Business Administration and Business Economics

SMEs and Social Responsibility Policies in the Romanian Business Environment

Stefan Gheorghe[1]

Abstract: The activity of economic organizations and not only, is based on the contribution of large and diverse socio-professional groups (such as employees, consumers, providers, local communities – stakeholders in one word) whose interests must be respected. When a company initiates successful social responsibility programs at local, regional or national level, these particular programs contribute to its financial success allowing it also the "luxury" of getting involved in "generous" initiatives. In addition to these economic arguments, one must consider the moral arguments in favour of the companies' social responsibility. Competitiveness in this field is real, thus making the companies' visibility to depend on it. Consequently, underestimating their impact can lead to the loss of customers, narrowing of economic activity and difficulties in attracting new customers. The consequences for business are: decrease of the profit, reduced development perspectives, a significant abatement, etc.

Keywords: social responsibility; corporate social responsibility; business ethics; best practices

JEL Classification: M21; M1

The activity of economic organizations and not only, is based on the contribution of large and diverse socio-professional groups (such as employees, consumers, providers, local communities – stakeholders in one word) whose interests must be respected. When a company initiates successful social responsibility programs at local, regional or national level, these particular programs contribute to its financial success allowing it also the "luxury" of getting involved in "generous" initiatives. In addition to these economic arguments, one must consider the moral arguments in favour of the companies' social responsibility. Competitiveness in this field is real, thus making the companies' visibility to depend on it. Consequently, underestimating their impact can lead to the loss of customers, narrowing of economic activity and difficulties in attracting new customers. The consequences for business are: decrease of the profit, reduced development perspectives, a significant abatement, etc.

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The globalization of economic problems such as the increased gap between the developed and underdeveloped countries, inflation, environmental pollution, resource depletion and the further preservation of the large areas at subsistence level, have brought to the attention of numerous specialists and international structures, the need for designing a new economic model economic able to solve at least a part of these issues and if possible others as well (unemployment, education and training, health, political issues). Besides all these problems, the increase of economic competitiveness and companies' profits which operate on the market is an indispensable accessory in nowadays global economy.

The European Union actively supports the approach of the Member States to succeed in asserting a new approach of the relationship between communities and companies working on the national and international markets. The effort of becoming "the most competitive and dynamic economic sector in the world capable of sustaining economic development through better jobs and a better social cohesion" (according to the target set by the European Council in Lisbon in 2000) represent a major social component of all actors involved on the market. This way, the international and national authorities, public and private companies alongside with other organizations able to engage responsibly are required to relate with each other so that the economic development and social inclusion to correspond to the European moral and cultural traditions especially to the new social standards specific to a model of economic growth and social welfare as envisioned by the EU.

Social responsibility policies in environmental protection is not the exclusive domain of the state in the XXI century, on the contrary, the need benefit from a healthy environment is a sine qua non requirement of all current participants in social activities. Although, individually speaking, the possibilities of expression oneself according to these norms are not absolute and correctly represented, through non-governmental organizations the goals can be achieved punctually. Generally, the state and the society take on the role of instructor by involving themselves in the early education of citizens in order to achieve a sustainable development. Economic growth is usually associated with the terms of development, progress and competitiveness roughly corresponding to people's expectations in most situations, thus generating the illusion of a myth of economic growth which can provide an overall solution to the social and economic gaps of states and communities.

CSR (Corporate Social Responsibility) is a way of understanding the development of any medium and long term business in terms of the in achieving the standards and development of contemporary society. Adopting the CSR principles by the economic actors helps achieving the goals of a sustainable development, and for this end, the states and international bodies have completed a series of criteria in order to explain on the meaning of all what the "desirable corporate behavior in society" is. Companies are now directly ready to cooperate with various local authorities in order to increase the visibility of their power on a market whose standards are constantly changing. In the frame of the organization, companies, in their relation with the employees, are recommended to pay close attention to:

• optimizing the life quality standards of their employees

• ensuring a safe and healthy work environment for everyone involved directly and indirectly in the company's activity

• the specific interests of all parties involved in situations of crisis by restructuring activities responsibly

• minimizing the impact of company's activities on natural resources and especially on the environment

The problem is topical for the companies which operate in the Romanian economy because the achieving of a functional and competitive market economy should be characterized by an increase of economic efficiency and productivity, meaning the disappearance of sectors with low/ medium performance and massive staff dismissal. On the other hand, the professional reconversion of dismissed workforce is conducted with some slowness, many discharged employees putting pressure on the local and central budgets thus redirecting and limiting the potential for new investments and job opportunities. Social responsibility can be perceived as a logical consequence of the obligation deriving from the increased social strength (importance) of a company and the non- correlation of this growth with social responsibility may, ultimately, lead to the loss of this social power and company's decline. Currently, CSR - Corporate Social Responsibility is situated at the intersection point between political, cultural and economic systems. Along the time, a growing number of people with solid academic knowledge stated the idea that companies could no longer be considered purely private institutions, but social institutions. A.B.Carroll suggests that corporate social responsibility defines itself through society's economic, legal, ethical and social demands with respect to business. Similarly, other authors place corporate social responsibility at the border between societal expectations from business and business ethics. There are three main principles according to which managers , but society as well must consider when dealing with the responsible behaviour of an organization:

1. a company's right to exist depends on its responsibility towards the environment;

2. governments can resort to strict laws if businesses do not include in their area social standards;

3. a policy characterized by social responsibility leads to social acceptance thus consolidating the company's viability.

Companies' competitiveness derives not only from their technical and material capabilities, but also by the provided marketing products and services or exclusively by the price and quality relation. Currently, companies must face new challenges in order to be kept in their customers' top choices. Consequently, they are forced to conduct social responsibility programs designed to strengthen their connection with their communities and to reward the faithful customers and not only. Competition is obvious, the economic actors from the market having both for and against arguments which their partners, respectively critics do not hesitate to bring them into discussion. This is precisely because they do want to avoid having their image and market damaged when involved in the unfolding of a a business (employees, suppliers, customers, community, local and central authorities).

Companies need to know, apply and use *best practices*. For instance, companies should support the communities' development they operate in, help in the development of the economic systems through public-private partnerships and not least to protect and encourage environmental protection at local, regional and global level. More and more managers understand that CSR has become a genuinely competitive advantage for every

company due to the given advantages from the communities they operate in and which extensively need the involvement of private partners in the best interest of their members. Through various social practices, every company can improve its business voluntarily in a manner meant to contribute to the community's welfare and environment's protection. Voluntary nature is therefore a feature of any CSR initiatives on the organization made any pressure from the authorities or other governmental organizations are not considered as such. Still have to admit that in many cases the onset of a new responsible approach to society had as a starting point such reproaches of civil society, and beyond. Medium and long term competitiveness of companies that have switched to social responsibility programs has multiplied so that good practices implemented by businesses helped to develop the field itself and to raise standards in business.

Multinational corporations, generally considered as representing the top of the iceberg, and socially responsible, can benefit from of a larger and more generous public, while the public perception of social irresponsibility can result in a boycott or other hostile actions from the part of consumers. The arguments in favour of the sustainable social development should be interpreted by companies as long-term investment in building a safer community life, better educated and more fair, of which all parties involved can benefit from, thus unfolding their activity in a business environment more environmentally and people friendly, more potent and stable. These are serious economic reasons which can be beneficial to the economic agents who assume certain obligations towards different social groups.

Nowadays, the companies' voluntary social involvement represents a model frequently encountered due to a combination of factors, such as: economic globalization, competitiveness, the tendency of resources' depletion, the increase danger of pollution and decrease of the public sector's role. Corporate social responsibility is becoming an increasingly important asset of the business interaction with the society where every economic actor operates in. This term is of interest for both those who apply it in their daily activities and in the academic environment, who in order to create future responsible managers, get involved in its studying. Companies which can prove that they apply social responsibility policies are associated with the economic business elite, be it the EU area or not. According to general opinion, only these ones will resist globalization from the economic field, while the rest will disappear, therefore competitiveness is built on the basis of a cause-effect relation with social responsibility meaning that both generate one each other. Currently, people have become more aware of protecting the environment, of the companies' involvement in the their communities' problems, the way a company achieves its purpose this being due to the fact that the companies are expected more than only products and services quality.

A research report on the balance of social responsibility in 2010, coordinated by a group of experts concluded that the main successful companies from the Romanian market have developed social responsibility programs propelling them in the customer's top choices. According to this study, a characteristic of all analyzed companies highlight that their notoriety is due primarily not to their specific activities, on the contrary, they have become visible due to social responsibility programs, conducted online, widely advertised and which have invested in young people's education and environment protection. With respect to the second criterion, one can remark a certain saturation of the ones already familiar with

the area of corporate social responsibility, though the expectations are still high due to an exponential increase of those interested in. According to the ranking, Petrom got situated on the first place followed by Vodafone, UniCredit Tiriac and Bank Reiffeisen. These companies were far behind the group due to the top managers' decisions who coordinate the activity, meaning the investment in education programs for young people associated with the environment protection; this decision aligns to the standards for social responsibility from the Romanian market and Romanians' expectations, fact which already happens in the EU or the U.S. Other nominations concerned OTP Bank, BCR, URBB-Tuborg, Orange, Rompetrol and Coca Cola. These companies developed social responsibility projects, but their impact at national level was reduced and lacked in effective publicity.

The connection between competitiveness and social responsibility is absolutely relevant only if it is analyzed in terms of the allocated budgets by companies for such projects. A generous budget allocated to a project with high social impact can only be applied by a top company which distinguishes itself through real financial performances. The high impact on society derives from the civic behavior stimulation, generally considered a criterion which needs to be fulfilled by most companies operating on the market. Leaders and opinion makers expect a more extensive involvement in the "development of local communities", fact which can only be achieved by competitive companies.

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On an Algorithm for Identifying Sessions from Web Logs

Claudia Elena Dinucă[1], Dumitru Ciobanu[2]

Abstract: The quality of decisions is based on the quality of processed data. So it is important that at the beginning of the data mining process to provide correct and quality data. The preprocessing data is a necessity for avoiding the failure of the data analysis. The idea that the data mining process can be done without human supervision has proved to be wrong. Even so, the humans are trying to automate as much as possible the process. From here are resulting many algorithms and techniques that are implemented using various programming language. In this work is presented an algorithm for identifying the sessions from a web logs file. It uses a value of 30 minutes to mark the end of a session and start another. We compute the average time for visiting the pages and using this we show that the presented algorithm produces errors in identifying sessions. We consider that the correct way to identify the session is to take into account the average time for visiting the pages.

Keywords: clickstream analysis; preprocessing data; sessions' identification.

JEL Classification: L86; C63; C88.

1. Introduction

World Wide Web or Web on short is the universal information space that can be accessed by companies, governments, universities, students, teachers, businessmen and some users. In this universal space trading and advertising activities are held. A Web site is a lot of interconnected web pages that are developed and maintained by a person or organization. Web mining and analyzing studies reveal useful information on the web. Web mining studies analyzes and reveals useful information from the Web (Cooley, Mobasher & Srivastava, 1997). Web mining is a term used for applying data mining techniques to Web access logs (Zaiane, 2000). Data mining is a non-trivial process of extracting previously unknown and potentially useful knowledge from large databases (Piatetsky-Shapiro, Fayyad, Smith & Uthurusamy, 1996).

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Web mining can be divided into three categories: Web content mining, Web structure mining and Web usage mining (Zaiane & Han , 1998). Web content mining is the process of extracting knowledge from documents and content description. Web structure mining is the process of obtaining knowledge from the organization of the Web and the links between Web pages.

