, Latvia

Prof. Prof. Eleftherios Thalassinou, University of Piraeus, Piraeus, Greece

Assistant Editor

Konstantinos Stergidis, International Hellenic University, Kavala, Greece

Editorial Board of IJBESAR

Prof. Alexander P., Bournemouth University,
Bournemouth, UK

Prof. Anagnostopoulos Y., Kingston Business School,
Kingston upon Thames, Surrey, UK

Prof. Apergis N., University of Piraeus, Piraeus,
Greece

Prof. Bartholdy J., University of Aarhus, Aarhus V,
Denmark

Prof. Batzios Ch., Aristotle University, Thessaloniki,
Greece

Prof. Bourlakis M., Cranfield School of Management,
Bedfordshire, UK

Prof. Burton B., University of Dundee, Dundee,
Scotland, UK

Prof. Chatzis V., International Hellenic University,
Kavala, Greece

Prof. Chortareas G., University of Athens, Athens,
Greece

Prof. Coste Jacques-Henri, Sorbonne University Paris
III, Paris, Cedex 05, France

Prof. Darskuviene V., ISM University of
Management and Economics, Vilnius, Lithuania

Prof. De La Robertie Catherine, Université Paris I,
Panthéon Sorbonne, France

Prof. Delias P., International Hellenic University,
Kavala, Greece

Prof. Dimitriadis E., International Hellenic
University, Kavala, Greece

Prof. Dritsakis N., University of Macedonia,
Thessaloniki, Greece

Prof. Fernandez-Feijoo B., University of Vigo, Vigo,
Spain

Prof. Florou G., International Hellenic University,
Kavala, Greece

Prof. Fousekis P., Aristotle University of
Thessaloniki, Thessaloniki, Greece

Prof. Thurner T., Higher School of Economics,
Moscow, Russian Federation

Prof. Gúčik M., Matej Bel University, Banská
Bystrica, Slovakia

Prof. Hahn E., University of Applied Sciences
Zittau/Görlitz, Zittau, Deutschland

Prof. Hajidimitriou Y., University of Macedonia,
Thessaloniki, Greece

Prof. Inese Mavlutova, Banku Augstskola School of
Business and Finance, Riga, Latvia

Prof. Kalantaridis Ch., De Montfort University,
Leicester, UK

Prof. Karagiorgos T., University of Macedonia,
Thessaloniki, Greece

Prof. Karasavvoglou A., International Hellenic
University, Kavala, Greece

Prof. Katrakilidis K., Aristotle University of
Thessaloniki, Thessaloniki, Greece

Prof. Kollias Ch., University of Thessaly, Volos,
Greece

Prof. Koujianou Goldberg P., Yale University, New
Haven, USA

Prof. Kousenidis D., Aristotle University of
Thessaloniki, Thessaloniki, Greece

Prof. Macheridis N., Lund University, Lund, Sweden

Prof. Mamalis S., International Hellenic University,
Kavala, Greece

Prof. Mohannak K., Queensland University of
Technology, Brisbane, Australia

Prof. Lopez-Rodriguez J., The University of La
Coruña, A Coruña, Spain

Prof. Sevic Z., University Utara, Kedah Darul Aman,
Malaysia

Prof. Stankevičienė J., Vilnius Gediminas Technical
University, Vilnius, Lithuania

Prof. Stathakis G., University of Crete, Rethymno,
Greece

Prof. Theriou Nikolaos, International Hellenic
University, Kavala, Greece

Prof. Tsaklagkanos A., Neapolis University, Paphos,
Cyprus

Prof. Tsalavoutas I., Adam Smith Business School
University of Glasgow, Glasgow, Scotland, UK

Prof. Utkulu U., Dokuz Eylül University, Izmir,
Turkey

Prof. Zoumboulakis M., University of Thessaly,
Volos, Greece

AIM AND SCOPE

The **International Journal of Business and Economic Sciences Applied Research** (IJBESAR) is a blind peer-reviewed, scholarly journal devoted to publishing high-quality papers and sharing original business and economics research worldwide. The Journal considers only manuscripts that have not been published (or submitted simultaneously), at any language, elsewhere. Contributions are in English. The authors retain the copyright of their work without restrictions. The Journal is issued both in electronic form (for free) and in printed form as annual volume (free for the authors). The Journal accepts 9 types of articles defined as follows:

1. **Research Articles:** A research article is a regular article which aims to present new findings.
2. **Letters to the Editor:** A letter to the editor is a short article which aims to present new findings that require fast publication procedures.
3. **Notes:** A note is an article (regular or short) which aims to present rather new findings.
4. **Comments:** A comment is a short article that makes comments on another article already published by this journal or replies to a comment;
5. **Review Articles:** A review article is an article which aims to present comprehensively already existing findings.
6. **Lecture Notes:** A lecture note is a short review article.
7. **Monographs:** A monograph is a thesis of one or more authors on a unique subject; apart from the standard reviewing procedures, a monograph must also be accepted from a committee of specialists appointed by the Editor.
8. **Innovations:** An innovation is an article which aims to present new procedures or devices.
9. **Selected conference articles:** Upon an agreement with a conference committee, selected papers may be published by the Journal in a special section. In this case the editor will appoint in collaboration with the conference committee guest editors.

ETHICAL NOTES

An author is a person who has a substantial contribution to the article; all other contributions should be mentioned as acknowledgments. Authors should cite only the articles which have contributed to their work; unnecessary citations should not be listed. Authors should present their work as objectively as possible. Arguments that discriminate people by race, sex, origin, religion, etc are not accepted. Bogus results must not be given. Reviewers should not take advantages from the manuscript; instead, they should help the authors to improve their work. Reviewers should not criticize in public the manuscripts. The Editor guarantees the anonymity of the reviewers.

The Effects of Structural Shocks on Macroeconomic Fundamentals under Aggressive Monetary Policy: The Case of Turkey

Mahmut Sami Güngör¹ †, Bülent Güloğlu¹

¹ Istanbul Technical University, Department of Economics, Istanbul, Turkey

ARTICLE INFO

Article History

Received 27 September 2019;
Accepted 23 October 2019

JEL Classifications
C11, E12, E52

ABSTRACT

Purpose:

This study aims to investigate the impact of aggressive monetary policy in terms of inflation on the effects of structural shocks over macroeconomic fundamentals in Turkey. For this purpose, we estimate the basic new Keynesian model by using the Bayesian method for the period of 2000Q1 to 2019Q1.

Design/methodology/approach:

We use the most recent quarterly dataset of the real gross domestic product index, consumer price index and short term interest rate for Turkey. The prior distribution of structural parameters and shock processes are determined according to the literature. Then, we estimate two different version of the basic new Keynesian model with six distinct chains of Metropolis-Hasting algorithm with each of 100000 draws. Finally, we examine the long term impact of aggressive monetary policy on the effects of structural shocks with the help of the unconditional variance decomposition. Besides, the short term and over time analysis are conducted via the conditional forecast error variance decompositions.

Findings:

The results of Bayesian impulse responses are consistent with theoretical framework of the new Keynesian synthesis. Besides, the historical shock decompositions of endogenous variables give valuable insight for the last twenty years of Turkish economy. The empirical results show that aggressive monetary policy increases the effects of monetary policy shock on inflation while its impact on output gap and interest rate decreases at every quarter. Moreover, the aggressive monetary policy boosts the effects of supply shock on the variability of output gap over time.

Research limitations/implications:

If the Central Bank of Turkey intends to implement aggressive monetary policy to sustain price stability, the monetary authority should bear in mind that their effects on both the real sector and the short term interest rate will diminish.

Originality/value:

This study deals with the popular discussion about the aggressiveness of monetary authority in emerging countries with its own distinctive design.

Keywords:

New Keynesian Model,
Bayesian Estimation,
Monetary Policy Inertia,
Aggressive Monetary Policy,
Turkey

1. Introduction

Monetary authorities in advanced economies (e.g., the Fed and the ECB) implement monetary policies with some inertia which come into view as gradual adjustment of policy interest rate in response to varying economic conditions (Woodford, 1999). The gradual fashion in monetary policy is often referred as monetary policy inertia or interest rate smoothing (Castelnuovo, 2007). Woodford (1999) indicates that the inertial behavior of the central bank results in optimal consequences. Besides, Christiano et al. (2008) show that the stabilizing effect of the monetary policy of the ECB was greater than the Fed by virtue of having more inertia in the monetary policy rule of the ECB. However, monetary authorities in emerging countries follow a different path from their counterparts in developed countries.

Monetary policy makers in emerging countries are often criticized in terms of their timing and the degree of their aggressiveness although they contend that monetary policy is implemented in accordance with their primary objectives which are generally to achieve and to maintain price stability. In 2018, the Central Bank of Turkey (CBT)

† Corresponding Author: Mahmut Sami Güngör
e-mail: gungorma@itu.edu.tr

were seriously criticized by the public opinion for the delayed intervention in response to the sudden decrease in the value of Turkish Lira. Then, the monetary committee of CBT raised the policy interest rate which is one-week repo auction rate 125 basis points and 625 basis points in the meeting of June and September of 2018, respectively. Recently, it is again expected to dramatically decrease the policy interest rate in order to relax the credit channels in Turkey.

The level of these reactions might be due to delayed responses or because the CBT anticipates positive externalities from aggressive policies. In this regard, Lei and Tseng (2019) note that the monetary authority is more reluctant to amend its policy interest rate in case of increased uncertainty. Therefore, the probability of postponing monetary policy implementation is much higher in an emerging country relative to a developed country due to differences in uncertainty regarding their economies. To be more specific, compare the most recent policy interest changes in the US and Turkey: The Federal Open Market Committee (FOMC) decided to raise the policy rate by only 25 basis points whereas the monetary committee of CBT increased the policy interest rate 625 basis points in September, 2018. These figures apparently indicate the tremendous differences in the aggressiveness of monetary authority between developed and emerging countries. Whatever the reasons, the crucial issue is the potential effects of an aggressive monetary policy on the macroeconomic dynamics of an economy. Thus, we study the impact of an aggressive monetary policy on the effects of structural shocks over macroeconomic fundamentals during the last twenty years in Turkish economy.

The next section presents the building blocks of the basic new Keynesian model which is a workhorse model of modern macroeconomics. Third section provides information about the data set and the empirical findings. Third section consists of six subsections which include the Bayesian estimation of the benchmark and the aggressive monetary policy model, the Bayesian impulse response functions, the historical shock decompositions, the unconditional variance decomposition and the conditional forecast error variance decompositions. Finally, the last section presents the concluding remarks.

2. The Theoretical Model

In this study, we closely follow the standard notation of the basic new Keynesian model of Gali (2008). This model is sometimes called as a three equation new Keynesian model or a canonical new Keynesian model in the literature. Most of the new Keynesian macroeconomic models make use of this model as their starting point. Thus, it constitutes the fundamental structure of modern macroeconomic models. The building blocks of the model is presented below.¹ This model has a simple framework to consider the relationships among monetary policy, business cycle and inflation (Gali, 2008).

The model has three types of agents: households who live infinitely and maximize their welfare considering their intertemporal budget constraint, firms who produce differentiated goods and maximize their profit taking into account nominal rigidities, and monetary authority who manage the monetary policy of the country (Gali, 2008).

The first building block of the model is the new Keynesian Phillips' curve which has a forward looking behavior and is derived from the Calvo (1983) model. The new Keynesian Phillips' curve is defined as follows:

$$\pi_t = \beta E_t \pi_{t+1} + \kappa \tilde{y}_t + \varepsilon_t^s \quad (1)^2$$

π_t , $E_t \pi_{t+1}$ and \tilde{y}_t are current period inflation, expected inflation and current period output gap³, respectively. Although the basic new Keynesian model of Gali (2008) does not have any exogenous process in the new Keynesian Phillips' curve, we add the exogenous cost push shock in equation 1 to take into account the effects of shocks on inflation in line with Poutineau et al. (2015). The exogenous supply shock process is assumed as: $\varepsilon_t^s = \rho_s \varepsilon_{t-1}^s + \xi_t^s$ with $\xi_t^s \sim iid N(0, \sigma_s^2)$. ρ_s is the parameter of persistency of supply shock. In fact, equation 1 represents the aggregate supply side of the model.

The second building block of the model is the dynamic IS curve which is basically a log linearization of the Euler equation. The following equation is the dynamic IS curve in the model:

$$\tilde{y}_t = E_t \tilde{y}_{t+1} - \frac{1}{\sigma} (i_t - E_t \pi_{t+1} - r_t^n) + \varepsilon_t^d \quad (2)$$

¹ Interested reader can look into the details of the micro foundations and the derivation of the basic new Keynesian model in Gali (2008) or Gali (2015). In spite of the notational differences, Walsh (2003) provides a helpful material for the basic new Keynesian model.

² Where $\kappa \equiv \lambda(\sigma + \frac{\varphi+\alpha}{1-\alpha})$, $\lambda \equiv \frac{(1-\theta)(1-\beta\theta)}{\theta} \Theta$ and $\Theta \equiv \frac{1-\alpha}{1-\alpha+\alpha\epsilon}$. α , β , ϵ , φ , σ , θ are capital share, discount factor, elasticity of substitution, Frisch elasticity, relative risk aversion and Calvo parameter. All parameters are positive in this study.

³ $\tilde{y}_t \equiv y_t - y_t^n$ where $y_t^n = \psi_{ya} a_t + \psi_y$, $\psi_y \equiv -\frac{(1-\alpha)(\mu - \log(1-\alpha))}{\sigma(1-\alpha)+\varphi+\alpha}$ and $\mu = \log(\frac{\epsilon}{\epsilon-1})$.

\tilde{y}_{t+1} , i_t , r_t^n are next period output gap, current period interest rate, and the natural rate of interest rate⁴, respectively. Actually, Gali (2008) does not include any exogenous process in the dynamic IS curve equation of the basic new Keynesian model. However, we include the exogenous demand shock process with AR(1) form in the model in order to capture the effects of demand shock following the study of Poutineau et al. (2015). This exogenous process is described as: $\varepsilon_t^d = \rho_d \varepsilon_{t-1}^d + \xi_t^d$ with $\xi_t^d \sim iid N(0, \sigma_d^2)$. ρ_d is the parameter of persistency of demand shock. Indeed, equation 2 stands for the aggregate demand side of the model.

Final building block of the model is the monetary policy schedule which is represented by the simple form of Taylor's rule. The model assumes that the monetary authority sustains the monetary policy compatible with the Taylor's rule which is characterized by the following equation:

$$i_t = \phi_\pi \pi_t + \phi_y \tilde{y}_t + \varepsilon_t^m \quad (3)$$

ϕ_π and ϕ_y are the feedback parameter of inflation and output gap in Taylor's rule, respectively. These parameters measure the influence of inflation and output gap in monetary policy rule. The exogenous variable ε_t^m is described as the monetary policy shock defined as: $\varepsilon_t^m = \rho_m \varepsilon_{t-1}^m + \xi_t^m$ with $\xi_t^m \sim iid N(0, \sigma_m^2)$. ρ_m is the parameter of persistency of monetary policy shock. In this framework, equation 3 exemplifies the monetary policy rule controlled by monetary authority.

In addition to three structural equations described from equation 1 to equation 3, the standard basic new Keynesian model has another exogenous process related productivity or technology. This exogenous process represents the total factor productivity shock which is described as follows: $a_t = \rho_a a_{t-1} + \xi_t^a$ with $\xi_t^a \sim iid N(0, \sigma_a^2)$. ρ_a is the parameter of persistency of total factor productivity shock. The log linearization of the aggregate production function is as follows: $y_t = a_t + (1 - \alpha)n_t$ where n_t is equilibrium level of employment.

3. Data and Findings

3.1 Data

We use the most recent quarterly dataset of the real gross domestic product index (GDPI, 2010=100), consumer price index (CPI, 2010=100) and short term interest rate during the period of 2000Q1 to 2019Q1 for Turkey. While both the real GDP index and the CPI are taken from the IMF International Financial Statistics, the short term interest rate (SIR) is from Oxford Economics.⁵ Table 1 shows the descriptive statistics of observable variables.

Table 1: Descriptive Statistics of Observable Variables

Variables	GDPI	SIR	CPI
Mean	105.69	26.0	99.25
Standard Deviation	31.76	31.45	50.86
Minimum	56.97	5.71	16.20
Maximum	171.52	153.0	224.10
Skewness	0.38	2.56	0.47
Kurtosis	2.06	8.97	2.60
Observation	77	77	78

Before we estimate the model with the Bayesian methods, we do some transformation on the dataset. First of all, real GDP index and CPI are seasonally adjusted by using the Census X-13 procedure. Then, the cyclical component of seasonally adjusted real GDP index is extracted using two-sided Hodrick-Prescott⁶ (HP) filter⁷. In line with the suggestions of Pfeifer (2018), we do the following computations:

⁴ If we assume $y_{t+1} = y_t^n$ and plug the above definition of natural output into the real interest rate equation [$r_t^t = \rho + \sigma E_t \Delta y_{t+1}^n$], we will get $r_t^n = \rho + \sigma E_t [\psi_{ya} a_t + \psi_y - \psi_{ya} a_{t-1} - \psi_y] = \rho + \sigma \psi_{ya} E_t \Delta a_{t+1}$ where $\psi_{ya} \equiv \frac{1+\phi}{\sigma(1-\alpha)+\phi+\alpha}$.

⁵ Thomson Reuters Datastream codes are TKI99BV.F, TKQ64...F, and TKXRSHR.R for real GDP index, CPI, and short term interest rate, respectively.

⁶ This procedure is resemble to de-trending of the data (e.g. $y_t^{obs} = \log(y_t^{data}) - \log(y_t^{trend})$). This filter gives the deviations of log output from the long-term trend and has zero mean.

- i. $\pi_t^{obs} = \log\left(\frac{cpi_t^{data}}{cpi_{t-1}^{data}}\right) - \text{mean}\left(\log\left(\frac{cpi_t^{data}}{cpi_{t-1}^{data}}\right)\right)$
- ii. $i_t^{obs} = \log\left(1 + \frac{i_t^{data}}{4 \times 100}\right) - \text{mean}\left(\log\left(1 + \frac{i_t^{data}}{4 \times 100}\right)\right)$

With the above calculation, we implicitly assume the steady state values of inflation⁸ and short term interest rate are their long run mean. These computations are actually demeaning of the related data.

3.2 Bayesian Estimation of the Benchmark Model

Bayesian estimation have become popular especially in applied macroeconomics over the last twenty years with the help of increasing the computational performance of computers. Macroeconomists have also made considerable efforts on Bayesian techniques because of its computational power to estimate medium or large scale dynamic stochastic general equilibrium models (DSGE) using Markov chain Monte Carlo simulators (Guerron-Quintana and Nason, 2013). Smets and Wouters (2003, 2007), An and Schorfheide (2007) and Benchimol and Fourçans (2012) are among the several prominent examples of studies applied Bayesian methods to estimate their models in macroeconomics. In this section of the study, we do not plunge into the tedious and laborious world of the Bayesian estimation. Dejong and Chetan (2007), Guerron-Quintana and Nason (2013) and (Fernández-Villaverde, 2010) give the detailed discussion about Bayesian estimation of DSGE models.

Following the literature, the parameters of capital share (α), discount factor (β), elasticity of substitution (ϵ), Frisch elasticity (φ) and relative risk aversion (σ) are calibrated to 0.33, 0.99, 6, 1, 1, respectively. The prior distribution of remaining structural parameters and shock processes in the model are given in Table 2. The calibration of both the structural parameters and the shock processes comes from Galí (2008), Benchimol and Fourçans (2012), and Poutineau et al. (2015). We assume the standard errors of shocks are to follow inverse gamma distributions in order to force the parameters to be greater than zero. Besides, we prefer a beta distribution for the persistency parameters of shocks, the feedback parameter of output gap and the Calvo parameter owing to the fact that these parameters should fall between zero and one. On the other hand, the feedback parameter of inflation that should be greater than one is assumed to be follow a normal distribution.

The model presented in the second section is estimated⁹ by using Bayesian techniques with the data of Turkey for the period of 2000Q1 to 2019Q1. For the posterior distribution, we prefer to use six distinct chains of Metropolis-Hasting (MH) algorithm with each of 100000 draws¹⁰. Furthermore, we opt to employ the optimizer of Chris Sim's csmmwel for the mode computation. Any value between 0.2 and 0.4 is referred to the suitable acceptance rate in the literature. Roberts et al. (1997) indicate the optimal acceptance rate is around 0.234 under general conditions. The average acceptance rate¹¹ per chain is in the interval between 0.233 and 0.238 for the benchmark model. Table 2 shows the posterior distribution of structural parameters and shock processes and a 90 percent Highest Posterior Density (HPD) interval.

⁷ We use the standard value of λ which is 1600 for quarterly data.

⁸ Inflation is calculated as follows: $\pi_t^{data} = \log(cpi_t^{data}) - \log(cpi_{t-1}^{data})$. Due to the one period lag in the definition of inflation, we launch the period of consumer price index data from the fourth quarter of the year of 1999.

⁹ We use the version 4.5.6 of Dynare software (Adjemian et al., 2018) with Matlab (R2018b) during the estimation procedure.

¹⁰ We discard the first decile of the draws from MH algorithm at each chain. Besides, we opt to choose the value of scale parameter for the jumping distribution in MH algorithm as 0.75.

¹¹ The exact acceptance ratio (in percent) for each chain is 23.344, 23.678, 23.478, 23.786, 23.371, 23.776, respectively.

Table 2: Prior and Posterior distribution of structural parameters and shock processes

Parameter	Prior Distribution		Posterior Distribution				
	Law	Mean	Std.	Mode	Mean	HPD Interval	
						10%	90%
θ	Beta	0.67	0.05	0.6740	0.6699	0.5880	0.7542
ϕ_π	Normal	1.50	0.50	2.0169	1.9959	1.7051	2.2765
ϕ_y	Beta	0.125	0.10	0.4392	0.5122	0.3105	0.7227
ρ_s	Beta	0.75	0.10	0.7293	0.6936	0.5700	0.8238
ρ_m	Beta	0.50	0.10	0.2267	0.2597	0.1583	0.3573
ρ_d	Beta	0.75	0.10	0.8564	0.8445	0.7634	0.9339
ρ_a	Beta	0.75	0.10	0.7787	0.7268	0.5460	0.9165
ξ_t^s	Invgamma	0.02	2.00	0.0087	0.0093	0.0069	0.0115
ξ_t^d	Invgamma	0.02	2.00	0.0150	0.0151	0.0096	0.0203
ξ_t^m	Invgamma	0.02	2.00	0.0419	0.0435	0.0368	0.0501
ξ_t^a	Invgamma	0.02	2.00	0.0093	0.0238	0.0048	0.0468

According to the posterior mean of the Calvo price parameter¹² (θ), the average duration¹³ of pricing is approximately three period in Turkey. Besides, the highest value of posterior mean of persistency parameter is attributed to the demand shock with the value of 0.8445. On the other hand, the monetary policy shock has the lowest value of posterior mean of persistency parameter with the value of 0.2597. The reaction of the monetary authority to the deviation of inflation from its steady state is about 3.90 times greater than the reaction of those to the deviation of output gap from its steady state in Turkey with respect to the benchmark model. The posterior mean of the feedback parameter of inflation (ϕ_π) in the Taylor's rule is around 1.99 which is higher than the standard value¹⁴ in the literature. Thus, this empirical result shows that the monetary authority in Turkey follows the inflation stability policy¹⁵ which is consistent with the primary objective of the Central Bank of Turkey (CBT).

3.3 Impulse Response Analysis

The estimated Bayesian impulse response functions (IRFs) to the several structural shocks are given in Figure 1 to Figure 4. They are the mean impulse responses and the shaded areas shows the 90 percent HPD intervals (Pfeifer, 2017) which are actually the equivalent of a confidence interval in the Bayesian framework. We obtain these impulse responses from the estimation of the benchmark model. When the Bayesian IRFs are plotted, we only consider the observable variables which are output gap, short term interest rate and inflation for the benchmark model. The Bayesian IRFs of the aggressive monetary model are very similar to the ones from the benchmark model. That's why we only present the Bayesian IRFs of the benchmark version of the basic new Keynesian model for Turkey during the period of 2000Q1 to 2019Q1.

Figure 1 shows the effects of a one percent negative supply shock on the observable macroeconomic variables in the model. Firstly, this shock directly leads to an increase in inflation. Then, the monetary authority reacts this inflationary situation with the Taylor's rule by rising the short term interest rate. Since the rise in interest rate dominates the inflation rate the real interest rate increases. As a result, output falls below its natural level because of costly investment. On the other hand, the rise in interest rate reduces inflation over time. After fifteen quarters, the output gap returns its steady state level while the inflation reaches its long run level.

¹² θ can be interpreted as the natural price stickiness index (Gali, 2008).

¹³ This duration is calculated by the following formula: $(1 - \theta)^{-1}$.

¹⁴ The standard value of the feedback parameter of the Taylor's rule is 1.5 (Taylor, 1993, 1999).

¹⁵ This result is also consistent with the findings for emerging countries, see (Popescu, 2014).

Figure 1: The Impulse Responses to a Supply Shock

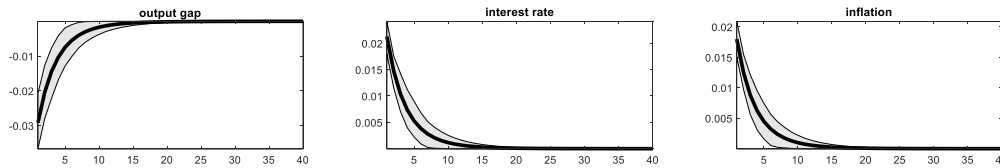
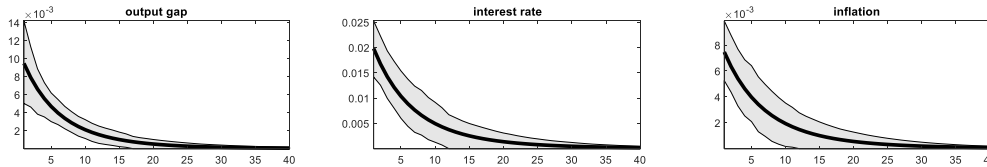


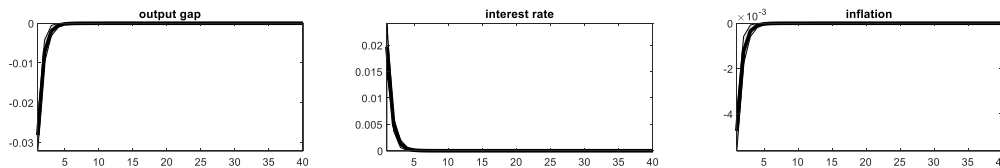
Figure 2 documents the impulse responses of a one percent positive demand shock on the observable macroeconomic variables in the model. The increase in economic activity owing to higher demand for goods and services results in both higher inflation and the positive output gap (i.e., where output is above its natural level). Due to the high inflation and the positive output gap, the Taylor’s rule dictates the monetary authority to increase the interest rate. The effects of positive demand shock on the output gap, inflation and interest rate will vanish after twenty-five quarters and all of them return their natural levels.

Figure 2: The Impulse Responses to a Demand Shock



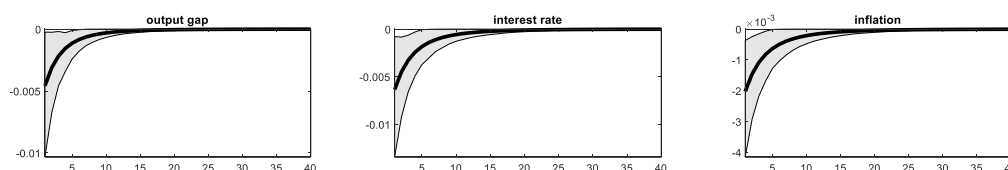
The consequences of a one percent contractionary monetary policy are given in Figure 3. This shock corresponds to a twenty-five basis points rise in short term interest rate in a quarter. Because of the price stickiness the real interest rate rises in the short run. This, in turn, leads to a holdup in consumption decisions of households and decreases the demand for goods and services in the economy. The deficiency of the overall demand create deflation in the economy. After short period of time, the monetary authority reacts the negative output gap and deflation in the economy by reducing the interest rate because of the Taylor’s rule. Finally, the effects of a monetary policy shock on the observable macroeconomic variables in the model diminish after only five quarters and all of them return to their long run levels. Its effects vanish very quickly in the short run relative to the other shocks in the model.

Figure 3: The Impulse Responses to a Monetary Policy Shock



The impulse response functions of a positive total factor productivity shock (or, technology shock) are presented in Figure 4. This shock increases the natural level of output. Thus, it causes to decrease output gap. The monetary authority decreases interest rate on account of the negative output gap and the lower inflation. The effects of technology shock on macroeconomic variables diminish in the medium term and all observable endogenous variables return to the levels of their steady state.

Figure 4: The Impulse Responses to a Total Factor Productivity Shock



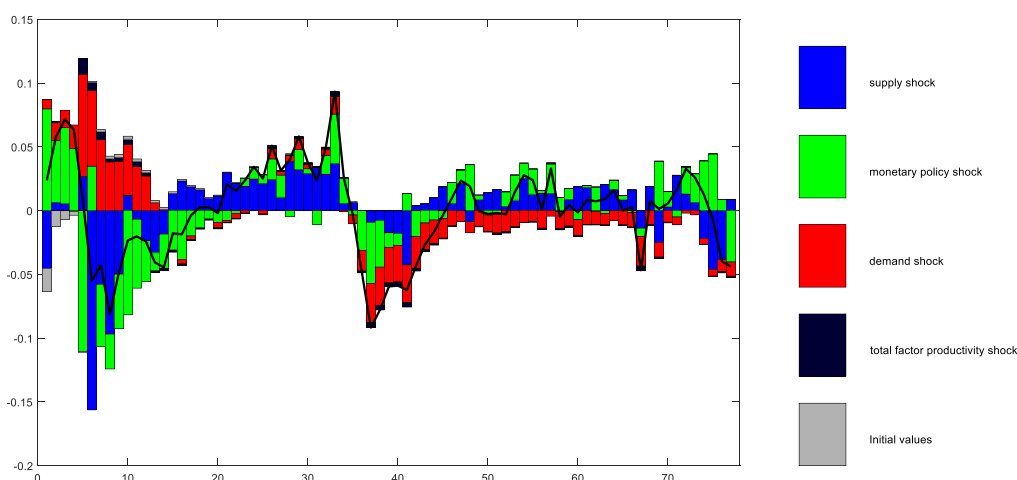
3.4 Historical Shock Decomposition

In the preceding section, the Bayesian IRFs presented the isolated effects of shocks on the observable endogenous variables. However, the shocks jointly occur and affect the macroeconomic variables in real life (Poutineau et al., 2015). In order to investigate the combined effects of the structural shocks in the model we analyze the historical shock decomposition of observable endogenous variables.

The historical shock decomposition of endogenous variable gives the contribution of the related smoothed shocks to the deviation of smoothed endogenous variable from its steady state which is depicted by the colored bars (Pfeifer, 2017). The historical shock decompositions of the observable endogenous variables in the benchmark model are given from Figure 5 to Figure 7. Since these results resemble to those from the aggressive monetary policy model we do not present them separately. The contributions of the smoothed shocks of supply, demand, monetary policy and total factor productivity are displayed by blue, red, green and navy blue shaded area, respectively. The initial values box shaded by grey refers to the part of the deviations from steady state explained by the unknown initial value of the related variables rather than the smoothed shocks in the model (Pfeifer, 2017).

Figure 5 shows the historical shock decomposition of output gap between 2000Q1 and 2019Q1 in Turkey. The black line represents the deviation of the smoothed values of the output gap from its steady state. Before the 2001 crisis in Turkey, the most dominant shock on the output gap was the monetary policy shock. However, the crisis was transformed into a demand and supply shock during the crisis. The main reason of the catastrophic decline of output gap during the 2001 crisis was the supply shock. The 2001 crisis was actually emerged from the banking system crisis resulted in bankruptcy of some banks in Turkey. This crisis crunched the credit channels of Turkish real sector, and in turn, the supply side turned out to be the dominant factor in amplifying the crisis. On the other hand, before the 2008 financial crisis, the supply shock played an important role in ascending output gap. During the 2008 financial crisis, the composition of shocks in Turkey was somewhat different from the 2001 crisis. The monetary policy and demand shocks were the main sources of the decline during the 2008 financial crisis while the negative effects of supply shock were relatively small. Conversely, the demand shock was the major factor against the decline in output gap in Turkey during the 2001 crisis. The negative effects of demand shock on output gap during the 2008 financial crisis might be due to the decline in the volume of Turkish total international trade with either EU or advanced countries which were seriously affected by the crisis. Thus, the sources of this demand shock were mainly from the outside of Turkey in the course of the 2008 global financial crisis.

Figure 5: Historical Shock Decomposition of Output Gap



The historical shock decomposition of interest rate during the period of 2000Q1 to 2019Q1 in Turkey is given in Figure 6. Similar to Figure 5, the black line shows the deviation of the smoothed values of the short term interest rate

from its steady state. The major driver of peaking the short term interest rate during the 2001 crisis in Turkey was the demand shock which preceded the supply shock. In addition to the demand shock, all other shocks contributed interest rate positively both during the 2001 crisis and the post crisis period. On the other hand, there were some unknown factors that caused interest rates to rise during the same period since this initial uncertainty in the model is expected to die out quickly. One of these unknown factors might be the fixed exchange rate regime in Turkey at that time. The monetary authority in Turkey tried to prevent both the rise in exchange rate parity and outflow of the foreign capital with the help of boosting the interest rate. Although the overnight rate reached its peak level, demand for foreign currencies continued. As a result, Turkish monetary authority quit the fixed exchange rate regime and let the exchange rate fluctuate in February, 2001. The effects of monetary policy shock on the deviation of the short term interest rate from its steady state were relatively small with respect to either the demand shock or the supply shock over time. It can be inferred that the demand shock was the most dominant determinant of the deviation of the short term interest rate over the whole period. Apart from this, the dynamic of the interest rate in Turkey during the 2001 crisis was somewhat different from the 2008 global financial crisis. Following the dot-com crisis in 2000, the Fed started decreasing its policy interest rates in order to prevent the likelihood of a recession in the United States. While the low interest rate policy was rather moderate, it paved the way to housing bubble and the global financial crisis in 2008. Nevertheless, when the global financial crisis broke out, the Fed policy interest rates were already at low levels; and in order to prevent even a deeper crisis, the Fed as well as the ECB, and the Bank of England started following asset purchases or quantitative easing (QE) programs. Hence, low interest rates at a global extent mark the monetary policy situation in 2008.¹⁶ Furthermore, interest rates are not expected to be increased when the dominant source of the crisis is demand shock. That's why the interest rate did not increase in Turkey during the 2008 global financial crisis as opposed to the 2001 crisis. On the other hand, the Turkish financial sector did not keep the risky financial derivatives in their balance sheet. Moreover, the soundness of Turkish banking sector was plausible level due to the lessons learned from the 2001 crisis. Thus, the contagion of the subprime crisis to Turkish economy was not realized. As a result, the credit channel of banking sector in Turkey did not crash during the 2008 financial crisis on the contrary the 2001 crisis.

¹⁶ See Yağmur (2015) for a detailed discussion about the loose monetary policy of the Fed starting from the 2000s, and how it triggered the 2008 global financial crisis.

Figure 6: Historical Shock Decomposition of Interest Rate

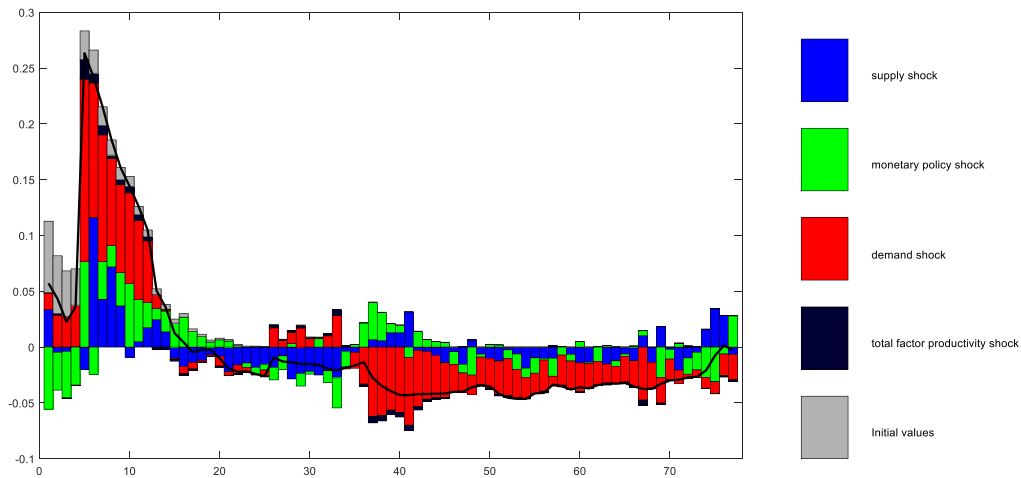
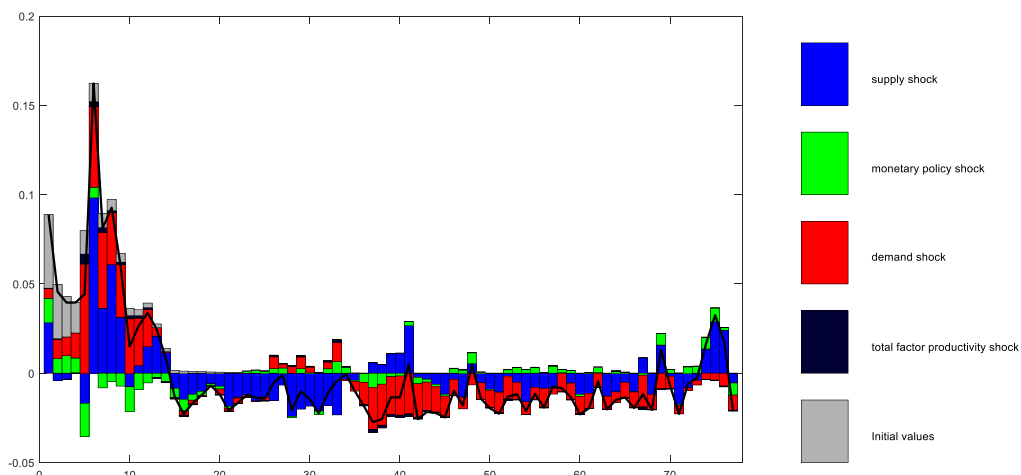


Figure 7 demonstrates the historical shock decomposition of inflation for the period of 2000Q1 to 2019Q1 in Turkey. The black line also depicts the deviation of the smoothed values of the inflation from its steady state. The monetary policy shock did not have any considerable impact on the deviation of the inflation from its long run level with respect to other shocks. Both the demand and supply shock are the dominant sources of rising inflation during the 2001 crisis. Before the 2008 global financial crisis, the major driver of the deviation of inflation from its steady state is the supply shock. On the other hand, the demand shock contributed the deviation of the inflation from its steady state more than any other shocks during the 2008 financial crisis. Furthermore, the demand shock was the dominant source of low inflation during and after the 2008 financial crisis. Moreover, the sudden increase in inflation at the year of 2018 in Turkey was mostly related to the supply shock. This was due to the foreign exchange rate crisis at the last year. At the beginning of the year of 2018, one United States dollar was 3.77 Turkish lira (TL), however, its value reached to 6.88 TL over time and was 5.26 TL at the end of that year. The depreciation of TL caused to increase the cost of intermediate goods and production in Turkey shrank due to its high imported intermediate good dependency. The deviation of inflation from its steady state began to decline from the first quarter of 2019 with the almost equal contributions of supply, demand and monetary policy shock.

Figure 7: Historical Shock Decomposition of Inflation



3.5 Bayesian Estimation of the Aggressive Monetary Policy Model

In this part of the study, we again estimate the basic new Keynesian model with the help of Bayesian methods for Turkey for the period 2000Q1 to 2019Q1. The main difference of this model from the benchmark model is the prior distribution of the feedback parameter of inflation in Taylor's rule. In this manner, we increase the feedback parameter of inflation (ϕ_π) three folds from 1.5 to 4.5 in order to investigate the effects of the aggressive monetary policy on exogenous structural shocks defined in the model. All previous assumptions regarding the prior distribution are valid except the prior mean of the feedback parameter of inflation in the aggressive monetary policy model. The prior distribution of structural parameters and shock processes are given in Table 3.

We maintain the previous estimation settings which are the use of six distinct chains of MH algorithm with each of 100000 draws and the Chris Sim's csminwel optimizer for the mode computation in the aggressive monetary policy version of the benchmark model. The average acceptance rate¹⁷ per chain is in the interval 0.233 and 0.236 for the aggressive monetary policy model. Table 2 presents the posterior distribution of structural parameters and shock processes and a 90 percent HPD interval.

The average duration of pricing increases only in negligible amounts¹⁸ when the level of aggressiveness of monetary authority raises. Similarly, with the benchmark model, the demand shock has the highest value of posterior mean of persistency parameter while the monetary policy shock has the lowest one. Furthermore, all the values of posterior mean of persistent parameters rise when the monetary authority implements the aggressive monetary policy in Turkey. The reaction of the monetary authority to the deviation of inflation from its steady state is approximately 4.25 times larger than the reaction of those to the output gap deviation from its steady state in the aggressive monetary policy model. The magnitude of the difference in the reactions of the monetary authority to the steady state deviations of both inflation and output gap rises about nine percent when the aggressive monetary policy is implemented in Turkey. The posterior mean of the feedback parameter of inflation in Taylor's rule increases from 1.99 in the benchmark model to 2.44 in the aggressive monetary policy model. This result indicates that the extent of the sensitivity of inflation in monetary policy (or the level of inflation stability policy) enhances by virtue of boosting the aggressiveness of monetary policy in Turkey.

Table 3: Prior and Posterior distribution of structural parameters and shock processes

Parameter	Prior Distribution		Posterior Distribution				
	Law	Mean	Std.	Mode	Mean	HPD Interval	
						10%	90%
θ	Beta	0.67	0.05	0.6740	0.6707	0.5869	0.7525
ϕ_π	Normal	4.50	0.50	2.4017	2.4429	2.0771	2.8116
ϕ_y	Beta	0.125	0.10	0.5432	0.5753	0.3952	0.7672
ρ_s	Beta	0.75	0.10	0.7326	0.7113	0.5975	0.8287
ρ_m	Beta	0.50	0.10	0.2464	0.2678	0.1721	0.3627
ρ_d	Beta	0.75	0.10	0.8713	0.8573	0.7864	0.9408
ρ_a	Beta	0.75	0.10	0.7795	0.7473	0.5787	0.9215
ξ_t^s	Invgamma	0.02	2.00	0.0087	0.0092	0.0071	0.0113
ξ_t^d	Invgamma	0.02	2.00	0.0163	0.0161	0.0115	0.0210
ξ_t^m	Invgamma	0.02	2.00	0.0472	0.0491	0.0403	0.0575
ξ_t^a	Invgamma	0.02	2.00	0.0093	0.0258	0.0045	0.0550

¹⁷ The exact acceptance ratio (in percent) for each chain is 23.676, 22.132, 22.81, 22.887, 23.4, 22.84, respectively.

¹⁸ The precise value of the average duration of pricing is 3.029 periods for the benchmark model while its value is around 3.036 periods for the aggressive monetary model.

3.6 Forecast Error Variance Decomposition

In this section we investigate the impact of aggressive monetary policy in terms of inflation on the effects of shocks over macroeconomics fundamentals in Turkey with the help of the forecast error variance decompositions (FEVDs) of each observable endogenous variables at the mean of the posterior distribution with respect to the exogenous structural shocks. Firstly, the long term analysis is conducted via the unconditional variance decomposition. Then, the short term analysis is made via the first period conditional variance decomposition. Finally, we plot the graphs of the conditional forecast error variance decompositions of observable endogenous variables for the benchmark and the aggressive monetary model so as to compare them over time.

3.6.1 Long Term Analysis

The unconditional variance decomposition at the posterior mean for the benchmark and the aggressive monetary model is given in Table 4. For the benchmark model, more than fifty percent of output gap variability is explained by the supply shock. The monetary policy shock account for one third of this variability. On the other hand, the demand and supply shocks contribute the variation of interest rate approximately three out of four. The dominant source of the variability in inflation is from the supply shock which is accounted for more than seventy-five percent of change in inflation. The effect of supply shock on output gap rises while its effects on both interest rate and inflation decrease under the aggressive monetary policy. Besides, the aggressive monetary policy reinforces the impact of demand shock on both interest rate and inflation while it does not considerably change the effect of this shock on output gap. Moreover, the aggressiveness of monetary authority reduces the effects of monetary policy shock on output gap and interest rate. However, the impact of monetary policy shock on inflation increases when the monetary authority implements more aggressive policy.

3.6.2 Short and Over Time Analysis

Table 5 shows the conditional variance decomposition at the mean of the posterior distribution for the first period. In the short run, the effects of monetary policy shock on all observable endogenous variables increase for the benchmark and aggressive monetary policy model relative to the long run. On the other hand, the effects of both supply and demand shocks on all observable endogenous variables reduce except the effect of supply shock on inflation in the first quarter relative to the infinite time horizon for the both model. Besides, the impact of aggressive monetary policy on the effects of shocks in the short run are very similar to the consequences of the long run for the supply and monetary policy shock. The magnitudes of the difference in FEVDs between the benchmark model and the aggressive model are smaller in the short run than the long run. However, by contrast with the long run results the effects of demand shock on both output gap and inflation decreases in the short run in the case of having aggressive monetary policy.

Table 4: Posterior Mean Unconditional Variance Decomposition (in percent)

	Supply Shock (ξ_t^s)	Demand Shock (ξ_t^d)	MP Shock (ξ_t^m)	TFP Shock (ξ_t^a)
Benchmark [$\phi_\pi = 1.5$]				
Output Gap (\tilde{y}_t)	57.65	6.03	34.68	1.64
Interest Rate (i_t)	40.14	35.64	20.50	3.72
Inflation (π_t)	77.57	17.58	3.68	1.17
Aggressive Monetary Policy [$\phi_\pi = 4.5$]				
Output Gap (\tilde{y}_t)	61.73	6.81	30.90	0.56
Interest Rate (i_t)	28.80	54.29	15.34	1.58
Inflation (π_t)	67.99	27.30	4.18	0.53

Table 5: First Period Posterior Mean Conditional Variance Decomposition (in percent)

	Supply Shock (ξ_t^s)	Demand Shock (ξ_t^d)	MP Shock (ξ_t^m)	TFP Shock (ξ_t^a)
Benchmark [$\phi_\pi = 1.5$]				
Output Gap (\tilde{y}_t)	47.31	5.64	44.93	2.12
Interest Rate (i_t)	34.42	30.88	29.70	5.01
Inflation (π_t)	78.16	14.46	5.81	1.57

Aggressive Monetary Policy [$\phi_\pi = 4.5$]

Output Gap (\tilde{y}_t)	54.43	3.11	41.54	0.91
Interest Rate (i_t)	33.96	32.01	29.52	4.51
Inflation (π_t)	77.77	13.34	7.42	1.48

With the aim of comparing the benchmark model to the aggressive monetary policy model with respect to the impact of structural shocks on observable endogenous variables we plot the conditional forecast error variance decompositions of output gap, short term interest rate and inflation over the next forty quarters. The red line depicts the benchmark model and the blue line represents the aggressive monetary policy model from Figure 8 to Figure 10.

Figure 8 represents the conditional forecast error variance decomposition of output gap. The aggressive monetary policy boosts the effects of supply shock on output gap over time. However, it dampens the impact of shocks of demand, monetary policy and total factor productivity on output gap at every quarter.

The conditional forecast error variance decomposition of interest rate is given in Figure 9. The effects of supply and monetary policy shocks on interest rate decrease, however, the size of the reduction of the monetary policy is relatively small in the case of aggressive monetary policy. On the other hand, the aggressiveness of monetary authority reinforces the effects of demand and total factor productivity shocks on interest rate over time. The impact of both demand and monetary policy shocks do not change over about four quarters with respect to the benchmark model in the case of aggressive monetary policy.

Figure 10 depicts the conditional forecast error variance decomposition of inflation over time. Initially, the effect of supply shock on inflation does not change under the aggressive monetary policy for seven quarters, then its effect diminishes. Besides, the impact of demand shock on inflation decreases with the aggressive monetary policy. On the other hand, the impact of monetary policy and total factor productivity shocks on inflation reduce in the case of implementing aggressive monetary policy.

As a result, the aggressive monetary policy increases the effects of monetary policy shock on inflation while its impact on output gap and interest rate decreases in each period. Because the primary objective of the CBT is to achieve and maintain price stability, rise in the aggressiveness of monetary authority results in consistent outcome with the objective of the CBT in terms of inflation. However, the aggressive monetary policy decreases the effects of monetary policy shock on both interest rate and output gap which correspond to the real sector. In other words, if the CBT intends to implement aggressive monetary policy to sustain price stability, the monetary authority should bear in mind that their effects on both the real sector and the short run interest rate will diminish. This result is consistent with the real life situation. The monetary policy committee of the CBT reduced the policy interest rate by 425 basis points (from 24 percent to 19.75 percent) in the meeting of 25th July of 2019. The immediate effect of this policy on consumer loan rate did not meet the expectation of monetary authority. The average consumer loan rate only decreased from 26.46 percent to 26.34 percent the following week of the decision. Nevertheless, the state-owned banks simultaneously initiated a policy of lowering real estate loan rates in order to stimulate private banks to reduce their loan rates. Then, all types of average loan rates started to decrease over time.

Figure 8: Conditional Forecast Error Variance Decomposition of Output Gap

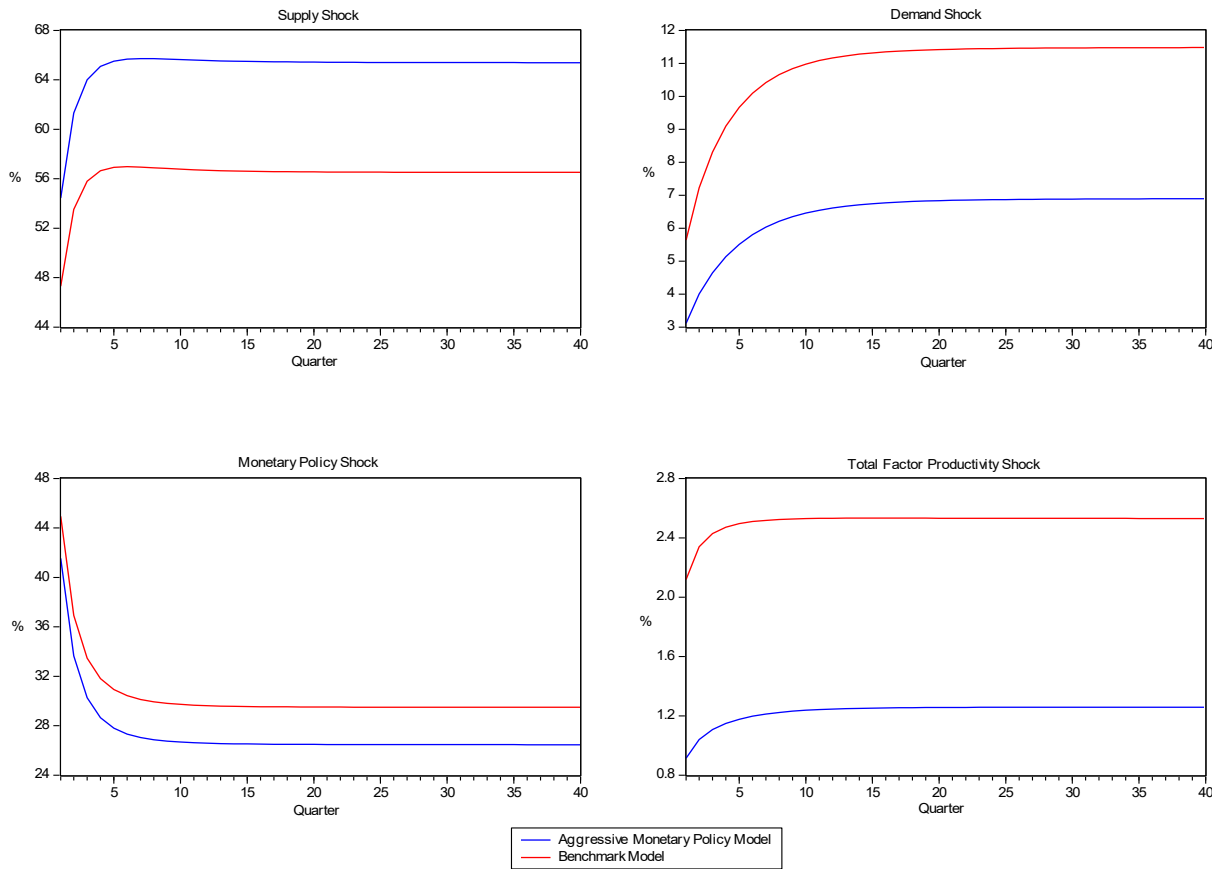


Figure 9: Conditional Forecast Error Variance Decomposition of Interest Rate

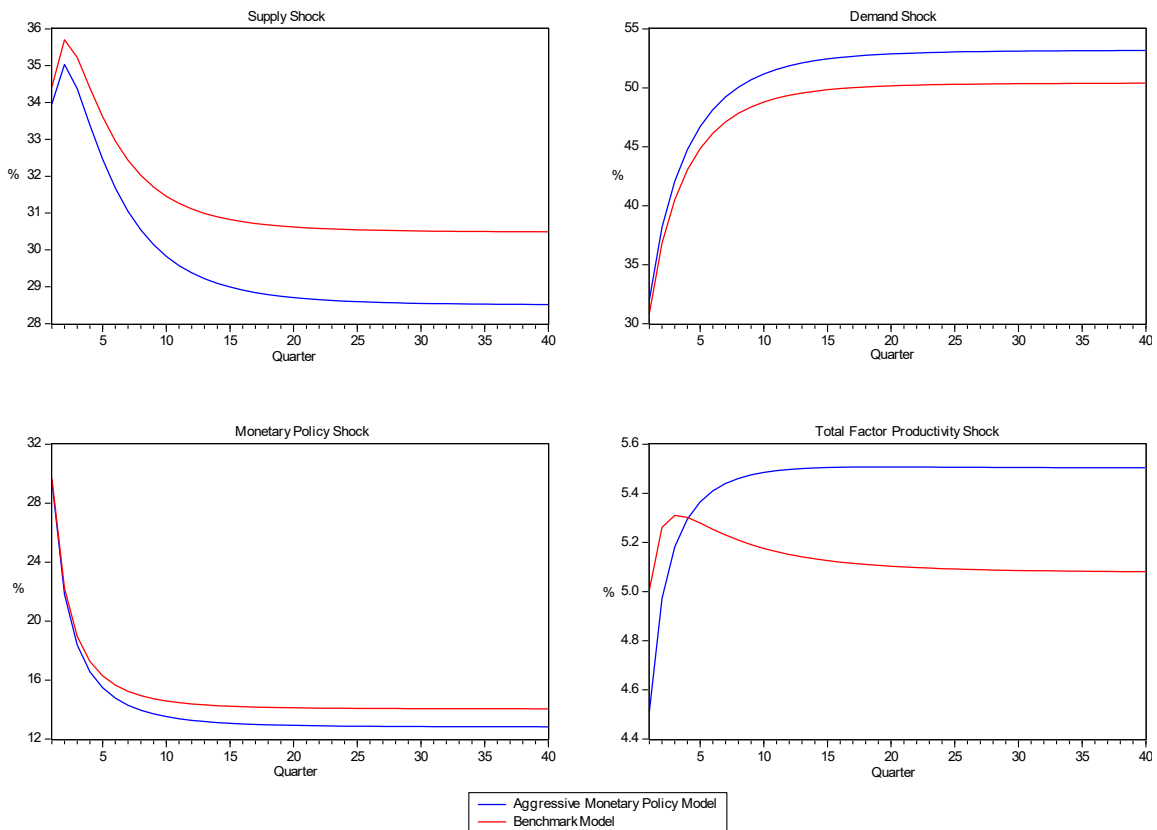
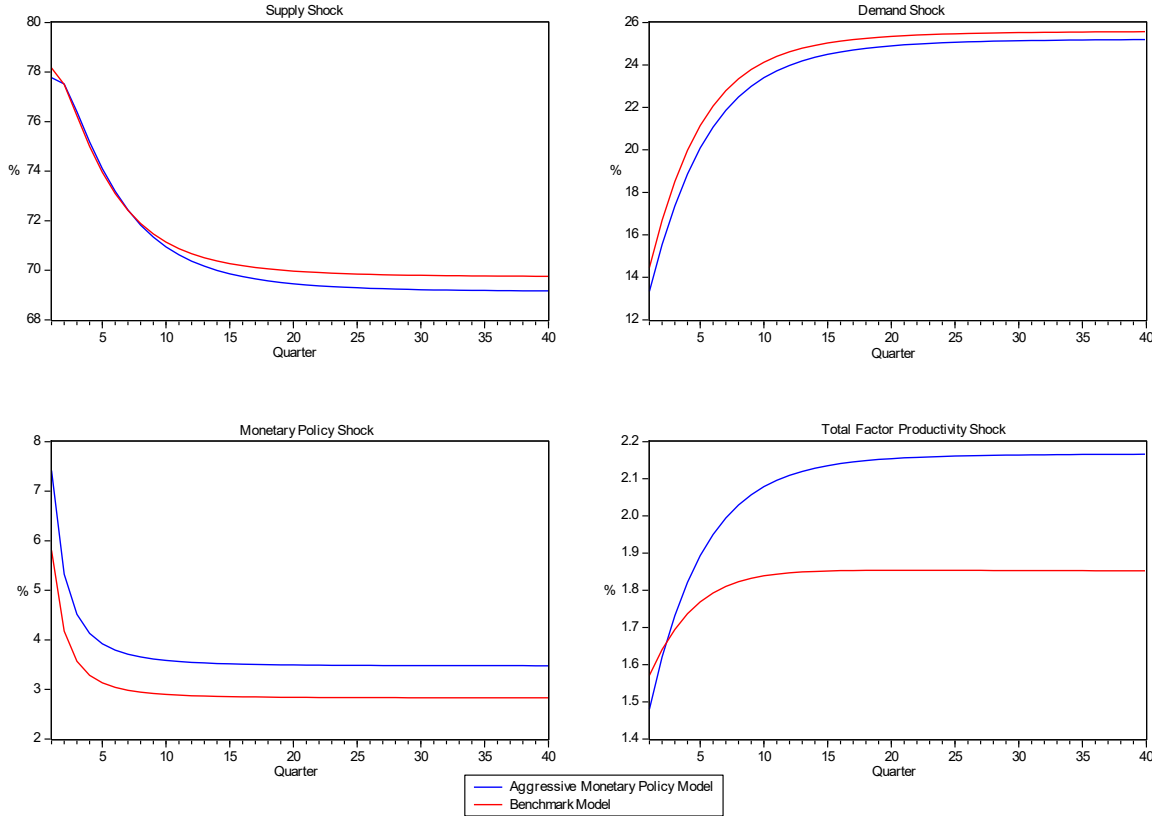


Figure 10: Conditional Forecast Error Variance Decomposition of Inflation



4. Conclusion

The potential effects of an aggressive monetary policy on the macroeconomic dynamics is of great importance for the public opinion, investors and governments. Nevertheless, monetary authorities in emerging countries are often criticized both on the basis of their timing and degree of their aggressiveness in changing policy interest rates. Thus, on the back of this observation, we examine the impact of the aggressiveness of monetary authority on the effects of structural shocks in Turkey. To do this, we estimate the basic new Keynesian model by employing Bayesian techniques for Turkey during the period of 2000Q1 to 2019Q1. The Bayesian IRFs give the results which are coherent with the new Keynesian theory. Furthermore, the historical shock decompositions of endogenous variables enable us to grasp the dynamics of Turkish economy in terms of structural shocks over twenty years. The empirical results indicate that the level of inflation stability policy improves in consequence of increasing the aggressiveness of monetary policy in Turkey.

Besides, we find that the aggressive monetary policy increases the effects of monetary policy shock on inflation while its impact on output gap and interest rate decreases at every quarter. Thus, the monetary policy committee of CBT should be meticulous in deciding to raise the aggressiveness of their policies.

As we mentioned earlier, most of the new Keynesian macroeconomic models make use of this model as their starting point. In spite of its simple framework, this model generates practical results which explain the dynamics of the Turkish economy in terms of structural shocks. Nevertheless, one should note that in order to properly examine the potential effects of the aggressiveness of monetary authorities in emerging countries, different characteristics of small open economies, financial frictions and heterogeneous agents should be included in the basic new Keynesian model. Then, the resulting model can be extended to the multi-country version so as to investigate the transmission of structural shocks across economies.

Acknowledgement

The authors are grateful to the Dynare Team and Johannes Pfeifer from University of Cologne for his precious materials about Dynare. We also thank Mete Han Yağmur from Istanbul Technical University and Vildan Merve Yılmaz from Erzurum Technical University for their helpful comments.

References

- Adjemian, S. *et al.* (2018) 'Dynare: reference manual version 4', *Dynare Working Paper Series*, (1), pp. 1–202. Available at: <https://ideas.repec.org/p/cpm/dynare/001.html>.
- An, S. and Schorfheide, F. (2007) 'Bayesian Analysis of DSGE Models', *Econometric Reviews*, 26(2–4), pp. 113–172.
- Benchimol, J. and Fourçans, A. (2012) 'Money and risk in a DSGE framework: A Bayesian application to the Eurozone', *Journal of Macroeconomics*. Elsevier Inc., 34(1), pp. 95–111. Available at: <http://dx.doi.org/10.1016/j.jmacro.2011.10.003>.
- Calvo, G. (1983) 'Staggered Prices in a Utility Maximizing Framework', *Journal of Monetary Economics*, 12(3), pp. 383–398.
- Castelnuovo, E. (2007) 'Taylor rules and interest rate smoothing in the Euro area', *Manchester School*, 75(1), pp. 1–16.
- Christiano, L., Motto, R. and Rostagno, M. (2008) 'Shocks, structures or monetary policies? The Euro Area and US after 2001', *Journal of Economic Dynamics and Control*, 32(8), pp. 2476–2506.
- Dejong, D. N. and Chetan, D. (2007) *Structural Macroeconometrics*. New Jersey: Princeton University Press.
- Fernández-Villaverde, J. (2010) 'The econometrics of DSGE models', *Journal of the Spanish Economic Association*, 1(1–2), pp. 3–49.
- Gali, J. (2008) *Monetary Policy, Inflation and the Business Cycle: An Introduction to the New Keynesian Framework*. 1st edn. New Jersey: Princeton University Press.
- Gali, J. (2015) *Monetary Policy, Inflation and the Business Cycle: An Introduction to the New Keynesian Framework and Its Applications*. 2nd edn. New Jersey: Princeton University Press.
- Guerron-Quintana, P. A. and Nason, J. M. (2013) 'Bayesian Estimation of DSGE models', in Hashimzade, N. and Thornton, M. A. (eds) *Handbook of Research Methods and Applications in Empirical Macroeconomics*. Cheltenham: Edward Elgar Publishing Limited, pp. 486–512.
- Lei, X. and Tseng, M. C. (2019) "'Wait-And-See" Monetary Policy', *Macroeconomic Dynamics*, 23(5), pp. 1793–1814.
- Pfeifer, J. (2017) *An Introduction to Graphs in Dynare*. Available at: <https://sites.google.com/site/pfeiferecon/dynare>.
- Pfeifer, J. (2018) *A Guide to Specifying Observation Equations for the Estimation of DSGE Models*, *University of Mannheim Working Paper*. Available at: <https://sites.google.com/site/pfeiferecon/dynare>.
- Popescu, I. V. (2014) 'The impact of the recent global crisis on the prioritization of central banks final objectives. A structural approach in the context of Central and Eastern European states', *International Journal of Economic Sciences and Applied Research*, 7(2), pp. 51–76.
- Poutineau, J.-C., Sobczak, K. and Vermandel, G. (2015) 'The analytics of the New Keynesian 3-equation model', *Economics and Business Review*, 2(2015), pp. 110–129.
- Roberts, G. O., Gelman, A. and Gilks, W. R. (1997) 'Weak Convergence and Optimal Scaling of Random Walk Metropolis Algorithms', *The Annals of Applied Probability*, 7(1), pp. 110–120.
- Smets, F. and Wouters, R. (2003) 'An estimated dynamic stochastic general equilibrium model of the euro area', *Journal of the European Economic Association*, 1(5), pp. 1123–1175.
- Smets, F. and Wouters, R. (2007) 'Shocks and frictions in US business cycles: A Bayesian DSGE approach', *American Economic Review*, 97(3), pp. 586–606.
- Taylor, J. B. (1993) 'Discretion versus Policy Rules in Practice', in *Carnegie-Rochester Conference Series on Public Policy* - 39. North-Holland: Elsevier B.V., pp. 195–214.
- Taylor, J. B. (1999) 'A Historical Analysis of Monetary Policy Rules', in Taylor, J. B. (ed.) *Monetary Policy Rules*. Chicago: University of Chicago Press, pp. 319–341.
- Walsh, C. E. (2003) *Monetary Theory and Policy*. 2nd edn. London: The MIT Press.
- Woodford, M. (1999) 'Optimal Monetary Policy Inertia', *The Manchester School*, 67(1), pp. 1–35.
- Yağmur, M. H. (2015) 'Monetary Policy and the 2007-08 Global Financial Crisis: an Overview', *Finansal Araştırmalar ve Çalışmalar Dergisi*, 7(12), pp. 227–243.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Licence



Relationship between Intellectual Capital and Performance of Small and Medium Manufacturing Enterprises in Kenya

Muturi, Moses Murimi^{1 †}, Beatrice Elesani Ombaka², Joseph Muchiri³

¹ Department of Business and Economics, Karatina University

² Lecturer, Department of Human Resource Development, Karatina University

³ Lecturer, Business & Economics Department - Karatina University

ARTICLE INFO	ABSTRACT
<p>Article History</p> <p>Received 1 April 2019; Accepted 20 May 2019</p> <p><i>JEL Classifications</i> M12, M10, M13</p> <p>Keywords: Intellectual capital, Performance, Small and Medium Manufacturing Enterprises</p>	<p>Purpose: The purpose of the Study was to establish the relationship between intellectual capital and performance of small and medium manufacturing enterprises in Kenya.</p> <p>Design/methodology/approach: The study adopted positivist philosophy. The research designs were descriptive survey as well as explanatory research design. The target population consisted of all the small and medium manufacturing enterprises in Kenya with a sample of 183 respondents comprising of one respondent from each firm, being either the Managing director, General Manager, Production Manager or Strategic Manager. Data analysis was conducted using descriptive statistics and inferential analysis.</p> <p>Findings: The study concluded that intellectual capital had no significant influence on performance of small and medium in Kenya and therefore investment in intellectual capital should be economically justified.</p> <p>Research limitations/implications: The data used in the study was collected for a period of ten years only and the results may not be used to make long term inference regarding the relationship that exist between the study variables.</p> <p>Originality/value: The findings of this study significantly contribute to the existing pool of knowledge regarding the concept of intellectual capital and its implications on organizational performance. Scholars and other researchers would find the outcomes of this study relevant as reference material to advance in their research.</p>

[†] Corresponding Author: Muturi, Moses Murimi
Email: mosesm.murimi@gmail.com

1. Introduction

Arising from the turbulent business environment tied with stiff competition that the current manufacturing firms operate, these firms are required to search for better competitive approach for modern business as the traditional orientations may not respond adequately in the wake of fundamental business environmental changes (Hatch & Howland, 2015). Keller (2014) observed that organizations require strategic resources such as intellectual capital to compete effectively. Similarly, to effectively compete, manufacturing companies will require to constantly improve their performance by reducing costs, enhancing quality, and differentiating their products. Consequently, the postulations of the Resource Based View (RBV) theory (Penrose, 1959) that firm's resources such as intellectual capital are key in developing competitive advantage are found relevant in this paper (Teece, 2014). Further, literature supports that for resources to be strategic and thus generate competitive advantage, such resources must be valuable, rare, and imperfectly imitable and non-substitutable (Barney & Hesterly, 2010).

It follows that, intellectual capital, which is also referred to as knowledge assets, business intelligence or intellectual property and which is infinite and rests upon the individual can help manufacturing firms to gain competitive advantage and greater performance (Zott, Amit & Massa, 2011). Further, intellectual capital is viewed as the most important strategic resource since it is hard to imitate and is sustainable over a long period. Intellectual capital is expressed in form of knowledge, experience, ability and skills rooted among employees of the organization. Tactical knowledge acquired by a firm cannot be easily duplicated by rivals, since it is implanted in the human skills and experience of a firm, which leads to profitability (Lazear, 2009). It is thus noted that performance differentials may be attributed to intellectual capital obtained and utilised by the company, having intrinsically different levels of efficiency making them strategic (Rothaermel, 2015).

Research indicates that, across the board, small and medium enterprises are faced by constant threat of failure and most of them never grow into large enterprises (Kamath, 2010; RoK, 2005). Ashton, Russell and Futch (2017) indicated that small and medium enterprises lack adequate resources, adequate management skills and successful marketing strategies. Past studies indicate that the SMEs sector in Kenya is characterized by high mortality rate (RoK, 2005). That is in every five SMEs three of them will fail within the first few months of operation (Bowen, Morara & Mureithi, 2009; RoK, 2015). Over 60 percent of new enterprises started in a year fail within the year (KNBS, 2007) while another 40 percent of survivors are likely to close in the second year (Ellis, 2007) and most do not survive to their third anniversary (Ngugi, 2014). Many SMEs are generally low margin, have very little differentiation and are survival or necessity driven (The Guardian, 2014). This implies that SMEs in Kenya may have failed to identify the relevance of intellectual capital that may help them gain competitive advantage and ultimately superior performance. The reviewed literature showed that many of the previous studies conducted only described the relationship that exist between the various strategic resources and the other study variables but did not go to the extent of determining the nature of the relationship that exist. This study therefore establishes that gaps exist in literature and sought to fill it by establishing the relationship between intellectual capital and performance of small and medium manufacturing enterprises in Kenya.

2. Literature Review

This study was anchored on the resource based view theory advanced by Penrose (1959) which holds that a firm's superior performance is achieved through resources, which are owned and controlled by the firm. Therefore, the focus of the RBV is on attributes of organisational resources and capability (Kraaijenbrink, Spender & Groen, 2010). According to Molloy, Chadwick, Ployhart and Golden (2011), for a firm to have competitive advantage and superior performance, resources have to qualify as exceedingly valuable, rare, inimitable, and non-substitutable. It is noted that resources that are valuable add to advancing the firm's performance. Rareness creates ideal competition in view of the fact that resources in that category are possessed by fewer firms. Inimitable resources are costly to duplicate and non-substitutable, meaning that there is no alternative to accomplishing an equal function instantly available to competitors (Barney & Hesterly, 2010). In this view, the study found that intellectual capital which is inherent in individuals has all the characteristics of strategic resources in that it is valuable, rare, inimitable cannot be substituted. For this reason the study found the theory relevant in explaining the relationship existing between intellectual capital and performance of small and medium manufacturing enterprises in Kenya. Additionally, in this study resource based view theory played a role of evaluating and explaining the capability of a firm to use its intellectual capital to create

and maintain a competitive advantage and thus higher performance among small and medium manufacturing enterprises in Kenya.

Dzenopoljac, Yaacoub, Elkanj and Bontis (2017) conducted a study to investigate the impact of intellectual capital on innovation in telecommunication companies in Jordan, through the presence of knowledge management as a mediator. The results of the study revealed that intellectual capital did have a significant impact on knowledge management and the latter on innovation. Similarly, Obeidat, Tarhini, Masa'deh and Aqqad (2017) in their research conducted with the aim of filling a gap in the intellectual capital (IC) literature by providing insights into the relationship between IC and corporate performance among Arab companies and second and to challenge the validity of the Value Added Intellectual Coefficient (VAIC) as a measure of IC's contribution to performance, they found that earnings and profitability were significantly affected by structural and physical capital; efficiency was determined primarily by physical capital; and market performance was mainly influenced by human capital.

Moreover, Wang, Liang, Wang and Xiang (2018) in their study is to explore the influence of intellectual capital (IC) on firm performance concluded that the three components of IC, namely human capital, structural capital, and relational capital, are positively related to innovation speed and quality, which in turn facilitate the operational and financial performance of a firm.

According to Chu, Chan, Yu, Ng and Wong (2011) intellectual capital represents the relationships with customers and partners, innovation efforts, the infrastructure of the firm and the knowledge and skill of the members of the organisation. Similarly, Vafaei, Taylor and Ahmed (2011) indicated that intellectual capital is that knowledge that can be converted into future profits and comprises resources such as ideas, inventions, technologies, designs, processes and informatics programs. In a study to investigate the influence of intellectual capital and its components, employee capital, structural capital and customer capital, upon their innovation performance Zerenler, Hasiloglu and Mete (2008), established that human capital, structural capital and customer capital had significant positive relationships with innovation performance. However, the study was carried out in the Turkish automotive industry while the current study was conducted on small and medium manufacturing enterprises in Kenya.

Exploring the influence of intellectual capital on the growth of SMEs in Kenya, Ngugi (2014) revealed that innovativeness positively influence the growth of Small and Medium Sized Enterprises in Kenya. A study adopting a descriptive research design to investigate the concept of intellectual capital and financial performance of Kenyan state corporations indicated that the company culture, which contains valuable practices of conducting business, is the major benefit resulting from organizational intellectual capital. The findings also indicated that employees being very highly skilled in their jobs as the major way of human capital to improve the firm's performance (Njuguna & Moronge, 2014). On the other hand, Mungai (2014) sought to establish the relationship between intellectual capital and operational performance of commercial banks in Kenya. The study established that intellectual capital affects the operational performance of commercial banks in Kenya largely.

In addition, studying the influence of intellectual capital on the performance of small and medium enterprises in Mombasa county Kenya, Otor (2015) found that management's technical skills influenced the performance of small and medium enterprises. Although this study was conducted among SMEs, the study was based on SMEs in only one county out of the 47 counties in Kenya. Therefore, its findings cannot be applicable to the whole country. The current study focused on the influence of strategic resources on performance of small and medium manufacturers in Kenya. Finally, while studying the relationship between intellectual capital and performance of firms listed on Nairobi securities exchange, Kariuki, K'Obonyo and Ogotu (2015) conducted a survey of 50 firms listed the study found that there was significant relationship between social capital, organizational capital and non-financial performance.

Based on the reviewed literature, it is evident that there exists empirical literature on intellectual capital from previous research work. However, the study notes that the literature available is limited and previous scholars have measured intellectual capital against other variables in limited scope such as innovation performance, operational performance, financial performance and growth. The study also notes that most of studies conducted were conducted among financial institutions such as commercial banks and insurance companies but no known study has linked intellectual capital and performance of small and medium sized manufacturing enterprises.

3. Methodology

This study adopted positivism philosophy because it maintains that knowledge should be based on facts and no abstractions, thus knowledge is predicated on observations and experiments. The researcher was independent of the researched subject and could not influence the subjects. Cross-sectional descriptive survey as well as explanatory research design. Using the descriptive survey design, the researcher was able to describe the variables of study while explanatory research design was used in order to assess effect of specific changes to explain the patterns of relationships between variables (Sekaran & Bougie, 2010).

The target population for this study consisted of all small and medium manufacturing enterprises in Kenya. According to Kenya Association of Manufacturers (KAM) there are about 350 small and medium manufacturing enterprises in Kenya categorised into 14 sectors (Building, Mining & Construction, Chemical & Allied, Energy, Electrical & Electronics, Food & Beverages, Leather & Footwear, Metal & Allied, Automotive, Paper & Board, Pharmaceutical & Medical Equipment, Plastics & Rubber, Services & Consultancy, Textiles & Apparel, Timber, Wood & Furniture, Agriculture/Fresh Produce). The study adopted stratified and simple random sampling techniques to select a sample of 183 respondents from the small and medium manufacturing enterprises in Kenya representing 52 percent of all the small and medium manufacturing enterprises in Kenya.

Primary data was collected using semi structured, self-administered questionnaire which was tested for validity using content validity and reliability internal consistency via Cronbach's alpha coefficient (α) respectively. The questionnaire contained two sections, the first section covered the demographic characteristics of the respondents while the second section consisted of the research questions on the dependent variable (performance of small and medium manufacturing enterprises) and independent variable (intellectual capital). The independent variable was operationalized into innovation efforts, number of patents, knowledge level and number of new products (Shakya, Patel & Singh, 2016; Pisano, 2015). while performance of small and medium manufacturing enterprises was measured in terms of profitability, sales volume, market share and number of customers as recommended by advised by Chu, et al (2011), Vafaei, et al (2011) and Dumay and Garanina (2013). The respondent were required to respond to the research items on the extent to which they agree with the statements on the aspects of study variables in a 5-point Likert scale where 5- was very large extent and 1 represented no extent.

In this study, data was analysed using descriptive statistics such as frequencies, means and standard deviation and presented inform of tables and graphs as well as inferential analysis using measures such as correlation and multiple regression analysis to establish the nature and magnitude of the relationships between the variables (Jobson, 2012). Correlation analysis was carried out to determine the nature and strength of the relationship that exist among the study variables (Glesne, 2015) while regression analysis was conducted using linear and multiple regression models to determine the extent to which strategic resources affect performance of small and medium manufacturing enterprises in Kenya. The multiple regression model was as follows;

$$FP = \beta_0 + \beta_1 \cdot INC + e$$

Where: - FP = Firm Performance; β_0 = Constant; β_1 = Beta Coefficient; INC = Intellectual Capital
 e = Error Term

Results and Discussions

The study used descriptive and inferential statistics to make conclusions on the relationship existing between the study variables. The descriptive statistics provides a summary on the characteristics of the study variables through measures of central tendency: specifically, the mean and the standard deviation. Intellectual capital was operationalised through, innovation efforts, number of patents, knowledge level and number of new products as advised by Chu, et al (2011), Vafaei, et al (2011) and Dumay and Garanina (2013). The descriptive results were as shown in Table 1.

Table 1: Descriptive Statistics: Intellectual Capital

	N	Mean	Std. Deviation	Coefficient of Variation	t-statistic	Sig. (2-tailed)
Innovation Efforts						
We encourage all our staff to be innovative.	131	3.63	1.131	0.312	36.758	.000
The management of this firm has adopted a number of innovative initiatives.	131	3.31	1.082	0.327	35.048	.000
We design new production processes frequently	131	3.24	1.108	0.342	33.427	.000
Number of new Products						
We encourage our employees to suggest new products that may increase customer utility	131	3.47	1.185	0.341	33.537	.000
This firm develop new products regularly	131	3.13	1.041	0.333	34.421	.000
Our enterprise design and produce new products every year	131	2.90	1.129	0.389	29.407	.000
Knowledge Level						
Our company encourage our staff to research widely	131	3.51	1.211	0.345	33.180	.000
Our production processes are knowledge based	131	3.31	1.171	0.354	32.390	.000
This firm has a library to encourage our staff to improve their knowledge level	131	2.91	1.406	0.483	23.680	.000
Number of Patents						
This company has patented all its production formulae	131	3.13	1.303	0.416	27.487	.000
This firm boast of having the most number of patents	131	2.88	1.259	0.437	26.163	.000
Aggregate Score	131	3.221	1.184			

Source: Survey Data (2018)

The results shown in Table 1 indicated that the overall mean score for intellectual capital was 3.221 meaning that majority of small and medium manufacturing enterprises employed intellectual capital only to a moderate extent. This may be attributed to the fact that majority of the manufacturing enterprises developed and produced a certain line of

products which are patented already and therefore, only a few developed new products and innovated new once. As noted earlier by Vafaei, Taylor and Ahmed (2011) intellectual capital can be converted into future profits and comprises resources such as ideas, inventions, technologies, designs, processes and informatics programs. Consequently, majority of small and medium manufacturing enterprises may have experienced poor performance and ultimately closing down their operations as observed by Bowen, Morara and Mureithi (2009) because of failing to exploit the intellectual capital at their disposal.

The results however showed that the statement with the highest mean score was that majority of small and medium manufacturing enterprises in Kenya encourage their staff to be innovative with mean score of 3.64. This implied that in some manufacturing enterprises innovation was enthralled. The results tallied with the statement with the least mean score which indicated that most firm boasted of having majority number of patents with a mean score of 2.88 meaning that manufacturing enterprises hardly innovated new products and process as shown by few patents granted. The study thus established that although some manufacturing enterprises endeavoured to be innovative, this did not translate into new products or process. In view of Ngugi (2014) intellectual capital positively influence the growth of Small and Medium Sized Enterprises in Kenya while at the same time Njuguna, (2014) showed that intellectual capital improves financial performance of Kenyan state corporations. In light of these revelations, the study finds that small and medium manufacturing enterprises in Kenya would benefit immensely from capitalisation on the available intellectual capital by being innovative, developing new products and processes and sharing this knowledge across the firm.

Table 2: Descriptive Statistics for Performance

	N	Mean	Std. Deviation	Coefficient of Variation	t-statistic	Sig. (2-tailed)
Profitability						
Gross profit margin has been on the rise	131	3.79	.950	0.251	45.687	.000
We have observed a steady increase in profit before tax	131	3.66	1.058	0.289	39.553	.000
This company has over the years experienced gradual growth in profit after tax	131	3.63	1.083	0.298	38.409	.000
Sales volume						
Our firm has been experiencing growing sales volume	131	3.85	1.016	0.264	43.419	.000
Our customers have been gradually increasing their order volumes	130	3.62	1.109	0.306	37.157	.000
Market Share						
Our main products occupy the bigger portion of market share	131	3.63	1.018	0.280	40.775	.000
We pride as the manufacturing firm with the highest market share	131	3.52	1.126	0.320	35.784	.000
Number of Customers						

The quality of our products has helped us increase the number of customers	131	3.95	1.152	0.292	39.199	.000
The number of customers in this firm has been gradually increasing	131	3.89	1.010	0.260	44.136	.000
	N	Mean	Std. Deviation	Coefficient of Variation	t-Statistic	Sig. (2-tailed)
Aggregate Score	131	3.727	1.058			

Source: Survey Data (2018)

The overall mean score for the firm performance was 3.727 indicating that majority of respondents agreed that the performance of their firms had increased to a great extent. Additionally, the overall standard deviation was 1.058 which shows that there was a high dispersion in performance among the small and medium manufacturing enterprises in Kenya. Based on the magnitude, it was found that majority of small and medium manufacturing enterprises in Kenya relied on the quality of their products to increase the number of customers as shown by a mean score of 3.95 and a standard deviation of 1.152. The high value of the standard deviation depict that there was high variability on the pursuit of quality products among the small and medium manufacturing enterprises.

The respondents also believed to a great extent that their manufacturing firm had the highest market share with a mean score of 3.52 and a standard deviation of 1.126. Although, this is the statement that received the least mean score, the results showed that majority of the respondents believed that their firm held a significant proportion of the market in the regions that they operate. Hatch and Howland (2015) had earlier concluded that for firms to effectively compete in the complex and highly competitive environment, companies must constantly improve the quality of their products, reducing costs, and differentiating their products and services. The results therefore show that small and medium manufacturing enterprises in Kenya had adopted this strategy to a great extent though with a significant level of variability as shown by the standard deviation.

Reliability of the Research Instruments

Reliability of the research instrument in this study was tested using internal consistency test. The internal consistency was measured using Cronbach's alpha coefficient (α) which indicates how well the items in a set are positively correlated to one another (Benjamin & Orodho, 2014). The study calculated the reliability of the study variables and the results are as shown in Table 3.

Table 3: Validity and Reliability Analysis

Variable	Cronbach's Alpha		Remarks
	Pilot	Main Study	
Intellectual capital	.953	.905	Reliable
Performance	.904	.904	Reliable

Source: Survey Data (2018)

From the result shown in Table 3.4, it is found that intellectual capital had a coefficient of 0.905 while performance had a coefficient of 0.904. Based on these observations, the study noted that the coefficients intellectual capital was greater than 0.7 and it was therefore concluded that the questionnaire was reliable.