Web usage mining analyzes information about website pages that were visited which are saved in the log files of Internet servers to discover the previously unknown and potentially interesting patterns useful in the future. Web usage mining is described as applying data mining techniques on Web access logs to optimize web site for users.

Click-stream means a sequence of Web pages viewed by a user; pages are displayed one by one on a row at a time. Analysis of clicks is the process of extracting knowledge from web logs. This analysis involves first the step of data preprocessing and then applying data mining techniques. Data preprocessing involves data extraction, cleaning and filtration followed by identification of their sessions.

2. Sessions Identification

Correct identification of sessions is an important step in preprocessing data from web logs. Some studies indicate a period of 30 minutes between pages viewed as sufficient to establish the end of a session and start another. However, this period may not be sufficient for certain types of websites, for example those which contains documents that the user reads. Also in this category may fall and commerce sites pages which are opinions about products. Should be taken into account that different people need time to cover the same amount of information, for example an elderly person can slowly follow the information presented on the website. Also in the case when a potential client who wants to better inform about a product may exceed this time and the analyst wrongly consider the session ended, longer time spent on the website in this case showing interest in the product and maybe the wish to purchase the product than to leave the website. More bad decisions in sessions' identification can significantly alter the results of applying data mining techniques. In an attempt to reduce errors in session identification, an improved algorithm is proposed to amend the classic algorithm. More bad decisions identification sessions can significantly alter the results of applying data mining techniques.

In an attempt to reduce errors in sessions identification we propose to amend the sessions identification algorithm.

Model description.

We consider IP the set of IP adresses of users = {IP1, IP2, ..., IPN}. PIPk is the set of user pages that were visited by the user identified through IP_k IP, PIPk = {PIPk1, PIPk2, ...} and TS_PIPki is the timestamp of PIPki page. We denote by ID_PIPki the sessions identifications numbers assigned to PIPki page and we note ID the set of all these identifications numbers.

The pseudo-code Algorithm

For each IP IP_k repeat

If $| PIP_k |=1$ and $ID\_PIP_{k1}=max(ID)+1$;

Then $ID\_PIP_{k1}=max(ID)+1$;

I=1;

While $(I<| PIP_k |)$ repeat

I=I+1;

If $TS\_PIP_{ki}- TS\_PIP_{ki-1}<1800$ then $ID\_PIP_{ki}= ID\_PIP_{ki-1}$;

Else $ID\_PIP_{ki}= ID\_PIP_{ki-1}+1$;

In the logs table from the database we create a column to keep the time that user spent on the page regardless of session. We select the pages for each IP ordered by timestamp of the IP we make the difference between timestams of consecutive pages. For the last page we attribute a great value for example 20,000 seconds. Now we can calculate in various ways an average time that user spent on a web page. We set a maximum time limit of 2 hours time for the visit allocated to a page visit and a minimum of 2 seconds. We eliminate records that are off limit and calculate the average time spent by an user on a page. Based on this average time we will decide if the page is part of the old session or it is the first page in a new one.

If the average time spent by users on that page is close to 30 minutes it is clear that the algorithm presented above will produce errors in identifying sessions.

3. Case Study

We used the logs database that can be free downloaded from NASA website by clicking on http://ita.ee.lbl.gov/html/contrib/NASA-HTTP.html. For the implementation we used Java programming language. We used the version Java jdk.1.6.0. It is used NetBeans IDE, version 6.9.1. We calculated how long an user could stay on a page. For this we proceeded as follows. First we selected all the distinct IDs. For each ID we selected the identifications codes for each visited pages and the timestamp. When we have found some pages accessed only one time we attribute a default value of 20000 seconds. When we have more viewed pages, we calculate the time as the difference between two consecutive timestamps and for the last page we would set the default value of 20000. After data preprocessing phase there have been obtained 47 583 for 508 separate pages and 12 805 distinct IDs.

From these 508 pages, 118 pages were visited only once or twice.

To calculate the average time spent on a page we have eliminated times greater than 19000 seconds and we grouped by the codes of pages.

In Fig. 1. we display the pages in descending order of average time spent on those pages by users. The fields displayed in Fig. 1. are cod page (COD_PAGINA), average time (MEDIE_TIMP) and the number of visits (NR_PAGINI) for the page identified by cod page. Thus for the 14 pages that the average time of visiting is more than 1500 seconds, the probability to assume wrongly a session end is very high. We will look more closely at page 207 that has the most visits and the average visitation time is 1608.80 seconds.

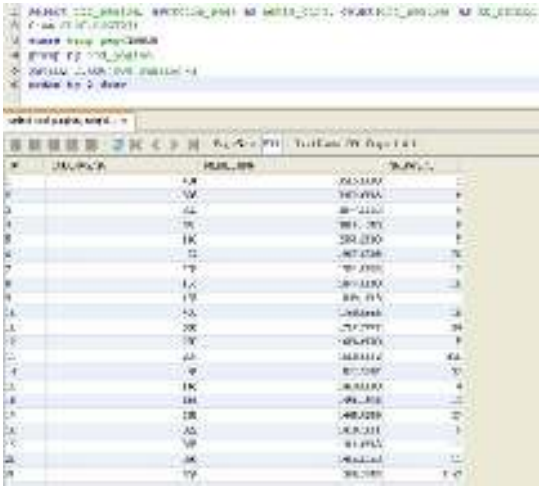

Figure 1.

From the 966 visits of page 207, 197 visits have visited time greater than 1800 seconds (Figure 2) and can lead to errors in the sessions' identification.

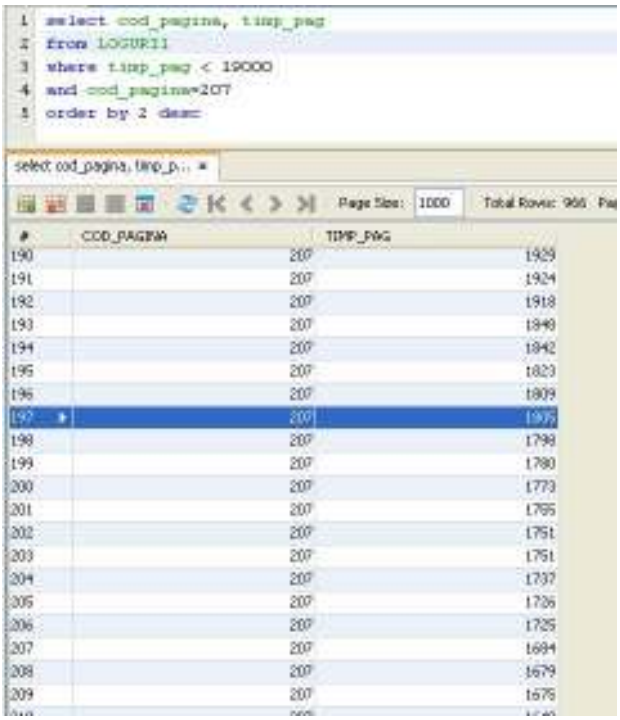

Figure 2.

Last observation justifies the proposal to replace the value of 1800 seconds (30 minutes) from the session' identification algorithm with another value that depends on the average time.

4. Conclusions

For a successful analysis of click-stream it requires the use as accurate data from web clicks. Sessions identification is an important step in data preprocessing whose poor performance may negatively influence the results. We note that the determination of the main visiting time of web pages from the websites requires, depending on the size of log files used for a certain period of time that is unprofitable to determine in real time. But calculating the mean can be offline and may be updated, depending on the level of accessing the website, daily, weekly or even less. Using a calculated time depending on average time for sessions' identification increases the accuracy of data used in the knowledge extraction

process. It remains an open problem on a different calculation method of the time based on the mean time to have maximum effect when used to identify sessions.

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Psychosocial Aspects of the Performance of Strategic Alliances: A Critical Review of the Literature - II

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Abstract: This paper presents a critical review of the strategic alliance literature, with an emphasis on the psychosocial factors involved in strategic alliances' performance. We argue that these have been neglected in favour of macro and meso-level theories, which tend to ignore performance-effects of micro-level behavioural factors. The schools of thought and methodologies that have shaped the development of the strategic alliance literature are discussed along with the key success factors that have been related to strategic alliances' performance. In conclusion, we put forth a set of recommendations for future research.

Keywords: strategic alliances; performance; management

JEL Classification: M10; M12; M21

1. En quoi une alliance réussit-elle ? Commentaire sur les FCS

Un examen des publications académiques et professionnelles sur les alliances fait apparaître une croyance selon laquelle certains facteurs peuvent favoriser la réussite et la création de valeur au sein des alliances. Ces littératures sont analysées ici dans le but de mettre en évidence des domaines insuffisamment explorés.

1.1. Forme, Périmètre, Mode d'organisation et Gouvernance

Les structures des alliances ont été identifiées comme étant un facteur clé de succès (Hennart, 2006). Elles peuvent aller de relations simples, informelles ad hoc, faisant intervenir deux entreprises, à des relations plus complexes et formalisées impliquant deux entreprises ou plus à des degrés divers d'intégration. Leur périmètre peut être limité dans le but de ne mettre en œuvre qu'une seule fonction telle que le marketing, ou elle peuvent permettre de réaliser de multiples fonctions telles que des activités de recherche et développement et de marketing. Leur mode

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d'organisation peut être horizontal - sous la forme d'une collaboration entre entreprises offrant des produits et des services complémentaires ou de remplacement - ou bien vertical - sous la forme de collaborations entre entreprises à différents stades de la chaîne de valeur - par exemple, des relations entre acheteurs et fournisseurs. La participation à une alliance soulève également certaines questions quant aux choix de la forme légale et de la gouvernance, qui peuvent aller de simples accords informels à des accords plus formels mettant en jeu soit des contrats soit des investissements participatifs, soit ces deux options, en tant que méthodes permettant de garder la maîtrise des processus ou des résultats d'une alliance. Par conséquent, bien que des alliances puissent se ressembler au sens où deux organisations ou plus collaborent pour atteindre certains objectifs, il faut relever les défis qu'impliquent la définition et la gestion de différents types d'alliances.

1.2. Motivations, Vision et Objectifs

Un deuxième facteur jouant sur la réussite d'une alliance semble découler de la variabilité des objectifs que se fixe l'alliance. Les motivations des firmes sont celles qui animent la firme elle-même - les alliances constituant alors un moyen leur permettant d'atteindre ces objectifs. Ces motivations peuvent par exemple être de devenir leader d'une industrie, une certaine vitesse de croissance, la pénétration de nouveaux segments du marché, l'acquisition d'informations ou de compétences, l'innovation, l'augmentation de la qualité, des profits ou du taux d'utilisation des capacités. Ces motivations, lorsqu'elles sont combinées à celles d'autres partenaires des alliances, auront tendance à façonner les motivations de l'alliance dans son ensemble, et peuvent être plus larges que la motivation poussant un partenaire donné à participer à l'alliance.

L'alignement des objectifs des entreprises sur ceux de l'alliance est considéré comme étant déterminant pour la réussite d'une alliance (Bamford, Gomes-Casseres, & Robinson, 2003). Il a été recommandé aux entreprises participant à des alliances de faire en sorte que les objectifs de l'alliance soient issus de ceux de l'entreprise elle-même (ASAP, 2002; Bamford et al., 2003; Hoffmann & Schlosser, 2001), que les buts stratégiques des entreprises membres d'une alliance soient compatibles (Hausler, Hohn, & Lutz, 1994; Saxton, 1997; Teichert, 1993), que les buts de l'alliance elle-même soient définis conjointement (Slowinski, Seelig, & Hull, 1996) et que les alliances aient une vision et un ensemble d'objectifs clairs et réalistes (Hoffmann & Schlosser, 2001; Kim & Lee, 2003; Whipple & Frankel, 2000).