The inferential analysis conducted through regression analysis showed the results in Table 4.

Table 4: Regressing Performance on Intellectual Capital

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.158 ^a	.025	.017	.78576		
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	12.043	1	12.043	22.306	.071 ^b
	Residual	69.647	129	.540		
	Total	81.69	130			
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	3.212	.300	10.697	.000	

Intellectual Capital	.162	.089	.158	1.819	.071
a. Dependent Variable: Performance					
b. Predictors: (Constant), Intellectual Capital					

Source: Survey Data (2018)

Table 4 shows that the R square (R^2) for the model was 0.025 meaning that intellectual capital contributed 2.5 percent of the changes in performance of small and medium manufacturing enterprises in Kenya. The results also meant that 97.5 percent of the changes in performance of small and medium manufacturing enterprises in Kenya are explained by other variables other than intellectual capital. At the same time, the F-statistic for the regression model was 22.306 which was greater than the F-Critical of 3.9146. Similarly, the P-value for the F-statistic was found to be 0.071 which was greater than the significance level of 0.05. Therefore, the study concluded that the model was not fit in predicting performance.

In addition, the coefficient results for the regression model showed that the unstandardized coefficients of the constant and intellectual capital were 3.212 and 0.162 respectively. These results showed that holding intellectual capital constant at zero, performance of small and medium manufacturing enterprises in Kenya would be equal to 3.212. In addition, the results indicate that holding all other factors constant, if intellectual capital increases by one unit, it would cause a 0.162 increase in performance of small and medium manufacturing enterprises in Kenya. Further, the P-value for the coefficient of intellectual capital was found to be 0.071 which was greater than the significance level of 0.05. Therefore, on the basis of these results the study failed to reject the null hypothesis and concluded that intellectual capital has no significant influence on performance of small and medium manufacturing enterprises in Kenya.

The regression results were thus summarised as follows;

$$FP = 3.212 + 0.162INC + e$$

The regression results in this study were in line with the descriptive statistics which showed that the aggregate mean score of intellectual capital was 3.221 which represents a moderate extent. These results are in line with the low regression coefficients. In particular the respondents indicated to a moderate extent that they encourage their staff to be innovative and suggest new products that may increase customer utility. In addition, the study noted that the production process was relatively knowledge based to a moderate extent. Further, the results showed that just a few enterprises designed and produced new products every year. Moreover, it was noted that while some manufacturing firms had patented all its production formulae some of them had not depicting that they were not keen on their intellectual capital resulting in the low scores observed.

Theoretically, the variable was anchored on the Resource Based View Theory as advanced by Penrose (1959). The theory postulates that for strategic resources to help a firm gain superior performance, such strategic resources must be unique and non-substitutable. In view of Barney and Hesterly (2010) intellectual capital is based on the firm's employees and when patented can be protected by law as a strategic resource to the firm. In addition, no firm can be able to imitate another in terms of innovation efforts and knowledge levels. For this reason, the study supports the postulates of the theory that for strategic resources to generate competitive advantage and superior performance they need to be unique and non-substitutable.

The results obtained in this study contradicted the conclusions reached by Zerenler, Hasiloglu and Mete (2008) who showed that intellectual capital has a significant positive relationship with innovation performance. Further, Ngugi (2014) exploring the influence of intellectual capital on the growth of SMEs in Kenya revealed that managerial skills of the owner/managers positively influence the growth of Small and Medium Sized Enterprises in Kenya. Moreover, Njuguna (2013) showed that intellectual capital improves the firm's performance financial performance of Kenyan state corporations through culture, which contains valuable practices of conducting business. Finally, Mungai (2014) studying intellectual capital and operational performance of commercial banks in Kenya, established that intellectual capital largely affects the operational performance of commercial banks in Kenya.

Earlier studies done by Zerenler, Hasiloglu and Mete (2008), Kianto, Andreeva and Pavlov (2013), Ngugi (2014), Njuguna (2014), Mungai (2014) and Kariuki, K'Obonyo and Ogutu (2015) had identified that most of the studies done had focused on large and established firms ignoring the small and medium sector particularly in manufacturing. The study had also identified that earlier studies had focused on the relationship between intellectual capital and other constructs such as growth, operational efficiency failing to show the link between intellectual capital and integrated firm performance. This study therefore contributes to the body of knowledge by filling these gaps.

Correlation Analysis

The objective of correlation analysis was to establish the nature and strength of the relationship that exist among the study variables. To achieve this objective, Pearson's product moment correlation was used. The decision on the

† Corresponding Author: Muturi, Moses Murimi
Email: mosesm.murimi@gmail.com

strength of the relationship was based on Dancey and Reidy (2004) recommendations who indicated that a correlation coefficient of 1 indicates that there is a perfect correlation between the variables, a correlation coefficient of 0.7 to 0.9 shows a strong correlation, a coefficient of, 0.4 to 0.6 indicates a moderate correlation, a coefficient of 0.1 to 0.3 shows a weak correlation while a coefficient of 0 shows absence of correlation. The results of the correlation analysis were as summarised in Table 5:

Table 5 Correlations Analysis Results

		Performance	Intellectual Capital
Performance	Pearson Correlation	1	.158
	Sig. (2-tailed)		.001
	N	131	131
Intellectual Capital	Pearson Correlation	.158	1
	Sig. (2-tailed)	.001	
	N	131	131

Based on the results shown in Table 5, it is found that the correlation coefficient between performance and intellectual capital was 0.158 with a significance level of 0.001. These results show that there a weak positive correlation between performance of small and medium manufacturing enterprises and intellectual capital. In general, the results showed that there was a positive correlation between performance of small and medium manufacturing enterprises and intellectual capital implying that an increase in strategic resources lead to an increase in performance of small and medium manufacturing enterprises in Kenya.

4. Conclusion

The results in the study showed that intellectual capital had a moderate influence on performance however, this influence was not significant. The study thus concluded that intellectual capital has no significant influence on performance of small and medium manufacturing enterprises in Kenya. The results further showed that innovation efforts significantly predicted performance while number of patents, number of new products and knowledge level failed to significantly predict performance of small and medium manufacturing enterprises in Kenya. The study further concluded that intellectual capital was significant in predicting profitability but insignificant in predicting number of customers, sales volume and market share.

Recommendation

Based on the study results, the study concluded that intellectual capital has no significant influence on performance of small and medium manufacturing enterprises in Kenya. In this regard the study recommend that the management of small and medium manufacturing enterprises should carry our cost benefit analysis before committing their resources to protect their intellectual capital in form of patents. It was however noted that innovation efforts and new products affected performance to a great and the management should therefore focus their energy on them.

References

- Ashton, W., Russell, S., & Futch, E. (2017). The adoption of green business practices among small US Midwestern manufacturing enterprises. *Journal of Environmental Planning and Management*, 60(12), 2133-2149.
- Shakya, M. S., Patel, M. M., & Singh, V. B. (2016). Knowledge level of chickpea growers about chickpea production technology. *Indian Research Journal of Extension Education*, 8(3), 65-68.
- Pisano, G. P. (2015). You need an innovation strategy. *Harvard Business Review*, 93(6), 44-54.
- Barney, J. B., & Hesterly, W.S (2010). *Strategic management and competitive advantage concept*. Upper saddle River, N.J: Pearson Prentice Hall.
- Bowen, M., Morara, M., & Mureithi, M. (2009). Management of business challenges among small and micro enterprises in Nairobi-Kenya. *KCA journal of business management*, 2(1), 957-983.
- Chu, S. K. W., Chan, K. H., Yu, K. Y., Ng, H. T., & Wong, W. K. (2011). An empirical study of the impact of intellectual capital on business performance. *Journal of Information & Knowledge Management*, 10(01), 11-21.
- Dumay, J., & Garanina, T. (2013). Intellectual capital research: a critical examination of the third stage. *Journal of Intellectual Capital*, 14(1), 10-25.
- Dzenopoljac, V., Yaacoub, C., Elkanj, N., & Bontis, N. (2017). Impact of intellectual capital on corporate performance: evidence from the Arab region. *Journal of Intellectual Capital*, 18(4), 884-903.

- Glesne, C. (2015). *Becoming qualitative researchers: An introduction*. Delhi, Pearson Education.
- Hatch, N. W., & Howland, C. (2015). When Does Competitive Advantage Improve Customer Welfare? In *Academy of Management Proceedings* (Vol. 2015, No. 1, p. 18091). Academy of Management.
- Jobson, J. (2012). *Applied multivariate data analysis: volume II: Categorical and Multivariate Methods*. Berlin, Springer Science & Business Media.
- Kamath, G. B. (2010). Intellectual capital efficiency analysis of Indian private sector banks. *IUP Journal of Bank Management*, 9(3), 23.
- Kariuki, A., K'Obonyo, P., & Ogotu, M. (2015). Intellectual Capital and Performance of Firms Listed on Nairobi Securities Exchange. *DBA Africa Management Review*, 5(2).
- Keller, R. H. (2014). Is team based tacit knowledge transferable? Players as strategic resources. *Journal of Management Policy and Practice*, 15(4), 40.
- Kraaijenbrink, J., Spender, J. C., & Groen, A. J. (2010). The resource-based view: A review and assessment of its critiques. *Journal of management*, 36(1), 349-372.
- Lazear, E. P. (2009). Firm-specific human capital: A skill-weights approach. *Journal of political economy*, 117(5), 914-940.
- Molloy, J. C., Chadwick, C., Ployhart, R. E., & Golden, S. J. (2011). Making intangibles "tangible" in tests of resource-based theory: A multidisciplinary construct validation approach. *Journal of Management*, 37(5), 1496-1518.
- Mungai, S. N. (2014) *Intellectual capital and operational performance of commercial banks in Kenya*. (Unpublished doctoral dissertation), University of Nairobi, Kenya.
- Ngugi, J. K. (2014). *Influence of Intellectual Capital on the growth of small and Medium Enterprises in Kenya*. (Unpublished MBA Project), University of Nairobi, Kenya.
- Njuguna, L., & Moronge, M. (2014). Influence of the managerial behaviour of agency cost on the performance of listed firms on NSE. *International Journal of Social Sciences and Entrepreneurship*, 1(7), 397-410.
- Obeidat, B. Y., Tarhini, A., Masa'deh, R. E., & Aqqad, N. O. (2017). The impact of intellectual capital on innovation via the mediating role of knowledge management: a structural equation modelling approach. *International Journal of Knowledge Management Studies*, 8(3-4), 273-298
- Otor, E.O (2015). *The influence of intellectual capital on the performance of small and medium enterprises a case of Mombasa county Kenya*. (Unpublished doctoral dissertation), University of Nairobi, Kenya.
- Penrose, E.T. (1959). *The Growth of the Firm*. New York, Wiley.
- R.o.K (2005). *State of implementation of the micro and small enterprises act*. Nairobi, Government Printer.
- RoK, (2015). *The National Micro and Small Enterprise Baseline Survey in Kenya*. Nairobi, Government Printer.
- Rothaermel, F. T. (2015). *Strategic management*. New York, McGraw-Hill Education.
- Sekaran, U., & Bougie, R. (2010). Research Methods for Business: A Skill. *Building Approach*. Hoboken, New Jersey: John Wiley & Sons.
- Teece, D. J. (2014). The foundations of enterprise performance: Dynamic and ordinary capabilities in an (economic) theory of firms. *The Academy of Management Perspectives*, 28(4), 328-352.
- Vafaei, A., Taylor, D., & Ahmed, K. (2011). The value relevance of intellectual capital disclosures. *Journal of Intellectual Capital*, 12(3), 407-429.
- Wang, Z., Cai, S., Liang, H., Wang, N., & Xiang, E. (2018). Intellectual capital and firm performance: the mediating role of innovation speed and quality. *The International Journal of Human Resource Management*, 1-29.
- Zerenler, M., Hasiloglu, S. B., & Sezgin, M. (2008). Intellectual capital and innovation performance: empirical evidence in the Turkish automotive supplier. *Journal of technology management & innovation*, 3(4), 31-40.
- Zott, C., Amit, R., & Massa, L. (2011). The business model: recent developments and future research. *Journal of management*, 37(4), 1019-1042.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Licence



Towards a New Approach of Innovation in Less Developed Regional Business Ecosystems

Fotios Katimertzopoulos^{1 †}, Charis Vlado¹

¹ Democritus University of Thrace, Department of Economics, Komotini, Greece

ARTICLE INFO

Article History

Received 2 November 2019;
Accepted 24 November 2019

JEL Classifications
O30, R11

Keywords:

peripherality, innovation,
regional and local under-
development, business
dynamics and physiology,
multi-level competitiveness,
Stra.Tech.Man approach

ABSTRACT

Purpose:

Most studies are undertaken using the differences in regional characteristics to either explain variations in the creation of innovation or interpret regional development forms based on innovative activities inside a region. However, many researchers suggest that businesses instead of regions are those that produce innovation, combining in their research the use of business data together with local characteristics. The purpose of this article is to propose a new approach to innovation in less developed regional business ecosystems, focusing on the integration of business' strategy, technology and management dynamics.

Design/methodology/approach:

By performing a literature review, the purpose of this article is to investigate whether the policy on innovation is able to either aim at improving regional innovation conditions or focus more on the specific needs of SMEs in those regions. All these are envisaged and enhanced under the prism of a new approach to regional innovation systems: the Stra.Tec.Man (Strategy. Technology. Management) method.

Findings:

In summary, it seems that innovation may be concentrated on a practical field, with distinct targeting, but it must transplant the organism's intrinsic capability (material or intangible) in the particular circumstances of its external environment, within the specific regional dynamics. Its productivity, its innovativeness and, finally, its ability to survive and expand is always synthetically coordinated by the business (and its specific physiology), the industry (and its special dynamics) and the socio-economic environment (and its particular historical evolution).

Research limitations/implications:

Consequently, the present study was based on a literature review. The analyzes of the theoretical method of Stra.Tech.Man (initiated by the regionalism question in this study) are aimed at encouraging future research on innovation measurement in less-developed areas.

Originality/value: The main objective of this study is to present the Stra. Tech. Man's multidimensional analytical specter, including the theoretical approach of innovation in order to map the factors that affect business ecosystem growth and development in less developed regions.

1. Introduction: The particularity of producing innovation in less developed regional ecosystems.

Innovation is the creation and adoption, assimilation and exploitation of value-added transformations in the social and economic spheres; the expansion and renewal of services, products and markets; the development of new production methods; and the establishment of new management systems (Crossan and Apaydin, 2009). The final analysis concerns any outflow or method that contributes to increasing the profitability of each socio-economic organization. Here innovation is perceived at the same time as a process and as a result.

Innovative activity is a highly complex process that unfolds combined and simultaneously at national, regional and global level. National innovation systems show a range of characteristics that vary from one region to another, and it is therefore necessary to place as well parallel emphasis on regional innovation systems (Doloreux and Parto, 2005).

[†] Corresponding Author: Fotios Katimertzopoulos
e-mail: fkatimertzopoulos@gmail.com

These, of course, depend on the internal organization of the hosted businesses, the nature of the inter-business relations, the capacity to absorb external resources, the role of the public sector and government policy, the institutional structure of the financial sector, the degree to which the system is opened, the intensity and organization of R&D, the institutional framework, the character of the production system, the learning ability, and the hierarchical center-periphery forces (Evangelista, Iammarino, Mastrostefano & Silvani, 2002; Oughton, Landabaso & Morgan, 2002).

Peripherality is 'of a socio-economic system (defined at the same time in complex terms such as economic, geographic, communicative, cultural, etc.) away from their geographical core growth or the control center of the economy (Goodall, 1987). So the "general principles" that apply to central urban areas do not always have the ability to capture and explain the economic development and crisis of "remote" areas, often characterized as "underdeveloped" (backward), "stagnant" or developmentally lagging behind (Gatrell, 1999).

There are researchers who use the differences in regional characteristics either to explain the deviations in innovative performance or to interpret the different forms of regional development based on regional innovative activities (Gossling and Rutten, 2007). On the other hand, some researchers argue that it is not the regions that innovate but firms, and therefore they use combined data at the enterprise level along with regional characteristics (Sternberg and Arndt, 2001).

Great importance has been given to the fact that firms in distance regions are often deprived of well-trained staff and ease of physical communication (Romijn and Albaladejo, 2002). Due to this fact, they are forced to pay additional costs to provide services or produce goods, as their access to business advice and professional work is limited, since their larger customers and suppliers are far away from their region (Katimertzopoulos and Vlados, 2017; Anderson, 2000).

This study examines the peculiarities and variables that influence the creation and the diffusion of innovation in regional ecosystems. Also in this study, the meso and micro environment of innovation will be approached and studied through the theoretical approach of Stra.Tech.Man innovation (Vlados, Katimertzopoulos & Blatsos, 2019).

2. Enhance the logic of regional innovation systems

Innovation is an important factor affecting the performance and regional development (Gossling and Rutten, 2007). Regional innovation systems play an important role in strengthening the geographic concentration of innovation (Asheim, 1998; Isaksen, 2003; Cooke, 2002). A regional innovation system can be defined as a locally concentrated network of actors, public and private institutions whose activities and interactions create, import, modify and diffuse new technologies (Evangelista et al., 2002).

The logic of regional innovation systems is based on the recognition of existence of technology trajectories based on localized learning in an area. The theory of regional innovation systems argues that regions can become more innovative and competitive by promoting stronger relationships between businesses and a regional knowledge infrastructure. Institutions and foundations play a central role in promoting innovation-based regional development (Eskelinen, Hannibalsson, Malmberg, Maskell and Vatne, 2002; Karlsson, Andersson & Norman, 2015).

The emergence of the concept of regional innovation systems coincides with the success of theories on regional clusters and industrial areas in the post-Fordist era (Asheim and Gertler, 2005). Types of regional innovation systems could be analyzed as follows (Asheim, 1998): territorially embedded regional innovation systems, where businesses base their innovative activity on locally-integrated learning processes supported by geographic social and cultural proximity, without any direct interaction with knowledge organizations. An example of particular type of regional innovation system is the media networks in industrial areas (Asheim and Gertler, 2005).

There are also regionally networked regional innovation systems, where firms and organizations are embedded in a specific area and are characterized by locally concentrated learning (Katimertzopoulos and Vlados, 2017; Asheim, 1998). In this type of regional innovation system and with the assistance of policy interventions (such as, strengthening the role of R&D institutes, training organizations, etc.) institutional infrastructure is empowered. Examples of this type of regional innovation systems are the clusters found in Austria, Scandinavia and Germany (OECD, 2005).

Finally regionalized national innovation systems, which differ from the above, since parts of the industry and institutional infrastructure are integrated functionally in the national or international innovation systems, because of the fact that external factors and relationships play an important role. In these systems, cooperation is mainly developed between people with a similar scientific background, as such the community of practice is promoted. A typical example of this type of innovation system is science parks (Karlson et al., 2015; Asheim, 1998).

In order to study the environment of the region and whether and to what factors the innovation is affected by, the firm is essential to perform an analysis of the barriers to innovation, both "internally" and "externally" (Neely and Hii, 1998; OECD, 1992). Among the internal factor are included the conservatism, the lack of insight and motivation, the rigid organizational structures, the hierarchical communication structures etc. The external obstacles include lack of appropriate legislation, lack of infrastructure, the inappropriate education systems and training systems (Katimertzopoulos and Vlados, 2017). On the other hand, OECD (2005) refers to barriers due to economic factors (high costs and risk, lack of resources), market (competition, uncertain product demand), operational factors (insufficient innovation potential, organizational rigidity), and in institutions (lack of infrastructure, regulations and legislation).

The progress in modern visual exploration of innovation's phenomenon in organizational and operational literature shows the gradual deepening of the study towards the intra-organizational dimensions (Ahlstrom, 2010; Li, Lee and Liu, 2010). Nonetheless, to a large extent, the necessary dynamic and coexistence perception of the socio-economic

environment of innovation continues to be perceived in a relatively timid and restrictive manner (Lebas, 2003; Perez, 2003). At the same time, the preservation and reproduction of a peculiar "interpretive tripolism" is observed, with the rendering of the analytic primacy in either strategy or technology or in management, while in contrast, it becomes progressively clear that the innovative phenomenon can always and necessarily have a mixed and synthetic content, both in strategic terms and in terms of technology and management (Stra.Tech.Man innovation theory) (Vlados and Katimertzopoulos, 2019).

3. Innovation in less developed business ecosystems

3.1 Contemporary approaches

Prior research has explored whether innovation policy can either aim to improve regional innovation conditions, in particular through a modern approach to regional and local innovation systems, or focus more on the specific needs of SMEs in these areas (Sternberg and Arndt, 2001). These surveys are studied and enriched in the light of theoretical methodology for Stra.Tech.Man innovation (Vlados, Katimertzopoulos & Blatsos, 2019).

Based on the previous analysis, the concepts of peripherality and accessibility come into the sphere of study, and therefore a spatial dimension is given to innovation policy. Crescenzi (2005) argues that it is more productive to concentrate innovation efforts in the more accessible areas, while Rodriguez-Pose (2001) argues that, in a Sumbeterian view, the presence of increasing returns on investment, concentration economies and a minimum investment threshold, make investment in R & D in distance areas less attractive than in the central areas. Crescenzi (2005), on the other hand, argues that, given the technological gap, the intention to imitate would lead to a strengthening of the contribution of innovative activities to the development of those regions that are lagging behind. Neoclassical perspective regional policy views also emphasize the ease of support for innovative activity in regions lagging behind (Rodriguez-Pose, 2001).

Therefore, in the perspective of evolutionary economics, development and innovation are depicted as the end product of innovative knowledge, in large terms, referring in this way to policies that facilitate business and innovation, technological diffusion and interactive relationships between cooperative business, while exploring the structural influences on the innovation systems that create, reproduce and expand in the localized innovative environments in which they operate (Altomonte and Bekes, 2016; Annoni and Dijkstra, 2013).

Thus, based on the specific characteristics of the regions, some innovative systems have been developed in analytical terms, such as the 'innovation environment', 'innovative regions', 'industrial clusters', 'knowledge clusters' (Asheim and Coenen, 2005; Gereffi and Lee, 2014; Todtling and Trippl, 2005; Cooke, 2002; Cooke and Morgan 1998; Audretsch and Feldman, 1996), 'Business clusters' (Piperopoulos, 2012), 'Entrepreneurial ecosystem' (Geels and Schot, 2007).

By examining the notion of the entrepreneurial ecosystem in this study, it enables to illustrate a lack of relationships and links between the Triple Helix actors and the company's business operations as well as the niche innovation project (Autio, Kenney, Mustar, Siegel and Wright, 2014; Geels and Kemp, 2007). Geels and Kemp (2007) defined the socio-technical structure as a structure produced with the following components: "technology, science, regulation, user practices, markets, cultural meaning, infrastructure, production and supply networks" (Geels and Kemp, 2007). The supply and demand side actors generate, maintain and treat these elements (Geels and Kemp, 2007). The first is composed of businesses, universities, research establishments as well as policy makers. The second is composed of many different clients, users and other stakeholders (Geels and Kemp, 2007).

In general terms, the triple helix theory seems particularly interesting in approaching the innovation inadequacy that characterizes many less developed regional ecosystems. In particular, the helix theory is established as a "laboratory for economic development based on knowledge," which conceptualizes the numerous organizational actors responsible for developing the conditions for a thriving innovation environment particularly at regional level (Etzkowitz and Leydesdorff, 1995). Such knowledge-based development leads to a "endless transition" phenomenon where the three hell realms of institutionalization are interconnected with a process of technological innovation and ongoing organizational reform (Etzkowitz and Leydesdorff, 1998).

The triple helix model differs analytically from alternative models of knowledge creation and innovation, such as Mode 2 and National Systems of Innovation. Mode 2 is the new mode of knowledge production, which is interdisciplinary and differs from the traditional mode of knowledge, as argued in the analysis of. This transformation is undertaken into a new mode of knowledge production, replacing the old paradigm for existing institutions, scientific disciplines, practices and policies. Moreover, National Innovation Systems reflect the flow of information and technology between individuals, companies and organizations that is vital to the advancement of innovation at the national level. According to this theory, implemented in the late 1980s, the creation of innovation and technology benefits from the complex relationships between the actors in the process, especially between businesses, universities and government research institutes (Lundvall, 1992; Gibbons et al., 1994).

In summary, as a result of co-evolving inter-institutional linkages, this first theoretical step attempts to explain innovation. The method of Etzkowitz and Leydesdorff (2000) indicatively parallels this development phase in helix theory, in which the triple helix paradigm differs from the 'state-oriented' or laissez-faire (market-oriented) model as it involves trilateral and hybrid organizations (see Figure 1).

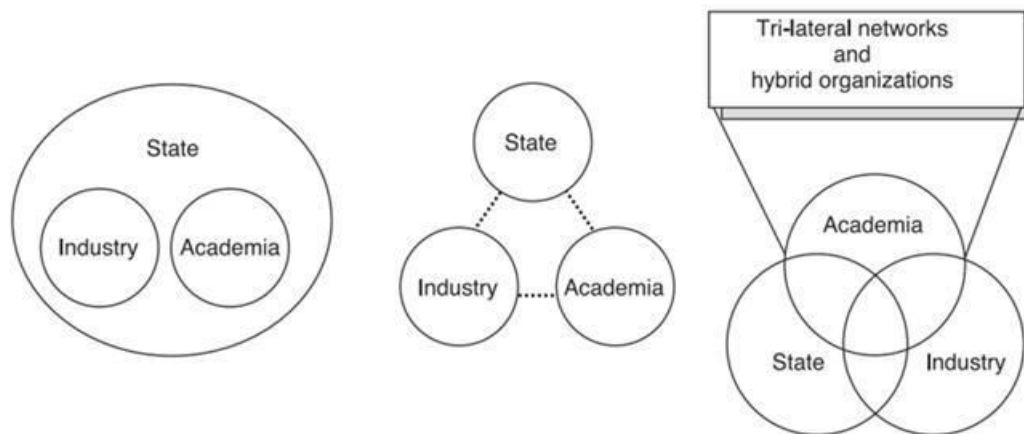


Figure 1. From “statistic” and “laissez-faire” to the triple helix.
Adjusted from Etzkowitz and Leydesdorff (2000)

A micro-level dynamics perspective seems gradedly better suited to the analysis of the triple helix model of local development rather than a macro-level perspective. Finally, we are aware from this last step that the three helix models have the potential to be implemented at local, regional, national and, more specifically, at a global and transnational level for specific innovation policies (Ryan, Geoghegan, & Hilliard, 2018; Sá, Casais & Silva, 2018).

The multi-level perspective of the Triple Helix configuration of actors also includes three heuristic levels known as niche technologies, socio-technical regimes and social-technical landscapes (Geels and Schot, 2007; Geels, 2002; Rip, 1998). These can be compared with the space in which innovation develop, the set of institutions and regulations that define the ecosystem boundaries and the business environment of an ecosystem. The successful interaction between domestic culture and both political and legal systems and entrepreneurial cognition lead to successful communication between ecosystem members (Nambisan and Baron, 2013).

Triple Helix's actors are the main components of the current system. Socio-technical systems combine the institutions and the rules of an economy driven by technology (Geel and Kemp, 2007). According to Geels and Schot (2007) this regime “accommodates this broader community of social groups and their alignment of activities”. In particular, this might be seen in regional business ecosystems consisting of interdependent actors situated in close geographical proximity, who co-evolve and share economic interests (Geels and Kemp, 2007). However the sense of belonging to the society between ecosystem members can be expressed in interdependencies in case of inter-organisational and in specific inter-firm relations (Geels and Kemp, 2007).

At the Knowledge Spillover Theory of Entrepreneurship, the same conclusion as Arrow (1962) is reached: knowledge is not perceived as being the same as economically relevant knowledge, suggesting that diffusion may occur automatically. The Knowledge Spillover Theory of Entrepreneurship recognizes that there are diffusion mechanisms that determine the rate at which the knowledge pool is converted into economically useful operational knowledge as well as it points that these diffusion mechanisms are a graphical representation (wedge) that filters the knowledge of the economic knowledge (Audretsch, 1995; Acs and Audretsch, 2005; Audretsch and Lehmann, 2005).

Thus, high levels of innovative activity that may characterize some areas are highly dependent on the operation of knowledge diffusion filters. Looking back and through modern multiperspectivity to Aghion's (2005) and Gerschenkron's (1962) view of development policies, it can be argued that innovation policies affect innovation activity differently depending on the efficiency of a socioeconomic space in exploiting knowledge and its distance from the global frontier of knowledge exploitation. At this point it could be argued that the unobserved factors that generate the gap in innovation across regions are the filtering mechanisms that prevent regions from achieving higher innovation rates regardless of the observed characteristics of their businesses.

3.2 Towards a theoretical reformulation

By regarding the multiprismity of the theoretical approaches to macro, meso and microenvironment, Stra.Tech.Man's approach attempts to analytically link these three environments by holistically analyzing the development of effective innovation. So, according to Stra.Tech.Man, the "heart" of every living, real firms - that wants to innovate and develop in local and regional environments - is always at the innermost level of analysis within the three fundamental structural spheres: These spheres are the strategy, technology and management that any firm possesses and mobilizes. Within these fundamental functional spheres, each company compiles and reconsolidates its available potential (material and immaterial) for effective innovation that will allow it to compete for survival and growth within its ever evolving socio-economic environment (Vlados and Katimertzopoulos, 2019; Vlados, Katimertzopoulos & Blatsos, 2019) (see Figure 2).

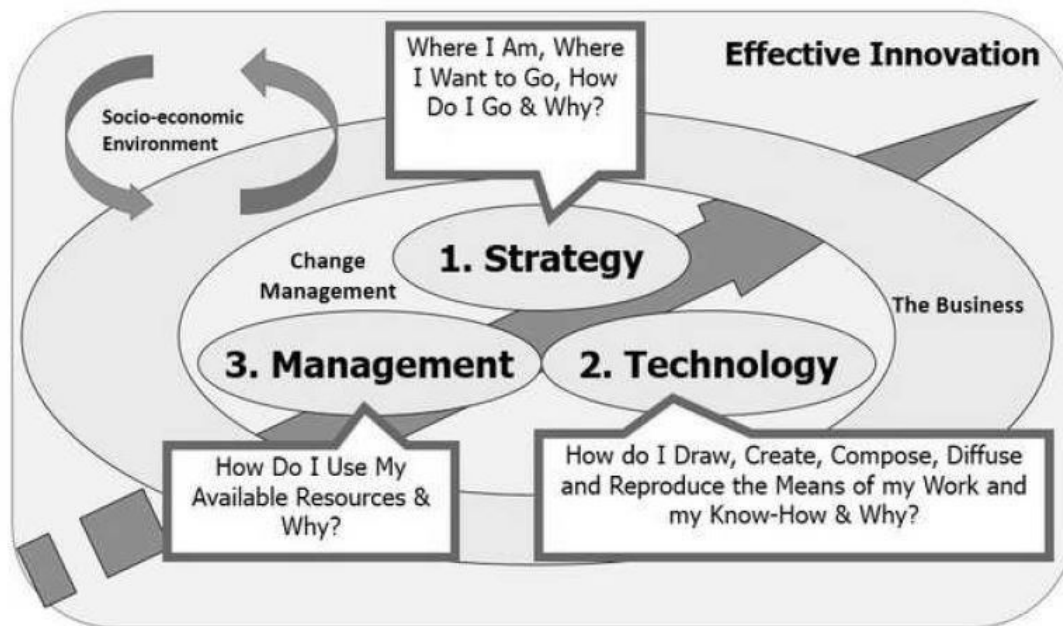


Figure 2. The evolutionary core of business. Vlado, Katimertzopoulos & Blatsos, (2019)

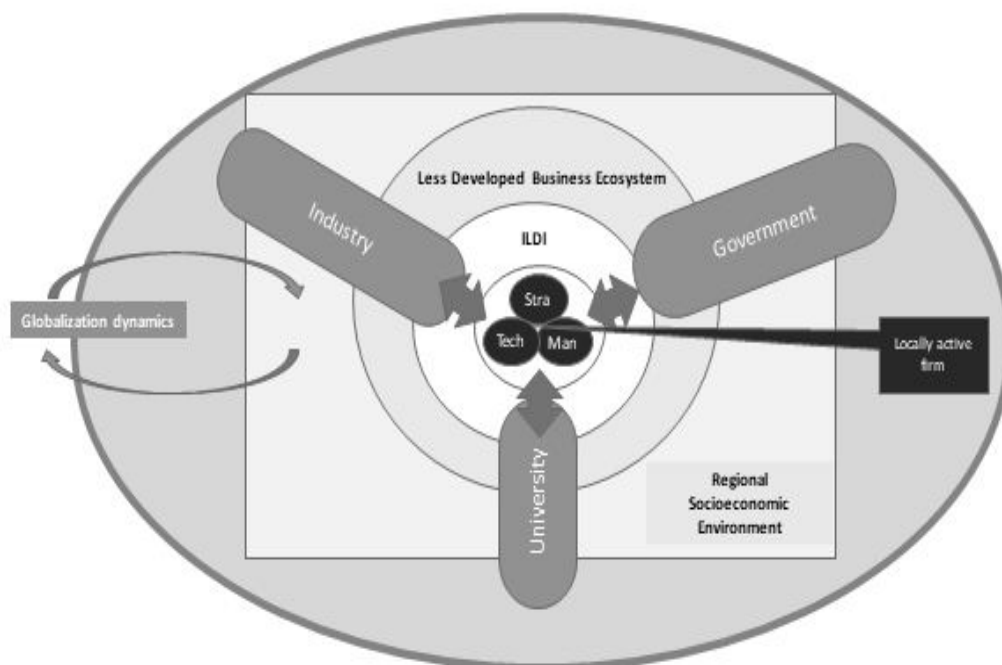
Innovation can start from one point, focus on a functional area with a distinct focus, but every innovation necessitates, at all times, combined repositioning and adjustments for the entire organization (Vlados and Katimertzopoulos, 2019; Vlados, Katimertzopoulos & Blatsos, 2019): a) in the strategy: and / or its relations with its customers, and / or in the markets, and / or value proposition and / or in the product mix b) in the technology: and / or tools of, and / or working in, and / or the expertise, and / or the production process c) and in firm management: and / or programming, and / or the organization and / or staffing, and / or the management and / or control and / or coordination and communication.

In these terms could be repositioned the whole perspective of the theory of the triple helix. In this direction, a new business ecosystems policy proposal is presented, called "Institutes of Local Development and Innovation" (ILDI) (Katimertzopoulos and Vlados, 2017). Such institutes will be founded in the Greek regions, as proposed by the authors. The goal of the ILDIs is to link together public and private actors, that are characterized by loose coordination (banks, chambers of commerce, universities, and any other actor that can stimulate local development), at the regional level. The "living firm" in Stra.Tech.Man is a cellular element of a local business ecosystem, which works as both a policy intervention receiver and a generator of the development process. This type of government policy is both top up and bottom up.

By resembling examples of intermediary organizations in triple helix systems, the ILDI follows a cyclical procedure (Altaf, Hassan, & Batool, 2018; Yuwawutto et al., 2010). It diagnoses the organization's innovative prospects in Stra.Tech.Man (business ' physiology ') terms and provides an extensive business consulting and consulting framework with a view to enhancing local entrepreneurship's innovative potential, while activating feedback and monitoring mechanisms to monitor development results. The operation of the ILDI is focused on and can unify all the co-determined dialectic levels — local, regional, global — that the "living business" transforms with innovation from Stra. Tech. Man.

In this context, this study proposes to integrate in a Stra. Tech. Man micro-level analysis the triple helix model of university-industry-government relations as a theoretical methodological structure for linking structural organizational actors in a socio-economic system (see Figure 3).

Figure 3. The helix theory in Stra.Tech.Man terms



In particular, the living organization (in terms of Stra. Tech. Man) operates as the interactive and unifying epicenter of the helix mechanism at the center of the socioeconomic system (Katimertzopoulos and Vlado, 2019). At the same time, the ILDI intermediary entity draws and disseminates know-how matrix from the three helices, while the overall socio-economic environment with the cultural, philosophical, conceptual and political dimensions — the "civil society" in a quadruple helix theory context — participates in the existing transformation dynamics in the system's developmental or under-developmental path (Vlado and Chatziniolaou, 2019).

4. Conclusions: Towards enriching modern methodologies by evaluating the Stra.Tech.Man approach

This study explored why the analysis of regional innovation performance differences is an important research issue with major policy implications. Dicken and Malmberg (2001) concluded that the capacity for innovation and competitiveness has apparently a territorial nature, regardless of whether it can be defined in terms of Porter's dynamic (Porter, 1990), or related relational assets (Storper, 1997) or spatially localized competences (Maskell, Eskelinen, Hannibalsson, Malmberg & Vatne, 1998). Empirical results support the view associated with the innovation environment that, when attempting to explain regional differences in innovation, the region is important as an environment for business development (Gossling and Rutten, 2007).

There are also researchers who come in partial opposition to this bibliography. Sternberg and Arndt (2001) argue that critical determinants of business-related innovation are more important than those related to external factors or the region itself. As a result, innovation policy can either aim at improving regional conditions for innovation, for example through an approach to regional innovation systems, or focus more on the specific needs of SMEs in these areas (Katimertzopoulos and Vlado, 2017; Sternberg and Arndt, 2001).

Regarding the entrepreneurial ecosystem, it does not appear to develop autonomously but through the participation of players and social groups such as the socio-technical systems (Geels, 2004). Collective value development and trust-based communication between members of ecosystems are essential (Iansiti and Levien, 2004; Thoms and Autio, 2014). The willingness to develop new interconnections and interdependence at both interpersonal and inter-organisational level (Zaheer, McEvily & Perrone, 1998) is affected by trust. While exploring factors that explain the choice of governance structures in inter-firm alliances, Gulati (1995) found evidence that supporting trust and familiarity are essential factors in inter-firm cooperation.

A company integrated into a local ecosystem could therefore profit from a reduction in transaction costs in the pursuit for prospective partners. These ecosystem features may form a significant part of the development of support structures for niche innovation projects. In addition, the interrelationship of technology, which can reinforce the bond

of niche innovation project and the local industry (future providers in the development scheme) is considered as an integral element of an ecosystem (Thomas and Autio, 2014).

In the perspective of this research, every innovation seems to always be Stra.Tech.Man, either provoked by internal or external factors in micro, meso or macro environment. Therefore, it always contains a part of Strategy, a part of Technology and a part of Management (Vlados and Katimertzopoulos, 2019). No innovation can be achieved and implemented effectively without starting and without resulting, at the same time, to some changes in the three inner realms of the business: the strategy, technology and the management of a firm.

In order for a composition of Stra.Tech.Man to prove effective, it has to transplant the organism's intrinsic capability (material or intangible) in the particular circumstances of its external environment, within the specific regional dynamics. Its productivity, its innovativeness and, finally, its ability to survive and expand is always synthetically coordinated by the business (and its specific physiology), the industry (and its special dynamics) and the socio-economic environment (and its particular historical evolution).

The present study was therefore based on a comparative literature review. The analysis of Stra.Tech.Man's theoretical approach (launched in this research on the basis of the problem of regionalism) was intended to stimulate future research into the measurement of innovation in less developed regions. The present study attempts in an introductory effort to crystallize the multidimensionality and the theoretical approach of innovation by Stra.Tech.Man in order to map the factors that influence the growth and development of business ecosystems in less developed regions.

References

- Acs, Z. and Audretsch, D. 2005. Entrepreneurship, Innovation and Technological Change. *Foundations and Trends in Entrepreneurship*, 1(4), 149-195.
- Aghion, P. 2005. Growth and institutions. *Empirica*, 32(1), 3-18.
- Ahlstrom, D. 2010. Innovation and growth: How business contributes to society. *Academy of Management Perspective*, 24(3), 10-23.
- Altaf, A., Hassan, I. E. and Batool, S. 2018. The role of ORIC in the evolution of the triple helix culture of innovation: The case of Pakistan. *Technology in Society*, 56, 157-166.
- Altomonte, C. and Bekes, G. 2016. *Measuring Competitiveness in Europe*. Resource Allocation, Granularity and Trade, rapport Bruegel, <http://bruegel.org/>.
- Anderson, A. 2000. Paradox in the Periphery: an entrepreneurial reconstruction? *Entrepreneurship and Regional Development*, 12(2), 91-109.
- Annoni, P. and Dijkstra, L. 2013. *Regional Competitiveness Index 2013*, JRC Scientific and Policy Reports of the European Commission.
- Arrow, K. 1962. 'Economic welfare and the allocation of resources for invention', in The Rate and Direction of Inventive Activity, Nelson R.R. (ed.), Princeton University Press, Princeton, NJ, pp. 609-626.
- Asheim, B. and Gertler, M. 2005. 'The Geography of Innovation: Regional Innovation Systems', in The Oxford Handbook of Innovation, Fagerberg, J., Mowery, D. & Nelson, R. (eds), Oxford University Press, New York.
- Asheim, B. 1998. 'Territoriality and Economics: on the Substantial Contribution of Economic Geography', in Economic Geography in Transition, Johnsson, O. & Olander, L. (eds), The Swedish Geographical Yearbook, 74, Lund, pp. 98-109.
- Asheim, B. T. and Coenen, L. 2005. Knowledge bases and regional innovation systems: comparing Nordic clusters. *Research Policy*, 34(8), 1173-1190.
- Audretsch, D. 1995. *Innovation and Industry Evolution*. Cambridge, MA: MIT Press.
- Audretsch, D. and Feldman, M. 1996. Innovative clusters and the industry life cycle. *Review of Industrial Organization*, 11(2), 253-273.
- Audretsch, D. and Lehmann, E. 2005. Does the knowledge spillover theory of entrepreneurship hold for regions?. *Research Policy*, 34(8), 1191-1202.
- Autio, E., Kenney, M., Mustar, P., Siegel, D. and Wright, M. 2014. Entrepreneurial innovation: the importance of context. *Research Policy*, 43(7), 1097-1108.
- Cooke, P. 2002. *Knowledge Economies. Clusters, Learning and Cooperative Advantage*. London: Routledge.
- Cooke, P. and Morgan, K. 1998. *The Associational Economy: Firms, Regions and Innovation*. Oxford: Oxford University Press.
- Crescenzi, R. 2005. Innovation and regional growth in the enlarged Europe: The role of local innovative capabilities, peripherality, and education. *Growth and Change*, 36(4), 471-507.
- Crossan, M.M. and Apaydin, M. 2009. A Multi-Dimensional Framework of Organizational Innovation: A Systematic Review of the Literature, *Journal of Management Studies*, 47(6), 1154-1191.
- Dicken, P. and Malmberg, A. 2001. Firms territories: a relational perspective. *Economic Geography*, vol. 77(4), 345-363.
- Doloreux, D. and Parto, S. 2005. Regional innovation systems: Current discourse and unresolved issues. *Technology in Society*, 27(2), 133-153.
- Eskelinen, H., Hannibalsson, I., Malmberg, A., Maskell, P. and Vatne, E. 2002. *Competitiveness, Localised Learning and Regional Development*. London: Routledge.
- Etzkowitz, H. and Leydesdorff, L. 1995. The Triple Helix -- University-Industry-Government Relations: A Laboratory for Knowledge Based Economic Development. *EASST Review*, 14(1), 14-19.

- Etzkowitz, H. and Leydesdorff, L. 1998. The endless transition: A “Triple Helix” of University-Industry-Government relations: Introduction. *Minerva*, 36(3), 203–208.
- Etzkowitz, H. and Leydesdorff, L. 2000. The dynamics of innovation: From National Systems and “Mode 2” to a Triple Helix of university–industry–government relations. *Research Policy*, 29(2), 109–123.
- Evangelista, R., Iammarino, S., Mastrostefano, V. and Silvani, A. 2002. Looking for regional systems of innovation: evidence from the Italian innovation survey. *Regional Studies*, 36(2), 173–186.
- Gatrell, J. 1999. Re-thinking economic development in peripheral regions. *The Social Science Journal*, 36(4), 623–639.
- Geels, F.W. 2002. Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. *Research Policy*, 31(8-9), 1257–1274.
- Geels, F.W. 2004. From sectoral systems of innovation to socio-technical systems: in-sights about dynamics and change from sociology and institutional theory. *Research Policy*, 33(6-7), 897–920.
- Geels, F.W. and Kemp, R. 2007. Dynamics in socio-technical systems: typology of change processes and contrasting case studies. *Technology in Society*, 29(4), 441–455.
- Geels, F.W. and Schot, J. 2007. Typology of sociotechnical transition pathways. *Research Policy*, 36(3), 399–417.
- Gereffi, G. and Lee, J. 2014. Economic and Social Upgrading in Global Value Chains and Industrial Clusters: Why Governance Matters. *Journal of Business Ethics*, 133(1), 25–38.
- Gerschenkron, A. 1962. *Economic Backwardness in Historical Perspective and Other Essays*. Cambridge, MA: Harvard University Press.
- Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P., and Trow, M. 1994. *The new production of knowledge: The dynamics of science and research in contemporary societies*. Retrieved from <http://sk.sagepub.com/books/the-new-production-of-knowledge>
- Goodall, B. 1987. *The Dictionary of Human Geography*. London: Penguin.
- Gössling, T. and Rutten, R. 2007. Innovation in regions. *European Planning Studies*, 15(2), 253–270.
- Gulati, R., 1995. Does familiarity breed trust? The implications of repeated ties for contractual choice in alliances. *Academy of Management Journal*, 38(1), 85–112.
- Iansiti, M. and Levien, R., 2004. Strategy as ecology. *Harvard Business Review*, 82 (3), 68–81.
- Isaksen, A. 2003. ‘National and regional contexts for innovation’, in Regional Innovation Policy for Small-Medium Enterprises, Asheim, B., Isaksen, A., Nauwelaers, C. & Tödting, F. (eds), UK, Cheltenham: Edward Elgar, pp. 49–77.
- Karlsson, C., Andersson, M. and Norman, T. 2015. *Handbook of Research Methods and Application in ECONOMIC GEOGRAPHY*. USA, Massachusetts: Edward Elgar Publishing, Inc.
- Katimertzopoulos, F. and Vlahos, C. M. (2017). Local support mechanisms for entrepreneurship: The approach of local development and innovation institutions. *International Journal of Business and Economic Sciences Applied Research*, 10(1), 30–41.
- Katimertzopoulos, F. and Vlahos, C. M. (2019). “The three dimension of innovation in local development systems, based on the Stra.Tech.man approach”, *Proceedings of the 6th International Conference on Applied Economics “INSTITUTIONS & THE KNOWLEDGE ECONOMY”*, 2019, Volos, Greece.
- Lebas, C. (2003). « *La théorie évolutionniste de la firme ; état des lieux raisonné et implications pour l'analyse stratégique* », WP, centre Walras, université Lyon 2. Cambridge: Cambridge University Press.
- Li, Y., Lee, S., Li, X., and Liu, Y. (2010). Knowledge codification, exploitation, and innovation: The moderating influence of organizational controls in Chinese firms. *Management and Organization Review*, 6(2), 219–241.
- Lundvall, B.-Å. 1992. *National Innovation Systems: Towards a theory of innovation and interactive learning*. London: Pinter Publishers.
- Maskell, P., Eskelinen, H., Hannibalsson, I., Malmberg, A. and Vatne, E. 1998. *Competitiveness, localized learning and regional development – Specialisation and prosperity in small open economies*. London: Routledge.
- Nambisan, S. and Baron, R.A. 2013. Entrepreneurship in innovation ecosystems: entrepreneurs' self-regulatory processes and their implications for new venture success. *Entrepreneurship Theory and Practice*, 37(5), 1071–1097.
- Neely, A. and Hii, J. 1998. *Innovation and Business Performance: a literature review*. The Judge Institute of Management Studies, University of Cambridge.
- OECD. 1992. OECD proposed guidelines for collecting and interpreting technological innovation data- OSLO manual. Paris: OECD.
- OECD. 2005. OECD Oslo Manual: Guidelines for collecting and interpreting innovation data. European Communities/OECD.
- Oughton, C., Landabaso, M. and Morgan, K. 2002. The Regional Innovation Paradox: Innovation Policy and Industrial Policy. *Journal of Technology Transfer*, 27(1), 97–110.
- Pérez, R. (2003). *La Gouvernance de l'entreprise*, Paris, La Découverte, coll. « Repères ».
- Rip, A.K.R., 1998. Technological Change. In: Rayner, S., Malone, E.L. (Eds.), *Human Choice and Climate Change*. Battelle Press, Columbus, OH, pp. 327–399.
- Piperopoulos, P. 2012. *Entrepreneurship, Innovation and Business Clusters*. London: Routledge.
- Rodriguez-Pose, A. 2001. Is R&D investment in lagging areas of Europe worthwhile? Theory and empirical evidence. *Papers in Regional Science*, 80(3), 275–295.
- Romijn, H. and Albaladejo, M. 2002. Determinants of innovation capability in small electronics and software firms in southeast England. *Research Policy*, 31(7), 1053–1067.

- Ryan, P., Geoghegan, W. and Hilliard, R. 2018. The microfoundations of firms' explorative innovation capabilities within the Triple Helix framework. *Technovation*, 76–77, 15–27.
- Sá, E., Casais, B., and Silva, J. 2018. Local Development Through Rural Entrepreneurship, from the Triple Helix Perspective: The Case of a Peripheral Region in Northern Portugal. *International Journal of Entrepreneurial Behavior & Research*, 21(1), 5–26.
- Stam, E. 2015. Entrepreneurial Ecosystems and Regional Policy: A sympathetic Critique. *European Planning Studies*, 23(9), 1759–1769.
- Sternberg, R. and Arndt, O. 2001. The firm or the region: what determines the innovation behavior of European firms?. *Economic Geography*, 77(4), 364–382.
- Storper, M. 1997. *The Regional World*. New York: Guildford Press.
- Thomas, L.D. and Autio, E., 2014. The fifth facet: the ecosystem as an organizational field. Innovation and Entrepreneurship Group Working Papers.
- Todtling, F. and Trippl, M. 2005. One size fits all? Towards a differentiated regional innovation policy approach. *Research Policy*, 34(8), 1203–1219.
- Vlados, C. and Hatzinikolaou, D. (2019). Development on Helix Theory: Exploring a Micro-Evolutionary Repositioning in Stra.Tech.Man Terms. *International Journal of World Policy and Development Studies*, 5(10), 87–99.
- Vlados, C. and Katimertzopoulos, F. (2019). The “Mystery” of Innovation: Bridging the Economic and Business Thinking and the Stra.Tech.Man Approach. *Business and Economic Research*, 9(1), 236–262.
- Vlados, C., Katimertzopoulos, F. and Blatsos, I. (2019). Innovation in Stra. Tech. Man (Strategy-Technology-Management) Terms. *Journal of Entrepreneurship and Business Innovation*, 5(2), 1–26.
- Yuwawutto, S., Smitinont, T., Charoenanong, N., Yokakul, N., Chatratana, S. and Zawdie, G. 2010. A Triple Helix Strategy for Promoting SME Development: The Case of a Dried Banana Community Enterprise in Thailand. *Industry and Higher Education*, 24(3), 177–187.
- Zaheer, A., McEvily, B. and Perrone, V. 1998. Does trust matter? Exploring the effects of inter-organizational and interpersonal trust on performance. *Organization Science*, 9(2), 141–159.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Licence



Influence of Emotional Intelligence on Organizational Performance Among Insurance Companies in Kenya

Mwangi Grace Wangari^{1 †}, Gichuhi D. M.², Macharia S. M.³

¹ Department of Human Resource Development, School of Business, Karatina University, P.O. BOX 1957—10101, Karatina

² Department of Human Resource Development, School of Business, Karatina University

³ Business and Economics Department, School of Business, Karatina University

ARTICLE INFO

Article History

Received 28 May 2019;
Accepted 22 October 2019

JEL Classifications
L60, M12, M16

ABSTRACT

Purpose:

The purpose of this study was to establish the influence of emotional intelligence on organizational performance among insurance companies in Kenya.

Design/methodology/approach:

Positivism research philosophy was adopted for the study. Descriptive and explanatory cross-sectional research designs were used. The target population consisted of all the 55 registered insurance companies in Kenya as at 28th February 2017 and a sample size of 208 participants drawn from lower, middle and top level. Primary data was collected using collected using semi-structured questionnaires containing both open and closed-ended questions while secondary data was obtained using a secondary data collection sheet. Data analysis was conducted using descriptive statistics and inferential analysis.

Findings:

There is a weak positive correlation between self-awareness and organization performance. Self-management, social awareness, and organization performance were moderately correlated while interpersonal relationship management was strongly correlated with organization performance. Emotional intelligence has a significant influence on organizational performance among insurance companies in Kenya. Specifically, self-awareness, self-management, social awareness, and interpersonal relationship management have a significant impact on organizational performance among insurance companies in Kenya.

Research limitations/implications:

Study was limited in scope since it focused on the Kenyan insurance firms and thus the findings might not be generalized to other sectors such as banking and agricultural sectors. The management of insurance companies should ensure that they cultivate, create and maintain good rapport with stakeholders, seek to understand each stakeholder requirements, observe healthy competition with competitors, encourage amicable conflict resolution where grievances arise and enhance effective communication within and outside the organization. Insurance companies should ensure that there are programs that are specially designed to offer training and enhancement of self-awareness to help the management staff and employees to be emotionally stable and make optimal decisions.

Originality/value:

The results of this research will add knowledge in the available literature on emotional intelligence and how it impacts on the performance of organizations by showing that emotional intelligence plays a significant role in personal career development and motivating people to act and control their actions and emotions.

Keywords:

Emotional Intelligence,
Organizational
Performance, Insurance
companies

[†] Corresponding Author: Mwangi Grace Wangari
Email: gkiritu.gm@gmail.com

1. Introduction

In the last decade, the Kenyan insurance industry has faced hard economic times with a penetration rate of under 3%. This has resulted in a number of insurance companies bowing to pressure and exiting the market (IRA, 2016). Mohanty and Kar (2012) indicated that employee performance is a function of motivation and ability. Hence, competency mapping, if well understood and adopted forms an important resource management strategy which allows the firm to build their employees competencies, to employ the best suited job seekers for a role, assign duties to the most suitable candidate and come up with proper succession plans and talent management strategies (Almajali, Alamro and Al-Soub, 2012; Wambua, 2016). As proposed in the competency theory, which is linked to the resource-based view theory, firms are viewed as open systems that are guided by a strategic logic derived from managerial cognitions and governed by management processes.

Teece (2010) described a firm's competence, as special capabilities that might be in terms of technological abilities, unique assets or an organisations culture or way of doing things that provide an organisation with superior performance. These competences offer the firm in possession a competitive edge allowing them superior performance. The theory relates to the current study because it allows the linkage between the construct of emotional intelligence to the performance of companies in the insurance sector in Kenya.

Consequently, emotional intelligence as explained by Brackett, Rivers and Salovey (2011) is the ability to identify, manage and use emotions to guide decision-making. It may also be viewed as the ability to understand emotions. By assimilating emotions in ones thoughts, one is able to understand and control their emotions. The emotions are made up of feelings such as of pleasure and pain and often operate on interpersonal and intrapersonal states. Watson (2000) observed that emotional intelligence plays a significant role in personal career development and motivating people to act as well as control their actions. Based on this argument, it is imperative that every manager understands the emotional intelligence of their employees since this contributes to how one handles the needs of individuals, how he motivates and make them feel comfortable which increases organizational performance.

2. Literature Review

This study was anchored on competency theory which is credited to Harter's (1978, 1981) who points out that organisations require to have competency as a trait that emphasises on the need of the firm to have capabilities and resources particularly knowledge to maximize performance (Qiao, Zhang & Cheng, 2016). Birgit (2010) study that was based in Namibia looked at the association between emotional intelligence and leadership among Namibian based middle managers with the aim of looking into traits of emotional intelligence and if these had any impact on the middle managers leadership styles. According to the results most of the middle managers in Namibia used the transactional style of leadership, the study further showed no significant association between transactional leadership and emotional intelligence. Moreover, Acha (2013) did a research looking at the relationship between a leaders emotional intelligence and employee motivation to job performance and established that emotional intelligence affects performance.

In a study conducted to establish the relationship between emotional intelligence and job performance, Mwathi (2013) found that there was a moderate and positive relationship between emotional intelligence and job performance. In addition, Nzomo (2012) studied the relationship between principals' emotional intelligence and students' learning achievements. Adopting a correlation research design, he indicated that there existed a significant association between emotional intelligence of principals and students' academic achievements in national schools and in co-curricular activities. On the other hand, Omondi (2016) sought to establish the influence of manager's emotional intelligence on employee job satisfaction at the Kenya Post Office Savings Bank and found out that there is a significant and strong relationship between manager's emotional intelligence and employee job satisfaction.

Literature indicates that there are studies done in the past touching on emotional intelligence. Other variables that relate to emotional intelligence including leadership style (Birgit, 2010), employee motivation (Acha et al., 2013), job performance (Mwathi, 2013), academic performance (Nzomo, 2012) and job satisfaction (Omondi, 2016) are the ones targeted in these studies.

Additionally, the study finds that a contingent of research has been done in the education sector as well as in the banking sector hence there is limited literature on the relationship between emotional intelligence and firm's performance. The study sought to fill the gap by determining the relationship between emotional intelligence and organizational performance in the insurance industry in Kenya.

3. Methodology, Results and Discussions

The research philosophy adopted for the study was positivism. The positivistic philosophical foundation focuses on facts, measuring, validity, neutrality, and objectivity of the findings (Saunders, 2011). According to the positivism view, knowledge should be provided through facts and not abstracts. The quantitative nature of data in the current research is from the positivist philosophy which points out that objective realities exist and they can be shown in numeral forms (Bryman & Bell, 2015). The study adopted the descriptive and explanatory research designs. The target population for the study was comprised of the management staff of all the 55 registered insurance companies in Kenya and a sample size of 208 participants drawn from lower, middle and top level management using stratified sampling and simple random sampling techniques.

The study used both primary and secondary data. Primary data was collected using questionnaires and on the other hand, secondary data was collected using a secondary data collection sheet. The questionnaire was structured to contain two sections; the first section was the demographic section that entailed questions regarding the respondents and the second section contained questions (closed and open ended) regarding the study variables (Emotional Intelligence and Organizational Performance). Emotional Intelligence was operationalized into: Self-Awareness, Self-Management, Social Awareness and Interpersonal Relations Management as opined by Vito-Thomas, Allyn, Wagner, Hodges and Streitmatter (2018). On the other hand Organizational Performance was measured in terms of Sales Volume and Profitability (Corvellec 2018).

The respondents were required to respond to the research items on the extent to which they agree with the statements on the aspects of study variables in a 5-point Likert scale where 5- was very large extent and 1 represented no extent. Moreover, Pilot testing was done to ensure that the research tool was valid and reliable and also to improve its face validity (Smith, 2015). Data analysis was conducted using descriptive statistics and inferential statistics as well as SPSS software. Descriptive statistics mainly; frequencies, the mean, and standard deviation were computed for each of the study variables in order to allow the researcher come up meaningful scores that used few indices (Taylor, Bogdan & DeVault, 2015). Inferential data analysis was conducted using Pearson correlation coefficient and regression analysis (multiple regression analysis). The coefficient of determination (R^2) was used to determine if the model was significant and the extent to which each of the independent variables explained the changes in the dependent variable.

The study used descriptive and inferential statistics to make conclusions on the relationship existing between the study variables. Emotional intelligence was the independent variable in the study. The variable was adopted due to its contribution to employee stability for effective decision making. Brackett, Rivers and Salovey (2011) observed that it is important for the management staff to understand emotion, assimilate it and reason with it in their minds. In this study, emotional intelligence was measured through self-awareness, self-management, social awareness and interpersonal relations. The descriptive results were as presented in Table 1.

Table 1: Descriptive Statistics for Emotional Intelligence

	N	Min	Max	Mean	Std. Deviation
Interpersonal relations management					
This company strongly emphasise on management of relationships within the organisation	153	1	5	3.98	.892
We pride in having the best interpersonal relations management in our organization	153	1	5	3.92	.892
A key pillar of our success is good employer – employee relations	153	1	5	3.14	1.161
A key pillar of our success is good employee – employee relations	153	1	5	1.98	1.138
Average				3.68	0.982
Self-management					

Our company endeavours to establish the strengths and weaknesses our staff.	153	2	5	4.01	.827
We train our staff on how to control themselves through tasks	153	1	5	2.46	1.230
Average				3.24	1.029
Social awareness					
We encourage our staff to work in teams	153	1	5	2.37	1.056
Our company always seek to establish the staff level of social awareness	153	1	5	2.03	1.100
Average				2.20	1.078
Self-awareness					
This company regularly undertake to assess the staff level of self-awareness	153	1	5	2.07	1.151
We train our staff on self-awareness on a regular basis	153	1	5	1.91	1.132
Average				1.99	1.142
Aggregate Score				2.787	1.0579

Source: Survey Data (2018)

The results in Table 1 indicated that emotional intelligence was emphasised to a moderate extent as shown by aggregate mean score of 2.787. However, there was a high degree of variance in the observations made by the respondents as shown by the high aggregate standard deviation of 1.0579. These results may suggest that the respondents believed that emotional intelligence has a moderate influence on performance of insurance companies in Kenya. This conclusion was similar to that of Mwathi (2013) who reported a moderate favourable association between emotional intelligence and job performance. Similarly, Acha (2013) concluded that there exists a positive relationship between emotional intelligence and performance. At the same time, Omondi (2016) concluded that there exists a significant and strong relationship between manager's emotional intelligence and employee job satisfaction.

The results further showed that interpersonal relations management was the most adopted element of emotional intelligence as shown by an average mean score of 3.68. There was a general agreement on the emphasis of the construct among the respondents with a low standard deviation of 0.982. The second most, emphasised element of emotional intelligence was self-management with a mean score of 3.24 followed by social awareness and self-awareness with a mean score of 2.20 and 1.99 respectively.

In particular, the results suggested that most insurance companies in Kenya endeavour to establish the strengths and weaknesses their staff to a great extent, strongly emphasise on management of relationships to a great extent and pride in having the best interpersonal relations management to a great extent as shown by a mean score of 4.01, 3.98 and 3.92 respectively and a standard deviation of 0.827, 0.892 and 0.892 respectively. The study also found that employer - employee relations formed a key pillar of success in the insurance companies in Kenya to a moderate extent as shown by a mean score and a standard deviation of 3.14 and 1.161 respectively. The results also indicated that insurance companies in Kenya trained their staff on how to control themselves but to a low extent, encourage teamwork among staff to a low extent, regularly assess the staff level of self-awareness to a low extent, always seek to establish the staff level of social awareness to a low extent, encourage good employee - employee relations and trained their staff on self-awareness on a regular basis to a low extent as shown by a mean score of 2.46, 2.37, 2.07, 2.03, 1.98 and 1.91 and a standard deviation of 1.230, 1.056, 1.151, 1.100, 1.138 and 1.132 respectively.

The study also descriptively analysed the performance of insurance companies in Kenya. To facilitate analysis, the data collected using secondary data collection sheet was converted into a 5-point Likert scale. Regarding sales, 1 represented values less than one billion, 2 represented values greater than one billion but less than two billion, 3 represented values greater than two billion but less than three billion, 4 represented values greater than three billion

but less than four billion while 5 represented values greater than four billion. On profitability ratios, 1 represented a ratio less than 0%, 2 represented a ratio greater than 0% but less than 10%, 3 represented a ratio greater than 10% but less than 20%, 4 represented a ratio greater than 20% but less than 30% while 5 represented a ratio greater than 30%. Descriptive results for performance were as presented in Table 2.

Table 2: Descriptive Statistics for Performance

	N	Minimum	Maximum	Mean	Std. Deviation
Sales Volume	153	1.10	5.00	3.3497	.89928
ROSE	153	1.00	5.00	3.3399	.93396
ROTA	153	1.00	5.00	3.3098	.91499
Aggregate Score	153			3.333	0.916

Source: Survey Data (2018)

The results in Table 2 above showed that most insurance companies had sales volumes greater than 10% but less than 20% as shown by a mean score of 3.3497, Return on Shareholders' Equity (ROSE) ranked second with a mean score of 3.3399 meaning that in most insurance companies the ROSE were greater than 10% but less than 20% while many insurance companies had their Return on Total Assets (ROTA) greater than 10% but less than 20%. The aggregate mean score for performance was 3.333 which means that the insurance industry in Kenya posted moderate results during the period. However, the results also showed that there was high variability in these results as shown by the standard deviations. ROSE had the highest dispersion with a standard deviation of 0.93396 followed by ROTA with a standard deviation of 0.91499 and finally sales volume with a standard deviation of 0.89928. These results implied that while there were some insurance companies that were performing well, there were some others that produced very poor results.

The results posted on this variable agreed with the observations of IRA, 2016 that showed that the insurance industry in Kenya had faced hard economic times and showed average performance with a number of insurance companies exiting the market. Similarly, Ngugi (2007), Ndura (2010), Alipour (2012), Ntinyari (2014) and Mwangi and Murigu (2015) indicated that changing interest rates, mispricing of insurance policies, natural catastrophes, changes in legal framework, false claims by fraudulent customers, inadequate human resource capacities and competences had led to poor performance and mortality of most insurance companies in Kenya.

Reliability of the Research Instruments

The study also tested the reliability of the questionnaire aimed at establishing the extent to which the questionnaire produces the same results under similar circumstances but on different scenarios as noted by Bell (2010). In this study, the research tool reliability was assessed through internal consistency using Cronbach's alpha (α). A construct composite reliability co-efficient (Cronbach alpha) of 0.6 or above is considered adequate (Bryman & Bell, 2015). Based on this argument, a coefficient of 0.6 or above for all the constructs was accepted. The reliability test findings are as indicated in Table 3.

Table 3 : Summary of Reliability Statistics

Variable	Cronbach's Alpha coefficient	Conclusion
Self-Awareness	0.887	Reliable
Self-Management	0.773	
Social Awareness	0.887	Reliable
Interpersonal Relationship Management	0.925	
Performance	0.958	
Overall Cronbach's Alpha	0.890	Reliable

Source: Survey Data (2018)

The summary of reliability statistics shown in Table 3 above, indicates that overall, the Cronbach's Alpha coefficient for all the variables was 0.890. Self-awareness had a coefficient of 0.887, the coefficient for self-management was 0.773, social awareness 0.887, interpersonal relationship management 0.925 while performance had a coefficient of 0.958. The study relied on the recommendations of Bryman and Bell (2015) who indicated that a coefficient of 0.6 or above is

considered adequate. Based on these results the study found that all the constructs had internal consistency since all the Cronbach's Alpha coefficients were greater than 0.6.

The study sought to determine the effect of emotional intelligence as measured through self-awareness, self-management, social awareness, and interpersonal relationship management on performance of insurance companies in Kenya. The results of the study were interpreted using the R², F-statistic, t-test statistics and the P-values. Multiple linear regression analysis was conducted in which organisation performance was regressed on emotional intelligence and the model summary results were as shown in Table 4.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.446 ^a	.199	.177	.78622

a. Predictors: (Constant), Interpersonal Relationship Management, Social Awareness, Self-Awareness, Self-Management

Source: Survey Data (2019)

The results shown in Table 4 showed that the correlation coefficient (R) was 0.446 indicating that there was a medium favourable correlation between organisation performance and emotional intelligence. At the same time the results showed that the coefficient of determination, which measures the percentage of the changes in the dependent variable that can be associated by variations in the independent variable, as shown by the adjusted R Square (R²) was 0.177 meaning that the model predicted 17.7% of all the variations in organizational performance among the selected Kenyan insurance firms. These results implies that 82.3% of the variations in the performance of Kenyan based insurance firms were attributed to other factors other than self-awareness, self-management, social awareness, and interpersonal relationship management.

To establish the Fitness of the model in predicting organisation performance, the study conducted an Analysis of Variance (ANOVA) and the findings are as indicated in Table 5.

Table 5: ANOVA^a Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.2	4	5.8	9.197	.000 ^b
	Residual	93.339	148	.631		
	Total	116.539	152			

a. Dependent Variable: Organisation Performance

b. Predictors: (Constant), Interpersonal Relationship Management, Social Awareness, Self-Awareness, Self-Management

Source: Survey Data (2019)

The ANOVA results showed that the F-statistic for the model was 9.197, which was found to be greater than the F-critical value (2.433). Therefore on the basis of the F-statistic, the study concluded that the model was a good fit and could be used to predict the performance of the selected Kenyan insurance firms. Further, the results showed that the significance level for the F-test statistic was 0.000 which was less than the significance level of 0.05. The conclusion made was that the F-test statistic was significant and therefore the model was fit in predicting performance of Kenyan based insurance firms.

To determine the significance of the model coefficient and the constant, the study conducted a t-test for the study coefficients and the findings are as indicated in Table 6.

Table 6: Table of Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.714	.535		6.944	.000
Self-Awareness	0.108	0.012	0.108	9.000	0.000
Self-Management	0.132	0.046	0.122	2.870	0.005
Social Awareness	0.122	0.034	0.194	3.588	0.000
Interpersonal Relationship Management	0.179	0.021	0.173	8.524	0.000

a. Dependent Variable: Organisation Performance

Source: Survey Data (2019)

As observed in in Table 6, the constant had an unstandardized coefficient of 3.714. This indicates that holding all factors constant at zero (0), performance of the selected insurance companies in Kenya would be equal to 3.714. The results further showed that self-awareness had an unstandardized coefficient of 0.108 implying that if all other factors were held constant a rise in self-awareness by a unit would result in a 0.108 rise in the performance of Kenyan insurance firms. Similarly, self-management had an unstandardized coefficient of 0.132 indicating that holding all other factors constant, a unit increase in self-management would result in a 0.132 increase in performance of insurance companies in Kenya.

Social awareness had a coefficient of 0.122 suggesting that holding all other factors constant, a unit increase in social awareness would result in a 0.122 increase in performance of insurance companies in Kenya. Finally, interpersonal relationship management had a coefficient of 0.179 indicating that if all other factors were held constant and interpersonal relationship management increased by one unit, performance of insurance companies in Kenya would increase by 0.179. Based on the magnitude, interpersonal relationship management had the highest effect followed by self-management, and social awareness while self-awareness had the least effect.

It was also noted that the constant had a t-statistic of 6.944 which was greater than the t-critical value (t-critical at 152 df and 0.05 significance level= 1.655). Thus based on the t-statistic results, the conclusion made was that the constant was significant. Moreover, the results showed that self-awareness had a t-statistic of 9.000, for self-management was 2.870, for social awareness was 3.588 while for interpersonal relationship management was 8.524. It was established that the t-statistics for all the study variables were greater than the t-critical value (at 152 df and 0.05 significance level= 1.655). Further, the results in Table 6 showed that the P-value for the constant and all study variables were less than the significant level of 0.05. Based on these results the study concluded that self-awareness, self-management, social awareness, and interpersonal relationship management have a significant impact on organizational performance among insurance companies in Kenya.

The model was thus summarised as follows:

$$\text{Organisation Performance} = 3.714 + 0.108 \text{ Self-Awareness} + 0.132 \text{ Self-Management} + 0.122 \text{ Social Awareness} + 0.179 \text{ Interpersonal Relationship Management} + \varepsilon$$

The conclusion reached on this variable tallied with the observations made by Watson (2000) who stated that emotional intelligence had a significant effect on personal career development and motivating people to act as well as control their actions. Additionally, the results posted on this hypothesis were in agreement with the results shown by Acha (2013) who showed that the emotional intelligence level of a leader affected the motivation of the workers to excel. Similarly, Mwathi (2013) studying the association between emotional intelligence and service providers job performance determined that a moderate favourable association did exist between the study variables as was found in the current study.

Correlation Analysis

The aim of this part of the study was to deduce if the variables in the study were correlated with each other. The decision on the strength of correlation coefficient was based on Dancy and Reidy (2004) who stated that if the correlation coefficient is equal to 1, then there is perfect correlation, if the correlation coefficient lies between 0.7-0.9, there is a strong correlation, if the correlation coefficient lies between 0.4-0.6 there is moderate extent correlation, if the correlation coefficient lies between 0.1-0.3, there is weak correlation and if the correlation coefficient is 0, then there is no correlation. The results of the correlation analysis were as shown in Table 7.

Table 7: Correlations coefficients

		Organisation Performance	Self- Awareness	Self- Management	Social Awareness	Interpersonal Relationship Management
Organisation Performance	Pearson	1				
	Correlation					
	Sig. (2-tailed)					
Self-Awareness	N	153				
	Pearson	.101	1			
	Correlation					
Self-Management	Sig. (2-tailed)	.007				
	N	153	153			
	Pearson	.414	.147	1		
	Correlation					

	Sig. (2-tailed)	.006	.070			
	N	153	153	153		
Social Awareness	Pearson	.310	.021	.141	1	
	Correlation					
	Sig. (2-tailed)	.017	.792	.082		
	N	153	153	153	153	
Interpersonal Relationship Management	Pearson	.528	.095	.097	.052	1
	Correlation					
	Sig. (2-tailed)	.015	.245	.234	.524	
	N	153	153	153	153	153

Source: Survey Data (2018)

The results in Table 7 showed that the correlation coefficient between organisation performance and self-awareness was 0.101 indicating a weak positive correlation. The results also showed that the correlation coefficient between organisation performance and self-management was 0.414 suggesting that there was a moderate positive correlation between organisation performance and self-management. In addition, the results showed that the correlation between organisation performance and social awareness was 0.310, an indication that social awareness was moderately correlated with organisation performance. Finally, the correlation coefficient between organisation performance and interpersonal relationship management was 0.528 indicating that there was strong positive correlation between interpersonal relationship management and organisation performance. All the coefficients had a P-value of less than 0.05 indicating that they were significant. The conclusion that emotional intelligence has a significant influence on organisation performance was consistent with the conclusions reached by Mwathi (2013) who concluded that emotional intelligence influences employee performance which in turn influences organisation performance. On the other hand, the results failed to agree with the conclusion of Omondi (2016) that there is a strong significant relationship between emotional intelligence and performance as measured through job satisfaction. However, Omondi's study was a case study conducted in the public sector at Kenya Post Office Savings Bank while the current study was conducted in the insurance industry which is predominantly privately owned.

4. Conclusion

The objective of this study was to assess the influence of emotional intelligence on the performance of Kenyan based insurance firms. It was established that emotional intelligence was emphasised to a moderate extent in the insurance industry in Kenya. In particular, interpersonal relations was the most emphasised aspect of emotional intelligence followed by self-management and social awareness while self-awareness was least emphasised. Correlation analysis revealed that there exist a weak positive correlation between self-awareness and organisation performance. Self-management, social awareness, and organisation performance were moderately correlated while interpersonal relationship management was strongly correlated with organisation performance. All correlations were positive and significant. Regression results showed that self-awareness, self-management, social awareness, and interpersonal relationship management have a significant impact on organizational performance among insurance companies in Kenya. It was thus concluded that emotional intelligence has a significant influence on organizational performance among insurance companies in Kenya.

Recommendation

It was established that emotional intelligence was emphasised to a moderate extent among insurance companies in Kenya. It was also noted that there exist a positive relationship between emotional intelligence and organizational performance. The study thus recommends that the management staff of insurance companies should put more emphasis on emotional intelligence. Insurance companies should ensure that there are programs that are specially designed to offer training and enhancement of self-awareness to help the management staff and employees to be emotionally stable and make optimal decisions.

The study also concluded that self-awareness, self-management, social awareness, and interpersonal relationship management have a significant impact on organizational performance among insurance companies in Kenya. The study also recommends that employees should be trained on self-management, social awareness, and interpersonal relations so as to increase the performance level of the firm. Moreover, regulators in the market, specifically, the Insurance Regulatory Authority should emphasise on the adoption of emotional intelligence among insurance companies to improve on their performance.

However, the results in this study were based on data collected from insurance companies in Kenya, meaning that the findings were only applicable to insurance companies in Kenya. Owing to generalizability constraint, this study suggests that more research should be done in other organisations rather than those in the insurance industry in Kenya. The study further suggests that other studies be conducted among other insurance companies within the East African Community to determine if there are cross-border factors that influence the relationship between emotional intelligence and performance of insurance companies.

Further, the study findings were based on data for a ten year period starting from 2008 to 2017. The period covered by the study was affected by post-election violence. The study found that the results could therefore not be extrapolated for longer periods due to the ever changing business environment in which the insurance companies operate. This study thus suggests that other studies be conducted covering longer periods beyond 10 years to determine if similar results would be posted.

References

- Acha, V. (2013). *The relationship between emotional intelligence of a leader and employee motivation to job performance* (Unpublished doctoral dissertation), Capella University, USA.
- Alipour, M. (2012). The effect of intellectual capital on firm performance: an investigation of Iran insurance companies. *Measuring Business Excellence*, 16(1), 53-66.
- Almajali, A. Y., Alamro, S. A., & Al-Soub, Y. Z. (2012). Factors affecting the financial performance of Jordanian insurance companies listed at Amman Stock Exchange. *Journal of Management Research*, 4(2), 266- 275.
- Bell, J. (2010). *Doing your Research Project*. A guide for first time researchers in Education, Health and Social Science: 5th Edition, New York, McGraw- Hill.
- Birgit, H. (2010). *The relationship between emotional intelligence and leadership among middle managers in Namibia* (Doctoral dissertation).
- Brackett, M. A., Rivers, S. E., & Salovey, P. (2011). Emotional intelligence: Implications for personal, social, academic, and workplace success. *Social and Personality Psychology Compass*, 5(1), 88-103.
- Bryman, A., & Bell, E. (2015). *Business research methods*. Oxford, United Kingdom: Oxford University Press.
- Corvellec, H. (Ed.). (2018). *Stories of achievements: Narrative features of organizational performance*. Routledge.
- Dancey, C. P., & Reidy, J. (2004). *Statistics without Maths for Psychology* (Harlow).
- Hang, D. T. (2014). Determinants of innovation commercialization management and anticipated returns: An exploratory typology of SMEs. *International Journal of Innovation and Technology Management*, 11(06), 1450042.
- Harter, S. (1978). Effectance motivation reconsidered. Toward a developmental model. *Human development*, 21(1), 34-64.
- Harter, S. (1981). A new self-report scale of intrinsic versus extrinsic orientation in the classroom: Motivational and informational components. *Developmental psychology*, 17(3), 300.
- Harter, S. (1981). A new self-report scale of intrinsic versus extrinsic orientation in the classroom: Motivational and informational components. *Developmental psychology*, 17(3), 300-319.
- IRA (2010). *Insurance Regulatory Authority annual report*. Nairobi, Kenya: Author.
- Mohanty, K., & Kar, S. (2012). Achieving innovation and success: organizational learning. *SCMS Journal of Indian Management*, 9(1), 36-51.
- Mwangi, M., & Murigu, J. W. (2015). The determinants of financial performance in general insurance companies in Kenya. *European Scientific Journal, ESJ*, 11(1).
- Mwathi, K. B. (2010). *Relationship between emotional intelligence and job performance among service providers in rehabilitation schools in Kenya* (Unpublished doctoral dissertation), University of Nairobi, Kenya.
- Ndura, K. M. (2010). Effects of mergers on financial performance of insurance companies in Kenya. *Unpublished Dissertation, School of Business, University of Nairobi*.
- Ngugi, B. K. (2007). *Relationship between corporate governance structures and performance of insurance companies in Kenya* (Unpublished doctoral dissertation), University of Nairobi, Kenya.
- Ntinyari, E. (2014). *Competencies preferred by employers of interior design graduates in kenya* (Doctoral dissertation, Master Thesis), University of Nairobi).
- Nzomo, L. N. (2012). *Relationship between Principals' Emotional Intelligence and Students' Learning Achievements in Public Secondary Schools in Nairobi County, Kenya* (Unpublished doctoral dissertation), University of Nairobi, Kenya.
- Omondi, G. A. (2016). *Influence of manager's emotional intelligence on employee job satisfaction at the Kenya post office savings bank* (Unpublished doctoral dissertation), University of Nairobi, Kenya.
- Qiao, J. L., Zhang, X. T., & Cheng, Q. Q. (2016). Based on the Competency Theory of the New Generation of Migrant Workers Professional Ability Study. In *Proceedings of the 6th international asia conference on industrial engineering and management innovation* (pp. 779-786). Atlantis Press, Paris.
- Saunders, M. L., & Lewis, P & Thornhill, A. (2009). *Research methods for business students*, 4th Ed. Uttar Pradesh: Pearson Education Limited
- Saunders, M. N. (2011). *Research methods for business students*, 5th Ed. Uttar Pradesh: Pearson Education Limited
- Smith, J. A. (Ed.). (2015). *Qualitative psychology: A practical guide to research methods*. California: Sage publications.

- Taylor, S. J., Bogdan, R., & DeVault, M. (2015). *Introduction to qualitative research methods: A guidebook and resource*. New Jersey: John Wiley & Sons.
- Teece, D. J. (2010). Technological innovation and the theory of the firm: the role of enterprise-level knowledge, complementarities, and (dynamic) capabilities. In *Handbook of the economics of innovation* (Vol. 1, pp. 679-730). North-Holland.
- Vito-Thomas, D., Allyn, P., Wagner, L. B., Hodges, T., & Streitmatter, S. S. (2018). The Evidence-Based Practice Fulcrum: *Balancing leadership and emotional intelligence in nursing and interprofessional education*.
- Wambua, S. M. (2016). Effect of Human Resource Management Practices on Employee Performance in Commercial Banks in Nairobi County, Kenya. *Strategic journal of business & change management*, 3(2), 675-694.
- Watson, D. (2000). Basic problems in positive mood regulation. *Psychological Inquiry*, 11(3), 205-209.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Licence



Analysis and critical investigation of the financial statements of food sector companies in Thessaly Region (Greece) that were included in the investment development programs the period 2013-2016

Rigas Ioannis¹, Theodossiou George^{2 †}, Rigas Nikolaos³, Karelakis Christos⁴, Pantos Nikolaos⁵, Goulas Apostolos⁶

¹ BAIN CAPITAL CREDIT, NPLs Operations (London), United Kingdom

² Department of Business Administration, University of Thessaly, GAIOPOLIS, National Road, Larissa-Trikala P.C. 41110, Greece

³ MBA, KTEL Prefecture of Larissa Programming Department, Greece

⁴ Department of Agricultural Development, School of Geotechnical and Forestry Sciences, Democritus University of Thrace, Orestiada, Greece

⁵ MBA, TEI of Thessaly, National Road, Larissa-Trikala, P.C. 41500, Greece

⁶ Ph.D Candidate, Department of Planning and Regional Development, School of Engineering, University of Thessaly, Greece

ARTICLE INFO	ABSTRACT
<p>Article History</p> <p>Received 25 June 2019; Accepted 20 November 2019</p> <p>JEL Classifications F65, G11</p> <p>Keywords: Investment, financial analysis, financial statement items, Food Industry, Thessaly Region (Greece)</p>	<p>Purpose: The aim of this research study is to assess the progress of the food sector companies that received financial aid for investment through the Developmental Laws in the last years (2013-16) of the economic recession in Thessaly Region (Greece), by choosing a random and representative sample of companies.</p> <p>Design/methodology/approach: In order to achieve this goal, financial data was collected which would be able to provide us with information in order to study the evolution of the food industry in Thessaly Region (Greece). The statistical analysis of the data was done with the statistical analysis package IBM SPSS Statistics 23. The descriptive statistics on the distributions and frequency diagrams (Histograms) and normal frequencies curves for the percentages of changes were also calculated. To test the significance of the differences between the mean values of the financial statements items, the method of One-Way Analysis Of Variance (One-Way ANOVA) was used. The same method was used to test the mean values of both the changes in amounts and in their percentages.</p> <p>Findings: In short, we can say that the percentage changes in Total Assets and Equity the time period 2013-16 are small and concentrated around zero. The same period, we have a significant increase in L/M Debt and Sales, except for a few extreme cases, while the percentage changes in Gross Profit and Profit before Tax are limited. The year 2016 there were significant changes in Taxes and Net Profit from AM2005-16.</p> <p>Research limitations/implications: The collection, processing, and analysis of the financial data of the undertakings were limited to the undertakings which have the obligation to publish their financial data.</p> <p>Originality/value: In recent years, very few studies have been carried out on the effectiveness of investment by private companies subsidized by Greek or European Investment Programs.</p>

1. Introduction

Food sector is one of the most important branches of secondary production (processing) in Greece today, due to its large contribution to turnover (sales), employment, the number of manufacturing enterprises, support to primary production, added value and to the country's growth in general (Chatzitheodoridis F., et al. 2016; Kontogeorgos et al.2017).