Par conséquent, même si des firmes peuvent se fixer des objectifs clairs et convenus d'un commun accord au début du partenariat, ceux-ci peuvent souvent évoluer au cours du temps. Cela peut résulter de modifications de l'environnement

ou d'un changement de priorité des entreprises, et d'événements ou de résultats inattendus se produisant dans les alliances ou d'une divergence entre les points de vue des partenaires sur les objectifs, les stratégies ou les processus, qui peuvent se produire à tout moment. La prise en compte de ces tensions nécessite un effort particulier et constitue le principal défi à relever pour la gestion d'une alliance (Omae in Bleeke & Ernst, 1993).

1.3. L'adéquation des partenaires

Un troisième facteur influençant la réussite d'une alliance est le choix des partenaires et leur adéquation aux firmes et aux objectifs d'une alliance. Cette compatibilité est importante aux niveaux stratégique, culturel et fonctionnel (Child & Faulkner, 1998; Harrigan, 1988). Bien que l'adéquation stratégique puisse résulter d'un antécédent ou d'une motivation poussant à réaliser ou à poursuivre une alliance (Shamdasani & Sheth, 1995; Sivadas & Dwyer, 2000), les adéquations culturelle et fonctionnelle sont aussi très importantes pour les niveaux opérationnels de l'alliance.

Par adéquation stratégique, on entend le bon alignement entre les objectifs des firmes et des complémentarités des ressources et des compétences. Cet alignement et ces complémentarités sont les moteurs de la création, de l'exécution et de l'itération d'une stratégie conjointe dans des environnements évoluant sans cesse (Rich, 2003; Shamdasani & Sheth, 1995). D'autre part, dans des situations dans lesquelles les ressources sont du même type et où il y a de forts chevauchements, un partenariat peut être moins attrayant et moins efficace (Palmer, 2002) du fait de l'absence de synergies potentielles. Certains auteurs (e.g. Sivadas & Dwyer, 2000) doutent de l'intérêt d'alliances entre concurrents, car les objectifs de ces derniers peuvent être contradictoires, leurs niveaux de confiance peuvent être inférieurs et il peut y avoir un plus fort dédoublement de leurs ressources que dans le cas de firmes non concurrentes. Il est indéniable que les aspects concurrentiels augmentent la complexité des relations ; cependant, le fait que les entreprises soient en concurrence sur un certain plan ne signifie pas nécessairement qu'il n'y ait pas adéquation stratégique. En effet, la ressemblance entre leurs connaissances, leurs ressources et leurs objectifs peut constituer un motif valable et être le socle d'une adéquation stratégique. Dans l'industrie automobile, des sociétés concurrentes parviennent à collaborer pour développer et commercialiser des véhicules dans différentes régions du monde. Dans l'industrie informatique, des entreprises concurrentes s'allient pour lutter contre le piratage informatique, créer des normes techniques, combler des lacunes dans leurs gammes de produits, et éviter des acquisitions indésirables. La "coopétition", c'est-à-dire le partenariat avec des concurrents, peut parfois constituer le meilleur choix. Les entreprises qui développent les aptitudes requises pour "internaliser" certaines compétences et

connaissances, tout en se protégeant contre les transferts indésirables de connaissances et de compétences, peuvent tirer profit d'un partenariat avec des concurrents (Hamel, Doz, & Prahalad, 1989). Dans une étude portant sur 106 firmes dont 40 % s'étaient associées à des concurrents, il a été observé que celles qui optaient pour la coopétition pouvaient s'échanger relativement moins de connaissances complémentaires et qu'elles y étaient généralement réticentes. Cependant, la redondance conduit à une meilleure exploitation des informations, c'est-à-dire que les informations acquises sont plus facilement exploitables que dans les cas où il se produit un chevauchement ou une redondance moins concurrentiel (Rindfleisch & Moorman, 2001).

Pour ce qui est de l'adéquation culturelle entre partenaires, au moins trois types de cultures exercent une influence sur les organisations de partenaires d'une alliance. Il s'agit de la culture nationale (Hofstede (1980), de la culture d'entreprise (Elmuti & Kathawala, 2001) et de la culture professionnelle (Sirmon & Lane, 2004). L'impact des différences propres à ces trois types de cultures peut se révéler dans les attitudes, les hypothèses faites, les valeurs, les convictions, les philosophies et les façons de travailler (Elmuti & Kathawala, 2001; Hoffmann & Schlosser, 2001; Rai, Borah, & Ramaprasad, 1996). Un troisième niveau de compatibilité ayant été mis en évidence est l'adéquation fonctionnelle, c'est-à-dire la compatibilité entre les aspects opérationnels des entreprises associées.

On peut considérer que l'absence d'adéquation limite les chances de succès d'une alliance dans des situations dans lesquelles (a) la balance des pouvoirs de négociation penche fortement vers l'un des partenaires et ce partenaire exerce son pouvoir de façon indiscriminée, (b) le désir de concurrence entre les partenaires est de loin supérieur au désir de coopération, au point que les inconvénients d'une coopération prennent le pas sur ses avantages, (c) la distance culturelle est telle que les partenaires sont en fait incapables de collaborer, ou (d) il n'y a simplement aucune complémentarité au sein de l'alliance et celle-ci ne procure aucun bénéfice. Bien que l'absence d'adéquation soit souvent citée comme étant une cause d'échec des alliances, il est clair aussi que des firmes n'ayant rien "d'évident" en commun - par exemples des firmes en concurrence ou issues de contextes culturels différents - ont pu réussir leurs alliances. Cela a notamment été le cas, entre autres, dans les industries aérienne, automobile, informatique et électronique grand public. Par conséquent, bien que différents niveaux d'adéquation entre partenaires exposent à des défis différents, ils conduisent également à des opportunités différentes, pour autant que les dirigeants soient prêts à les explorer. Comme l'ont montré plusieurs exemples, certaines inadéquations entre partenaires sont gérables et soulignent le rôle central des perceptions, des décisions et des actions diverses entreprises par les acteurs d'alliances et influençant le développement de ces alliances.

1.4. Pratiques et processus de gestion

Un quatrième facteur ayant été identifié comme affectant le succès d'une alliance résulte du fait que les dirigeants chargés d'évaluer les opportunités, de sélectionner les partenaires, de définir et négocier les accords de partenariat, de les gérer et de déterminer le moment où ceux-ci doivent être rompus, se situent à différents niveaux de la hiérarchie des entreprises. Ces personnes ont indubitablement un fort impact sur la performance d'un partenariat et il est difficile de ne pas admettre que la plupart des variables analysées dans les recherches sur la performance des alliances peuvent d'une manière ou d'une autre être influencées par les dirigeants d'entreprises ou influencer ces derniers. Cependant, ce point de vue est vivement contesté dans la littérature. Selon les partisans des méthodes positivistes utilisées pour étudier les alliances, les dirigeants ont peu d'impact sur ce qui se produit dans les alliances. Ils soutiennent au contraire que les alliances sont façonnées par des éléments tels que leur environnement et leurs structures initiales ainsi que les ressources issues de leurs sociétés mères. De plus, ils considèrent que l'inclusion d'un niveau managérial d'analyse rend les choses trop complexes alors que nous, chercheurs, devrions à simplifier les choses en nous concentrant sur les propriétés structurelles des alliances afin d'en prédire l'évolution, et en partant de propositions vérifiables pour élaborer des théories précises pouvant être généralisées (e.g. Hennart, 2006).

Il n'est pas surprenant que ceux qui se sont intéressés au niveau managérial d'analyse ont observé que l'une des principales causes du succès et de l'échec des alliances était liée au comportement des équipes dirigeantes (Bamford & Ernst, 2002; de Rond, 2003; Doz & Hamel, 1998; Ernst & Bamford, 2005; Hamel, 1991; Hamel et al., 1989; Lawrence & ul-Haq, 1998). Ces recherches ont fourni un premier aperçu que j'analyse plus loin, mais globalement ont eu peu d'impact. Jusqu'à présent, la plupart des études s'intéressant au niveau managérial portaient sur l'observation et la prescription de "bonnes pratiques" semblant avoir un lien avec la réussite des alliances. A titre d'exemple, la présence d'une fonction d'alliance (ou d'une capacité d'alliance) dans une entreprise est vue comme un facteur pouvant favoriser la réussite des alliances (Bamford et al., 2003; Draulans, deMan, & Volberda, 2003; Kale, Dyer, & Singh, 2002). Une capacité d'alliance peut être décrite comme étant formée "d'outils, de systèmes, de personnels, et d'une structure organisationnelle qui institutionnalisent l'excellence d'une alliance et comblent les lacunes au niveau des dirigeants" (Bamford et al., 2003). Draulans et ses collègues observent qu'une capacité d'alliance, qu'ils déterminent comme étant la présence de méthodes d'évaluation de la performance des alliances (visant à accumuler des connaissances fondées sur l'expérience propre d'une firme en matière d'alliance avec ses partenaires), d'un apprentissage aux alliances (accumulation et diffusion des connaissances en matière d'alliances), et de spécialistes en alliances (archivage, intégration et diffusion des connaissances sur

les alliances), augmentait les chances de succès des organisations en matière d'alliances. Pour expliquer la performance des alliances, les auteurs privilégient avant tout l'aptitude des dirigeants à gérer les alliances plutôt que les caractéristiques de l'alliance elle-même (Draulans et al., 2003). De même, Kale (2002) note que "lorsqu'une firme investit dans une fonction d'alliance dans le but précis d'acquérir et d'appliquer le savoir-faire issu de l'expérience qu'elle a accumulée en matière d'alliances, le taux de réussite des alliances conclues par la firme croît". Ces auteurs constatent "qu'une fonction d'alliance spécialisée joue un rôle important dans la gestion des connaissances et est un véhicule permettant de partager les bonnes pratiques". Bien qu'une fonction d'alliance puisse séduire certaines organisations, il est important de reconnaître que chaque entreprise doit faire face à des besoins et à des défis qui lui sont propres (Bamford et al., 2003).

En plus de la création d'un département interne destiné à gérer les alliances, plusieurs pratiques et processus particuliers ont été relevés comme contribuant au succès des alliances. Ceux qui prédominent sont l'analyse des opportunités de collaboration (Hoffmann & Schlosser, 2001), l'évaluation soigneuse des partenaires (Rai et al., 1996), la planification des alliances, l'établissement de buts et d'objectifs précis (Elmuti & Kathawala, 2001), la mise en œuvre de mécanismes de contrôle (Child & Faulkner, 1998), la définition de droits et devoirs, la création d'un système d'information et de coordination (Child & Faulkner, 1998; Hoffmann & Schlosser, 2001), la définition d'un modèle pour la prise de décision, une communication ouverte (Bamford et al., 2003), les mesures de performance (Bamford & Ernst, 2002), des mécanismes clairs pour le règlement des litiges (Child & Faulkner, 1998), et la gestion des ressources humaines qui participent à l'alliance (Lajara, Lillo, & Sempere, 2003).

Bien que ces pratiques puissent généralement bénéficier aux alliances, il convient de prendre en compte le contexte stratégique et organisationnel de la firme (Bamford et al., 2003) et de ses alliances et de reconnaître que certaines pratiques peuvent mieux convenir à certains stades du cycle de vie de l'alliance (e.g. Hoffmann & Schlosser, 2001) ou à certains types d'alliances (Kim & Lee, 2003; Rai et al., 1996; Rich, 2003). Il est important de noter que le fait de mettre l'accent sur des facteurs managériaux "durs" tels que la planification d'alliance et les mesures de performances ne doit pas éclipser les facteurs attitudinaux "mous", qui sont plus complexes et moins étudiés et peuvent avoir des effets plus fondamentaux. L'un de ces aspects est l'engagement de ceux qui sont impliqués dans une alliance, notamment des cadres dirigeants, car on peut considérer que l'engagement d'une grande entreprise dans une alliance est influencé par celui de ses dirigeants. Sans l'engagement des cadres supérieurs, les chances de réussite d'une alliance diminuent de manière significative car elle peut ne pas être considérée comme suffisamment prioritaire et les ressources nécessaires peuvent ne pas lui être consacrées (Bamford et al., 2003; Elmuti & Kathawala, 2001; Rai et

al., 1996). Il se peut donc qu'il soit difficile de convaincre d'autres membres d'une organisation de s'intéresser à une alliance si les cadres supérieurs ne s'y engagent pas eux-mêmes. Certains soulignent que "rien n'est plus important pour le succès d'une alliance que les attitudes des cadres qui y sont impliqués" (Lajara et al., 2003). En plus de la contribution aux alliances des cadres supérieurs, qui se traduit par leur soutien et leur engagement en termes de ressources, il a aussi été reconnu que l'engagement de ceux qui se situent aux niveaux opérationnels était essentiel. La présence de leaders qui croient en l'alliance est à cet égard déterminante (Rai et al., 1996). Bien que les cadres puissent apporter leur soutien à une alliance, l'exécution de la stratégie nécessite l'engagement des acteurs directement impliqués dans la gestion de l'alliance et y contribuant. Dans cette arène, le fait d'être proactif, le réseau de contacts ou bien le capital social, et les buts personnels des dirigeants ont été identifiés comme étant des caractéristiques qui influencent la réussite d'une alliance (Delios, Inkpen, & Ross, 2004; Duysters & Lemmens, 2003; Inkpen & Ross, 2001; Nielsen, 2007; Sarkar, Echambadi, & Harrison, 2001). Les attitudes et le comportement des dirigeants d'une alliance sont donc des facteurs qui façonnent de manière importante les relations. Par conséquent, les recherches menées sur la performance des alliances auraient intérêt à aller au-delà des techniques de gestion traditionnelles pour approfondir les aspects psychosociologiques qui sont au cœur de la dynamique de la performance des alliances.

1.5. Confiance et comportement des partenaires

Une cinquième et dernière dimension des alliances, identifiée comme affectant leur réussite, est la confiance qu'ont les dirigeants en une alliance, caractéristique largement reconnue comme étant l'un des principaux piliers de la création et du bon fonctionnement d'une alliance, notamment en raison des niveaux inhérents de risque et d'incertitude et de la dépendance mutuelle des partenaires cherchant à atteindre les buts qu'ils se sont fixés (Elmuti & Kathawala, 2001; Whipple & Frankel, 2000). Deux aspects essentiels de la confiance émergent de la littérature : la fiabilité des partenaires et leur intégrité (Sivadas & Dwyer, 2000). La fiabilité est liée à la capacité de prévoir qu'un partenaire sera en mesure de passer à l'action et le fera de façon prévisible, tandis que l'intégrité implique un bon caractère, c'est-à-dire le fait qu'un partenaire respectera ses engagements et n'agira pas de manière opportuniste au détriment de son homologue.

Alors que la confiance est indispensable aux alliances, elle n'apparaît spontanément que rarement. En effet, elle a tendance à apparaître petit à petit et par des efforts particuliers de la part de chaque partenaire tout au long du développement d'une alliance (Adobor, 2005; Hoffmann & Schlosser, 2001; Parkhe, 1998). Parkhe (1998) a mis en évidence trois types d'activités génératrices de confiance dans le contexte de partenariats : la confiance basée sur les processus (résultant

d'interactions passées et futures), la confiance basée sur les caractéristiques (résultant des attributs propres à un partenaire), et la confiance institutionnelle (résultant de mécanismes formels). Un exemple d'effort de ce type conduisant à instaurer la confiance est celui d'engagements unilatéraux qui sont synonymes de loyauté et traduisent un intérêt pour la relation (Hoffmann & Schlosser, 2001). En contrepartie de ces actions, on pu constater que ceux qui attendaient de leurs homologues qu'ils collaborent étaient plus enclins à en faire de même (Adobor, 2005). Par conséquent, les partenaires disposant d'une expérience de collaboration antérieure peuvent bénéficier d'un certain niveau de confiance préexistant (Child & Faulkner, 1998). Par exemple, lorsque les firmes possèdent une expérience de partenariat antérieure avec une autre firme, elles tendent à choisir des structures non participatives, alors que cela n'est pas aussi souvent le cas lorsqu'elles ne possèdent pas d'expérience antérieure avec un partenaire (Gulati, 1995, 1998). Par conséquent, l'expérience obtenue avec un partenaire est un élément pouvant influencer la perception qu'ont les dirigeants des alliances. Pour les entreprises qui n'ont pas encore collaboré, la réputation d'une entreprise ou de ses représentants peut aussi avoir une influence sur la perception et favoriser l'instauration de la confiance.

La confiance en une alliance offre plusieurs avantages, qui ont été identifiés. Comme pour d'autres aspects psychosociologiques des alliances, ceux-ci sont en fait liés aux résultats des alliances. D'un point de vue économique, la confiance diminue les coûts de transaction et d'internalisation et est donc un mécanisme qui favorise la viabilité des alliances (Jarillo, 1993; Seppanen, Blomqvist, & Sundqvist, 2007). En effet, la confiance peut avoir un effet positif sur des questions telles que les "dilemmes du contrôle, de l'intégration et de l'apprentissage inhérents à l'organisation d'alliances" (Child & Faulkner, 1998). La confiance en l'intégrité d'un partenaire ou la croyance selon laquelle un partenaire ne se soustraira pas à ses engagements au regard des normes et des attentes comportementales, permet aux partenaires de surmonter les moments et les discussions difficiles, et d'apprendre davantage, cela favorisant l'évolution de l'alliance au fil du temps (Wakeam, 2003; Weaver & Dickson, 1998). Par ailleurs l'absence de confiance en l'intégrité ou en la fiabilité d'un partenaire peut paralyser l'alliance et conduire à la mise en place de systèmes de protection coûteux susceptibles de provoquer une augmentation des coûts de transaction et d'intégration ou de rendre plus probable l'échec de l'alliance (Adobor, 2005; Hoffmann & Schlosser, 2001).

2. Conclusions et recommandations

Comme je l'ai souligné dans cette étude, les théoriciens devraient se pencher sur d'importantes questions philosophiques relatives à l'analyse des alliances. D'une part, les investigations sur les alliances ont été dominées par les approches positivistes (c.f. Lawrence & ul-Haq, 1998; Parkhe, 1993; Stiles, 2003). Les chercheurs se sont principalement focalisés sur les motivations théoriques des firmes à former des alliances et sur l'établissement de FCS par des méthodes "détachées" ne s'intéressant pas suffisamment à des éléments psychosociologiques présents dans les micro-contextes des firmes et conférant au problème des alliances un caractère idiosyncratique. Parallèlement à cela, le nombre de signalements d'échecs d'alliances reste inquiétant et les préoccupations de ceux qui sont responsables de la *gestion des alliances* ne restent, au mieux, qu'abordées de manière partielle (Bell, den Ouden, & Ziggers, 2006). Dans le présent article, j'ai défendu l'idée selon laquelle les questions relatives aux alliances sont socialement complexes et mettent en jeu des points de vue, des normes, des contraintes et des motifs variés (Adobor, 2002; de Rond, 2003; Delios et al., 2004; Inkpen & Ross, 2001; Ring & Van De Ven, 1994). Les alliances tendent à évoluer et ne sont pas facilement prévisibles (Doz, 1996) en raison des forces qui les influencent, notamment les variations affectant leur environnement, les tensions internes, les modifications de priorités internes des firmes partenaires, des événements ou des résultats inattendus se produisant dans l'alliance, et les priorités en perpétuelle évolution de ceux qui dirigent l'alliance. Dans leur ensemble, ces facteurs font que les questions relatives aux alliances sont idiosyncratiques au lieu d'être génériques, et qu'elles sont complexes au lieu d'avoir des solutions immédiates et prédéfinies. La simplification et la mise en évidence de caractéristiques communes des diverses alliances peuvent favoriser le processus d'élaboration d'une théorie. Cependant, cette démarche, qui ne saisit pas clairement la spécificité des alliances, et l'utilisation d'approches détachées, ont conduit à des résultats pouvant être clairs et précis, mais laissant systématiquement dans l'ombre certaines caractéristiques clés des alliances (Easterby-Smith, Thorpe and Lowe, 1991 cited in Stiles, 2003). Par conséquent, bien qu'elle ait réalisé des progrès significatifs, la théorie de la performance des alliances doit encore évoluer pour tenir compte de la nature multiforme et dynamique des efforts de collaboration constatés dans le monde réel (Bell et al., 2006; de Rond, 2003; Parkhe, 1993; Yan & Zeng, 1999). Afin de prolonger les travaux existants et de remédier à leurs limitations, on peut identifier trois impératifs principaux pour les travaux de recherche futurs : (1) la nécessité pour les chercheurs de reconnaître l'hétérogénéité des alliances, (2) la nécessité d'utiliser une approche qualitative, et (3) la nécessité d'entreprendre des recherches sur les alliances au niveau d'analyse des dirigeants individuels.

2.1. Reconnaître l'hétérogénéité des alliances

L'expression "alliance stratégique" n'est qu'un terme générique qui souligne le fait que deux organisations ou plus collaborent d'une manière ou d'une autre. En réalité, les alliances sont hétérogènes et opèrent dans diverses industries ayant des différences structurelles importantes (Kobrin, 1988; Kogut & Singh, 1988; Walter, Lechner, & Kellermanns, 2008) ; leur but, leur contexte stratégique et technologique et la nature du lien établi entre les entreprises sont divers (Ring & Van De Ven, 1994). Une conséquence de cette diversité est que les parties prenantes d'une alliance peuvent avoir à relever des défis managériaux différents selon les contextes. Les chercheurs, lorsqu'ils s'intéressent aux alliances au sens large sous l'angle de la recherche, en sont en fait réduits à se limiter à des niveaux abstraits, cela diminuant l'utilité et la précision de leurs contributions (Mintzberg, 1979).

Afin d'enrichir la compréhension de la dynamique des performances d'une alliance, les recherches devraient caractériser les alliances à la fois sous les angles structurel et contextuel. Pour les aspects structurels, une typologie des alliances peut aider à mieux catégoriser l'unité d'analyse. Le chercheur serait ainsi en meilleure position pour sélectionner les alliances qu'il convient d'étudier et mettre en évidence des questions liées au contexte et des critères de performance. Si l'on prend comme exemple un partenariat de recherche et une alliance de marketing, on peut considérer qu'une métrique très pertinente pour l'une pourrait être moins pertinente ou être hors de propos pour l'autre. Bien que des métriques financières telles que les chiffres de vente puissent être essentielles dans le cas d'une alliance de marketing, elles peuvent ne pas convenir dans le cas d'un partenariat de recherche pour lequel les gains en matière de savoir et d'innovation peuvent être fondamentaux (voir par exemple Stuart, 2000). De plus, dans le cas d'alliances complexes et à facettes multiples, certaines mesures peuvent être pertinentes dans le cas d'un aspect ou d'un ensemble d'acteurs de l'alliance mais non pour d'autres.