[†] Corresponding Author: Theodossiou George
e-mail: geortheo@uth.gr

According to Foundation For Economic & Industrial Research (2018), the food industry has been and continues to be one of the most dynamic, outward-looking and competitive sectors of the Greek economy, with strong investment and commercial activity in Greece, Balkans, and Europe. In terms of sales and employment both in Greece and at the level of the European Union, it is the most important sector, reaching 65-70% of the turnover in recent years. The food industry combined with the tourism industry has been the mainstay of the Greek economy for the past decade, supported and helped the growth of Greek agriculture and its extroversion and contributed to tackling the economic crisis and leaving the country out of the status of the memorandums.

The phenomenon of the emergence and growth of red loans (NPLs) after the financial year 2008 was an important stimulus for us to study, analyze and conclude how the major industry of the Greek industry was affected by the restrictive and rigorous financing policy Greek credit system (Louzis et al., 2012). NPLs have had a significant impact on the macroeconomic factors (macroeconomic variables) of the country (GDP, employment, interest rates, public debt, etc.) (Saba, I., 2012) and have significantly affected all sectors of the Greek economy (Stournaras, 2018). On the occasion of this event, we decided to address the food industries of Thessaly Region choosing a random and representative sample of 70 enterprises, from these that have been included in development programs, and to study the course, evolution and changes of selected financial statements items for four consecutive years (2013-16) and to consider as a further study their changes from the AM 2005-16.

The aim of the present study is to analyze and interpret the evolution of representative financial statements items of the food in Thessaly Region during the last years (2013-2016) of the economic recession in Greece. The selection of the 70 sample companies for the study was based on the following conditions:

- Their available financial data must be sufficient to enable the financial data to be compared between them.
- Companies belonging to the same activity code STAKOD 10 (Food Industry).
- Companies not to be established but to have ongoing economic activity and to have the legal form of the Societe Anonyme or the Limited Liability Company.
- The size of the companies to be such (Small, Medium, Large) to ensure the plurality of the sample.
- The type of companies' activity is different (dairy, meat products, olive groves, fish, etc.).
- The choice to be random and representative of the type of companies' activity.
- The integration of companies into investment programs

2. Literature Review

From the literature review, the role of investment incentives to reduce territorial disparities is a central issue of regional science (Glaeser and Edward, 2001; Gabe and Karybill, 2002; Harris and Trainor, 2005). There is, however, no agreement on the effectiveness of investment incentives, mainly because one should evaluate the same investments without subsidies, which is practically difficult. Some studies show that regional capital incentives can cause additional investment in subsidized enterprises (Daly et al., 1993;

Other research shows that the effect of subsidies on efficacy and productivity seems negligible or negative (Lee, 1996; Harris and Trainor, 2005; Criscuolo et al., 2009). The impact of capital subsidies on employment is also questionable (Gabe and Kraybill, 2002). Carlucci and Pellegrini (2005) present an empirical indication of a positive impact on employment, using different parametric and non-parametric approaches.

Policymakers prefer to subsidize programs with higher employment, even if they are less productive (Bronzini and Blasio, 2006). In one study, Schalk and Untied (2000) report that the incentives for regional investment in Germany, unlike other countries, have been successful in both the investment and employment objectives. However, the question remains whether the policy is also effective in relation to the regional income convergence objective in their own country. Similar findings have been made in Daly et al (1993) in Canada where it was found that tax incentives to invest in capital are not the most effective way to stimulate employment.

In Greece, there has been great difficulty over time in assessing the impact of investment incentives in Developmental Laws on companies. In no investment law, there was no provision for the collection of data referring to the performance of enterprises before and after their affiliation to the Law (Parliament of the Hellenic Republic, 2016). In the explanatory memorandum of the last-mentioned Development Law 4399/16, it is stated that the bases of the previous laws have been linked to external business information data, in order to ascertain the real impact of the inclusion of the enterprises in the benefits of the Investment Law. The only data published was that the ratio of the return on equity to the assessment of the effectiveness of the aid was used for hotels and industrial enterprises that had been included in L.2601/98, without specifying the sample number.

During the implementation of the Development Laws in Greece over the period 1994-2014, the investment amounting to EUR 38 billion amounted to 13.2% of the total gross private sector (non-residential) capital of the corresponding period (Explanatory Statement of U.S. Patent 4,399,16). It is clear, therefore, that State aid incentives can help boost investment activity, but it is not in itself a sufficient investment support factor. At the cost of creating new jobs, we see that average investment costs and average subsidies show a very large increase. Interpretation of these results is difficult because there is no evidence of the type and characteristics of the new jobs created and whether they involve low or highly skilled employment and pay.

The average time for realization and disbursement of the completed investments of AN 3299/04 in Thessaly was 46.4 months, approaching 4 years. (min = 170 days, max = 2,868 days), (Germanoloudis, 2017).

The economic stability of a country providing its citizens with the potential and security of investment and business openings (Norman and Ranciere, 2006). However, economic instability in a country leads to wage and pension cuts, as well as a large increase in unemployment and a reduction in consumption. The inability to finance from other sources shrinks the private sector of the economy.

Entrepreneurship is inextricably linked to productive activity and growth, which is seen as a necessary condition for overall and social development, such as growth in production, income, employment, exports, etc (Dias et al., 2019). Enterprises in the effort to grow, to become competitive and to survive in an uncertain economic environment, are forced to invest. The economic crisis has negatively affected the Greek economy, especially since 2009, after the crisis has deteriorated dramatically (Artelaris, 2017; Economic Bulletin, 2018). The financial crisis affects domestic economic activity because the tightening of criteria for credit to businesses and households limits liquidity (Cabral, R., Castellanos-Sosa, 2019). At the same time, the significant weakening of business and household expectations leads to a reduction in the momentum for consumption and to the risk of a decline in business investment. As a result, demand for credit is reduced by both households and businesses (Bank of Greece, 2009).

The economic crisis has clearly left its mark and has affected to a greater or lesser extent the overwhelming majority of the productive sectors of the domestic economy. Small and medium-sized enterprises that are the backbone of the national economy are the ones that have suffered the greatest blow. Between 2008 and 2014, 200,000 medium-sized businesses, which were essentially commercially active, ceased to operate and this represents a reduction of 25% (Manifava, 2015; Voumvaki, 2018; Ikonomidou, 2018).

The Greek food industry is one of the most important sectors of the Greek economy, it contributes significantly to employment, turnover, and growth, while developments in the sector usually affect the whole of Greek manufacturing (Loizou, et al. 2019; SEV, 2017; Polychronidou, et al. 2016). In 2009, when the country's recession began, the sector suffered a heavy blow to employment, added value, sales, etc. However, this decline comes mainly from smaller companies (under 10), which are also the vast majority, both in the Food sector (95%) and in the Drinks sector (90%). At the same time, the sector as an integral part of the agri-food chain is directly affected, but it also affects the other sectors of activity (primary and tertiary) to a significant extent, with corresponding consequences for the entire national economy (Foundation for Economic and Industrial Research, 2011)

The food industry can contribute to the growth of the Greek economy and establish both Greek branded products and the Mediterranean diet in international markets. (Foundation For Economic & Industrial Research (IOBE) 2018; Mattas, et al., 2006). The main reason for the development of the food industry was the increase in tourism and the improvement in living conditions that led to an increase in demand. During the interwar period the food industry was second in the Greek manufacturing sector after the textile industry and started to grow from the middle of the second half of the 20th century until the end of the same century, Chekimoglou, Roupa, 2006; Foundation for Economic & Industrial Research (IOBE, 2018.). More specifically, the food industry in Greece accounts for 21.2% of all Greek processing enterprises and is ranked first among the processing industries. The annual growth rates of the turnover of the food and beverage processing sector, the number of employees and the number of enterprises in Greece are noteworthy in a time of crisis (Foundation For Economic & Industrial Research (2018). As mentioned, among other things, in the report, the percentages of change in the key structural indicators of the domestic food industry in 2014 compared to 2013 indicate a marginal increase in the number of enterprises in the sector, as opposed to total processing, where the number of enterprises fell by 2%. A positive change in the number of enterprises is also recorded in the Drinks sector (2.4%). However, a significant drop was recorded in terms of gross value added in Food (-5%), but significantly lower than in the whole manufacturing sector (-13%).

At the European Union level, (E.U. Food Drink Europe, 2015), the food industry is the number one in manufacturing employment in the European Union, employing about 5 million people, which translates into 16% of the total number of workers in European industry and that it accounts for 13% of all European manufacturing firms).

The food and beverage industry in Greece faces a number of international challenges related to competition, as well as various problems stemming from the Greek reality as it has been shaped in recent years. Strong changes, in social institutions, economic issues, technological developments at the international level, the industry has to face a number of problems (Foundation for Economic and Industrial Research (2011), such as:

- Changes created by the economic conjuncture and its impact, which strongly affects consumer habits and consumer incomes.
- The decline in consumer purchasing power, which has led consumers to choose private label products as opposed to branded products.
- The reduced liquidity faced by several businesses and the reduction in bank lending have resulted in depleted corporate capital and low money mobility.
- The inadequate institutional framework and bad debts in relation to inefficient public administration have greatly reduced the climate for trade.
- Reduced investment, transportation problems and low credit limits from foreign suppliers have created several difficulties in producing products and have increased the cost of producing them.

According to the FAO, the challenges faced by the industry internationally are diverse and numerous, such as:

- Sustainable improvement in agricultural productivity to meet rising demand
- Ensuring a sustainable natural resource base
- Tackling climate change and intensifying physical risks
- Eliminate extreme poverty and reduce inequality
- Eliminating hunger and all forms of malnutrition

- Creating efficient food systems, inclusive and more resilient
- Improving income opportunities in rural areas and tackling the root causes of migration
- Building resilience to prolonged crises, disasters, and conflicts
- Preventing cross-border and emerging threats to agriculture and food
- Address the need for coherent and effective national and international governance.

(FAO, 2017).

From this point of view, the necessity of adapting the sector's enterprises to new data and rapid developments becomes necessary. Businesses need to adapt to the combination of quality, healthy Mediterranean food and fast food, the production and marketing of organic products, and the new food trends that meet consumer demands (Stratou A., 2013).

3. Data and Methodology

In this paper, we have attempted to assess the evolution of the Food sector in Thessaly Region the recent years (2013-16) of the economic recession in Greece. For this purpose, data were collected to provide us with information to create a global image of the evolution of the sector's companies in Thessaly Region-

a. Data collection

The data come from the financial statements of Food sector companies of Thessaly Region, which were included in development programs, and were drawn by ELSTAT (<http://www.statistics.gr>). The collection and processing of the economic data of a representative sample of 70 food sector companies of Thessaly Region (Greece), was carried out with a view to analysing in detail their economic evolution over the four-year period 2013-2016. The selection was done in a random and representative way, so that companies of different sizes (small, medium, large) and capacity were included, with the aim of extracting as reliable as possible conclusions.

b. Descriptive statistics and distribution of the data

Statistical analysis of the data was done with the statistical analysis package IBM SPSS Statistics 23. The descriptive statistics (mean, standard error, standard deviation, and confidence interval) for the distributions: a) of the amounts of financial statements items for the years 2013-2016 and the AM 2005-16; b) of the changes of the items between the years 2013-14, 2015-14, 2016-15 for both amounts and percentages and c) of the changes of the items for the years 2013, 2014, 2015 and 2016 from AM 2005-16 also for both the amounts and percentages thereof, were calculated. Moreover, histograms and the corresponded normal curves of the percentage changes of the items for the years periods 2013-14, 2015-14, 2016-15, as well as for the percentage changes of the items for the years 2013, 2014, 2015 and 2016 from the AM2005-16 were calculated.

c. One-Way Analysis of Variance (One-Way ANOVA)

In order to check the significance of the differences between the mean values of the amounts of financial statements items for the years 2013-2016 and the AM 2005-16, the method of one-way ANOVA was used. The one-way analysis of variance (ANOVA) is used to determine whether there are any statistically significant differences between the means of more than two independents (unrelated) groups (it used when there is a minimum of three groups). The same method was used to test the mean values of the items changes between the years 2013-14, 2015-14, 2016-15 for both amounts and percentages as well as for testing the mean values of the items changes for the years 2013, 2014, 2015 and 2016 from AM2005-16 also for both the amounts and percentages thereof.

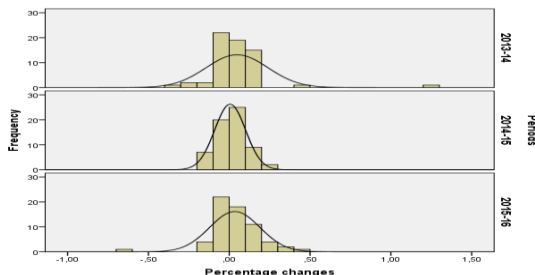
4. Results and Discussion

a. Descriptive statistics and item distributions

The histograms and the corresponded normal curves of the percentage changes of the items between the years 2013-14, 2015-14, 2016-15, as well as for the percentage changes of the items for the years 2013, 2014, 2015 and 2016 from the AM2005-16 are shown in Figures 1-9. It can be deduced from the Figures that the actual frequency curves for the distribution of the nine-item are almost normal curves (Figures 1-9) with slight variations in the shape of the curves (narrow curves, flat curves). So we have the picture for each element:

1. Total Assets

a.



b.

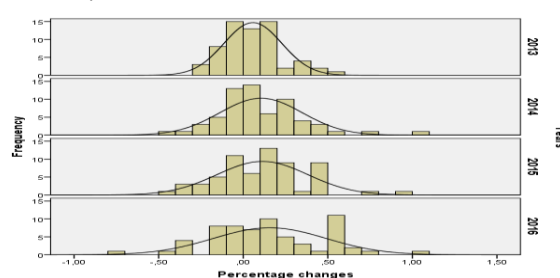


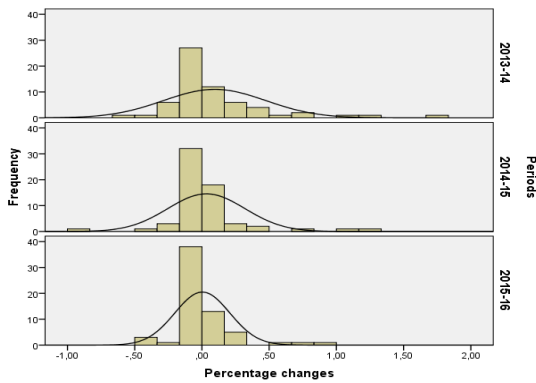
Figure 1.a. Histograms and normal curves of the percentage changes of the Total Assets the time periods 2013-14, 2014-15, 2015-16. **b.** Histograms and normal curves for the percentage changes of the Total Assets for the years 2013, 2014, 2015 and 2016 from the AM2005-16.

Figure 1a shows that the percentage changes curve for 2014-15 is much narrower than the other two. This means that the changes in Total Assets in this period (2014-15) are small and concentrated around zero. The other two appear more flattened with outliers (extreme values), especially for the period 2013-14. This is due to the doubling of the Total Assets of a large company.

From Figure 1b we have that for the curves of the percentage changes in Total Assets the years 2013-16 from AM2005-16 the curvature is decreasing with less normality and accompanied by the appearance of outliers. This means that many companies from 2014 onwards and mainly in 2016 have experienced significant changes in Total Assets.

2. Fixed Assets

a.



b.

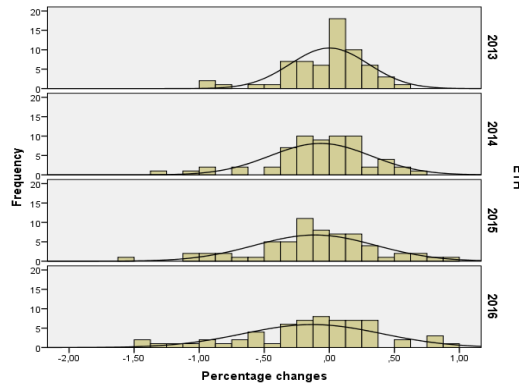
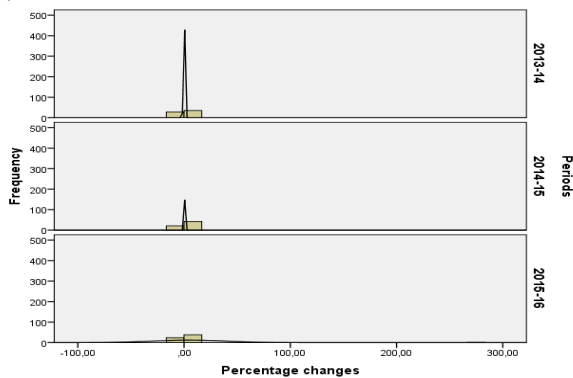


Figure 2.a. Histograms and normal curves of the percentage changes of the Fixed Assets the time periods 2013-14, 2014-15, 2015-16. **b.** Histograms and normal curves for the percentage changes of the Fixed Assets for the years 2013, 2014, 2015 and 2016 from the AM2005-16

From Figure 2.a we can see that the percentage changes curve for the period 2015-16 is slightly more narrow than the other two, the variables of which are more dispersed with outliers, especially for the period 2013-14. From Figure 2.b we have that for the curves of the percentage changes in Total Assets the years 2013-16 from AM2005-16 the curvature is decreasing with the variance increasing and accompanied by the appearance of outliers.

3. Equity

a.



b.

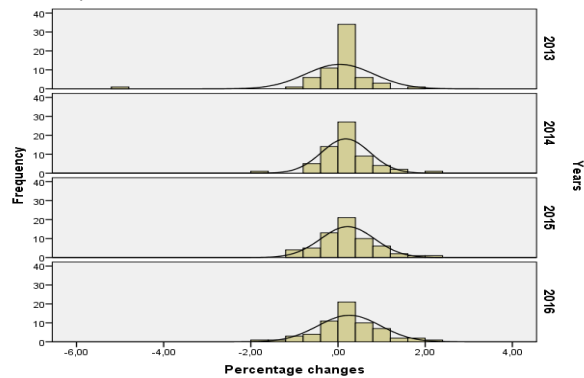


Figure 3.a. Histograms and normal curves of the percentage changes of the Equity the time periods 2013-14, 2014-15, 2015-16. **b.** Histograms and normal curves for the percentage changes of the Equity for the years 2013, 2014, 2015 and 2016 from the AM2005-16

From Figure 3.a we see that the percentage change curves for the 2013-14 and 2014-15 intervals are quite narrow with the values of the variables being concentrated around zero, while the third (2015-16) are quite flat asymmetrical to the right with a significant outlier. This is due to the fact that in this period the Equity of a company increased by 275.23%. From Figure 3.b we have that for the curves of the percentage changes of Equity the years 2013-16 from AM 2005-16 the curvature is approximately the same with the curves to show significant normality. Smaller normality is shown by the 2013 variable showing a significant outlier (-5.16).

4. Long/Medium-term Debt

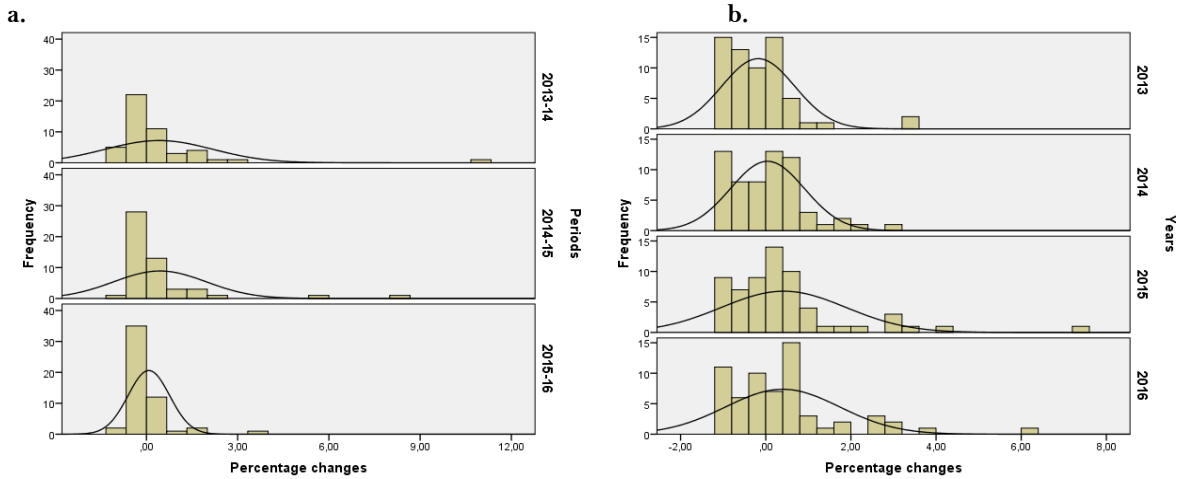


Figure 4.a. Histograms and normal curves of the percentage changes of the L/M Debt the time periods 2013-14, 2014-15, 2015-16. **b.** Histograms and normal curves for the percentage changes of the L/M Debt for the years 2013, 2014, 2015 and 2016 from the AM2005-16

From Figure 4.a we can see that the curve of the percentage changes in L/M Debt for the period 2015-16 is narrower than those of the other two percentage changes and shows some normality. The other two appear quite flat with right asymmetry and outliers. This means that in 2013-15 we had a significant increase in L/M debt for some companies. Figure 4.b shows that curvature is decreasing from 2014 onwards, accompanied by an increase in right asymmetry and outliers. This is due to the fact that some companies significantly increased the L/M Debt compared to the AM2005-16.

5. Sales

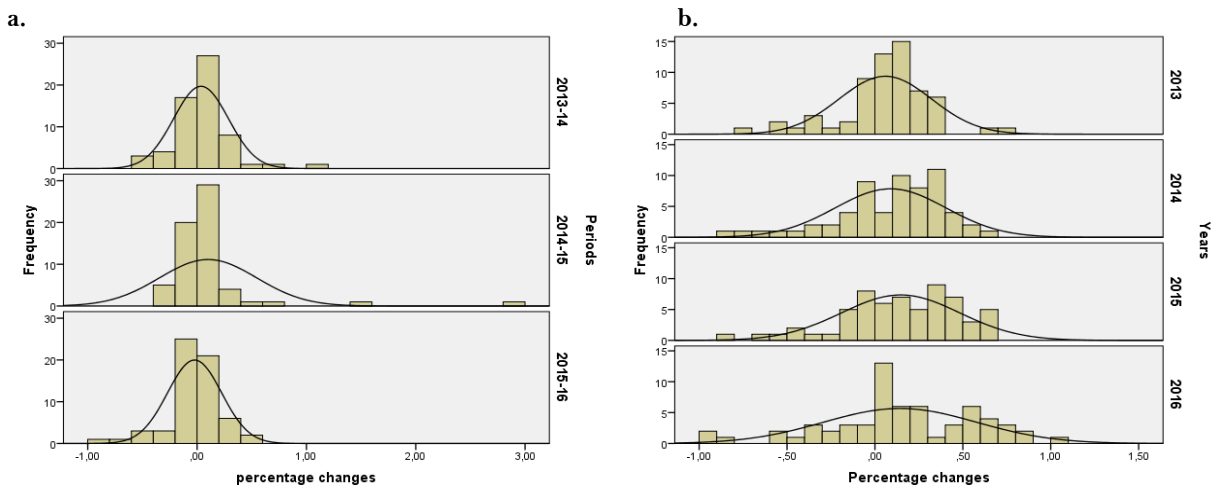


Figure 5.a. Histograms and normal curves of the percentage changes of the Sales the time periods 2013-14, 2014-15, 2015-16. **b.** Histograms and normal curves for the percentage changes of the Sales for the years 2013, 2014, 2015 and 2016 from the AM2005-16

From Figure 5.a we can see that the percentage changes in Sales of the time periods 2013-14 and 2015-16 are narrow and show significant normality. This means that Sales changes for these two time periods show a regularity centred around zero. The Sales percentage changes curve in 2014-15 is flat, present right asymmetry and outliers, which is translated to a significant increase in Sales in 2014-15 for some companies. Figure 5.b shows us that the curvature and normality of the percentage changes in Sales curves in the years of the period 2013-16 from the AM2005-16 are decreasing, with slight left asymmetry. This means that there are bigger changes in Sales of some companies and even to the worst as long as we go up the year's scale.

6. Gross profit

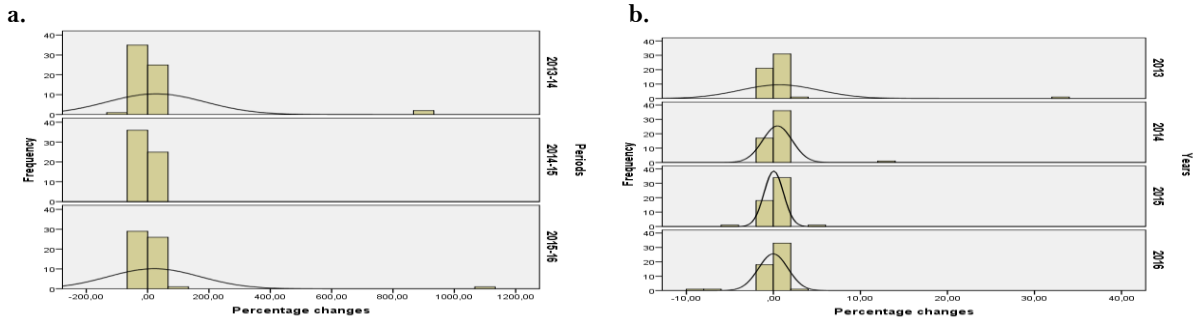


Figure 6.a. Histograms and normal curves of the percentage changes of the Gross profit the time periods 2013-14, 2014-15, 2015-16. **b.** Histograms and normal curves for the percentage changes of the Gross profit for the years 2013, 2014, 2015 and 2016 from the AM2005-16.

Figure 6.a informs us that the percentage changes in Gross Profit for the three periods show almost the same image with a concentration around zero. A major change presents the variable in the period 2013-14 in which a company showed a Gross Profit increase of -9567% (from -3 to 284). About the same image is shown in Figure 6.b where the percentage changes in the Gross Profit of the years of the period 2013-16 from MO2005-16 are almost similar with a concentration around zero and limited positive extreme changes for the years 2013 and 2014.

7. Profit before Tax

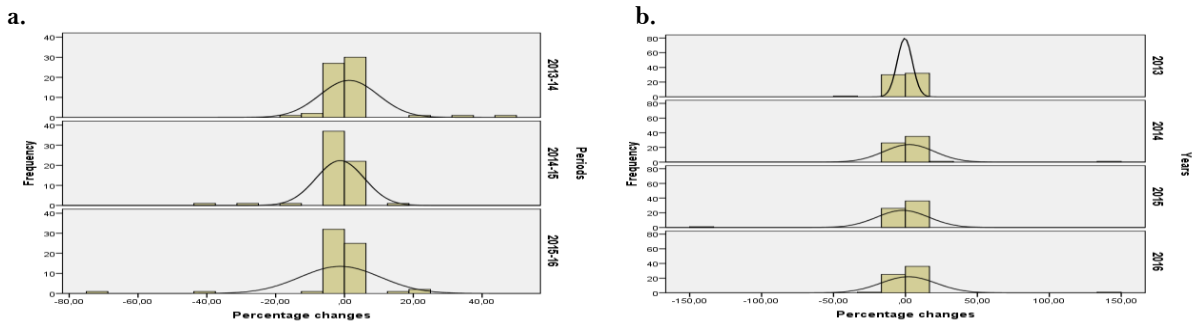


Figure 7.a. Histograms and normal curves of the percentage changes of the Profit before Tax the time periods 2013-14, 2014-15, 2015-16. **b.** Histograms and normal curves for the percentage changes of the Profit before Tax for the years 2013, 2014, 2015 and 2016 from the AM2005-16.

An almost similar picture to Gross Profit shows the percentage changes in Profit before Tax the time periods 2013-14, 2014-15, 2015-16 (Figure 7.a) as well as the percentage changes in the Profit before Taxes the years of the period 2013-16 from the average AM2005-16 (Figure 7.b). The only difference is that the percentage changes in Profit before Tax between the years of the period 2013-16 present some outliers and that the percentage changes in Profit before Tax of the year 2013 from AM2005-16 are restricted to a small area of zero (narrow curve).

8. Taxes

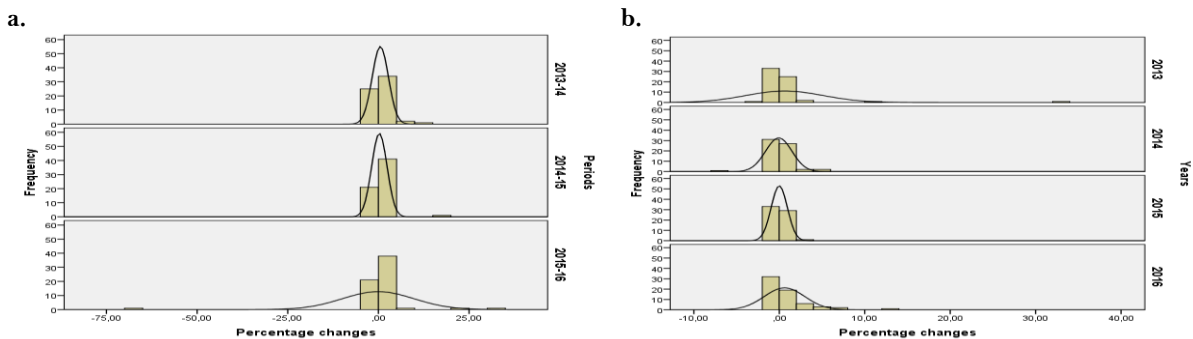


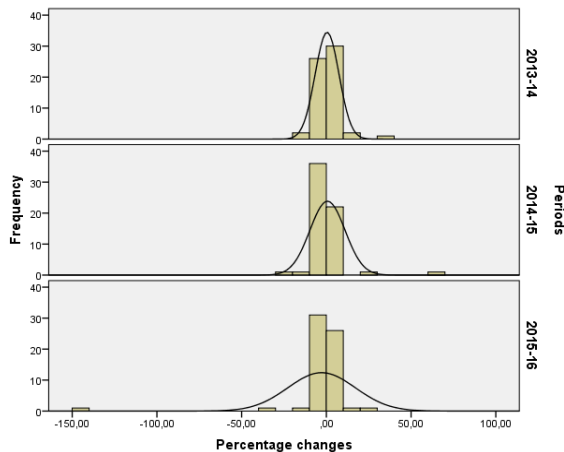
Figure 8.a. Histograms and normal curves of the percentage changes of the Taxes the time periods 2013-14, 2014-15, 2015-16. **b.** Histograms and normal curves for the percentage changes of the Taxes for the years 2013, 2014, 2015 and 2016 from the AM2005-16

The percentage changes in taxes the time periods 2013-14, 2014-15, 2015-16 show a similar picture to that of Profit before Tax (Figure 8.a). The only difference is that the curves of the percentage changes in taxes for the periods 2013-14 and 2014-15 are quite narrow, ie the changes in taxes from 2013 to 2014 and from 2014 to 2015 are virtually

nil. The curve from 2015 to 2016 appears quite flat, which means that there are significant changes in the relevant taxes in 2016. The percentage of changes in taxes for the years of the period 2013-16 from AM2005-16 (Figure 8.b) shows a marked difference between them. Percentage changes in taxes are fairly small in 2015 and slightly higher in 2014. In 2013, we have large positive and negative deviations (a flat curve) and 2016 a significant increase in proportionate taxes (right asymmetry).

9. Net Profit after taxes

a.



b.

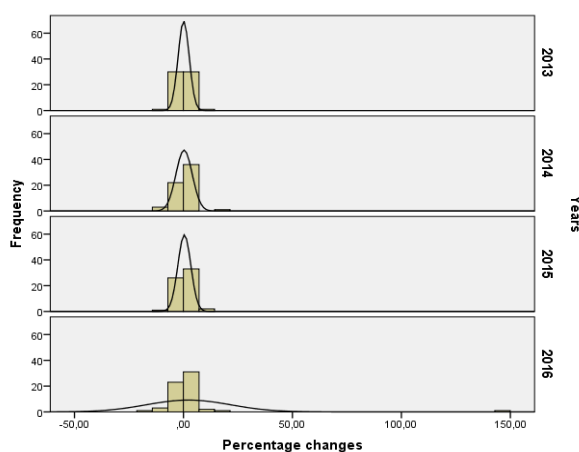


Figure 9.a. Histograms and normal curves of the percentage changes of the Net Profit after taxes the time periods 2013-14, 2014-15, 2015-16. **b.** Histograms and normal curves for the percentage changes of the Net Profit after taxes for the years 2013, 2014, 2015 and 2016 from the AM2005-16

Almost the same picture as that of Taxes shows the percentage changes in Net Profit after taxes the time periods 2013-14, 2014-15, 2015-16 (Figure 9.a). The curve of percentage changes in Net Profit after taxes in the period 2015-16 shows lower curvature than the other two, which means greater differentiation in net profit. In addition, the 2014-15 period the curve shows a slight right asymmetry, which translates into a small increase in Net Profit. From Figure 9.b we have that curves of the percentage changes in Net Profit after taxes of the years 2013, 2014 and 2015 from AM2005-16 are quite narrow and concentrated around zero. This means that the changes in Net Profit after taxes in these years were quite limited. The curve of the year 2016 is quite flat with an extreme value to the left. This means we have significant changes in Net Profit after taxes in several companies, both positive and negative. The extreme value comes from the change in the Net Profit after taxes of a company from -1 to -148.

b. One-way ANOVA

In order to check the significance of the differences between the mean values of the amounts of financial statements items for the years of the time interval 2013-2016 and the AM2005-16, and the AM2005-16, the method of one-way ANOVA was used. The same method was used to test the mean values of the items changes the time periods 2013-14, 2014-15, 2015-16 for both amounts and percentages as well as for testing the mean values of the items changes of the years 2013, 2014, 2015 and 2016 from AM2005-16 also both for amounts and percentages thereof. The most important assumptions that the data must meet in order a one-way ANOVA to give a valid result are: a) there should be no significant outliers, b) the dependent variable should be approximately normally distributed for each category of the independent variable and c) there needs to be homogeneity of variances.

When analyzing data using SPSS Statistics, usually one or more of these assumptions is violated. This is not uncommon when working with real-world data, but it is acceptable the use of the one-way ANOVA when the conditions are met approximately. From the Histograms and the normal curves of the amounts of financial statements items for the years 2013-2016 and the AM2005-16, of the items changes between the years 2013-14, 2015-14, 2016-15 for both amounts and percentages and of the items changes of the years 2013, 2014, 2015 and 2016 from AM2005-16 also both for amounts and percentages we see that the two first assumption are approximately satisfied. For the third assumption, we have the Levene's test for homogeneity of variances in SPSS Statistics. The application of the One-Way Analysis of Variance in the financial statements items showed:

1. The test of Homogeneity of Variances of the Total Assets

The test of Homogeneity of Variances of the Total Assets for the years of the time period 2013-16 and the AM2005-16 showed that there are no significant differences between the variances of the five variables (or groups) of the amounts of Total Assets (Levene Statistic = 0.293, Sig. = 0.882). The one-way ANOVA showed that there are no statistically significant differences between the mean values of the five variables ($F=0.127$, Sig.=0.973). Figure 10 gives the profile plot of the mean values of the five variables.

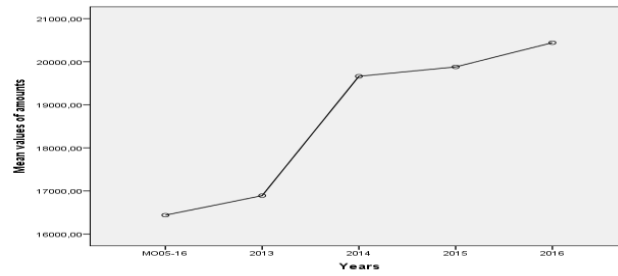


Figure 10. Profile plot of the mean values of the amounts of Total Assets the years of the period 2013-16 and of the AM2005-16.

The test of Homogeneity of Variances of the changes of the Total Assets in the time periods 2013-14, 2014-15 and 2015-16 showed that there are no significant differences between the variances of the three variables both for the changes in amounts and in percentages, (Levene Statistic = 1.620 Sig. = 0.201) and (Levene Statistic = 2.705 Sig. = 0.069) respectively. The one-way ANOVA showed that there are no statistically significant differences between the mean values of the three variables for both the changes in amounts and percentages, ($F = 1.295$, Sig. = 0.276) and ($F = 0.848$, Sig. = 0.430) respectively. Figure 11 gives the profile plots of the mean values of the three variables (a) for amounts and (b) for percentages.

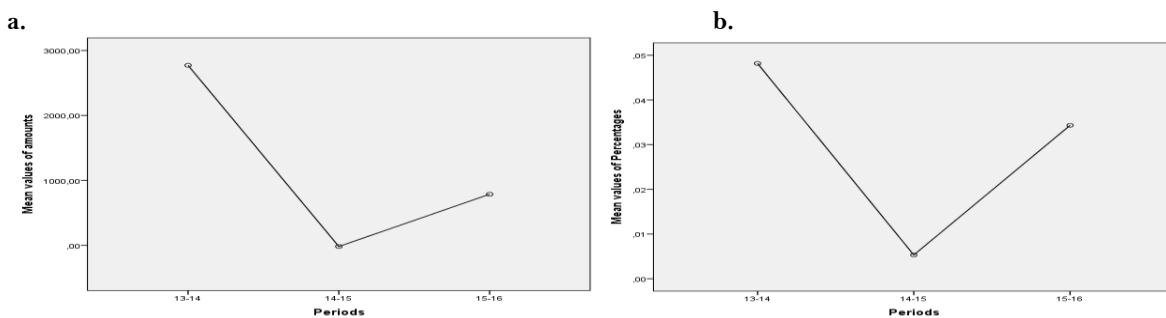


Figure 11. Profile plots of the mean values of the changes of the Total Assets the time periods 2013-14, 2014-15 and 2015-16 (a) in amounts and (b) in percentages.

The test of Homogeneity of Variances of the changes of the Total Assets for the years of the time period 2013-16 from the AM2005-16 (four variables) showed that there are no significant differences between the variances of the amounts changes (Levene Statistic = 1.114, Sig. = 0.344) but the variances in percentage changes differ (Levene Statistic = 6.965, Sig. = 0.000). The one-way ANOVA showed that there are no statistically significant differences between the mean values of the four variables for both the changes in amounts and in percentages, ($F = 0.525$, Sig. = 0.666) and $F = 1.533$, Sig. = 0.206) respectively. Since the post hoc test for variables with different variances (Games-Howell test) showed that the mean values of the four variables do not differ by two, we can accept the results of the variance analysis. Figure 12 gives the profile plots of the mean values of the four variables (a) for amounts and (b) for percentages.

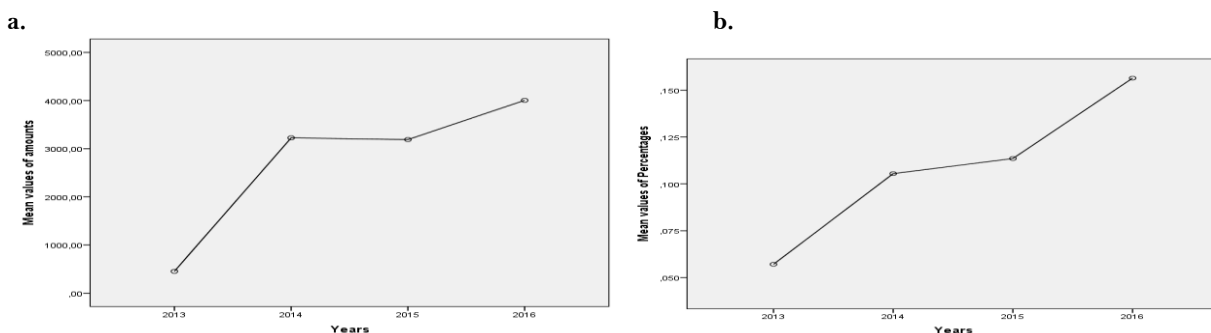


Figure 12. Profile plots of the mean values of changes of Total Assets the years of the period 2013-16 from AM2005-16 (a) in amounts and (b) in percentages.

2. The test of Homogeneity of Variances of the Fixed Assets

The test of Homogeneity of Variances of the Fixed Assets for the years of the time period 2013-16 and the AM2005-16 showed that there are no significant differences between the variances of the five variables (or groups of the amounts of Fixed Assets) (Levene Statistic = 0.198, Sig.=0.939). The one-way ANOVA showed that there are no statistically significant differences between the mean values of the five variables ($F=0.071$, Sig.=0.991). Figure 13 gives the profile plot of the mean values of the five variables.

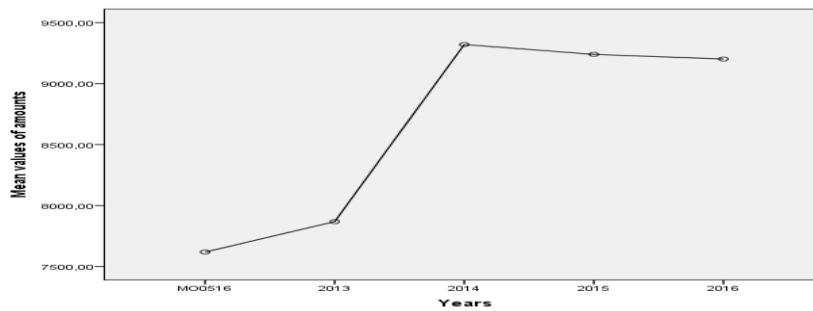


Figure 13. Profile plot of the mean values of the amounts of Fixed Assets the years of the period 2013-16 and of the AM2005-16.