Jusqu'à présent, la plupart des typologies d'alliances ne prenaient en compte qu'un petit nombre d'aspects des alliances (e.g. Child & Faulkner, 1998; Palmer, 2002) et, bien que celles-ci puissent être utiles dans le contexte d'initiatives de recherche particulières, elles demeurent incomplètes. Étant donné qu'une typologie réellement exhaustive des alliances peut ne pas être réalisable dans la pratique, il semble essentiel de définir les dimensions structurelles suivantes pour leur classification : (a) forme ou type de la personne morale - il peut s'agir d'un continuum allant d'un accord informel, à une relation contractuelle ou à une relation dans laquelle une participation est mise en jeu comme dans le cas des co-entreprises ; (b) périmètre - une alliance peut ne remplir qu'une seule fonction ou n'avoir qu'un seul but, par exemple le marketing, ou bien peut être complexe et présenter de multiples facettes, parmi lesquelles le marketing, la recherche, le développement et la logistique ; (c) les modalités - l'alliance peut être établie entre des partenaires

horizontaux qui peuvent par exemple proposer des produits ou des services complémentaires ou de substitution, ou entre des partenaires verticaux, comme par exemple ceux qui se situent à différents stades d'une chaîne de valeur ; (d) le nombre de partenaires - deux ou davantage ; et (e) la gouvernance - c'est-à-dire le fait de savoir si le contrôle et la gestion sont partagés ou centralisés et s'ils s'effectuent à l'intérieur ou à l'extérieur de l'alliance. Cette typologie des alliances, qui peut si nécessaire être élargie, aiderait à comparer et à faire ressortir le contraste entre les différents types d'alliances.

En plus d'une typologie de base, on peut affiner encore l'analyse afin d'y inclure des éléments contextuels. Il serait par exemple utile de se focaliser sur une industrie présentant des caractéristiques intéressantes, ou d'analyser un ensemble de questions, par exemple relatives à des alliances pour lesquelles le pouvoir de négociation ou les aspects concurrentiels sont importants. Un champ plus étroit se prêterait à l'étude de questions pertinentes *se posant au sein* des alliances. C'est ainsi par exemple que dans le secteur des technologies de l'information et des communications (TIC), on constate une vaste prolifération d'alliances ; elles tendent à être plus éphémères et leurs structures sont souvent plus informelles que dans d'autres secteurs tels que la biopharmacie, dans lesquels les relations à base de prise de participation sont plus fréquentes. Comment les dirigeants d'alliances s'adaptent-ils aux priorités sans cesse changeantes de leurs partenaires dans des industries évolutives ? Un autre dilemme auquel on se heurte est que plusieurs entreprises peuvent établir des partenariats avec d'autres firmes chez lesquelles des aspects concurrentiels ou des différences significatives de capacité de négociation sont présents. Quelles stratégies les firmes utilisent-elles pour réussir dans de tels contextes ? Si l'on reconnaît l'hétérogénéité des alliances et si on la catégorise, on pourra se concentrer sur les questions réelles que pose la gestion des alliances dans l'intérêt des praticiens et du même coup, approfondir les connaissances en matière d'alliances par une caractérisation plus poussée des divers types d'alliances et des questions liées aux alliances.

2.2. Etude qualitative des alliances

En utilisant un jeu d'hypothèses ontologiques incluant l'homogénéité et la constance des alliances ainsi que la rationalité des acteurs (de Rond, 2003), une grande partie de la littérature existante sur les alliances a adopté une posture positiviste, et s'est concentrée sur de grands échantillons, des analyses croisées et des données secondaires obtenues au niveau des firmes dans le but de trouver quels paramètres pouvaient être appliqués de façon générale (Bell et al., 2006; Hennart, 2006; Stiles, 2003). Bien que les partisans de ce type de recherches revendiquent le besoin de "rigueur" de la méthode et la possibilité de généraliser les résultats, un nombre croissant de chercheurs pensent que ces procédés sont peu satisfaisants

pour la recherche sociale (Morgan & Smircich, 1980) et que "de nombreuses questions de recherche ne peuvent trouver une réponse que dans le contexte dans lequel elles se posent" (Wooldridge, 2003). Les approches détachées ont tendance à négliger de nombreux points pertinents qui font que les organisations sont des éléments d'étude convaincants en raison des couches d'abstraction mises en jeu lors de l'observation du phénomène (Mintzberg, 1979).

Bien qu'il convienne d'établir une relation entre les décisions ontologiques et épistémologiques et le projet de recherche considéré, dans l'ensemble, l'orientation prédominante des travaux de recherche sur les alliances a conduit à des théories plus générales mais assez restreintes et laissant de côté les idiosyncrasies des efforts de collaboration (Parkhe, 1993; Stiles, 2003). Pour comprendre un phénomène organisationnel complexe tel que la dynamique de la performance d'une coopération, et élaborer une théorie robuste et pertinente, il convient de suivre une démarche plus directe et qualitative. Comme l'explique Mintzberg (1979), pour comprendre les organisations, il est plus approprié de réaliser une "recherche fondée sur la description et l'induction plutôt que sur la prescription et la déduction implicite ou explicite", de recourir à des "méthodes simples, inélégantes et non pas rigoureuses pour la collecte des données", de se concentrer sur "la mesure de nombreux éléments dans un contexte organisationnel réel s'appuyant sur l'anecdote, plutôt que d'un petit nombre de variables dans un contexte abstrait observé de loin", et de viser "la synthèse de ces éléments sous forme d'agrégats, au lieu d'analyser des paires de variables sous forme de relations continues". Les approches qualitatives sont intéressantes car elles permettent au chercheur de confronter les connaissances existantes à des exemples réels riches d'informations, et de définir de nouvelles voies d'approche conduisant à des théories améliorées et plus utiles au travers d'une découverte directe (Mintzberg, 1979).

Des exemples convaincants de recherche qualitative existent déjà dans le domaine des alliances stratégiques. Un bon exemple en est l'analyse détaillée faite par Hamel (1991) de neuf alliances pour lesquelles il a notamment pu remarquer que la stabilité et la longévité étaient des mesures inadaptées de la performance des alliances (ces mesures ont souvent été utilisées dans la littérature dans le contexte des approches détachées) et que les résultats étaient plus influencés par les processus que par les structures (la plupart des travaux réalisés dans le domaine des alliances négligeaient les processus à la faveur de considérations sur les structures). De même, de Rond (2003), qui a étudié trois alliances biopharmaceutiques, a observé le fait important que les événements et les résultats d'alliances avaient pour moteurs les aspects sociaux et au lieu d'être uniquement déterminés d'un point de vue économique basé sur la prévoyance et la planification structurée, comme cela est souvent supposé. Un troisième exemple de ce type est l'étude réalisée par Doz (1996) sur trois alliances pour lesquelles il a observé des distinctions entre des

projets d'alliance ayant réussi ou échoué. Ceux qui ont réussi étaient fortement évolutifs et mettaient en jeu un apprentissage, une réévaluation et un réajustement notables. Ce résultat contraste fortement avec les hypothèses selon lesquelles les conditions initiales déterminent les résultats des alliances (e.g. Hennart, 2006)(e.g. Hennart, 2006) (e.g. Hennart, 2006)(e.g. Hennart, 2006)(e.g. Hennart, 2006)(e.g. Hennart, 2006). Il montre également le caractère central du travail des dirigeants d'alliances, par opposition au simple recours à des mécanismes de contrôle formels, par exemple des structures de gouvernance, des clauses contractuelles et une architecture financière, auxquelles la littérature sur la performance des alliances s'est intéressée de façon disproportionnée.

Des exemples qualitatifs d'approches relevant du domaine des alliances stratégiques montrent toute leur supériorité lorsqu'il s'agit d'apprécier des questions du monde réel, leur utilité, puisque leurs résultats sont applicables plus directement, et le fait qu'elles permettent par conséquent de bousculer les idées reçues. Ce sont donc elles qui conviennent le mieux pour faire progresser notre compréhension de la performance des alliances.

2.3. Adopter un niveau d'analyse managérial

La question centrale se posant lors de l'étude des performances d'alliances stratégiques est la détermination d'un niveau et d'une unité d'analyse appropriés. Je maintiens qu'il serait utile pour certaines études futures de se focaliser sur la compréhension de la performance d'alliances au niveau des réseaux, au niveau dyadique ou selon le point de vue de l'un des partenaires. De plus, à un niveau plus profond, les études pourraient se focaliser sur les vues de chacune des parties prenantes de l'alliance. Il peut y avoir autant de vues qu'il y a de parties prenantes dans une alliance et il apparaît clairement qu'il est essentiel de déterminer un niveau et une unité d'analyse adaptés aux questions de recherche.

Dans l'ensemble, on peut considérer que l'analyse empirique des alliances stratégiques s'est faite en utilisant des données secondaires (e.g. Barkema, Shenkar, Vermeulen, & Bell, 1997) ou en se fiant au point de vue d'un répondant unique (e.g. Hoffmann & Schlosser, 2001; Walter et al., 2008) pour déterminer le niveau de performance d'une alliance. Comme on l'a montré précédemment, les limitations de ces approches considérant la performance d'une alliance comme une variable binaire soulignent combien il serait opportun d'améliorer la recherche sur les alliances. Comme les dirigeants d'alliances sont les principaux constituants de la collecte d'informations sur les performances tant du point de vue de la recherche que du point de vue de la prise de décision lors de la conception, de la mise en œuvre et de la dissolution des alliances, il est impératif d'élaborer une vue mieux informée des facteurs intervenant dans la perception qu'ont les dirigeants de la performance d'une alliance. Cela est important pour deux raisons. Il est utile de

comprendre la façon dont les acteurs individuels d'une alliance évaluent les alliances afin de garantir une mesure représentative d'un construit central de la théorie de la performance des alliances. En second lieu, une meilleure compréhension des différents points de vue que l'on peut avoir de la performance d'une alliance est essentielle pour apprécier les questions du monde réel auquel doivent répondre les dirigeants en ce qui concerne les alliances. Les partenariats nécessitent souvent une collaboration et une coordination approfondies d'une multitude d'unités organisationnelles et d'individus clés dont les priorités, les intérêts et les engagements sont susceptibles de varier et d'évoluer au cours du temps. Ces individus évaluent les alliances auxquelles ils participent et prennent leurs décisions en conséquence - celles-ci allant de décisions opérationnelles, comme l'estimation du volume de connaissances à acquérir, l'importance des efforts à investir et la façon de hiérarchiser les activités ayant trait à l'alliance, à des décisions stratégiques comme la fourniture d'un avis sur la performance de l'alliance et s'il est ou non souhaitable ou faisable de la prolonger. Nous savons qu'en général les dirigeants ne forgent pas leurs opinions concernant les alliances sur la base de métriques formelles (Bamford & Ernst, 2002; Dyer, Kale, & Singh, 2001; Inkpen & Ross, 2001). Nous croyons également que des schémas mentaux personnels et que des éléments de l'environnement des parties prenantes d'une alliance (Weick, 1995) influencent leurs avis en matière d'alliances, y compris en ce qui concerne le caractère souhaitable ou non de la poursuite ou de la rupture de la relation (Ring & Van De Ven, 1994). Cependant, ces questions d'influence en rapport avec les perceptions et des décisions des parties prenantes d'une alliance, qui ont des impacts significatifs sur l'évolution d'une alliance au cours du temps, restent mal comprises. Du fait du rôle clé que joue dans la recherche sur les alliances et la pratique des alliances la façon dont les individus les perçoivent, il serait tout à fait opportun de combler les lacunes psychosociologiques de la littérature en explorant la performance des alliances d'un point de vue managérial.

En résumé, la littérature sur la performance des alliances tend à présenter de manière déterministe les facteurs de performance des alliances, impliquant que la présence de certaines conditions ou de certains facteurs conduit généralement au succès ou à l'échec d'une alliance. Cette revue critique de la littérature élabore une perspective différente et défend l'idée selon laquelle ce sont les perceptions, les décisions et les actions menées par les acteurs d'une alliance en relation avec ces facteurs qui engendrent une certaine performance de l'alliance. Pour améliorer la robustesse et la pertinence de la littérature sur la performance des alliances, il est proposé de l'approfondir et d'y inclure des facteurs psychosociologiques qui sont présents dans les micro-contextes des firmes. Une meilleure appréciation de cet aspect central mais néanmoins négligé des efforts de collaboration, promet de favoriser le développement de méthodes adéquates pour la mesure de la performance des alliances, d'enrichir la théorie actuelle de la performance des

alliances et d'apporter une aide plus concrète aux acteurs impliqués dans la gestion des alliances.

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PESTE Analysis of the Romanian National Passenger Airline

Dan Păuna[1]

Abstract: A PESTE analysis is a view over the external environment of a company, business or an economical sector, and it plays an important part in the resource management and in a future decision making process. PESTE analysis places emphasis on the impact of each factor. At international level, different structures, from the governmental ones to well-known companies and not only, choose to analyze the important factors that disturb the good functioning of these entities. In the sector of passengers and freight air transport, the majority of airline operators have chosen to investigate the external environment in which they operate by using analytical methods. For instance, we can mention SWOT and PESTE analysis of the leading low-cost Air Asia, Malaysia's second carrier, that wishes to enter the Australian aviation market, PESTE analysis of Air Arabia - a new company in the Gulf that intends to corner the market of well-known companies such as Emirates Airlines, Gulf Air and Air China. Air Arabia, in order to implement TMQ (Total Management Qualities), has used a PESTE study. In this respect, the approach to monitor the external environment of Tarom national airline is essential in the world economic crisis and globalization activities in the passengers transport, under the conditions of deregulation of the airspace.

Keywords: PESTE analysis; Sky Team airline alliance; fear of terrorist attacks; Single European Sky; EU Emissions Trading Scheme

JEL Classification: L93; N74; O52

1. Assessment

Tarom is a well established airline in Romania, with a well set fleet, with a turnover of 191.4 million euro in 2009, it is Romania's national carrier, a member of the International Air Transport Association (IATA) since 1993 and of the Association of European Airlines (AEA) since 2000. Since the winter season 2010 - 2011, it operates in 49 destinations, covering countries in Europe, North Africa and the Middle East. Passengers have confidence in the services offered by the company and, despite higher rates, they prefer it to low-cost airlines. Tarom has managed to position itself in consumers' minds as the national airline offering flight conditions to European standards. The significant increase of its turnover in 2007 placed it, in terms of growth, in second place in Europe. Becoming a member,

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in 2010, of the Sky Team airline alliance , the second largest airline alliance in the world, composed of 898 destinations in 169 countries, has meant an opening through the placing of other 12 new destinations and promotional packages (return flights at lower prices).

2. TAROM. PESTE Analysis

2.1. PESTE analysis (Holloway, 2008) political factors

Community policies

Romania, as a state of the European Union, has implemented the Community policy on air transport liberalization[1], which covers four main areas:

- market access;
- capacity control;
- fares;
- issuing operating licenses to companies.

Tarom had to align to these areas, facilitating the company's access to the single European market in terms of granting exclusive air transport licensing recognized by states, the right of cabotage on the territory of the Member States, and in the case of unfair taxation, direct intervention of the European Commission. The alignment process had, in addition to positive effects, less desirable effects not only for Tarom but also for other Romanian airlines. The liberalization of air space has intensified competition among existing carriers in the EU states. Thus, low-cost competitors or classical companies in other countries already operate in Romania: the Austrian company Austrian Airlines and Malev Hungarian operate on Iasi airport, the German low cost airline Air Berlin operates on the airport Mihail Kogalniceanu - Constanta.

Counter-terrorism Measures

The fear of terrorist attacks does not elude Tarom. Before 1989, there was no ensuring of passengers and aircraft security during flight and brief stopovers, only two aviation companies in the world offering this service - the company EL - AL (Israel) and Tarom (Romania). In 2009, the Romanian State has signed an

[1] "Initial training in European affairs for civil servants from the central government" implemented by the European Institute of Romania in collaboration with the EUROMED - Euro Mediterranean Networks / Belgium, 2005 and Sustainable transport strategy for 2007-2013 and 2020, 2030, the Romanian Government, Ministry of Transport, 2008.

agreement with Air Marshals (representing the main security force of the Transportation Security Administration in the U.S.) for the training of undercover agents that will travel on Tarom flights between Romania and the United States, in order to prevent terrorist attacks and to intervene during these kinds of attacks.

Foreign Policy

Romania's foreign policy before and after 1989 to maintain good relations with Arab states, also exists in the air links of Tarom, that , in the 2010 summer season, operated towards destinations covering countries in North Africa and the Middle East, where, because of terrorist threats, leading companies did not operate.

As of June 25, 2010 Tarom is a full member of the SkyTeam alliance, which represents an important step in the further development of the company due to the benefits that such an alliance offers. Tarom, by joining SkyTeam alliance, strengthens its position in Central and Eastern Europe.

Government Policies to Support Airlines

The Romanian government supports the improvement of air services such as traffic control and airspace management (European Commission adopted a set of air traffic management measures aimed at creating "Single European Sky" - deadline December 31, 2004). One of the goals of EU integration aimed at this set of measures, which established objectives and operating principles, namely (Fistung, 2007):

1. establishing the joint management of airspace;
2. setting a single regulatory body of air traffic in Romania (Romatsa), integrated at European level (Eurocontrol);
3. gradual integration of civilian and military management;
4. better coordinating the human resources policy in the sector of air traffic control.

Other air services that are supported by the Romanian State are: aeronautical information, communications, the means of navigation, the integrated center to alert rescue missions, rescue missions on the airport and fire fighting services. In addition, the government supports programs for staff development and training, for aviation security and safety and provides access to rules and regulations.

2.2. PESTE Analysis, Economical Factors

Because of the acute financial crisis and plummeting consumer purchasing power, the European aviation industry has experienced the biggest loss in its financial history in 2009. In 2009, TAROM had a turnover of 191.4 million euros, and by 2011 it promised to present a strategic plan since in the first year mentioned, in the

absence of an actual trade policy and performance management, it has lost tens of millions of dollars, reaching the brink of bankruptcy and risking removal from Skyteam alliance. In this context, company management has adopted an action plan to increase revenue and reduce costs during the period 2010 - 2011, namely:

- reducing raw materials costs by 42%;
- reducing total expenses by 17%;
- reducing the company's debt by 19%;
- paying obligations to the state budget.

At the end of 2010 the measures implemented have increased the company's financial strength, characterized by the following indicators:

- overall liquidity of 4.34, compared to an average level of industrial companies in Romania of 1.2 - 1.8;
- financial security of 4.19, well above the average of firms in the Romanian industry that is about 1.

2010 was a difficult start because of unstable economic situation, consisting of rising oil prices compared to 2009, exchange rate fluctuations, the increase in VAT. Nevertheless, TAROM managed in the last months of 2010 to regain market share, which currently (2011) exceeds 20%, which is reflected in the growth in passenger number and revenue over the same period of 2009, while many of the operating expenses continued to decline (an important exception is the fuel cost, which showed fluctuations due to the changing world market price of a barrel of oil and kerosene, as shown in Figure 1.)

Figure 1. Fluctuations of oil and kerosene barrel cost in period 2006 - 2010

Source: www.iata.org/economics, Brian Pearce, Outlook for airline markets and financial performance, March 2010

The company's management team decided to design the budget in 2010 based on increasing the number of passengers, the aircraft freight over 56 percent, on the visible increase of market share by the end of the year.

Joining SkyTeam was an important step in the further development of the company, because passengers will benefit from the advantages offered by such an alliance, namely:

- access to a global network made up of more than 898 destinations in 169 countries;
- convenient connections to international airports where the foundations of the alliance lie;
- the opportunity to gain and use Flying Blue miles[1], by flying any airline which is a SkyTeam member.

2.3. PESTE Analysis, Social Factors

Social factors relate to cultural issues, public health, birth and mortality rates, age distribution, changes in buyer preferences, purchasing patterns and attitudes of employees towards work.

Population Migration, Birth and Mortality Rates.

According to the 2002 census, Romania has a population of 21,680,974 inhabitants; it is expected that in the coming years the population number will slowly decline due to negative natural growth. Access to the free movement of people after the entry into the European Union has allowed the latent emigration to manifest itself. As a result, external migration balance increased immediately after 2007 and, due to a negative natural increase, Romania's population gradually decreases.

The size of external migration is perhaps the most expressive manifestation of the stressing daily life which manifests itself by: lack of jobs, violence and deprivations of all sorts that have burdened the lives of people in these early years of crisis. Whether it is final migration or migration for work abroad, it became a widespread phenomenon in recent years also due to the feature of age and sex selectivity, which has negative influences on the demographic phenomenon on

[1] Flying Blue loyalty program belongs to Air France and KLM. It offers the advantage of accumulating and using miles on any SkyTeam flights and other partners (more than 30 airlines), and by using the services of over 100 partners from other areas. Miles obtained by members of Flying Blue Award are valid for lifetime, provided that the person uses a SkyTeam flight at least once every 20 months. Flying Blue loyalty program rewards its members with a variety of prizes: tickets, promotion in a higher class of travel, free excess baggage, services provided by partners or award tickets for trips around the world.

medium and long term. From this point of view, air travel is a necessity, the flow of Romanian citizens who choose this way of transport increases around the holidays, or holiday season, Tarom and other companies supplementing especially airline flights that make the connection with Italy and Spain.

Customers' Attitude and Opinions

Romanians support local air transport services and they have optimistic views on their quality in he future. Tarom brand is trusted by consumers; in 2009 it was voted "the most trusted brand" in the airline category, according to the hierarchy conducted by Reader's Digest Romania and image studies conducted by IMRCG Consulting. However, there is a low level of cynicism, especially among younger consumers. The behavior of air transport services consumer fits within the western culture model, people being focused on the quality and attributes of products and services. Still, air transport market is not homogeneous in terms of attitudes and preferences.

The Impact of Advertising

Airline passengers only have a ticket and the promise that they and their luggage will arrive at the destination safely and at the set time. To reduce uncertainty, buyers look for "signs" on the quality of these services, drawing conclusions in this direction from the tangible elements. (O'Connell, Williams, 2005) Therefore, the task of the service provider is to ensure the tangibility of the service and to promote the company image on the market.