The test of Homogeneity of Variances of the changes of the Fixed Assets in the time periods 2013-14, 2014-15 and 2015-16 showed that there are significant differences between the variances of the three variables both for the changes in amounts and in percentages, (Levene Statistic = 3.075 Sig.=0,49) and (Levene Statistic = 5.254 Sig.=0.006) respectively. Since the post hoc test for variables with different variances (Games-Howell test) showed that the mean values of the three variables do not differ by two, we can accept the results of the one-way ANOVA, which shows that the mean values of the three variables do not differ significantly for both the changes in amounts and in percentages, (F = 1.043, Sig. = 0.355 and F = 1.527, Sig. = 0.220) respectively. Figure 14 gives the profile plots of the mean values of the three variables (a) for amounts and (b) for percentages.

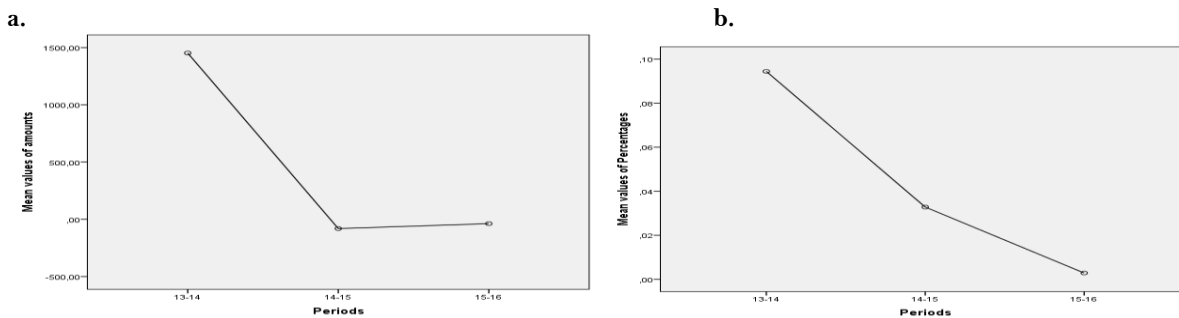


Figure 11. Profile plots of the mean values of the changes of the Fixed Assets the time periods 2013-14, 2014-15 and 2015-16 (a) in amounts and (b) in percentages.

The test of Homogeneity of Variances of the changes of the Fixed Assets for the years of the time period 2013-16 from the AM2005-16 (four variables) showed that there are no significant differences between the variances of the amounts changes (Levene Statistic = 0.908, Sig.=0.438) but the variances in the percentage changes differ (Levene Statistic = 4.329, Sig.=0.005). The one-way ANOVA showed that there are no statistically significant differences between the mean values of the four variables for both the changes in amounts and in percentages, (F=0.285, Sig.=0.836) and F=1.115, Sig.=0.344) respectively. Since the post hoc test for variables with different variances (Games-Howell test) showed that the mean values of the four variables do not differ by two, we can accept the results of the variance analysis. Figure 15 gives the profile plots of the mean values of the four variables (a) for amounts and (b) for percentages.

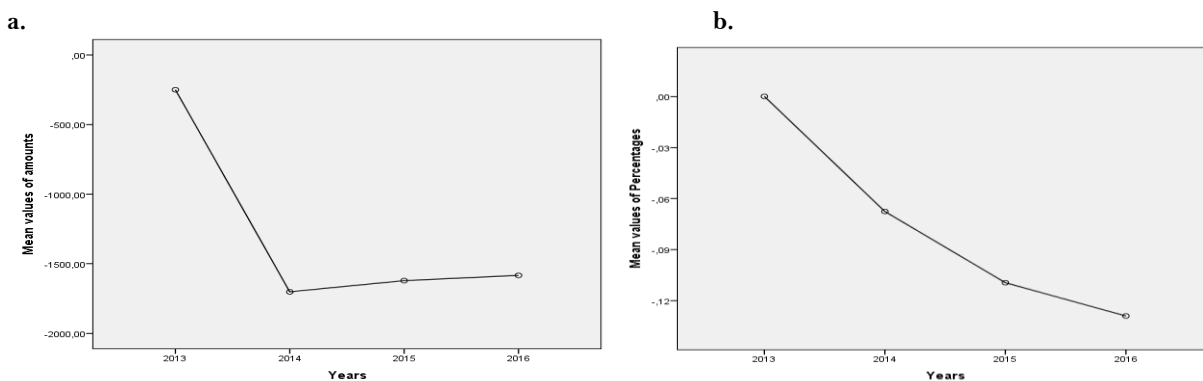


Figure 15. Profile plots of the mean values of changes of Fixed Assets the years of the period 2013-16 from AM2005-16 (a) in amounts and (b) in percentages.

3. The test of Homogeneity of Variances of the Equity

The test of Homogeneity of Variances of the Equity for the years of the time period 2013-16 and the AM2005-16 showed that there are no significant differences between the variances of the five variables (or groups of the amounts of Equity) (Levene Statistic = 0.725, Sig.=0.575). The one-way ANOVA showed that there are no statistically significant differences between the mean values of the five variables (F=0.218, Sig.=0.928). Figure 16 gives the profile plot of the mean values of the five variables.

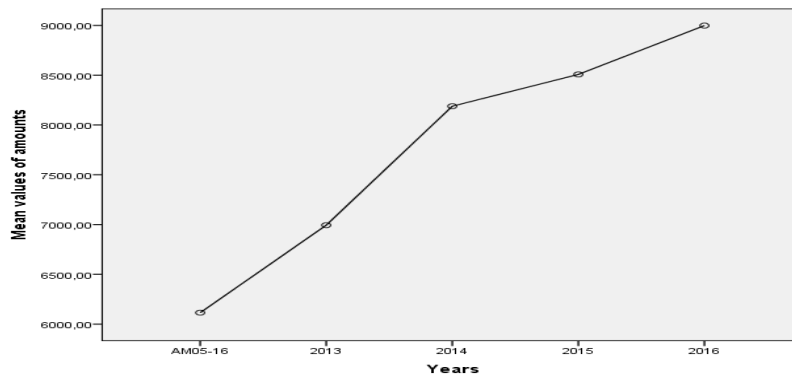


Figure 16. Profile plot of the mean values of the amounts of Equity the years of the period 2013-16 and of the AM2005-16.

The test of Homogeneity of Variances of the changes of the Equity in the time periods 2013-14, 2014-15 and 2015-16 inform us that there are no significant differences between the variances of the amounts changes (Levene Statistic = 2.102, Sig.=0.125) but the variances in the percentage changes differ (Levene Statistic = 3.907, Sig.=0.022). Since the post hoc test for variables with different variances (Games-Howell test) showed that the mean values of the four variables do not differ by two, we can accept the results of the analysis of variance. The one-way ANOVA showed that there are no statistically significant differences between the mean values of the three variables for both the changes in amounts and in percentages, (F=2.102, Sig.=0.696) and (F=0.947, Sig.=0.390) respectively. Figure 17 gives the profile plots of the mean values of the three variables (a) for amounts and (b) for percentages.

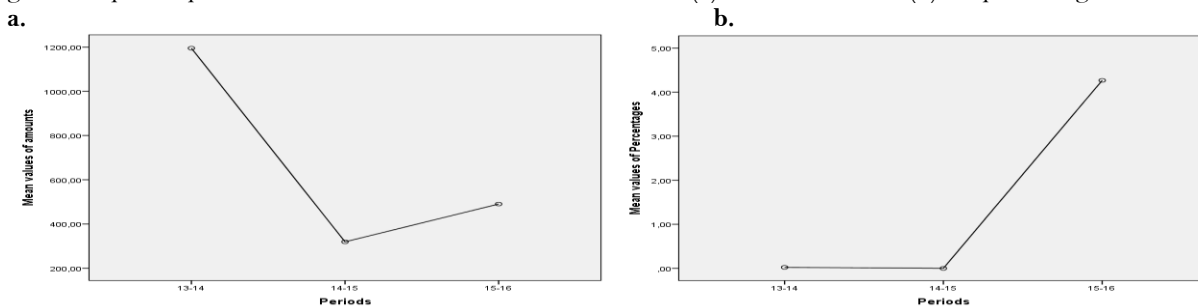


Figure 17. Profile plots of the mean values of the changes of Equity the time periods 2013-14, 2014-15 and 2015-16 (a) in amounts and (b) in percentages.

The test of Homogeneity of Variances of the changes of the Equity for the years of the time period 2013-16 from the AM2005-16 (four variables) showed that there are no significant differences between the variances of the four variables both for the changes in amounts and in percentages, (Levene Statistic = 1.412 Sig.=0.240) and (Levene Statistic = 1.494, Sig.=0.217) respectively. The one-way ANOVA showed that there are no statistically significant differences between the mean values of the four variables for both the changes in amounts and in percentages, (F=0.460, Sig.=0.711) and (F=1.299, Sig.=0.275) respectively. Figure 18 gives the profile plots of the mean values of the four variables (a) for amounts and (b) for percentages.

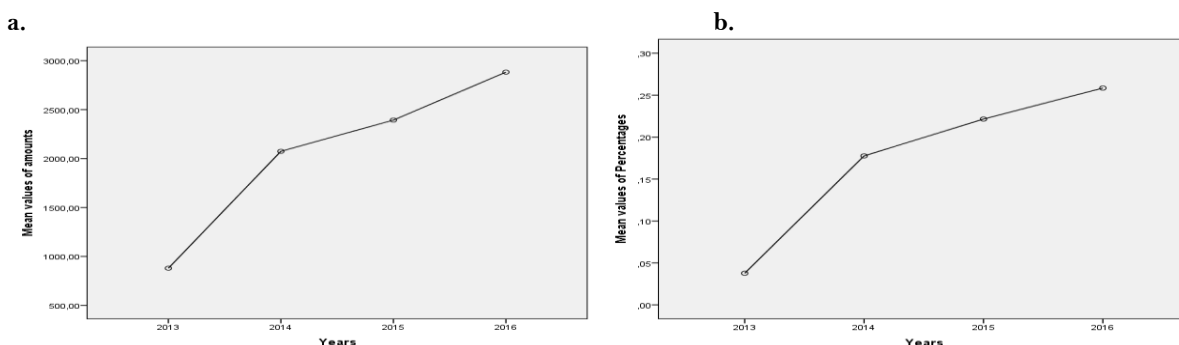


Figure 18. Profile plots of the mean values of changes of Equity the years of the period 2013-16 from AM2005-16 (a) in amounts and (b) in percentages.

4. The test of Homogeneity of Variances of the L/M Debts

The test of Homogeneity of Variances of the L/M Debts for the years of the time period 2013-16 and the AM2005-16 showed that there are no significant differences between the variances of the five variables (or groups of the amounts of L/M Debts) (Levene Statistic = 0.432, Sig.=0.785). The one-way ANOVA showed that there are no statistically significant differences between the mean values of the five variables (F=0.112, Sig.=0.978). Figure 19 gives the profile plot of the mean values of the five variables.

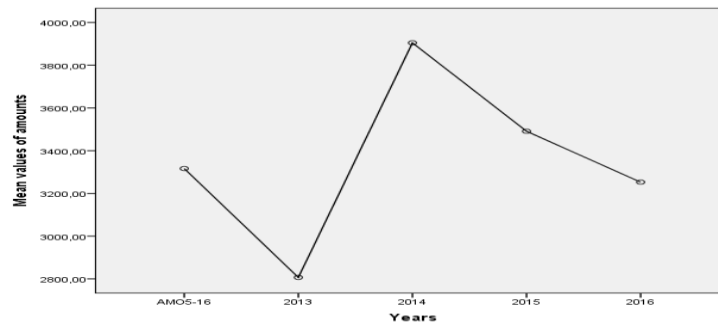


Figure 19. Profile plot of the mean values of the amounts of L/M Debts the years of the period 2013-16 and of the AM2005-16.

The test of Homogeneity of Variances of the changes of the L/M Debts in the time periods 2013-14, 2014-15 and 2015-16 showed that there are no significant differences between the variances of the three variables for the changes in amounts and for those in percentages we are at the limit, (Levene Statistic = 0.591, Sig.=0.555) and (Levene Statistic = 3.074, Sig.=0.049) respectively. The one-way ANOVA showed that there are no statistically significant differences between the mean values of the three variables for both the changes in amounts and in percentages, (F=1.438, Sig.=0.240) and (F=1.078, Sig.=0.343) respectively. Since the post hoc test for variables with different variances (Games-Howell test) showed that the mean values of the four variables do not differ by two, we can accept for both the changes in amounts and in percentages the results of the analysis of variance. Figure 20 gives the profile plots of the mean values of the three variables (a) for amounts and (b) for percentages.

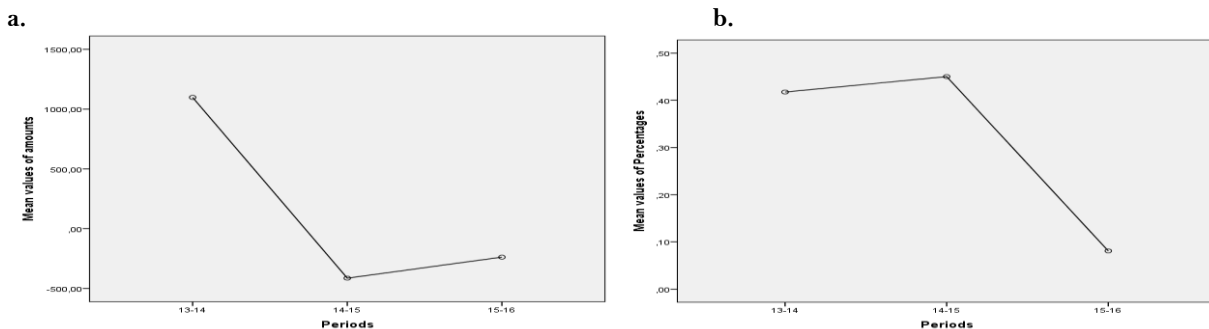


Figure 20. Profile plots of the mean values of the changes of L/ M Debts the time periods 2013-14, 2014-15 and 2015-16 (a) in amounts and (b) in percentages.

The test of Homogeneity of Variances of the changes of the L/M Debts for the years of the time period 2013-16 from the AM2005-16 (four variables) showed that there are no significant differences between the variances of the four variables for the changes in amounts (Levene Statistic = 0.548, Sig.=0.650) but the variances in percentage changes differ (Levene Statistic = 3.091, Sig.=0.028). The one-way ANOVA showed that there are no statistically significant differences between the mean values of the four variables for the changes in amounts (F=0.793, Sig.=0.499). In the case of the percentages, the one-way ANOVA showed that the mean values of the four variables present significant differences (F=3.932, Sig.=0.009). Post hoc test for variables with different variances (Games-Howell test) inform us that the mean value of percentage changes of the year 2013 from AM2005-16 differs significantly from those of the years 2015 and 2016. Figure 21 gives the profile plots of the mean values of the four variables (a) for amounts and (b) for percentages.

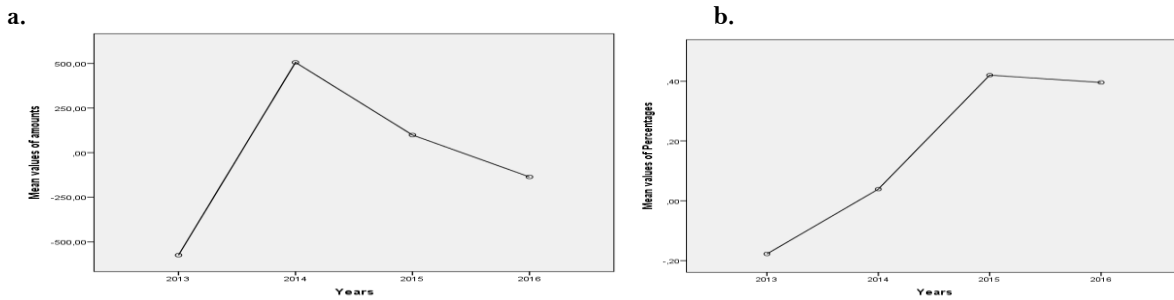


Figure 21. Profile plots of the mean values of changes of L/ M Debts the years of the period 2013-16 from AM2005-16 (a) in amounts and (b) in percentages.

5. The test of Homogeneity of Variances of Sales

The test of Homogeneity of Variances of Sales for the years of the time period 2013-16 and the AM2005-16 showed that there are no significant differences between the variances of the five variables (or groups of the amounts of Sales) (Levene Statistic = 0.399, Sig.=0.809). The one-way ANOVA showed that there are no statistically significant differences between the mean values of the five variables (F=0.165, Sig.=0.956). Figure 22 gives the profile plot of the mean values of the five variables.

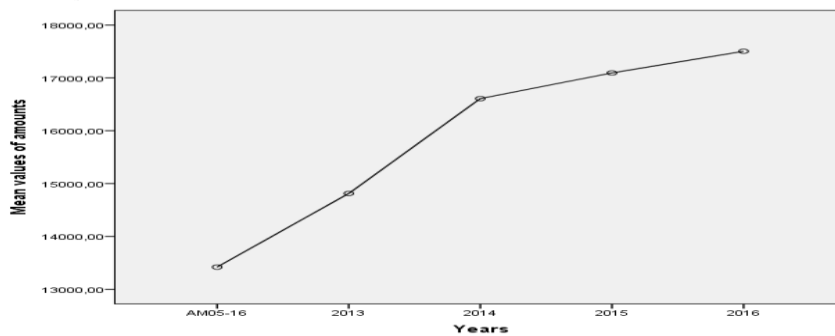


Figure 22. Profile plot of the mean values of the amounts of Sales the years of the period 2013-16 and of the AM2005-16.

The test of Homogeneity of Variances of the changes of Sales in the time periods 2013-14, 2014-15 and 2015-16 showed that there are no significant differences between the variances of the three variables both for the changes in amounts and in percentages, (Levene Statistic = 1.516, Sig.=0.222) and (Levene Statistic = 0.195, Sig.=0.823) respectively. The one-way ANOVA showed that there are no statistically significant differences between the mean values of the three variables for both the changes in amounts and in percentages, (F=0.932, Sig.=0.396) and (F=2.212, Sig.=0.112) respectively. Figure 23 gives the profile plots of the mean values of the three variables (a) for amounts and (b) for percentages.

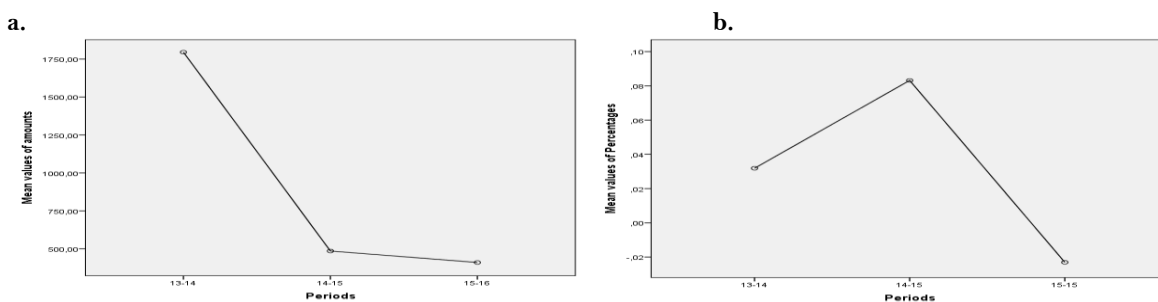


Figure 23. Profile plots of the mean values of the changes of Sales the time periods 2013-14, 2014-15 and 2015-16 (a) in amounts and (b) in percentages.

The test of Homogeneity of Variances of the changes of Sales for the years of the time period 2013-16 from the AM2005-16 (four variables) showed that there are no significant differences between the variances for the changes in the amounts (Levene Statistic = 2.018, Sig.=0.112) but the variances in the percentage changes differ (Levene Statistic = 4.968, Sig.=0.002). The one-way ANOVA showed that there are no statistically significant differences between the mean values of the four variables for both the changes in amounts and percentages, (F=0.722, Sig.=0.540) and F=0.940, Sig.=0.422) respectively. Since the post hoc test for variables with different variances (Games-Howell test) showed that the mean values of the four variables do not differ by two, we can accept the results of the variance analysis. Figure 24 gives the profile plots of the mean values of the four variables (a) for amounts and (b) for percentages.

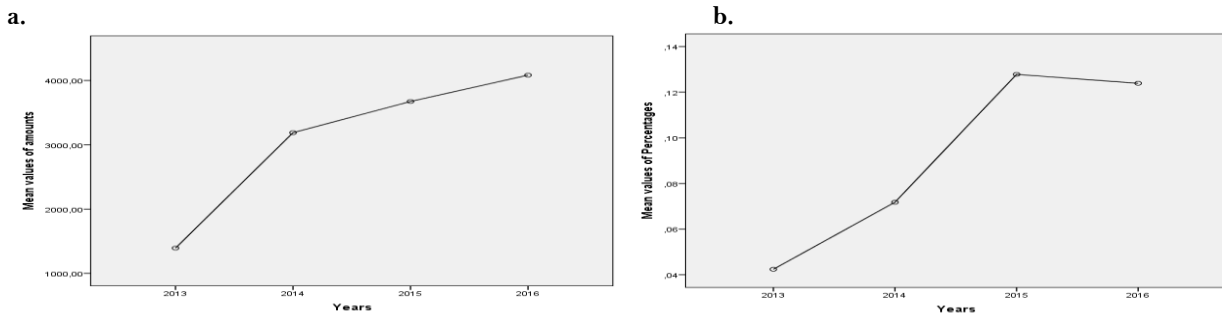


Figure 24. Profile plots of the mean values of changes in Sales the years of the period 2013-16 from AM2005-16 (a) in amounts and (b) in percentages.

6. The test of Homogeneity of Variances of the Gross profit

The test of Homogeneity of Variances of the Gross profit for the years of the time period 2013-16 and the AM2005-16 showed that there are no significant differences between the variances of the five variables (or groups of the amounts of Gross profit) (Levene Statistic = 0.399, Sig.=0.809). The one-way ANOVA showed that there are no statistically significant differences between the mean values of the five variables ($F=0.165$, Sig.=0.956). Figure 25 gives the profile plot of the mean values of the five variables.

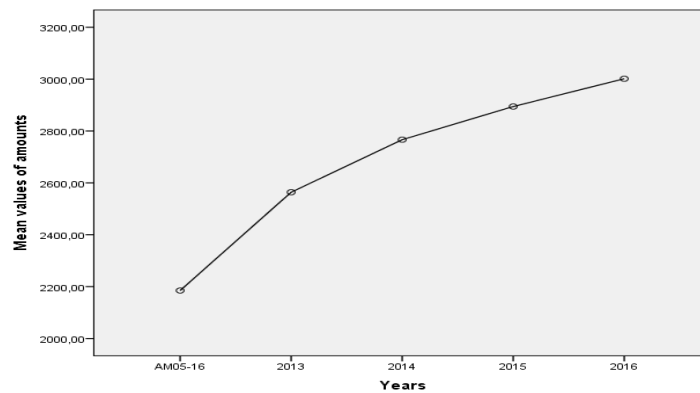


Figure 25. Profile plot of the mean values of the amounts of Gross profit the years of the period 2013-16 and of the AM2005-16.

The test of Homogeneity of Variances of the changes of the Gross profit in the time periods 2013-14, 2014-15 and 2015-16 showed that there are no significant differences between the variances of the three variables both for the changes in amounts and in percentages, (Levene Statistic = 1.516, Sig.=0.222) and (Levene Statistic = 0.195, Sig.=0.823) respectively. The one-way ANOVA showed that there are no statistically significant differences between the mean values of the three variables for both the changes in amounts and percentages, ($F=0.932$, Sig.=0.396) and ($F=2.212$, Sig.=0.112) respectively. Figure 26 gives the profile plots of the mean values of the three variables (a) for amounts and (b) for percentages.

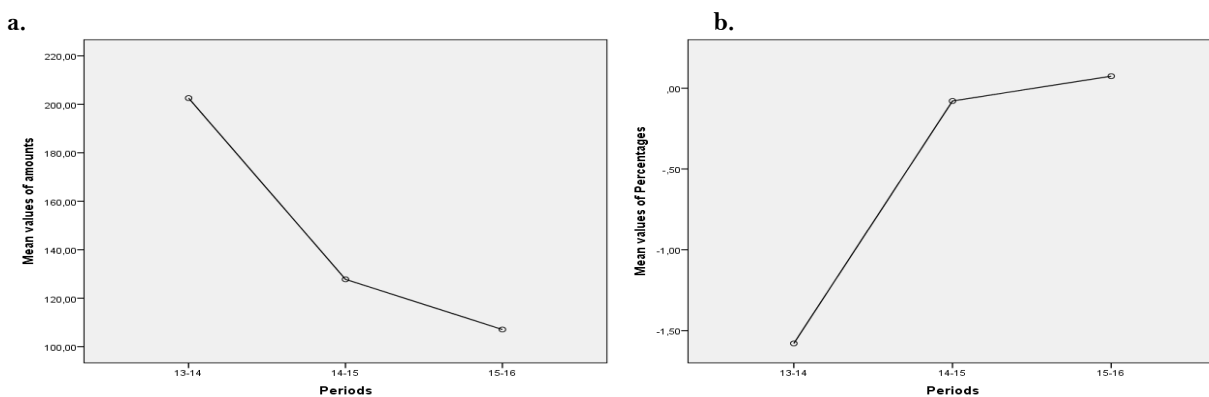


Figure 26. Profile plots of the mean values of the changes of Gross profit the time periods 2013-14, 2014-15 and 2015-16 (a) in amounts and (b) in percentages.

The test of Homogeneity of Variances of the changes of Gross profit for the years of the time period 2013-16 from the AM2005-16 (four variables) showed that there are no significant differences between the variances of the changes in the amounts (Levene Statistic = 2.018, Sig.=0.112) but the variances in the percentage changes differ (Levene

Statistic = 4.968, Sig.=0.002). The one-way ANOVA showed that there are no statistically significant differences between the mean values of the four variables for both the changes in amounts and percentages, ($F=0.722$, Sig.=0.540) and $F=0.940$, Sig.=0.422) respectively. Since the post hoc test for variables with different variances (Games-Howell test) showed that the mean values of the four variables do not differ by two, we can accept the results of the variance analysis. Figure 27 gives the profile plots of the mean values of the four variables (a) for amounts and (b) for percentages.

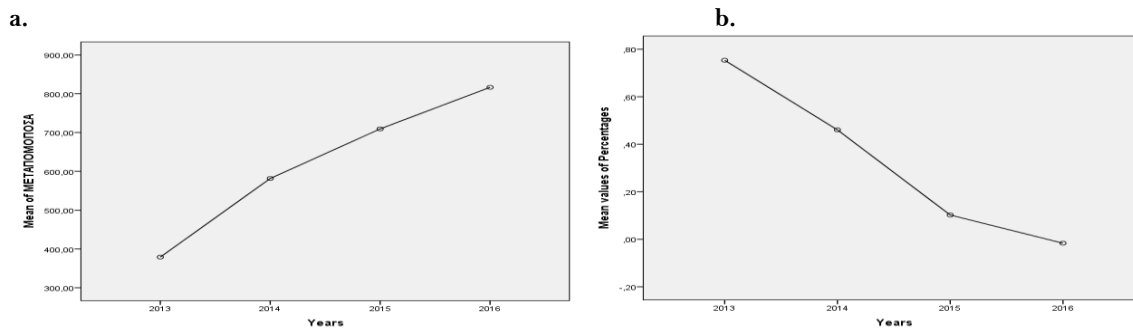


Figure 27. Profile plots of the mean values of changes of Gross profit the years of the period 2013-16 from AM2005-16 (a) in amounts and (b) in percentages.

7. The test of Homogeneity of Variances of the Profit before Tax

The test of Homogeneity of Variances of the Profit before Tax for the years of the time period 2013-16 and the AM2005-16 showed that there are no significant differences between the variances of the five variables (or groups) (Levene Statistic = 1.574, Sig.=0.181). The one-way ANOVA showed that there are no statistically significant differences between the mean values of the five variables ($F=0.637$ Sig.=0.536). Figure 28 gives the profile plot of the mean values of the five variables.

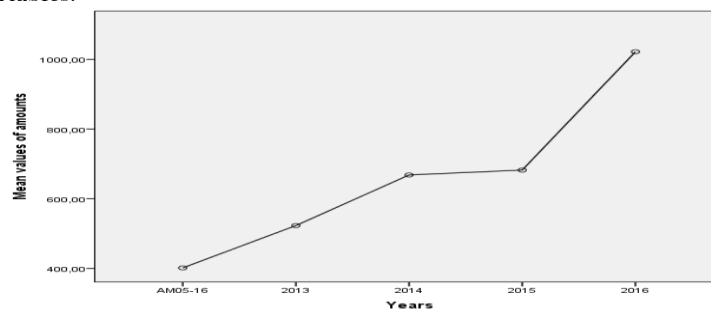


Figure 28. Profile plot of the mean values of the amounts of Profit before Tax the years of the period 2013-16 and of the AM2005-16.

The test of Homogeneity of Variances of the changes of the Profit before Tax in the time periods 2013-14, 2014-15 and 2015-16 showed that there are no significant differences between the variances of the three variables both for the changes in amounts and in percentages, (Levene Statistic = 0,512 Sig.=0,600) and (Levene Statistic = 0.437 Sig.=0.647) respectively. The one-way ANOVA showed that there are no statistically significant differences between the mean values of the three variables for both the changes in amounts and in percentages, ($F=0.487$, Sig.=0.616) and ($F=1.624$, Sig.=0.200) respectively. Figure 29 gives the profile plots of the mean values of the three variables (a) for amounts and (b) for percentages.

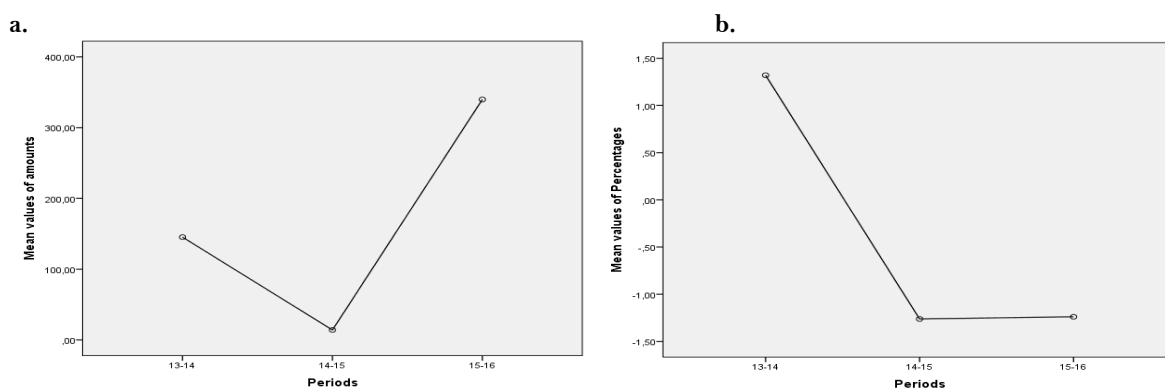


Figure 29. Profile plots of the mean values of the changes of Profit before Tax the time periods 2013-14, 2014-15 and 2015-16 (a) in amounts and (b) in percentages.

The test of Homogeneity of Variances of the changes of the Profit before Tax for the years of the time period 2013-16 from the AM2005-16 (four variables) showed that there are no significant differences between the variances of the four variables both for the changes in amounts and in percentages, (Levene Statistic =2.294, Sig.=0.079) and (Levene Statistic = 0.555, Sig.=0.645 respectively. The one-way ANOVA showed that there are no statistically significant differences between the mean values of the four variables for both the changes in amounts and in percentages, (F=1.098, Sig.=0.351) and F=1.078, Sig.=0.359) respectively. Figure 30 gives the profile plots of the mean values of the four variables (a) for amounts and (b) for percentages.

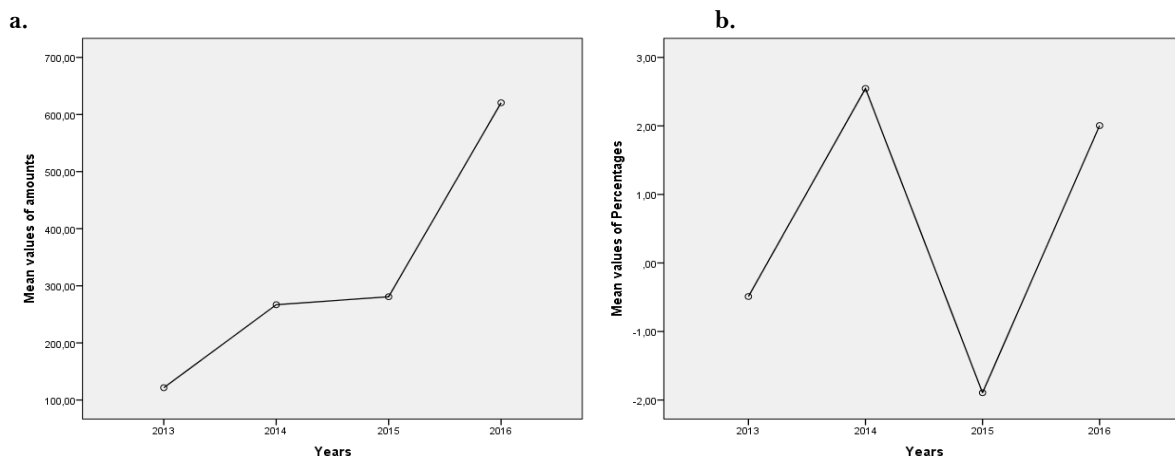


Figure 30. Profile plots of the mean values of changes of Profit before Tax the years of the period 2013-16 from AM2005-16 (a) in amounts and (b) in percentages.

8. The test of Homogeneity of Variances of the Taxes

The test of Homogeneity of Variances of the Taxes for the years of the time period 2013-16 and the AM2005-16 showed that there are significant differences between the variances of the five variables (or groups of the amounts of Taxes) (Levene Statistic = 4,065, Sig.=0,003). The one-way ANOVA showed that there are no statistically significant differences between the mean values of the five variables (F=1.365, Sig.=0.246). Since the post hoc test for variables with different variances (Games-Howell test) showed that the mean values of the five variables do not differ by two, we can accept the results of the variance analysis. Figure 31 gives the profile plot of the mean values of the five variables.

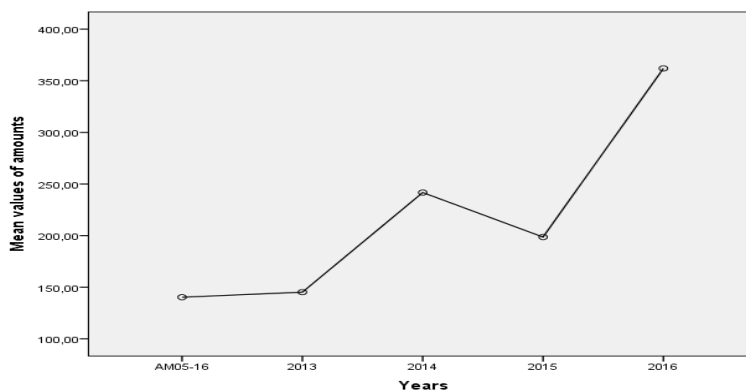


Figure 31. Profile plot of the mean values of the amounts of Taxes the years of the period 2013-16 and of the AM2005-16.

The test of Homogeneity of Variances of the changes of the Taxes in the time periods 2013-14, 2014-15 and 2015-16 showed that there are no significant differences between the variances of the three variables both for the changes in amounts and in percentages, (Levene Statistic = 0.705, Sig.=0.495) and (Levene Statistic = 1.395 Sig.=0.250) respectively. The one-way ANOVA showed that there are no statistically significant differences between the mean values of the three variables for both the changes in amounts and in percentages, (F=2.091, Sig.=0.126) and (F=0.155, Sig.=0.857 respectively. Figure 32 gives the profile plots of the mean values of the three variables (a) for amounts and (b) for percentages.

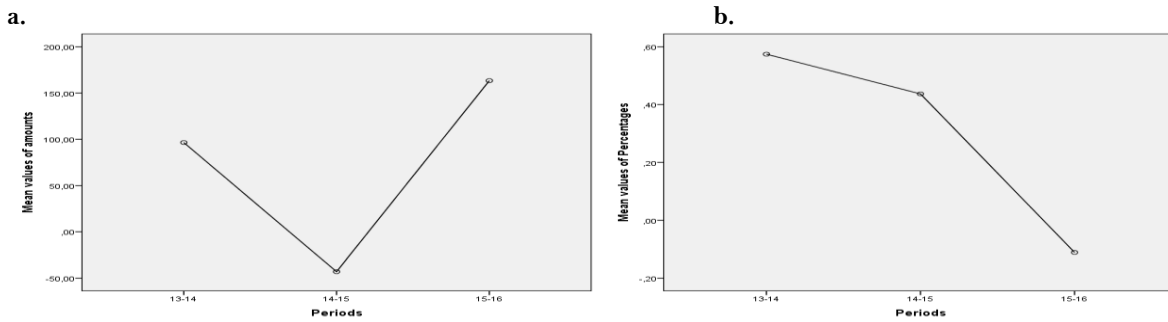


Figure 32. Profile plots of the mean values of the changes of Taxes the time periods 2013-14, 2014-15 and 2015-16 (a) in amounts and (b) in percentages.

The test of Homogeneity of Variances of the changes of the Taxes for the years of the time period 2013-16 from the AM2005-16 (four variables) showed that there are significant differences between the variances of the changes in the amounts (Levene Statistic = 4.583, Sig.=0.004) but the variances of the changes in the percentages do not differ significantly (Levene Statistic = 2.004, Sig.=0.114). The one-way ANOVA showed that there are no statistically significant differences between the mean values of the four variables for both the changes in amounts and in percentages, ($F=1.365$, Sig.=0.246) and ($F=1.175$, Sig.=0.320) respectively. Since the post hoc test for variables with different variances (Games-Howell test) showed that the mean values of the changes in amounts do not differ by two, we can accept the results of the variance analysis. Figure 33 gives the profile plots of the mean values of the four variables (a) for amounts and (b) for percentages.

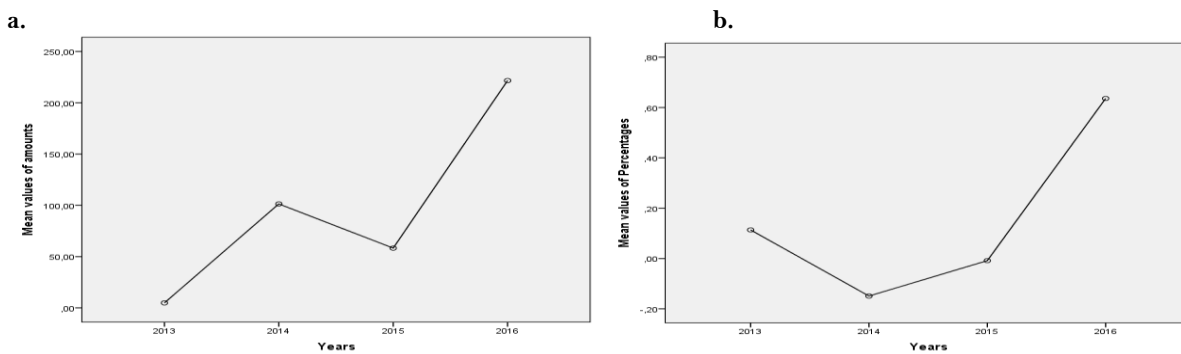


Figure 33. Profile plots of the mean values of changes of Taxes the years of the period 2013-16 from AM2005-16 (a) in amounts and (b) in percentages.

9. The test of Homogeneity of Variances of the Net Profit after taxes

The test of Homogeneity of Variances of the Net Profit for the years of the time period 2013-16 and the AM2005-16 showed that there are no significant differences between the variances of the five variables (or groups of the amounts of Net Profit) (Levene Statistic = 1.265, Sig.=0.284). The one-way ANOVA showed that there are no statistically significant differences between the mean values of the five variables ($F=0.127$, Sig.=0.973). Figure 34 gives the profile plot of the mean values of the five variables.

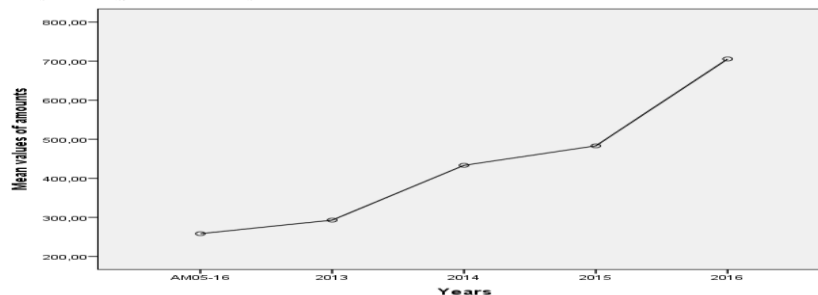


Figure 34. Profile plot of the mean values of the amounts Net Profit after taxes the years of the period 2013-16 and of the AM2005-16.

The test of Homogeneity of Variances of the changes of the Net Profit after taxes in the time periods 2013-14, 2014-15 and 2015-16 showed that there are no significant differences between the variances of the three variables both for the changes in amounts and in percentages, (Levene Statistic = 0.355, Sig.=0.702) and (Levene Statistic = 1.229, Sig.=0.295) respectively. The one-way ANOVA showed that there are no statistically significant differences between the mean values of the three variables for both the changes in amounts and in percentages, ($F=0.233$, Sig.=0.792) and ($F=1.253$, Sig.=0.288) respectively. Figure 35 gives the profile plots of the mean values of the three variables (a) for amounts and (b) for percentages.