Backed by tradition and characterized by professionalism, Tarom brand, like any other that has experience and history, is likely to fall under the conservatism of perception, thus defending the need to contradict the perception and to prove that things are different than they appear. The validity of this requirement revealed the need for transparency, communication, and why not, of something "new". The radio and TV campaign was based on qualitative and quantitative research studies on Tarom brand image among consumers in Romania; these studies have revealed the following strengths, weaknesses and opportunities:

- Tarom brand already has a foundation, being a leader in the minds of Romanians in important attributes such as tradition, trust, flights at convenient times, familiar image;

- Tarom is part of the values Romanians are proud of, but it is perceived as an old brand

The ad campaign was based on these perceptions and it aimed to refresh an outdated image and to build on authentic values, aligning Tarom to the attributes of modernity.

Tarom slogan in this communication campaign has been "The flight shapes us, but the destination defines us," which was a plea for real life experiences as the sum of all destinations and having as objective to give value to consumers' lives by offering new experiences.

Employees' Attitude to Work

The economic crisis may lead Romanians to reassess the perception on their jobs and to better understand the terms "efficiency" and "competition".

Romania's difficult economic situation has demonstrated that ordinary people know how to keep their job in times of trouble, even those who used to guide themselves by the "principle" of the communist era "time passes, salary is received" are striving to be useful so as not to be affected by the cut of staff costs.

In the context of crisis and rising unemployment, more and more employees are forced to work overtime without getting paid for it, the motivation being to keep their jobs.

Tightening conditions on the labor market and mass layoffs have generated strong competition among employees. On the other hand, employers can afford a more careful selection of staff, reducing staff salary and increasing requirements.

In Romania, there is no coherent model of the worker with whom we can identify ourselves and be proud of, and which could be perceived as an ideal (such as the perception on the German work model or on the accuracy of Swiss watches), we don't have a clear identity ... we do not know exactly what we want, we do not know what we will be like in 30 years, we do not know what we want to be in 30 years. It would be better for the Romanians to begin to think more rigorously to their identity because, ultimately, you are what you want to become. This enables us to manage during short periods of time and not have some form of continuity. We do not have continuity, but small adjusting jumps.[1]

Business Culture, Practices And Relationships

Tarom has an organizational culture based on equality, an important aspect of which being the direct and open way to address problems. In this context, a defining feature of this culture is respecting new ideas, encouraging discussion and debate. The business culture of the company addresses collaboration and, therefore, managers and subordinates express their views and choices before the final decision is reached. They negotiate major issues in an open and direct manner. Punctuality is the main strength of the company.

[1] Pleşu A., Extracted from the dialogue "La masa Adevărului/At the table of truth", published in August 2009, in Adevarul newspaper.

Management Style, Organizational and Hierarchical Structure

Mutual trust between management and staff team is important. The company management has the following attributes: open mind, clear goals, reasonable expectations, appropriate payment for work, appreciating knowledge and skills. The responsibility to make decisions is not always the job of senior managers, employees at an intermediate level often having considerable authority in the company.

2.4. PESTE Analysis, Technological Factors

Information and Communication Technology

Since February 2006 the national Romanian air transport company TAROM SA, uses a computerized sales and revenue accounting system (Revenue Passenger System), implemented by IBM.

The system is based on an application developed by the company Mercator (an Emirates Group division specialized in information technology applications specific to airlines, with projects implemented in more than 30 airlines in the world). Using this system, Tarom processes data regarding the revenues obtained from passenger transport.

IBM has integrated RAPID application in a project that contains records of supplies of IBM pSeries hardware, basic software and support services for implementing the application in accordance with Tarom distinctive features.

The project lasted a year and the cost reached $2.000.000, this application allowing Tarom to join the club of modern airlines, by simplifying the revenue and sales accounting. This application proves the willingness of the company to use the newest technology in the passenger transport.

Internet Users

Company customers can make reservations for Tarom flights, 24 hours a day, using any Internet connection. The reservation must be made at least 24 hours before the flight and no sooner than 10 months. Reservations with offline payments are made at least 72 hours before the flight and no sooner than 10 months before the flight. For all bookings, the service price is 8 euros, regardless of route, type of passenger, booking class or method of payment (there is no service charge for children). If payment is made on-line, the information (price + taxes) is transmitted via the Amadeus application by an external secure processor, which performs the authentication / authorization of transactions (including through 3D Secure for VISA and Mastercard) and processes payment.

Using New Innovations in Aeronautics

The main priority in the last 55 years has been the developing and the equipping of the fleet with the most advanced and modern types of available aircraft.

In November 2008, Tarom acquired the newest type of commercial aircraft in Romania - Boeing B737- 800 series, the first of the three new aircraft of this type that will be part of the Tarom fleet.

Series 800 is the most popular Boeing 737 Next-Generation - NG. Planes belonging to this series are the best-selling jet aircraft of all time, everywhere in the world, recording over 8,000 orders since the beginning of production.

Tarom operates New Generation series since 2001, when the first Boeing B737 700 series was introduced and now the Tarom fleet has four Boeing B737 700 series.

The 800 series is a longer version of the Boeing B737 700 series with more powerful engines, with a six-meter longer fuselage, which increases the capacity of the plane from 123 seats to 186 seats, depending on cabin configuration.

2.5. PESTE Analysis, Environmental Factors

Environment, Atmosphere, Air Quality, Greenhouse Gases

The phrase used by the company "We think green to keep the sky blue! ″ aims to demonstrate that air traffic growth is possible within the limits imposed by the environmental protection measures, that is all emissions produced by TAROM flights should be counterbalanced by various measures including the offset ones.[1] To reach these goals, TAROM implements a responsible policy on burnt fuel efficiency by trying to meet the requirements for managing carbon emissions under the EU Emissions Trading Scheme, EU ETS (in aviation, a tonne less of used fuel leads to a reduction in carbon dioxide emissions equivalent to 3.5 tonnes; a reduction in the duration of a flight by 29 minutes can lead, in only one year, to savings of over 25 million kg of fuel and to the decrease by more than 81 million kg of carbon dioxide emissions).

[1] Offset operations. Carbon offset is a reduction in carbon dioxide gas emissions or greenhouse gas emissions in order to counterbalance other emissions. Compensation is usually achieved through financial support, through projects that reduce emissions of greenhouse gases in the short or long term. The most popular type for this type of project is renewable energy such as wind farms, biomass energy, hydroelectric dams or other projects including energy efficiency, destruction of industrial pollutants and agricultural products, the destruction of landfills that emit methane.

"Continuous Descent Approach" Procedure

The company is among the first airlines worldwide to have implemented the pilot-project "**Continuous Descent Approach "(CDA)**: a completely new landing procedure, aimed at reducing the amount of burnt fuel. CDA replaces the traditional landing gears, reducing both the glide path emissions and the noise (aircraft noise). The pilot-phase of this project involved the Airbus A318 aircraft of the company.

The analysis of the results of the project being conducted in collaboration with AIRBUS and Research Center for Aviation and Environment (CATE), based in Manchester (UK) shows a reduction of emissions of up to 350 kg of CO2 per flight. Currently, the Tarom team works to optimize landing trajectory in CDA and to achieve a higher reduction in oil consumption and CO2 emissions.

"Single Engine Taxi" Procedure

The company is also about to finalize the implementation of the **'Single Engine Taxi** ", through which, after landing, a plane can use one engine to park, in order to reduce the fuel consumption during this procedure.

This procedure is already used by Airbus A318 and ATR aircraft, and for the BOEING aircraft the implementation is still in process.

This procedure reduces harmful aircraft emissions by 0,4% during one hour of flying.

The Winglet System

Since September 2009 Tarom equipped the Boeing 737 700 series with the Winglet system[1] thus reducing the aircraft fuel consumption and harmful emissions by up to 3%, and reducing noise by up to 6.5%.

The advantages of the Winglet system are the following:

- it increases cruising speed while reducing, at the same time, fuel consumption;
- it increases the maximum flight distance of the aircraft, enabling the operation to new destinations in more distant places;
- it reduces operating costs on existing routes by 3-4% depending on the destination;
- it reduces the intensity of swirls created at the end of the aircraft wings during the flight, optimizing them in terms of aerodynamics;

[1] The Winglet system is a device that is attached at the end of the wing, reducing drag and improving the performance of the aircraft. The Winglet-type devices have been a huge success, due to the unprecedented benefits they have brought to the airlines at a scale never met before in the history of aviation industry.

- it improves takeoff and landing, which allows pilots to use take-off procedures which reduce engine wear and thus their maintenance costs;
- it reduces the negative impact of the aircraft on the environment.

3. Conclusion

Tarom benefits by important opportunities on the passenger air transport market in Romania and not only, because it has important political, economical, technological and environmental features. The existing technological opportunities will allow Tarom to carry out profitable business, to extend control and to direct flight control systems, to decrease the likelihood of technical problems. However, there are social factors which could represent a problem for the company. The analysis shows that Tarom has more strengths than weaknesses. According to PESTE analysis one can say that there are more opportunities than threats. Taking into account these aspects, the company can review its economical and marketing policy regarding access on new markets. It should reconsider the access on the USA and the Far East markets by introducing long haul flights. There is no place in the world without business risks and the company can take these risks. On the whole, the expansion on other markets is a good idea, and the company needs to reconsider the access on the USA and the Far East markets by introducing long haul flights.

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Financial Institutions and Services

Comparative Analysis on Romanian Taxation in the European Context, as a Prerequisite for Tax Harmonization

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Abstract: The issue of tax harmonization at EU level is becoming more present in the global crisis context, as it is both accepted and disputed by the European officials that manifest their preference for coordination or tax competition. The crisis has generated, among other things, large budget deficits and a dangerous crisis of debts in the euro area, a situation that has attracted many followers in terms of tax harmonization. There is a European regulated Area, a unique European market, European unique currency and common monetary policy which regards the criteria relating to public finances (budget deficits, public debt). We ask ourselves to what extent is it necessary to achieve coordination or even tax unification and how does that help. This paper examines, according to the statistical database, the level and type of taxation, on categories of taxes and as a share of GDP, in Romania compared to EU countries, in order to clarify the current situation, the existing differences, the prospect of good European practice. If we speak of tax harmonization in terms of being acquired by Romania, the conclusion is that we cannot report only to the technical or quantifiable aspects, as compared with the best results in European area, because they do not represent a guarantee of similar results. The fiscal policy must be both a prerequisite and a consequence of sustainable economic and financial policies, and the tax harmonization can only help insofar as it relates to the relations between states and not at tax level.

Keywords: European tax harmonization; public policy; tax revenue as a share of GDP; GDP; EU

JEL Classification: G20; G21; G 29

1. Introduction

This paper examines, based on statistical data, the evolution of taxation in Romania, the level and type of taxation, on taxes' categories and as a share of GDP, compared with EU countries in order to clarify the current situation, the existing differences, directions and steps that could be taken for tax harmonization

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or the need of good practice takeover. The analyzed statistical data are taken from sources that provide a unified statistical framework – ESA95 harmonised system of national and regional accounts so that it enables the comparative analysis of some heterogeneous tax systems.[1] If we follow the distribution of the total tax burden in the EU in 2009, we state that Romania is the group of countries with the lowest taxes, that is less than 30% of GDP to the EU average 38.4% (compared with U.S. - 24% or Japan with 28.1% in same period). However, Romania is unable to raise its finance, that is to boost the economy and improve the living standards and the solutions on this matter should focus not on increasing taxation, so unbearable as reduced as it appears from the European perspective, but increasing the degree of discipline in the field, in order to improve collecting degree and reduce tax evasion, reducing bureaucracy and efficient administration, clearer legislation and without interpretations, close correlation with the economic and financial policy. On the other hand, there are European countries that have a very high tax - between 45 and 50% in Denmark and Sweden, for example, but the economy is strong, the standard of living is particularly high, the crises are less and the measures to prevent and counteract of their effects are more efficient.