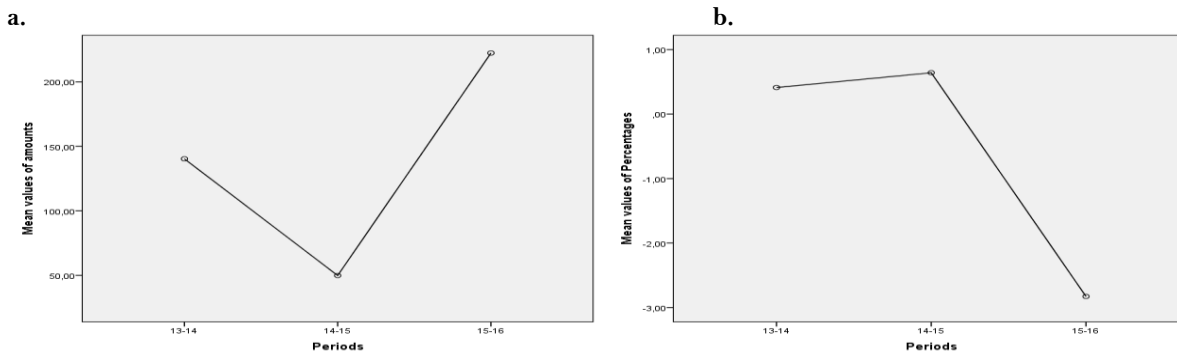


Figure 35. Profile plots of the mean values of the changes of Net Profit after taxes the time periods 2013-14, 2014-15 and 2015-16 (a) in amounts and (b) in percentages.

The test of Homogeneity of Variances of the changes of the Net Profit after taxes for the years of the time period 2013-16 from the AM2005-16 (four variables) showed that there are no significant differences between the variances of the changes in the amounts (Levene Statistic = 1.114, Sig.=0.344) but the variances in the percentages changes differ (Levene Statistic = 6.965, Sig.=0.000). The one-way ANOVA showed that there are no statistically significant differences between the mean values of the four variables for both the changes in amounts and in percentages, ($F=0.125$, Sig.=0.293) and $F=0.642$, Sig.=0.589) respectively. Since the post hoc test for variables with different variances (Games-Howell test) showed that the mean values of the four variables do not differ by two, we can accept the results of the variance analysis. Figure 36 gives the profile plot of the mean values of the four variables (a) for amounts and (b) for percentages.

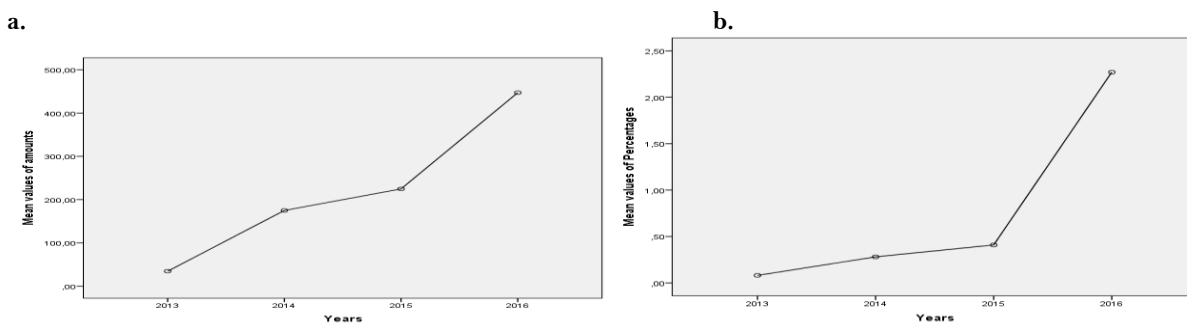


Figure 36. Profile plots of the mean values of changes of Net Profit after taxes the years of the period 2013-16 from AM2005-16 (a) in amounts and (b) in percentages.

5. Conclusions

The changes in amounts of the Total Assets in the time period 2014-15 are small and concentrated around zero. The percentage changes of the Total Assets in 2013 from the AM2005-16 shows the highest normality and concentration around zero. The variance of the changes in percentages of the fixed assets in the years of the period 2013-16 from the AM2005-16 increases from 2013 to 2016 and is accompanied by the appearance of outliers.

The percentage changes in Equity for the periods 2013-14, 2014-15 and 2015-16 are not significant except for the change in the capital of a company in the period 2015-16, which increased by 275.23%. During the period 2013-15, there was a significant increase in the L/M Debt for some companies. The percentage changes in the L/M Debt of the companies the years of the period 2013-16 from AM2005-06 are on the rise, and this is due to the fact that some companies have significantly increased their L/M Debt.

In the period 2014-15, some companies experienced a significant increase in Sales. The sales of many companies shifted to worse compared to AM2005-16, as we ascend the scale of years of the 2013-16 period. The percentage changes in Gross Profit the years of the period 2013-16 are quite limited, with the exception of one company showing a significant increase in Gross Profit in 2013-14 (from -3 to 284). Almost uniform percentage changes had Gross Profit the years of the period 2013-16 from AM2005-16 with very few outliers. A roughly similar picture to Gross Profit shows the percentage changes in Profit before Tax for the period 2013-16, except for a few extreme cases. The same image presents the percentages changes in the Profit before Tax the years 2013-16 from the AM2005-16.

In the year 2016, there are significant changes in the relevant taxes and a positive change (increase) from the AM2005-16. The largest percentage of changes in net profit are recorded in the period 2015-16. In 2016, there are, in many companies, significant changes in Net Profit from AM2005-16, both positive and negative. The one-way ANOVA showed that for the Total Assets, Fixed Assets, Equity, M/L Debt, Sales, Gross Profit, Profit before Tax, Taxes and Net Profit there are not statistically significant differences between the mean values of the amounts for the years of the time period 2013-16 and the AM2005-16.

The analysis of variance showed that for the Total Assets, Fixed Assets, Equity, L/M Debt, Sales, Gross Profit, Profit before Tax, Taxes and Net Profit, the mean values of the changes both in amounts and in percentages for the

time periods 2013-14, 2014-15 and 2015-16 do not show significant differences at level of 5%. In addition, the analysis of variance showed that the mean values of the changes in Total Assets, Fixed Assets, Equity, Sales, Gross Profit, Profit before Tax, Taxes and Net Profit the years 2013, 2014, 2015 and 2016 from AM2005-16 do not present significant differences at level of 5% for both amounts and percentages. The analysis of variance showed that the mean values of the amounts changes in the L/M Debt the years 2013, 2014, 2015 and 2016 from AM2005-16 do not show significant differences at the level of 5%. However, the mean values of the percentage changes in the L/M Debt the year 2013 from AM2005-16 differ significantly from those of the years 2015 and 2016 from AM2005-16. In short, we can say that the percentage changes in Total Assets and Equity the time period 2013-16 are small and concentrated around zero. The same period, we have a significant increase in L/M Debt and Sales, except for a few extreme cases, while the percentage changes in Gross Profit and Profit before Tax are limited. The year 2016 there were significant changes in Taxes and Net Profit from AM2005-16.

The present paper and the available data allow each candidate researcher to continue working by analyzing various ratios. In addition, the work may be extended by studying the evolution of the financial statement items, distinguishing the companies in small medium and large on the basis of Total Assets, Fixed Assets, Equity, Net Debt, Sales or Gross Profit.

Acknowledgement:

1. The present research was financed by the authors: Rigas Ioannis, Pantos Nikolaos, Rigas Nikolaos, Goulas Apostolos, Karelakis Christos and Theodossiou George.
2. Senior authorship is shared.

References

- Artelaris, P., 2017, "Geographies of crisis in Greece: A social well-being approach" *Geoforum*, Volume 84, Pages 59-69. <http://dx.doi.org/10.1016/j.geoforum.2017.06.003>.
- BANK OF GREECE 2009, "SUMMARY OF THE ANNUAL REPORT 2008", Presented to the General Meeting of Shareholders by Governor George Provopoulos. ISSN 1105 - 0527. https://www.bankofgreece.gr/BogEkdoseis/Summary_Annrep2008.pdf
- Bondonio, D. & Greenbaum, R., 2007, "Do local tax incentives affect economic growth? What mean impacts miss in the analysis of enterprise zone policies", *Regional Science and Urban Economics*, Volume 37 (1), 121-136.
- Bronzini, R. & Di Blasio, G., 2006, "Evaluating the impact of investment incentives: the case of Italy's Law 488/1992", *Journal of Urban Economics*, Volume 60 (2), 327-349.
- Cabral, R., Castellanos-Sosa, F., A., 2019, "Europe's income convergence and the latest global financial crisis", *Research in Economics*, Volume 73 23-34. <https://doi.org/10.1016/j.rie.2019.01.003>.
- Carlucci, C. & Pellegrini, G., 2005, "Nonparametric analysis of the effects on employment of public subsidies to capital accumulation: the case of law 488/92 in Italy", *Presented at the Congress AIEL 2004, Modena*.
- Chatzitheodoridis F., Kontogeorgos, A., Liltsi P., Apostolidou I., Michailidis, A. and Loizou E., 2016 "Small Women's Cooperatives in less favoured and mountainous areas under economic instability", *Agricultural Economics Review*, Volume .17 (1). <https://econpapers.repec.org/article/agsaergaa/262883.htm>
- Chekimoglou, E., Roupa, E. (2006) "History of the Food Industry", *Book*, Edit. Kerkira (in Greek).
- Criscuolo, C., Martin, R., Overman, H. & Van Reenen, J., 2009, "The Causal Effects of an Industrial Policy" *LSE, manuscript*. <https://www.nber.org/papers/w17842.pdf>
- Daly, M., Gorman I., Lenjosek, G., MacNevin A, & Phiriyapreunt, W. (1993). The impact of regional investment incentives on employment and productivity", *Regional Science and Urban Economics*, Volume 23, 559-575.
- Dias Claudia S.L., Ricardo Gouveia Rodrigues, João J. Ferreira, 2019, "What's new in the research on agricultural entrepreneurship?", *Journal of Rural Studies*, Volume 65; 99-115. <https://doi.org/10.1016/j.jrurstud.2018.11.003>.
- Economic Bulletin, Ministry of Finance, 2018, Council of Economic Advisors, Hellenic Republic. Issue 5, September 19; Retrieved from https://www.enterprisegreece.gov.gr/assets/content/files/c11/a1750/f60/Economic_Bulletin_5-MoF-Greece.pdf
- European Commission. "Internal Market, Industry, Entrepreneurship, and SMEs Food and drink industry" https://ec.europa.eu/growth/sectors/food/competitiveness_en. (Access 14-4-2019)
- FAO (2017). World's future food security "in jeopardy" due to multiple challenges, the report warns. <http://www.fao.org/news/story/en/item/471169/icode/>
- Foundation For Economic & Industrial Research (IOBE) 2018. "FOOD AND DRINKS INDUSTRY. FACTS & FIGURES" 14th edition, Retrieved from http://iobe.gr/docs/research/RES_05_B_05042019_REP_GR.pdf. (Access 14-4-2019)
- Foundation for Economic and Industrial Research, 2011, "The Greek Economy 4/11". *Quarterly Bulletin No 66*, December; Retrieved from http://iobe.gr/docs/economy/en/ECO_Q4_11_REP_ENG.pdf (Access 14-4-2019)

- Gabe, T.M. & Kraybill, D., 2002, "The effects of state economic development incentives on employment growth of establishments", *Journal of Regional Science*, Volume 42, 703–730. <https://onlinelibrary.wiley.com/doi/abs/10.1111/1467-9787.00278>
- Germanoloudis, C., 2017, "Fulfillment of the objectives of Development Law 3299/04 (B phasis) from its implementation in the Region of Thessaly". University of Thessaly. Volos Greece. <http://ir.lib.uth.gr/bitstream/handle/11615/47990/16313.pdf?sequence=1&isAllowed=y> (in Greek)
- Glaeser, E.L. & Edward, L., 2001, "The economics of location-based tax incentives", Discussion paper No. 1932, *Harvard Institute of Economic Research*. <http://scholar.harvard.edu/files/glaeser/files/hier1932.pdf%3Fm=1360042861>
- Harris, R. & Trainor, M., 2005, "Capital subsidies and their impact on total factor productivity: Firm-level evidence from Northern Ireland", *Journal of Regional Science*, Volume 45,(1),49–74. <https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.0022-4146.2005.00364.x>
- Hellenic Federation of Enterprises (SEV), 2017, "Top Priorities. Food and Beverages" https://en.sev.org.gr/business_priorities/sector-specific-policies/#top-priorities/
- Hellenic Statistical Authority, 2018 <http://www.statistics.gr/en/home/>
- IBM SPSS Statistics 23.
- Ikonomou C., 2018, "The great Greek crisis". Book chapter "Funding the Greek Crisis. The European Union, Cohesion Policies, and the Great Recession", Pages 1-71 <https://doi.org/10.1016/B978-0-12-814566-1.00001-X>
- Kontogeorgos A., Pendaraki, K., Chatzitheodoridis, F., 2017, "Economic crisis and firms' performance: Empirical evidence for the Greek Cheese industry" *Revista Galega de Economía*, Volume 26 -1 73. <https://dialnet.unirioja.es/ejemplar/478960> [accessed Apr 13 2019].
- Lee, J.W., 1996, "Government intervention and productivity growth" *Journal of Economic Growth* 1, 391–414 <https://link.springer.com/content/pdf/10.1007%2FBF00141045.pdf>
- Loizou, E., Karelakis, C., Galanopoulos K., Mattas, K., 2019, "The role of agriculture as a development tool for a regional economy", *Agricultural Systems*. Volume 173, July 2019, Pages 482-490. <https://doi.org/10.1016/j.agsy.2019.04.002>
- Louzis, D. P., Vouldis, A. T., & Metaxas, V. L., 2012, "Macroeconomic and Bank-Specific Determinants of Non-Performing Loans in Greece: A Comparative Study of Mortgage, Business, and Consumer Loan Portfolios", *Journal of Banking and Finance*, Volume 36(4), 1012–1027. <https://doi.org/10.1016/j.jbankfin.2011.10.012>
- Manifava, D., 2015, "The crisis has "eliminated" more than 200,000 Small and Medium-sized Enterprises from the trade maps", Newspaper Kathimerini. Retrieved from <http://www.kathimerini.gr/814601/article/oikonomia/epixeirhseis/h-krishe3afanise-apo-ton-xarth--toy-emporiouy-panw-apo-200000-mme> (in Greek)
- Mattas K., Loizou E. and Tzouvelekas V., 2006, "Agro-food Linkages in Rural Areas: An Empirical Evaluation of Integrated Development Programs" *Proceedings of the OECD workshop entitled "Coherence of Agricultural and Rural Development Policies"*, OECD publications.
- Norman, L., and Ranciere, R., 2006, "Financial Development, Financial Fragility, and Growth". *Journal of Money, Credit, and Banking*, Volume 38, 4: 1051-1076. <https://muse.jhu.edu/> (accessed April 11, 2019).
- Parliament of the Hellenic Republic 2016, "Explanatory Report of the Draft Law 4133/2016" <https://www.hellenicparliament.gr/UserFiles/c8827c35-4399-4fbb-8ea6-aebdc768f4f7/9606840.pdf>
- Polychronidou, P., Florou, G., and Karasavvoglou, A., 2016, "Consequences of the economic crisis to consumer behaviour in Greece - an empirical analysis", *International Journal of Applied Management Science*, 8, 2, 163-182.
- Saba, I. (2012). "Determinants of Non Performing Loans: Case of US Banking Sector" *Economic*, Volume 44(3), 81–121. <http://www.rejournal.eu/article/determinants-non-performing-loans-case-us-banking-sector>
- Schalk, H.J. & Untied, G., 2000, "Regional investment incentives in Germany: impacts on factor demand and growth" *Annals of Regional Sciences*, Volume 34, 173–195. <https://link.springer.com/content/pdf/10.1007%2Fs001689900008.pdf> [Access Sept.30, 2018]
- Stournaras, I., 2018, "Four Pillars to Address NPLs at NPL" Summit 2018: Red Loans - Openings & Society" Retrieved from <https://www.bankofgreece.gr/Pages/el/Bank/News/default.aspx> <https://doi.org/10.1016/j.jbankfin.2011.10.012>
- Stratou, A. (2013). "Strategic Business Analysis: Case Study Mediterranean Foods AE ", University of Piraeus, Library <http://dione.lib.unipi.gr/xmlui/handle/unipi/6142>
- Voumvaki, Jessie, 2018, "The Effects of Economic Crisis on Greek Entrepreneurship" *London School of Economics and Political Science*, <https://blogs.lse.ac.uk/greeceatlse/2018/02/01/greek-entrepreneurship/> (Access 10-4-2019).

This is an Open Access article distributed under the terms of the Creative Commons Attribution Licence



Procurement in Short Supply Chains: Lessons Learned from the Tourism Industry

Argyropoulou Maria^{1†}, Argyropoulou Rachel¹, Folinas Dimitris², Misopoulos Fotios¹, Najacaj Suela²

¹ Management School, University of Liverpool, United Kingdom

² Department of Supply Chain Management, International Hellenic University, Greece

ARTICLE INFO

Article History

Received 11 November 2019;
Accepted 6 December 2019

JEL Classifications
Z32

Keywords:

Short Supply Chains,
Hospitality industry,
Sourcing, Greece

ABSTRACT

Purpose:

This paper explores the procurement management strategies adopted in 100 five-star hotels operating in a highly touristic area in South Greece. The study identifies and discusses the benefits and the challenges of managing short supply chains in the selected region.

Design/methodology/approach:

Quantitative data were gathered by using a questionnaire with 16 closed-ended and 3 open-ended questions. The sample included the Managing Directors and some Administrators. The questionnaire was filled in between April 2017 and June of the same year.

Findings:

The majority of the respondents prefer to do business with local suppliers for a variety of reasons, the most important being the boost of local economy and immediate delivery which improves response time. High prices of local products and the availability of sufficient quantities were found the main concerns for the smooth running of operations.

Research limitations/implications:

The research uses data from two prefectures of Crete; a wider sample including other prefectures in Greece and in South Europe would provide a more holistic view on the effectiveness of short food supply chains.

Originality/value:

This paper makes a contribution by examining how short supply chains can be developed in local economies. This paper explores the procurement management strategies adopted in 100 five-star hotels operating in a highly touristic area in South Greece. The study identifies and discusses the benefits and the challenges of managing short supply chains in the selected region. The majority of the respondents prefer to do business with local suppliers for a variety of reasons, the most important being the boost of local economy and immediate delivery which improves response time. High prices of local products and the availability of sufficient quantities were found the main concerns for the smooth running of operations. Supplier selection criteria are also discussed.

1. Introduction

The dynamic nature of the international and domestic business environment has made many businesses consider their suppliers as an extension of their company in order to ensure that the right amount and quality of materials and services is procured at the right time and best possible price. In recent years, shortening of supply chains, and especially in the food sector, has become a notable phenomenon, as these networks have been linked to quality 'turn' food (Aubry and Kebir, 2013) Short supply chains are characterized by strong relationships and synergies between buyers and local food suppliers (Frash, DiPietro and Smith, 2015). This phenomenon becomes even more remarkable in the hospitality industry due to the combination of two important drivers: faster delivery of products and services, and improved product quality (O'Donovan, Quinlan and Barry, 2012).

[†] Corresponding Author: Argyropoulou Maria
e-mail: maria.argyropoulou@online.liverpool.ac.uk

Managing supply chains in the tourism industry is not easy for tourism-related businesses, especially for hotels who struggle to maintain a respected position due to tough competition and uncertainty of demand (Metaxas, Chatzoglou and Koulouriotis, 2019). High quality hotel services and customer satisfaction are positively related to strategic purchasing and supply chain management (Fantazy, Kumar and Kumar, 2010) and the choice of suitable suppliers who can deliver and promote their local goods. This need gave rise to the formation of short supply chains which are more effective for the constant replenishment of high quality goods and the seamless business operations (Onder and Kabadayi, 2015). Sourcing, therefore, is a valuable 'tool' for cost reduction, shortening of lead-times, and quality improvements (Oberoi and Khamba, 2005, p.279).

In light of the above analysis, this paper aims at the expansion of our knowledge on short supply chain networks and examines the procurement management strategies in the hotel industry focusing on the relationship with local suppliers. The companies selected for this research are the top five-star hotels of the prefectures of Heraklion and Lassithi in Crete (South Greece), which is an important tourist destination. At this point, it should be pointed out, that tourism is the most important sector in which the country has unquestionably comparative advantages due to its history and culture, natural environment and climate. The tourism sector represents an important part of the Greek economy, contributing significantly to the country's Gross National Product (GDP) occupying, either directly or indirectly, a large part of the workforce (Guduraš, 2014). The Greek tourism sector supports the establishment of local supply chain networks as local producers of famous products are located near the famous touristic destinations (Panagou, Nychas and Sofos, 2013). The contribution of the paper lies in understanding how short supply chains can be developed in local economies by exploring strategies and relationships with local suppliers. The paper is structured as follows: The next section provides the literature review on the social, economic and environmental benefits of short supply chains. Section 3 discusses the methodology and quantitative results. The last section presents the main conclusions and highlights the limitations of this research along with suggestions for further research.

2. Short supply chain benefits

A simple definition of the short supply chain is a "*supply chain involving a limited number of economic operators, committed to cooperation, local economic development, and close geographical and social relations between producers, processors and consumers*" (Jarzębowski and Pietrzyck, 2018, p. 198). Local or short supply chains have economic, social and environmental benefits for all the members of the supply chain (De Fazio, 2016). These are briefly discussed in the subsequent paragraphs.

2.1 Social benefits

The synthesis of the pertinent literature (Bimbo et al, 2015; Tanasã, 2014; Hunt, 2007) revealed a list of advantages for any regional economy and companies involved in short supply chains: a) The development of social interaction and trust between producers and consumers, b) The improvement of the so-called social capital, c) The enhancement of the sense of community, and d) The increase of consumers' knowledge on and understanding of concepts related to food, agriculture and environment, which in some cases might result in change in behavior (for example to green products). The social benefits of Local Supply Chains are most likely to be associated with the development of a sense of community within a local society, the exchange of knowledge and know-how, and the development of skills at an individual and social level which, in turn, are related to health and well-being. In this context, short supply chains usually focus on promoting social change, through the training of people on the values of sustainability related to environmental as well as social justice campaigns.

2.2 Economic benefits

The economic impact of Local Chain Supply Chains is difficult to be determined with precision. It is often extremely difficult to obtain financial data for many of the programs and actions developed at the local level, given their size, nature and scope, since many stakeholders fail to systematically collect or systematically publish such data (Renting, Marsden and Banks, 2003).

Understanding the economic impact of Local Chain Supply Chains is, therefore, complex. It is common for rural businesses to use a combination of individual "small" supply chains (or even large supply chains) and it is, therefore, difficult to separate the financial contribution of each partner to the total turnover and profits. In some cases, the "conventional" part of an enterprise's activities may be used to support or finance a local supply chain, particularly in the early stages of development of the latter (Renting, Marsden and Banks, 2003). Within a local supply chain, it is difficult to quantify the effect on the employment of local workers due to the complex combination of full, partial and seasonal employment, as well as the mix of family work with volunteers and local trainee workers. In order to effectively study employment and its results within the Local Supply Chains, the corresponding analysis should distinguish the different types of chains.

The economic benefits of local supply chains are associated with local sourcing, tight and fast-paced procurement and investments in the region. Consistent with these arguments, the pertinent literature and practice provide support to the positive impact of short supply chains on the boost of local economy through the increase in local sales and

demand for regional products (Levett, & Chandler, 2012; Marsden, Banks & Bristow, 2002) which can increase farmers' income (Kimberly, Von Massow & Joppe, 2017). Previous research, however, attests to the unsatisfactory improvement of local economy (e.g. Lass, Lavoie & Fetter, 2005). The relative importance of local sales or local supply chains is related to factors such as the company's size, its geographic location, e.g. proximity to urban markets or tourist destinations, etc. It should be noticed that occasionally, farmers and / or local producers involved in local chains do not necessarily seek to maximize profits. They rather join in the network for reasons such as financial security or more equitable trade relations (Mundler and Laugheria, 2016), aiming at an improvement in their social life and professional recognition of farmers (Mundler and Laugheria, 2016). Nonetheless, it is worth noting that although the financial contribution of Local Chain Supply Chains may be relatively small, their impact on societal and environmental levels is significantly positive.

2.3 Environmental benefits

The research on the environmental impact of local supply chains is usually divided into two major categories: energy use /carbon footprint and all the other environmental implications. Localizing a supply chain might bring out many benefits towards sustainability in the local community but researchers seem to be sharing various opinions (Schmitt et al, 2016). For some authors local supply chains can have a significant positive impact on the environment in terms of reduction in carbon emissions and enactment of energy efficiency (e.g. Pelletier et al. 2011; Canfora, 2016), on the reduced use of chemical inputs, and on the reduction of packaging and waste (Mundler and Laughrea, 2016). This is not fully supported, however, by other findings. For example, Schlich et al. (2006) believe that Local Supply Chains and the concentration of economic activities in one region only cannot contribute to substantial environmental benefits, mainly due to the small production volume. Nonetheless, local supply chains can contribute to the reduction or even elimination of pesticide and livestock use, reduction of soil and water pollution and soil quality degradation, to the maintenance of water reserves, and, finally, to the minimization of food processing (Enjolras and Aubert, 2018).

2.4 Short supply chain and customers

Consumers purchasing or consuming products from Local Supply Chains seem to be generally satisfied with the support provided by the local producers, and there are credible indications that these consumers consider that local products have higher quality standards. As far as consumers' interest in Local Chain of Supply is concerned, there are indications that many consumers are willing to support similar chains for ethical and environmental reasons (Mundler and Laughrea, 2016). For the authors, consumers are generally happy with the promotion of local products as the circulation of money remains local and boosts the local economy (Mundler and Laughrea, 2016).

3. Methodology and key findings

For the purposes of this study, a questionnaire with 16 closed-ended and 3 open-ended questions was used. The questionnaire was filled in between April 2017 and June of the same year. Respondents were Managing Directors and Administrators of 100 five-star hotels of the prefectures of Heraklion and Lasithi in Crete. Table 1 summarizes the main variables used in this research along with the pertinent literature:

Table 1: Research variables

Questionnaire items	Literature
<i>Relative importance of goods and services all items</i>	Salihoglu & Gezici (2018)
Reasons for choosing local suppliers	
<i>Quality</i>	Inwood,Sharp Moore&Stinner (2009)
<i>Shorter lead time</i>	Sharma , Gregoire & Strohbahn (2009)
<i>Cost</i>	Sharma , Gregoire & Strohbahn (2009)
<i>Support of local community</i>	Strohbahn & Gregoire (2003)
Challenges from using local suppliers	
<i>Inadequate distribution</i>	Inwood, Sharp,Moore & Stinner (2009).
<i>Consistent supply</i>	Curtis & Cowee(2009)
<i>Unavailability of resources</i>	Kang & Rajagopal (2014)
<i>Seasonal availability</i>	Kang & Rajagopal (2014)
<i>Inadequate quantity</i>	Kang & Rajagopal (2014)

The following paragraphs summarize the key findings.

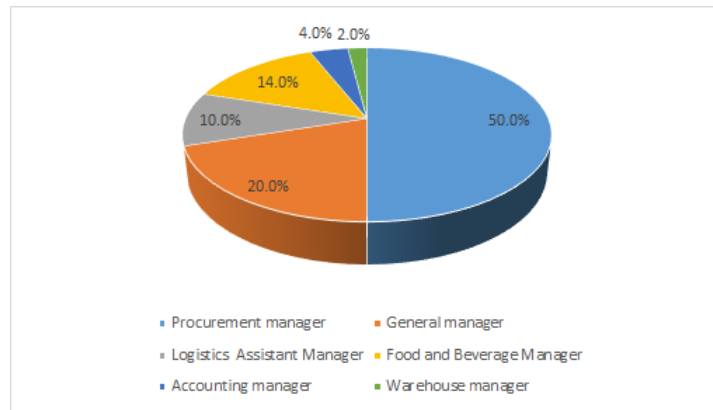


Figure 1: Profile of respondents

A closer look at Figure 1, reveals that all participants have experience in the sourcing and procurement process and can be considered as key informants for the collection of reliable data. More specifically, the respondents have considerable professional experience (40% have 6 to 10 years' managerial experience in the accommodation sector, 38% from 1 to 5 years, whilst 22% have more than 10 years of experience).

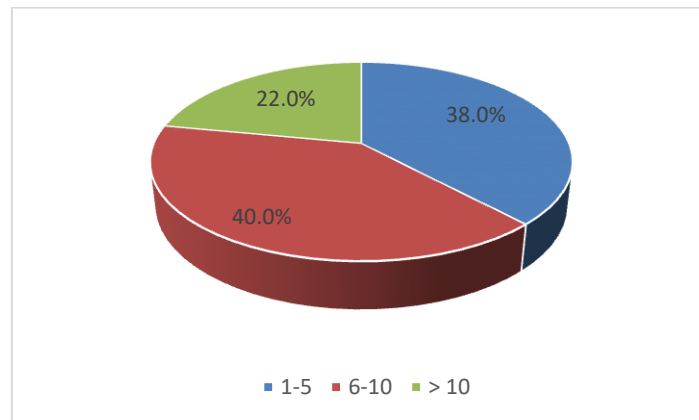


Figure 2: Work experience

The procurement department is in most cases responsible for the sourcing of goods and services (see Fig 3).

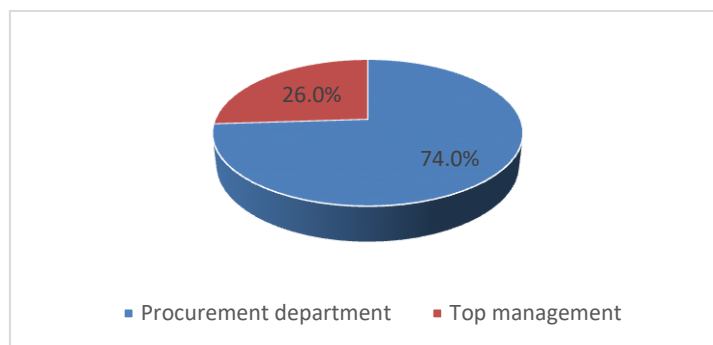


Figure 3: Sourcing responsibility

Respondents were asked to provide a list of the most critical supplies for the running of their operations. The analysis of the answers indicated that cleaning, food and beverages are the most important goods and services in this study (see table 2). The majority of hotel managers use local suppliers (see Fig. 4).

Table 2: Relative importance of goods and services

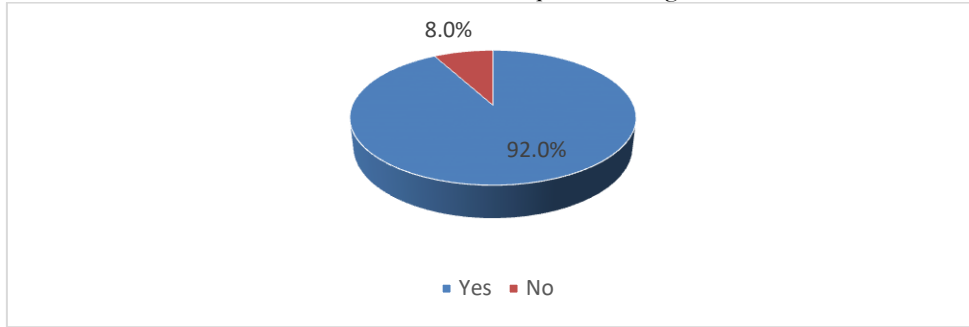
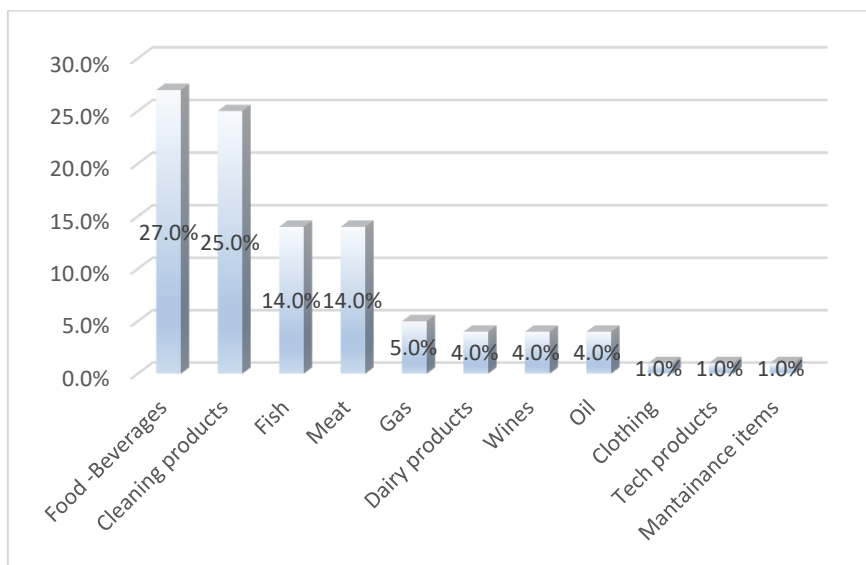


Figure 4: Use of local suppliers

Table 2: Relative importance of goods and services



The reasons for choosing local suppliers are summarized in figure 5. It is worth noting that shorter lead times and support of local economy are deemed the most significant in the minds of the hotel managers (Fig 5).

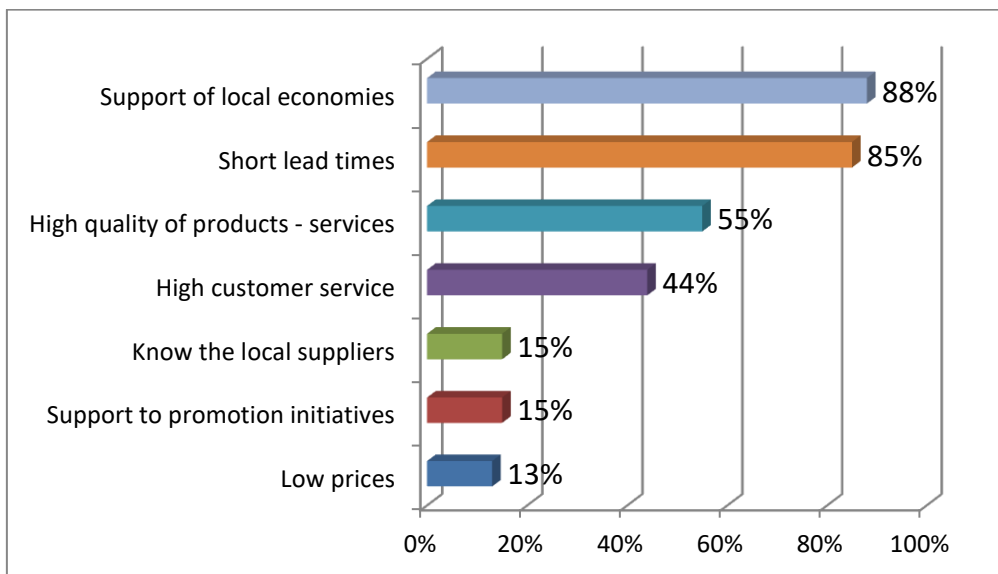


Figure 5. Reasons that hotel managers select local suppliers

With regard to suggestions for better services, the hotel managers indicated lower prices, larger quantities with flexible payment methods (Fig. 6).

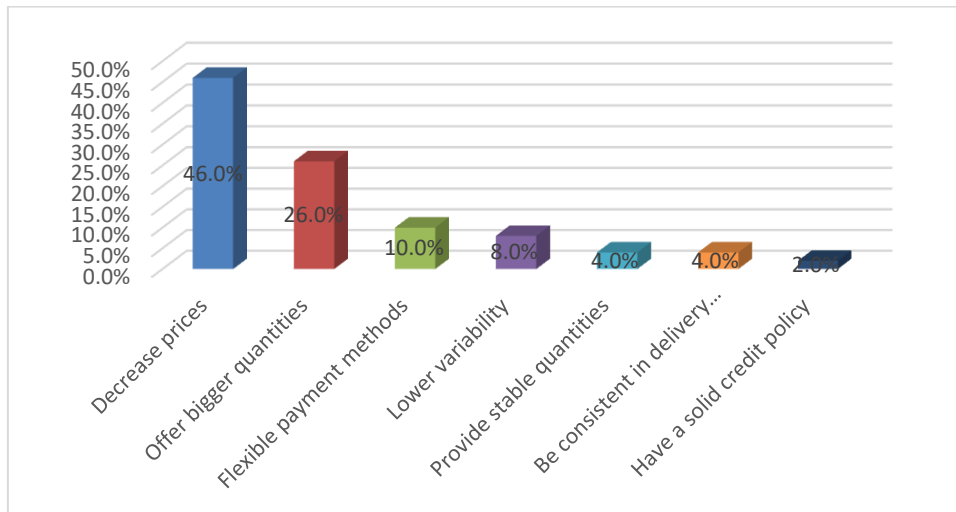


Figure 6: Suggestions made by hotel managers

When asked about the supplier selection criteria, surprisingly quality did not seem to matter. Most respondents agreed on the value for money (Fig. 7). The supplier evaluation methods are summarized in Figure 8.

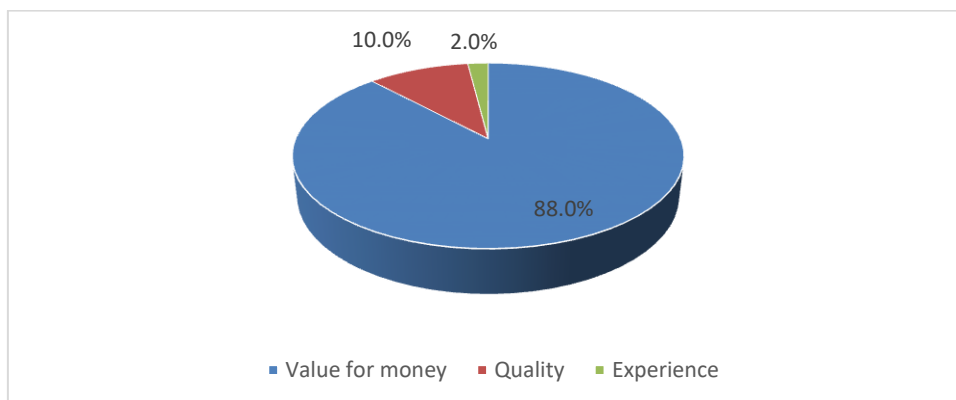


Figure 7: Supplier selection criteria

Finally, most hotels are certified and follow the ISO 22000 (44%) and ISO 9001-2008 (34%). 22% of respondents said that they maintain and use the HACCP standard. Specifically, most hotels in our sample have been certified with the ISO 22000 quality management system; an internationally applicable standard that defines the requirements for the development and implementation of an effective Food Safety Management System (see Fig.9).

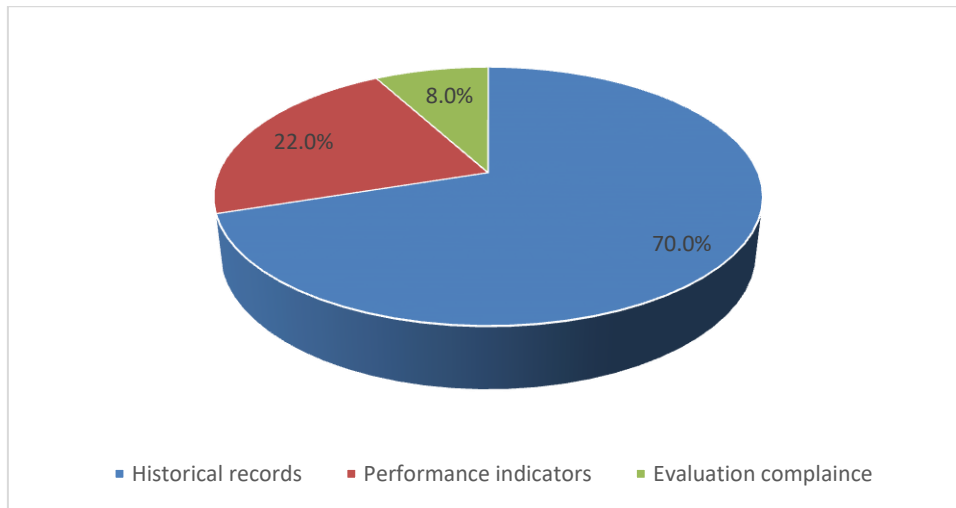


Figure 8: Supplier evaluation methods

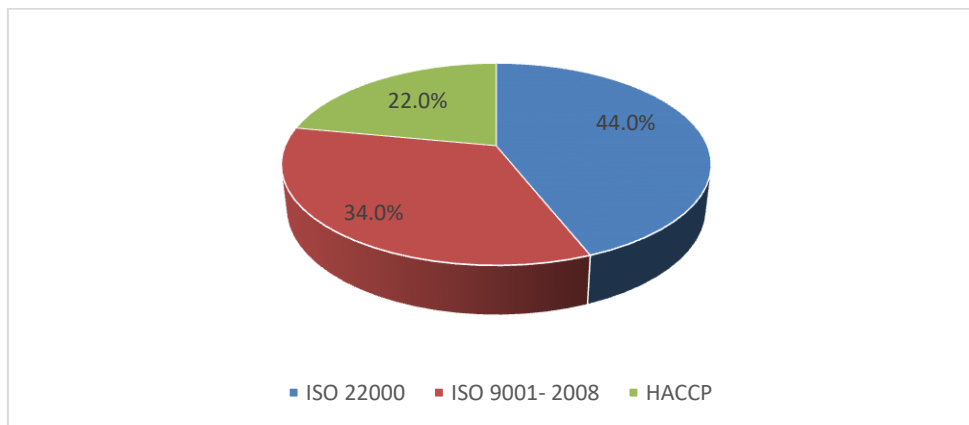


Figure 9: Certification by Quality Standards

4. Conclusions

The sample of this research includes one hundred five-star hotels located in the two prefectures of Crete (Lasithi and Heraklion). There is an upsurge in the short supply chains as supported by the findings of this research. In Greece and more specifically in Crete, the hospitality industry seems to acknowledge the benefits that can be reaped from local sourcing. Hotel managers prefer to use local suppliers mainly as they wish to support the local economy and receive the goods and services in a timely fashion.

The supplier base of the hotels in Crete is sufficient to provide typical and traditional products that give a competitive edge. The survey showed that the five stars hotels in Crete follow the supply chain management trends. A key finding is that high prices and the need for flexible payment agreements are the main challenges when procuring locally. The hotel managers in this area consider that there is room for improvement in the quantities they could purchase. Consistent quality and year round available that have been found as key concerns in this field of research (Kang and Rajagopal, 2014), do not contribute substantially to the success of this study's supply chain. This may be attributed to the fact that Crete has a large pasture area as well as a large irrigated area, producing olives, vegetables, cereals and fruits (Udias et al, 2018).

This study is not without limitations. The implications of this research are based on two prefectures of Crete which is a rural area with rich agricultural activity. The findings, therefore, are likely to reflect local cultural preferences and perceptions that may not apply to other Greek or European regions. Another limitation relates to whether the representative sample is sufficient to infer generalized conclusions. Future studies can focus on different regions to capture different perceptions and provide new opportunities and best practices extending thus our understanding on this rather new but most interesting area of research.

Future researchers can use the same approach to include other prefectures in Greece and in South Europe to examine the effectiveness of short food supply chains. The current EU policy puts great emphasis on these supply chains, funding several research programs regarding localization of the production, and setting legal frameworks and incentives to support such types of chains (Kneafsey et al, 2013). It is, therefore, necessary for future research to investigate the increasing phenomenon and provide recommendations that can develop local economies.

References

- Aubry, C. and Kebir, L., 2013, "Shortening food supply chains: A means for maintaining agriculture close to urban areas? The case of the French metropolitan area of Paris", *Food Policy*, 41, pp. 85–93
- Bimbo, F., Bonanno, A., Nardone, G. and Viscecchia, R., 2015, "The Hidden Benefits of Short Food Supply Chains: Farmers' Markets Density and Body Mass Index in Italy", *International Food and Agribusiness Management Review*, 18,1, pp. 1-16.
- Canfora, I., 2016, "Is the short food supply chain an efficient solution for sustainability in food market?", *Agriculture and Agricultural Science Procedia*, 8, pp. 402–407.
- Curtis, K., and Cowee, M., 2009, "Direct marketing local food to chefs: Chef preferences and perceived obstacles", *Journal of Food Distribution Research*, 40,2, pp.26-36.
- De Fazio, M., 2016, "Agriculture and sustainability of the welfare: the role of the short supply chain", *Agriculture and Agricultural Science Procedia*, 8, pp. 461–466.
- Enjolras, G. and Aubert, M., 2018, "Short food supply chains and the issue of sustainability: a case study of French fruit producers", *International Journal of Retail & Distribution Management*, 46,2, pp.194-209
- Fantazy, K.A., Kumar, V. and Kumar, U., 2010, "Supply management practices and performance in the Canadian hospitality industry", *International Journal of Hospitality Management*, 29, pp. 685–693
- Frash Jr, R.E, DiPietro, R. and Smith, W., 2015, "Pay More for McLocal? Examining Motivators for Willingness to Pay for Local Food in a Chain Restaurant Setting", *Journal of Hospitality Marketing & Management*, 24,4, pp. 411-434.
- Guduraš, D., 2014, "Economic Crisis and Tourism: Case of the Greek Tourism Sector" *Economic Thought and Practice*, 2, pp. 613-632 available at <https://hrcak.srce.hr/130855>
- Hunt, A.R., 2007, "Consumer interactions and influences on farmers' market vendors", *Renewable Agriculture and Food Systems*, 22,1, pp. 54–66.
- Inwood, S., Sharp, J., Moore, R. and Stinner, D., 2009 "Restaurants, chefs and local foods: insights drawn from application of a diffusion of innovation framework", *Agriculture and human value*, 26,3, pp 177-191.
- Jarzębowski, S. and Pietrzyk, K., 2018, "The Concept of Short Supply Chains in the Food Economy. The Common Agricultural Policy of the European Union – the present and the future, EU Member States point of view", Wigier, M., Kowalski, A. series "Monographs of Multi-Annual Programme" no 73.1, IAFE-NRI, Warsaw 2018, ISBN: 978-83-7658-743-1. Available at SSRN: <https://ssrn.com/abstract=3202653>
- Kang, S. and Rajagopal, L., 2014, "Perceptions of Benefits and Challenges of Purchasing Local Foods Among Hotel Industry Decision Makers", *Journal of Foodservice Business Research*, 17, pp. 301–322.
- Kimberly, T. F., Von Massow, M. and Joppe, M., 2017, "Strengthening Farmers–Hotel Supply Chain Relationships: A Service Management Approach", *Tourism Planning & Development*, 14,2, pp. 198–219.
- Kneafsey, M., L. Venn, U. Schmutz, B. Balázs, L. Trenchard, T. Eyden-Wood, E. Bos, G. Sutton, and Blackett, M., 2013, "Short food supply chains and local food systems in the EU. A state of play of their socio-economic characteristics" European Commission Report.
- Lass, D.A., Lavoie, N. & Fetter, T.R., 2005, "Market Power in Direct Marketing of Fresh Produce: Community Supported Agriculture Farms", *Working paper* No. 2005-2, Dept. of Res. Econ., University of Massachusetts, Amherst.
- Levett, M. & Chandler, A.E., 2012, "Maximising Development of Local Content Across Industry Sectors in Emerging Markets", Washington DC: Centre for Strategic & International Studies.
- Marsden, T., Banks, J. and Bristow, G., 2002, "The social management of rural nature: understanding agrarian-based rural development", *Environment and Planning A*, 34, p.p. 809-825.
- Metaxas, I.N., Chatzoglou, P.D. and Koulouriotis, D.E., 2019, "Proposing a new modus operandi for sustainable business excellence: the case of Greek hospitality industry", *Total Quality Management & Business Excellence*, 30,5-6, pp. 499-524.
- Mundler, P. and Laughrea, S., 2016, "The contributions of short food supply chains to territorial development: A study of three Quebec territories", *Journal of Rural Studies*, 45, pp. 218-229.
- Oberoi, J.S. and Khamba, J.S., 2005, "Strategically managed buyer-supplier relationships across supply chain: an exploratory study," *Human Systems Management*, 24, 4, pp. 275–283.
- O'Donovan, I., Quinlan, T. and Barry, T., 2012, "From farm to fork Direct supply chain relationships in the hospitality industry in the south east of Ireland", *British Food Journal*, 114,4, pp. 500-515.
- Onder, E. and kabadayi, N., 2015, "Supplier Selection in Hospitality Industry Using ANP", *International Journal of Academic Research in Business and Social Sciences*, 5,1, pp. 166-186
- Panagou, E.Z., Nychas, G.J.E. and Sofos, J.N., 2013, "Types of traditional Greek foods and their safety", *Food Control*, 29, pp. 32-41.

- Pelletier, N., Audsley, E., Brodt, S., Garnett, T., Henriksson, P., Kendall, A., Klaas Jan Kramer, K., Murphy, D., Nemecek, T. and Troell, M., 2011, "Energy Intensity of Agriculture and Food Systems", *The Annual Review of Environment and Resources*, 36, pp. 223–46.
- Renting, H., Marsden, T.K. and Banks, J., 2003, "Understanding alternative food networks: exploring the role of short food supply chains in rural development", *Environment and Planning A*, 35, p.p. 393-411.
- Salihoglu, G. and Gezici, F., 2018, "Geography of suppliers in the hospitality sector: The case of Alanya", *Tourism Management* 65, pp. 41-54.
- Schlich, E., Biegler, I., Hardtert, B., Luz, M., Schroder, S., Scroeber, J., and Winnebeck, S., 2006, "La consommation alimentaire d'énergie finale de différents produits alimentaires: un essai de comparaison", *Courrier de l'environnement de l'INRA*, 53, pp. 111-120.
- Schmitt, E., Keech, D., Maye, D., Barjolle, D. and Kirwan, D., 2016, "Comparing the Sustainability of Local and Global Food Chains: A Case Study of Cheese Products in Switzerland and the UK", *Sustainability*, 8,5, pp. 419-439.
- Sharma, A., Gregoire, M. and Strohbahn, C., 2009, "Assessing Costs of Using Local Foods in Independent Restaurants", *Journal of Foodservice Business Research*, 12,1, p.p 55-71.
- Strohbahn, C.H. and Gregoire, M. B., 2003, "Institutional and commercial food service buyers' perceptions of benefits and obstacles to purchase locally grown and processed foods", Leopold Center Completed Grant Reports. 205. Available at https://lib.dr.iastate.edu/leopold_grantreports/205
- Tanasă, L., 2014, "Benefits of Short Food Supply Chains for the Development of Rural Tourism in Romania as Emergent Country During Crisis", *Agricultural Economics And Rural Development, Year XI, no. 2/2014*, București, pp.181-193.
- Udias, A., Pastori, M., Malagò, A., Vigiak, O., Nikolaidis, N.P. and Bouraoui, F., 2018, "Identifying efficient agricultural irrigation strategies in Crete", *Science of The Total Environment*, 633, pp. 271-284.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Licence



An Investigation of the Impact of Facebook and Instagram on Consumer Buying Behaviour: The Case of Retail Fashion Consumers in Rhodes, Greece

Dionisia Tzavara^{1†}, Phaedra Clarke², Fotios Misopoulos³

¹Laureate Online Education, C River Building, Haarlerbergweg 23, Amsterdam/Netherlands and University of Liverpool, Chatham Street, Liverpool/UK

²Hunemoller Belgium, Frankrijlei 65, Antwerpen/Belgium

³University of Liverpool, Chatham Street, Liverpool./UK

ARTICLE INFO	ABSTRACT
<p>Article History</p> <p>Received 06/11/2019; Accepted 15/12/2019</p> <hr/> <p><i>JEL Classifications</i> M30, M31, M39</p>	<p>Purpose: The aim of this paper is to explore the impact of Facebook and Instagram on consumer buying behaviour in the retail fashion market in Rhodes, Greece. We look at the extent to which the two social media influence Rhodian consumer preferences toward certain stores and at whether Rhodians use these social media for fashion information and inspiration.</p> <p>Design/methodology/approach: The study is conducted online, using quantitative methodology and close-ended survey questionnaires to obtain data.</p> <p>Finding: We find that Facebook and Instagram influence Rhodian consumer behaviour. Rhodians believe that the two social media are a good way to follow fashion trends and that fashion is more accessible because of Facebook and Instagram compared to five years ago. The Rhodians seem to be getting fashion inspiration from Facebook and/or Instagram but more in a passive manner than through active engagement with fashion on the two social media.</p> <p>Research limitations/implications: Our findings demonstrate that Facebook and Instagram are very powerful in bringing fashion closer to consumers and they underline the role that these social media can play in the marketing mix. Our findings can be used by fashion retailers to inform their social media engagement strategies and decisions. Our research can be extended to investigate the impact of different social media constructs on consumer behaviour and to look at what type of social media content may be more impactful in shaping shopping behaviour.</p> <p>Originality/value: Research on the subject of how social media impacts the behaviour of fashion consumers in Greece is limited and literature on the retail fashion market is noticeably scarce. Studies published on the topic of social media influencing consumer decisions with a focus on the Greek market are almost exclusively confined to the tourism sector. Our findings can be used by fashion retailers to inform their social media engagement strategies and decisions.</p>
<p>Keywords: Consumer Buying Behaviour, Social Media Marketing, Retail Fashion, Greece</p>	

1. Introduction

Social media has changed the way companies communicate with consumers. Not only has social media created new marketing opportunities for companies (Brunh, Schoenmueller & Schafer, 2012; Goodrich & Mooij, 2013; Hajli, 2014; Felix, Rauschnabel & Hinsch, 2017) but also companies can use social media to engage in a dialog with consumers and to promote their brand and market their products/services (Lim, et.al., 2006; Hajli, 2014; Godey et. al., 2016; Lin, Li & Wang, 2017). At the same time, social media is a source of rich information for consumers about brands and products/services (Brunh, Schoenmueller & Schafer, 2012; Hudson & Hudson, 2013). Social media has also created opportunities for consumers to share views and opinions about product/services with other consumers (Kim & Park,

[†]Corresponding Author: Dionisia Tzavara
e-mail: dionisia.tzavara@online.liverpool.ac.uk

2013; Hudson & Hudson, 2013; Lin, Li & Wang, 2017) and to create content about brands and products (Patino, Pitta & Quinones, 2012; Brunh, Schoenmueller & Schafer, 2012; Goh, Heng & Lin, 2013; Hajli, 2014; Chen, Lu & Wang, 2017). Consumers share their reviews and recommendations about products/services through social media and they discuss their experiences with products/services with their online social network (Hajli, 2014; Lin, Li & Wang, 2017; Chen, Lu & Wang, 2017). There is no doubt that brand related content and brand presence on social media impact consumer decisions and behaviour (Kim & Ko, 2012; Goh & Heng, 2013; Hudson & Hudson, 2013; Rathore, Ilavarasan & Dwivedi 2016; Gautam & Sharma, 2017; Perakakis et. al., 2018; Nash, 2019).

The fashion industry is quickly embracing social media, with brands increasingly turning to social media to connect with their customers (Park, Ciampaglia & Ferrara, 2016; Gautam & Sharma, 2017; Nash, 2019). Fashion brands are developing their own specialised webpages which contain information about the brand and offer space for consumers to connect with the brand and interact with other consumers (Ng, 2014). Consequently, it is important for fashion brands to understand how social media is impacting consumer decisions and behaviour.

As a result of the financial crisis, the market in Greece in general has suffered a significant downturn and continues to be under significant pressure. However, despite the downturn, the apparel market seems to slowly pick up in the past 4-5 years and to show prospects for growth in the coming years as well (The Statistics Portal, 2018a), with large multinational clothing chains gaining shares (Euromonitor International, 2019). According to The Statistics Portal (2018b), the retail sector that is hosting the highest number of retail chains in the country is fashion and clothing. Also, internet usage in the country is increasing (Hellenic Statistical Authority, 2018; The Statistics Portal, 2019), and connecting buyers and sellers through social media in the country is growing (ELTRUN, 2016). Users feel more mature to use social media to connect with brands, and trust on the information that is available on social media is increasing. Social media is developing into an important tool in creating a “conversation” between companies and consumers in the country (ELTRUN, 2016).

The study will take an in depth look at how exposure to Facebook and Instagram has changed the way Rhodians shop for fashion and at how these two social media have impacted the Rhodian consumers’ behaviour toward fashion. Our study will look at whether having an Instagram or Facebook account drives Rhodian consumers to shop at specific stores and if social media are a source of fashion information for the Rhodians. We choose to focus on the island of Rhodes in Greece, because in the past 10 years the island has seen the arrival of several chain fashion retailers. Not just an attractive market for large retailers, Rhodes has also seen growth in local boutiques. We choose to focus on Instagram and Facebook as these two are largely the two most popular social media in Greece (Hutt, 2017; Vincos, 2019), with Facebook being the most popular social media with Instagram being second. Also, Instagram seems to be a very popular outlet for brands and fashion related activity (Cartner-Morley, 2015a & b).

2. Literature Review

In today’s fast paced world, social media offer an avenue for “conversation” between buyers and sellers that was previously unimaginable (Hajli, 2014; Rathore & Ilavarasan, 2016). Social media has created opportunities to move away from one sided communication from companies to consumers, to a two-way conversation and to consumer engagement (Rathore & Ilavarasan, 2016; Schivinski & Dabrowski, 2016). Social media has advanced from a medium where people could communicate easily with friends and family, to a platform where they can also easily learn about retail trends and new products and where they can share views and opinions about products and services. The use of social media to market products and services now provides a new way for consumers to shop, but also new avenues for them to learn more about what they purchase before actually following through (Shankar et al. 2011; Erkan & Evans, 2016; Chen, Lu & Wang, 2017).

Social media can be used to gather information about consumer behaviour and to conduct analysis, leading to a greater understanding of how the toll can be used to better market products and services (Paquette, 2013; Rathore & Ilavarasan, 2016; Felix, Rauschnabel & Hinsch, 2017). The inclusion of social media in the promotional mix radically changes the reach of promotion, and thus should never be overlooked as an important tool in the promotion of goods and services (Paquette, 2013; Felix, Rauschnabel & Hinsch, 2017). For companies, the use of social media as a marketing tool is ever more lucrative, with ‘Fortune 500’ companies using the tool increasingly over the past few years (Hatzithomas, Fotiadis & Courdounaris 2016). Through social media, companies gain attention for their product/service and brands can build stronger relationships with consumers, who can share opinions on products and services (Felix, Rauschnabel & Hinsch, 2017). With the focus of marketing shifting from product-centric to customer-centric, understanding the impact of social media on consumer behaviour is paramount (Geissinger & Laurel, 2016; Felix, Rauschnabel & Hinsch, 2017). Social media offer a dynamic environment in which consumers can communicate their experiences to others and create high interconnectedness with other users of the same products/services, adding personal relevance to consumer experience (Shadkam & O’Hara, 2013; Chen, Lu & Wang, 2017).

Fashion is especially well suited to “collaborate” with social media, as fashion “is known to spread through network effects” (Wolny & Mueller, 2013, 563). According to Wolny and Mueller (2013), fashion is a powerful social symbol, which can help create personal and group identities. The ability to express one’s self through fashion could be considered to have a direct relationship with social media as now people can express themselves through Facebook and/or Instagram. Social media represent a personal platform for the expression of ideas, and this resonates with fashion conscious users as it gives them another outlet for creative expression (Geissinger & Laurel, 2016). A lot of discussion about fashion is happening in online communities as fashion entails a social element, and users are seeking opinions about and evaluation of their style choices from their network (Wolny & Mueller, 2013). Also, the fashion

industry is very dynamic and innovative, with trends changing constantly (Mohr, 2013; Kontu & Vecchi, 2014; Perry & Kyriakaki, 2014). Ahmad, Salman & Ashiq (2015) argue that social media is uniquely suited to the promotion of fashion, as both of them grow and evolve at a fast pace, following consumer opinions and desires/needs. Thus, the relationship is clear: social media can keep up with fashion's fast pace.

Although the fashion industry was initially reluctant to develop a presence on social media, it is recently embracing social media at a fast pace (Morh, 2013; Kontu & Vecchi, 2014). Fashion retailers are using social media to connect and to engage in conversation with consumers, to strengthen their brand and promote their products/services, and to collect information about consumer behaviour towards fashion and understand and influence fashion consumption trends and patterns (Kontu & Vecchi, 2014; Ahmad, Salman & Ashiq, 2015; Chae & Ko, 2016; Godey, et. al., 2016; Gautam & Sharma, 2017; Nash, 2019). The communication between fashion brands and consumers has become so engaging and personal that "brands and customers are working together to create new products, services, business models and values" (Kim & Ko, 2012, 1480). The way social media helps people connect and exchange ideas fundamentally changes the way people engage in fashion consumption (Godey, et. al., 2016; Nash, 2019). Fashion retailers and consumers interact through social media and consumers exchange information about their experience of fashion retailers through social media, actively participating in creating and disseminating the brand's message (Kontu & Vecchi, 2014). This exchange creates opportunities for fashion retailers to monetise this tool and change the use of social media in the retail fashion industry as social media helps create a feedback loop with fashion retail companies (Kim & Ko, 2012; Wolney & Muller, 2013; Henninger, Alevizou & Oats, 2017; Nash, 2019).

The increased presence of fashion brands and the amount of fashion-related dialogue on social media, as well as the opportunities that these create for fashion retailers has drawn a lot of attention on understanding how social media may impact consumer decision making and consumer behaviour. However, this area of research is still young and mostly topical, and more research is required to get a better understanding of how social media affects consumers (Kontu & Vecchi, 2014; Gautam & Sharma, 2017; Chae & Ko, 2016; Nash, 2019). Interestingly, and perhaps tellingly, there is very little literature on the subject of how social media impacts the behaviour of fashion consumers in Greece and literature on the retail fashion market is noticeably scarce. Studies published on the topic of social media influencing consumer decisions are almost exclusively confined to the tourism sector (Chatzigeorgiou (2017), Kavoura & Stavrianeas (2015), Perakakis, et. al. (2018)). Our research attempts to fill this gap in the literature and to add to the conversation and generate interest for further studies on this topic, perhaps directing towards more comprehensive use of Facebook and Instagram in the marketing sphere.

3. Data collection

For our study we selected the geographical location of the island of Rhodes in Greece. The arrival of several chain fashion retailers to the island and the growth of local boutiques in the past few years as well as the confined geography of the island made it an interesting location for our study. We conducted a survey using questionnaires to collect quantitative data to capture how Facebook and Instagram have impacted consumer behaviour in the retail fashion market in Rhodes. Our interest was confined to two social media: Facebook and Instagram. Facebook and Instagram are the two most popular social media in Greece (Hutt, 2017; Vincos, 2019) and although Instagram is lagging behind Facebook in terms of widespread use, the fashion industry has embraced Instagram very quickly and Instagram seems to be the most prominent platform to disseminate fashion news (Cartner-Morley, 2015a & b).

The survey questionnaire was distributed through social media, using Survey Monkey. Dedicated pages were set up on Facebook and Instagram to invite participants to take part to the research. Potential participants were directed to Survey Monkey, where they could find additional information about the research and the link to the survey. The questionnaire included 18 statements and participants were asked to state their agreement with these using a 5-point Likert scale ranging from 1=Strongly agree to 5=Strongly disagree. All statements were aimed at capturing how the two social media platforms influence consumer behaviour in the retail fashion market in Rhodes. Data was collected over the period between mid-November 2017 and 1st January 2018.

For the research, we targeted Rhodian residents who had contact with the fashion retail market, who were permanent or temporary residents of Rhodes at the time of the research (including University students) and who were aged between 18-54. According to a study on The Statistics Portal (2018c), ages from 55- 64 have the lowest social media usage. Cox (2010) also argues that usage of social media and positive reactions to social media advertising is considerably lower for users over 55. For these reasons we have decided not to invite participants over the age of 55 to our study.

4. Findings

We collected 115 completed questionnaires. Among the respondents, 55.65% were between the ages of 25-34, and 20% of the respondents were between 18-24. These two age groups have quite high social media presence (The Statistics Portal, 2018c; Kavoura and Stavrianeas, 2015; Hudson & Hudson, 2013). Also, interestingly, according to Cox (2010), the age group with the highest positive reaction to social media marketing is between 18-28 years old and according to Qualman (2009) young adults actively engage with fashion brands through social media. Also, all our respondents were residing in Rhodes at the time of the research, and more specifically 69.57% respondents were permanent residents of the island, 26.09% were temporary residents and the remaining 4.35% were students.

The majority of the respondents confirmed that they were regular users of Facebook (84.35%) or Instagram (62.83%). More than half of the participant (54%) were regular users of both social media platforms, and only a small percentage indicated that they were not regular users of Facebook or Instagram (8.7% and 22.12% respectively). As these numbers confirm, Facebook is the predominant social media forum in the area of Rhodes, but Instagram is quite popular as well. These findings are in line with Hutt's (2017) study into the most popular social media networks worldwide, which reflected high usage of both Facebook and Instagram in Greece, with Facebook reigning supreme, and Instagram coming in a close second.

Out of 115 respondents, 75.65% were in agreement that Facebook and/or Instagram is a good way to follow trends, while only a very small number were in disagreement with this statement (4.35%) and 20% of the respondents were indifferent about this statement. Predominantly the respondents told us that fashion is more accessible today than it was 5 years ago due to Facebook and/or Instagram (76.75%) and only a very small percentage (8.7%) found themselves disagreeing with this statement. More than half of the respondents agreed that they follow fashion brands/stores on Facebook and/or Instagram (55.65%) and just under half of them (48.7%) agreed or strongly that they use Facebook and/or Instagram to seek opinions about brands/products. However, only 37.39% of the respondents indicated that they use Facebook and/or Instagram for fashion inspiration, while an equal percentage were neutral about this statement. It is interesting to comment that although 75.65% of the respondents thought that Facebook and/or Instagram is a good way to follow trends, only 55.65% of the respondents told us that they use the two media to follow fashion brands/stores. The percentages dropped even further when it came to seeking opinion over the two media about fashion (48.7%) and when it came to seeking fashion inspiration over the two media (37.39%). What our findings suggest is that our participants perceived the two social media platforms to be a good way to follow trends, with many of them 'actively' engaging to follow brands/products, a good number of the participants appeared to be less keen.

When we asked our participants about whether Facebook and/or Instagram has influenced where they shop for fashion, we found that the participants were mainly indifferent about presence on the two social media, when selecting the store. More specifically, 40.87% of the respondents were indifferent to shop from stores that use Facebook and/or Instagram to promote themselves and 41.74% of the respondents were indifferent about selecting a store because it has a Facebook and/or Instagram presence. Our findings suggest that only about 1/3 of the respondents were swayed by presence on Facebook and/or Instagram when they selected a store and only about 1/4 suggested that they will shop from a store based on its presence on social media, while mainly the respondents were indifferent about a store's presence on social media when making their selection.

When we asked about the impact of Facebook and/or Instagram on how they shop for fashion in general, 34.79% of the respondents agreed or strongly agreed that they buy fashion they have seen on Facebook and/or Instagram, while 35.66% of the respondents disagreed or strongly disagreed with this statement and 28.55% were neutral. Also, 38.26% of the respondents agreed or strongly agreed that they are more likely to buy fashion after they have seen a product on Facebook and/or Instagram, while 33.05% disagreed or strongly disagreed with this statement and 28.24% were neutral. What these findings suggest is that there was no "majority vote" as such about either of these two statements. And while there was a significant percentage of participants who indicated that they frequently buy fashion that they have seen on the two social media and who are more likely to buy fashion after they have seen the product on the two social media, there was about 1/3 of the respondents who disagreed with both statements.

Asking specifically about local stores and shopping for fashion locally, the majority of the respondents (48.7%) agreed that they use Facebook and/or Instagram to find out about local fashion stores and products, while the remaining of the participants were almost equally split between being neutral (26.09%) or disagreeing/strongly disagreeing (25.22%) with this statement. Also, 46.09% of the respondents agreed that Facebook and/or Instagram promotion has changed the way they shop for local fashion, while the number of participants that disagreed or strongly disagreed with this statement was 29.57%. However, when we asked participants to indicate whether they subscribe to Facebook and/or Instagram updates and alerts regarding brands or products in the Rhodes area, 47.83% disagreed or strongly with this statement, while only 30.04% respondents agreed. Again, we notice that when it comes to active engagement with the two social media in the form of subscribing to updates and alerts, our participants were less keen to keep up. While our participants suggested that they seek information about local fashion and this seems to have changed the way they shop for fashion locally, they were not invested enough to have alerts or subscriptions set-up. What this means is that while the Rhodes weren't subscribers per se, they did use these social media to follow what is happening in the local retail marketplace. Respondents suggested that they will use social media to stay abreast with local fashion and retail developments, however they lack the interest to subscribe to alerts or notifications from these outlets.

In relation to their buying behaviour, 38.26% of the respondents disagreed or strongly disagreed that their buying behaviour for fashion had changed because of Facebook and/or Instagram, 34.79% agreed with that statement, while 26.96% were neutral. Also, 43.48% of the respondents disagreed that they made unplanned purchases due to exposure to Facebook and/or Instagram, 33.05% agreed or strongly with this statement and 23.48% of the participants were neutral.

Finally, we asked the participants to compare the impact of Facebook and/or Instagram on their purchasing behaviour with that of traditional media. Just over half of the respondents (50.44%) agreed or strongly that Facebook and/or Instagram were more influential in their purchasing decision than traditional media and only 22.61% disagreed or strongly disagreed with this statement. However, when the participants were asked to consider whether they find fashion advertising on Facebook and/or Instagram more interesting than traditional media, the percentage

of those who agreed or strongly was slightly lower and dropped to 42.60%, while 39.13% of the participants were neutral toward this statement.

5. Discussion and Conclusions

This study was conducted to investigate how Facebook and/or Instagram affect the shopping behaviour of fashion consumers on the Greek island of Rhodes. We aimed to explore how the two social media are impacting the way Rhodians shop for fashion and the extent to which the two social media serve as a source of fashion information and inspiration for the Rhodians. We found that, although not to the extent that we expected, Facebook and Instagram are indeed impacting the way Rhodians shop for fashion. Facebook and/or Instagram are impacting where Rhodians shop for fashion and the Rhodians look on Facebook and/or Instagram and refer to these social media to help them form decisions about buying fashion. The two social media are a source of fashion information and inspiration for the Rhodians, although perhaps not so much through active engagement but more through passive exposure to information.

Although the impact of the two social media on the Rhodians' buying behaviour is not as strong as we expected, to put the findings in context, it should be considered that Greece continues to be a country in recession and that the apparel and clothing sector is only just picking up slowly (The Statistics Portal, 2018a) and that internet usage in the country is increasing (Hellenic Statistical Authority, 2018) but the country continues to have one of the lowest rates of regular use of the internet by individuals among EU countries (European Commission, 2019).

The Rhodians think that Facebook and/or Instagram is a good way to follow trends which is in line with earlier findings according to which consumers increasingly rely on the two social media to follow trends (Mohr, 2013; Ko, et al., 2013; Wonly & Mueller, 2013). Also, as anticipated (Morh, 2013; Ahmad, Salman & Ashiq, 2015; Cartner-Morley, 2105a), the Rhodians think that the two social media are making fashion more accessible today than it was 5 years ago. This is an interesting finding about the strength of these two social media platforms in bringing fashion closer to consumers and the potential that the two media could have as marketing tools (Kontu & Vecchi, 2014; Gautam & Sharma, 2017; Felix, Rauschnable & Hinsch, 2017).

The Rhodian consumers may follow brands on Facebook and/or Instagram and they may seek opinions on these social media about brands/products, but they do not feel strongly about Facebook and/or Instagram as the source where they will seek fashion inspiration. Throughout the research, we assumed that the Rhodians would turn to social media for fashion inspiration. This implied that people would actively use Facebook and/or Instagram to search for fashion news, fashion images, opinions and recommendations about fashion, as sources of fashion inspiration. What we found was that the Rhodians aren't subscribers per se, but they do use these social media to follow what is happening in the fashion retail marketplace. Respondents told us that they will use social media to stay abreast with fashion and retail developments, however many of them will not subscribe to alerts or notifications about fashion. This may have very useful implications for the development of fashion content that engages potential consumers in social media. As Ko et al. (2013) suggest, in order to engage consumers in discussions about fashion in social media platforms, the content needs to be engaging and relevant to them and frameworks for content development need to be created in order to achieve this goal.

There seem to be mixed findings in the literature about the effectiveness of social media compared to traditional media in the marketing mix and this is supported by our findings as well. Compared to traditional media, our findings do not suggest any strong dominance of these two social media over traditional media in terms of the interest of the content and the influence on the purchase decision. Social media adds a social element to the promotion of fashion, with consumers engaging with the fashion brands and with other fashion consumers and this creates new opportunities for fashion retailers (Kim & Ko, 2012; Gautman & Sharma, 2017), but as Ahmad, Sahman & Ashing (2015) and Godey et al. (2016) suggest both social and traditional media have a role to play in the promotion of fashion brands.

As social media has changed the way fashion retailers connect with consumers, a number of different opportunities have emerged, from fashion blogs, to broadcasting fashion shows and sharing fashion videos and pictures on social media, to internet communities, celebrity recommendations and customer reviews and ratings (Kim & Ko, 2012; Godey et al., 2016; Ahmed, Salman & Ashiq, 2015, Gautam & Sharma, 2017; Nash, 2019). In light of our findings that the Rhodians do take an interest in Facebook and/or Instagram when engaging with the fashion industry and that the two social media do impact the Rhodian consumers' shopping behaviour, it would be interesting to engage in a more in-depth investigation of what content is more impactful in shaping shopping behaviour. Also, it would be interesting to investigate in-depth the impact of the different social commerce constructs such as product/service recommendations and referrals, reviews and ratings or forums and communities on the behaviour of retail fashion consumers.

References

- Ahmad N., Salman A. and Rubab A. 2015. "The impact of Social Media on Fashion Industry: Empirical Investigation from Karachiites". *Journal of Resources Development and Management*, 7, 1-7.
- Bruhn, M., Schoenmueller, V. and Schafer, D.B. 2012. "Are social media replacing traditional media in terms of brand equity creation?". *Management Research Review*, 35(9), 770-790.

- Cartner-Morley, J. 2015a "Instagram: Welcome to fashion's new front row". *The Guardian*. [Online]. Available from: <https://www.theguardian.com/fashion/2015/sep/25/instagram-the-new-catwalk-of-fashion> [Accessed: 08 June 2019].
- Cartner-Morley, J. 2015b "How sociality barbie proves that Instagram has turned into reality TV". *The Guardian*. [Online]. Available from: <https://www.theguardian.com/fashion/2015/sep/14/how-sociality-barbie-proves-that-instagram-has-turned-into-reality-tv> [Accessed: 08 June 2019].
- Chae, H. and Ko, E. 2016. "Customer social participation in the social networking services and its impact upon the customer equity of global fashion brands". *Journal of Business Research*, 69(9), 3804-3812.
- Chatzigeorgiou, C. 2017. "Modelling the impact of social media influencers on behavioural intentions of millennials: The case of tourism in rural areas in Greece". *Journal of Tourism, Heritage & Services Marketing*, 3(2), 25-29.
- Chen, A., Lu, Y. and Wang, B. 2017. "Customers' purchase decision-making process in social commerce: A social learning perspective". *International Journal of Information Management*, 37, 627-638.
- Consenza, V. 2018. "World map of social networks". [Online]. Available from: <http://vincos.it/world-map-of-social-networks/> [Accessed: 03 December 2018].
- Cox S.A. 2010. "Online Social Network Member Attitude Toward Online Advertising Formats". MA thesis, The Rochester Institute of Technology.
- ELTRUN 2016. "Internet users in Greece say they are more mature and conscious relative to the use of social media and the tools of social media marketing on behalf of companies". [Online]. Available from: <http://www.greekecommerce.gr/gr/file-download/eltrun-digital-marketing-2016> [Accessed: 02 June 2019].
- Erkan, I. and Evans, C. 2016. "The influence of eWOM in social media on consumers' purchase intentions: An extended approach to information adoption". *Computers in Human Behavior*, 61, 47-55.
- Euromonitor International. 2019. "Apparel and footwear in Greece". [Online]. Available from: <https://www.euromonitor.com/apparel-and-footwear-in-greece/report> [Accessed: 09 June 2019].
- European Commission. 2019. "Use of Internet services". [Online]. Available from: <https://ec.europa.eu/digital-single-market/en/use-internet> [Accessed: 16 June 2019].
- Gautam, V. and Sharma, V. 2017. "The mediating role of customer relationship on the social media marketing and purchase intention relationship with special reference to luxury fashion brands". *Journal of Promotion Management*, 0(0), 1-17.
- Geissinger A. and Laurel C. 2016. "User engagement in social media – an explorative study of Swedish fashion brands". *Journal of Fashion Marketing and Management*, 20(2) 177-190.
- Godey, B. Manthiou, A., Pederzoli, D., Rokka, J., Aiello, G., Donvito, R. and Singh, R. 2016. "Social media marketing efforts of luxury brands: Influence on brand equity and consumer behaviour". *Journal of Business Research*, 69, 5833-5841.
- Goh, K.-Y., Heng, C.-S. and Lin, Z. 2013. "Social media brand community and consumer behavior: Quantifying the relative impact of user- and marketer-generated content". *Information Systems Research*, 24(1), 88-107.
- Goodrich, K. and de Mooij, M. 2013. "How 'social' are social media? A cross-cultural comparison of online and offline purchase decision influences". *Journal of Marketing Communications*, 20(1-2), 103-114.
- Hajli, M.N. 2014. "A study of the impact of social media on consumers". *International Journal of Market Research*, 56(3), 387-404.
- Hatzithomas L., Fotiadis T.A. and Courdounaris D.N. 2016. "Standardization, Adaptation, and Personalization of International Corporate Social Media Communications". *Psychology and Marketing*, 33(12), 1098-1105.
- Hellenic Statistical Authority. 2018. "Press Release – Survey on the use of Information and Communication Technologies by households and individuals: 2018". [Online]. Available from: <https://www.statistics.gr/en/statistics/-/publication/SFA20/> [Accessed: 02 June 2019].
- Henninger C.E., Alevizou P.J. and Oates C.J. 2017. "IMC, social media and UK fashion micro-organisations". *European Journal of Marketing*, 51(3), 668-691.
- Hudson, S. and Hudson, R. 2013. "Engaging with consumers using social media: a case study of music festivals". *International Journal of Event and Festival Management*, 4(3), 206-223.
- Hutt R. 2017. "The World's Most Popular Social Networks Mapped. *World Economic Forum*. [Online]. Available from: <https://www.weforum.org/agenda/2017/03/most-popular-social-networks-mapped/>, [Accessed: 01 September 2017].
- Kavoura A. and Stavrianeas A. 2015. "The importance of social media on holiday visitors' choices – the case of Athens". Greece, *EuroMed Journal of Business*, 10(03), 360-374.
- Kim, A.J. and Ko, E. 2012. "Do social media marketing activities enhance customer equity? An empirical study of luxury fashion brand". *Journal of Business Research*, 65, 1480-1486.
- Kim, S. and Park, H. 2013. "Effects of various characteristics of social commerce (S-commerce) on consumers' trust and trust performance". *International Journal of Information Management*, 33, 318-332.
- Ko, E., Chun, E., Song, S. and Kim, K.H. 2013. "Which content types increase participation in fashion social platforms?". *Journal of Global Scholars of Marketing Science*, 23(3), 297-313.
- Kontu, H. and Vecchi, A. 2014. "Why all that noise – assessing the strategic value of social media for fashion brands". *Journal of Global Fashion Marketing*, 5(3), 235-250.
- Kourtali, E. 2018. "Foreign investors concerned about growth rate, Greek stocks". *Ekathimerini*. [Online]. Available from: <http://www.ekathimerini.com/232923/article/ekathimerini/business/foreign-investors-concerned-about-growth-rate-greek-stocks> [Accessed: 03 December 2018].
- Lim, K.H., Sia, C.L., Lee, M.K.O. and Benbasat, I. 2006. "Do I trust you online, and if so will I buy? An empirical study of two trust building strategies". *Journal of Management Information Systems*, 23(2), 233-266.
- Lin, X., Li, Y. and Wang, X. 2017. "Social commerce research: Definition, research themes and trends". *International Journal of Information Management*, 37, 190-201.
- Mohr, I. 2013. "The impact of social media on the fashion industry". *Journal of Applied Business and Economics*, 15(2), 17-22.
- Nash, J. 2019. "Exploring how social media platforms influence fashion consumer decisions in the UK retail sector". *Journal of Fashion Marketing and Management*, 23(1), 82-103.
- Ng, M. 2014. "Social media and luxury fashion brands in China: The case of Coach". *Journal of Global Fashion Marketing*, 5(3), 251-265.
- Paquette H. 2013. "Social Media as a Marketing Tool: A Literature Review". *Major Papers by Master of Science Students*. Paper 2 [Online] Available from: http://digitalcommons.uri.edu/tmd_major_papers/2. [Accessed: 14 August 17].

- Park, J., Ciampaglia, G.L. and Ferrara, E. 2016. "Style in the age of Instagram Predicting success within the fashion industry using social media". Proceedings of the 19th ACM Conference on computer-supported cooperative work & social computing, 64-73, San Francisco, California, February 27 – March 2 2016.
- Patino, A., Pitta, D. and Quinones, R. 2012. "Social media's emerging importance in market research". *Journal of Consumer Marketing*, 29(3), 233-237.
- Perakakis, E., Trihas, N., Venitourakis, M., Mastorakis, G. and Kopanakis, I. 2018. "Social media as a marketing tool for Greek destinations". *Tourismos: An International Multidisciplinary Journal of Tourism*, 11(3), 157-181.
- Perry, P. and Kyriakaki, M. 2014. "The decision-making process of luxury fashion retail buyers in Greece". *Journal of Fashion Marketing and Management*, 18(1), 85-106.
- Rathore, A.K., Ilavarasan, P.V. and Dwivedi, Y. 2016. "Social media content and product co-creation: An emerging paradigm". *Journal of Enterprise Information Management*, 29(1), 7-18.
- Schivinski, B. and Dabrowski, D. 2016. "The effect of social media communication on consumer perceptions of brands". *Journal of Marketing Communications*, 22(2), 189-214.
- Shadkam, M. and O'Hara, J. 2013. "Social commerce dimensions: The potential leverage for marketers". *Journal of International Banking and Commerce*, 18(1), 1-14.
- Shankar V., Inman J., Mantrala M., Kelley E. and Rizley R. 2011. "Innovations in Shopper Marketing: Current Insights and Future Research Issues." *Journal of Retailing*, 1:s29-s42, doi:10.1016/j.jretai.2011.04.007.
- Shankar V., Inman J.J., Mantrala M., Kelly E. and Rizley R. 2011. "Innovations in Shopper Marketing: Current Insights and Future Research Issues". *Journal of Retailing* 87S, 1-2011, 29-42.
- The Statistics Portal. 2018a. "Apparel". [Online]. Available from: <https://www.statista.com/outlook/90000000/138/apparel/greece> [Accessed: 09 June 2019].
- The Statistics Portal. 2018b. "Number of retail chains in Greece in 2018, by sector". [Online]. Available from: <https://www.statista.com/statistics/642362/retail-chains-number-by-sector-greece/> [Accessed: 09 June 2019].
- The Statistics Portal. 2018c. "Age distribution of active social media users worldwide as of 3rd quarter 2014, by platform". [Online] Available from: <https://www.statista.com/statistics/274829/age-distribution-of-active-social-media-users-worldwide-by-platform/>. [Accessed: 10 September 2017].
- The Statistics Portal. 2019. "Share of households with internet access in Greece from 2007 to 2018". [Online]. Available from: <https://www.statista.com/statistics/377701/household-internet-access-in-greece/> [Accessed: 02 June 2019].
- Qualman, E. 2009 "Socialnomics, How Social media transforms the way we live and do the business". John Wiley & Sons, Inc.
- Vincos. 2019. "World map of social media networks". [Online]. Available from: <https://vincos.it/world-map-of-social-networks/> [Accessed: 02 June 2019].
- Wolny J. and Mueller C. 2015. "Analysis of fashion consumers' motives to engage in electronic word-of-mouth communication through social media platforms". *Journal of Marketing Management*, 29(5-6), 562-583.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Licence