The tax harmonization involves interpretations in relation to other concepts, for example the cooperation and tax coordination, but the details can make a difference, depending on the area to which they relate. The same problem occurs in all the unions that are being created, being generally valid the statement according to which “Harmonisation does not mean total equalization and egalitarianism (like in socialism). The nations shall keep their particularities in culture and tax culture.” (Petersen, et al., January 2010)

2. EU Positions in the Field of Tax Harmonization

The founding Treaties and the subsequent ones of the European Economic Community review decide on issues concerning the harmonization of legislation in European area on "the way in which it can be harmonized in the interest of the common market the internal right of different Member States relating to turnover taxes, excise duties and other indirect taxes" (The Establishment Treaty of the European Economic Community, 1957) or "the harmonization of legislation concerning the turnover taxes, excise duties and other indirect taxes, to the extent that such harmonization is necessary to ensure the establishment and functioning of the internal market in the established time." (The Treaty on European Union, 1992) and “the adoption of provisions for the harmonization of legislation concerning turnover taxes, excise duties and other indirect taxes, to the extent that such harmonization is necessary to ensure the establishment and functioning of the

[1] http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/publication?p_product_code=KS-DU-11-

internal market and to avoid distortion of competition." (Consolidated version of the Treaty on European Union and the Treaty on European Union, 2010)[1] Based on these facts, we can see that when it comes to tax harmonization, it is aimed mainly at indirect taxes in terms of fair competition, as the price of products that are traded on the common market include VAT and excise duties. In the field of direct taxation, a relative harmonization regarded the tax on turnover tax and corporate taxation in a country, where there is an economic and financial relationship with other Member States, so there are also concerns on the interests of other states, such as the cases of mergers, divisions, transfers of assets or subsidiarity relation and mother-society or a common system of taxation applicable to payment of interest and dividends between affiliated companies belonging to different Member States.

Tax harmonization, as shown in the European documents, consists of the coordination of Member States' tax systems in order to avoid uneven and competitive changes in national fiscal policies, which could undermine the internal market.[2]

The fiscal Maastricht limits provide an additional safety belt. The Maastricht limits on deficits and debt aim largely at safeguarding monetary policy credibility and, as yet, its Member countries have not planned a macroeconomic stabilisation role at the Community level. (Hoeller, Louppe, & Vergriete, 1996)
Tax harmonization can be interpreted as an instrument to reach the objective of a well-performing single market or a fundamental key towards European political union.[3]

The taxation domain remained largely within the decision of Member States. On several occasions, the European Commission reiterated its conviction that a full harmonization of tax systems of Member States is not necessary, as long as they comply with the EU legislation, being sufficient only a better coordination of national policies in this regard.[4]

At the same time, the fiscal policy should favor a greater cooperation between tax administrations, in terms of control and fight against fraud. Thus, in taxation context, the community legislation desires to be a tool for combating tax evasion and to avoid imposing over the Member States' borders of, in terms of a strong administration, properly equipped.

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[1] http://eur-lex.europa.eu/ro/treaties/index.htm#founding
[2]http://ec.europa.eu/romania/documents/eu_romania/tema_30.pdf;
http://ec.europa.eu/taxation_customs/index_en.htm.
[3] Francisco J Delgado, Maria Jose Presno, Convergence of fiscal pressure in the EU – a time series approach,
http://uniovi.academia.edu/FranciscoJDelgado/Papers/92965/Convergence_of_the_fiscal_pressure_in_the_European_Union_a_time_series_approach.
[4] COM(2006)823 (pdf 61 Kb)

The *community acquis* on taxation area aimed at indirect taxes primarily, focusing on value added tax and excise duties regimes. Adopting the unique currency in 17 of the Member States requires the establishment of some common shares for VAT and common rules for business taxation.

If the initial decision was that the fiscal and budgetary policies should be established at national level, however recently, the European officials said that the decision to create the euro area, of not to integrate the finance in a European framework, it can be modified (in December 2010).[1] The harmonization of imposing bases for corporate income tax is an initiative developed by the special communication of the European Commission in 2001[2], the idea was resumed from the point of creating a common basis for taxation of profits on the financial crisis background. Major European countries desire the tax corporate profits unique in the European Union, namely the creation of a common tax profit. The European Commission wants its implementation in order to reduce or eliminate the investors' difficulties that should take into account 27 different tax systems. Germany and France already have committed to better coordinate its policies on tax and labor market, in order to support the euro area convergence and anticipations go onto this direction. It is proposed a leveling or alignment both of tax base and tax share, in which case the tax will not be a criterion for investment decisions in one country or another. The changes would be favorable for multinational companies, eliminating the double taxation of profits and creating the possibility of tax consolidation for companies groups.

The political will for the purposes of strengthening the fiscal framework of the European Union is a strong signal in supporting the fiscal sustainability in the euro area and the events that precipitate in this area, the approaches that target common measures, are powerful signals throughout the entire EU space, in anticipation of future mutations in the fiscal-budget field.

During 2010, the European Council decided to strengthen the coordination of reform and fiscal- budgetary policies in the Member States so that the future economic policy decisions at EU level are consistent and integrated.[3]

But still, at the national level, the fiscal and budgetary strategy, on 2011-2013 period, of the Ministry of Public Finance of Romania's Government stated that, it continued to improve the legislation by harmonizing it with the Community law by national legislation transposing of the Directives adopted at EU level in VAT and excise duties domain.[4] Relatively to direct taxes, it was mentioned the idea of

[1] http://www.efin.ro/stiri_financiare/international

[2] *Towards an Internal Market without tax obstacles. A strategy for providing companies with a consolidated corporate tax base for their EU-wide activities*, Communication from the Commission, 23.10.2001.

[3] http://ec.europa.eu/europe2020/pdf/nrp/cp_romania_ro.pdf

[4] http://discutii.mfinante.ro/static/10/Mfp/strategbug/STRATEGIA_FB_27sept.pdf, pg. 31, 32.

maintaining, on medium term, the unique share of 16% and of social contributions' shares. On the other hand though, it is estimated that " the recession is proving to be slow, because the fiscal space is small to boost the economy ", which can only infer that tax, as currently conceived in Romania, is unable to provide a boost to the economy and the role of financial leverage is less visible and effective. Thus there should be considered the causes and what can be done in the fiscal policy domain, so as to achieve the desired economic boost. In this respect, the EU experience and best practice can be a landmark worthy of consideration.

3. Coordinates of the Current Taxation System in Romania in the European Context

Regarding the indirect taxes, the standard rate of VAT in Romania is of 24% from 1 July 2010, there were taken measures to rise it before this date; it was 19%,[1] a rate of 9% applies to certain supplies of goods and services provided by the Tax Code and since 2009, a rate of 5% applies for social housing. With the same date it was also extended the tax base. It remains however a number of exemptions from paying the VAT. The government declares the intent for the period 2011-2013, to promote a fiscal policy that would provide sustainability to the economic growing process by maintaining the current reduced VAT shares.[2]

Increases were applied periodically and the excise duties, mainly for fuel, cigarettes, coffee etc.

Most important aspects aimed at direct taxation, namely taxation of individuals' income and of companies' profit in Romania, coming from the unique share, set at 16%. Of the 27 European Union countries, the individual income is subject to progressive taxation in 25 countries and the base on unique share is practiced only in seven countries, namely: Lithuania (33% by 2006, reduced to 15 % currently), Estonia (26% by 2006, reduced to 21% currently) Latvia (25%, increased to 26% in 2010), Slovakia (unique share from 2004, 19%) and Romania, 16 % of 2005, unique share starting with 2008, Bulgaria (10%) and Czech Republic (15%).

Taxing the physical entities relates to a unique share of taxation system which, since 2005, replaced the previous system of progressive quota with four levels of taxation ranging from 18% to 40%. This quota generally applies to income from independent activities, royalties, income from movable and immovable assets, income from sale of listed shares, interest income from bank deposits. On the other hand, as series of income is deductible or exempt from tax on wages. The nature performance is taxed normally as meal tickets that were exempt from tax until July

[1] GEO no. 58/2010 for amending and supplementing Law no. 571/2003 regarding the Fiscal Code and other tax financial measures, published in Official Monitor no. 431/2010.
[2] http://discutii.mfinante.ro/static/10/Mfp/strategbug/STRATEGIA_FB_27sept.pdf,

1, 2010. The pension income is taxed but only when it exceeds a certain threshold value, it is adjusted from time to time (currently, this threshold is 1,000 lei, a bit over 230 euros).

The corporate income taxation in Romania follows the classic system: the profit is taxed at the corporate's level and the profit, distributed as dividends, is taxed at the level of company and at individual shareholders. The standard rate is 16%, lower, when before 2005 it was 25%. The dividends received from other Romanian companies are exempt from taxation. From May 1, 2009 it was introduced a minimum tax for companies between 2200 and 43 000 Ron based on gross income. The costs incurred for carrying out activities are generally deductible, but the fuel costs for companies' means of transport are not deductible under certain conditions, provided explicitly by the current legislation. For activities such as gambling, nightclubs or casinos there is a minimum of 5% tax on the turnover. The microenterprises pay the same tax as other companies. As of October 1, 2010 the minimum tax was eliminated and it is applied the 16% rate on corporates' profit. The legal entities, whose turnover is the equivalent of up to 100,000 euros for the previous year and have up to 9 employees, have the choice, since 2011, between paying a tax of 16% and pay a 3% income tax from the turnover. The microenterprises will not be able to choose, the ones that derive income from banking, insurance, gambling, management and consulting activities.

Regarding the tax on wealth, it is clear that real estate properties are subject to local taxes on housing. The fee ranges from 0.1% for individuals and between 0.25% and 1.5% for companies to 5% and 10% in certain situations. Earth, both built and unincorporated, is subject to all local taxes. Local taxes have increased by about 20% in 2010.

The social contributions were at a higher level, being subject to numerous proposals for reduction, in combination with increasing the minimum wage as a factor to stimulate consumption. In fact, maintaining the existing rates is supported by the politicians in power for 2012 as well. Social insurance contributions are paid both by the employer and employee and increased in 2009 by 1.5%. From February 1, 2009, the employees with normal working conditions pay for social contributions monthly 10.5% of income. Employers contribute at a rate of 20.8%. Higher taxes for employers of up to 30.8%, can be applied to special conditions of employment. Also, other categories of insured persons are transferred between 31.3% and 41.3% Social Security Contributions. In addition, both employees and employers contribute to health insurance fund and unemployment fund. All social contributions are deductible for establishing income tax. Employers have other contributions, such as accidents at work and occupational diseases (between 0.15% and 0.85% of monthly gross income for 2009-2011) to leave and health insurance benefits (0.85%), contributions to the Guarantee Fund for payment of wage claims

(0.25%). An evolution of the main mandatory social contributions is in the following table:

Table 1. The evolution of social security contributions rates in Romania

% Of payroll

The main mandatory social contributions	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009 - 2011**
CAS – social security contributions	**35,0**	**35,0**	**34,5**	**31,5**	**31,5**	**29,3**	**29,0**	**28,9**	**31,3**
- The employer (normal working conditions)	23,3	23,3	25,0	22,0	22,0	19,8	19,5	19,4	20,8
- Employee	11,7	11,7	9,5	9,5	9,5	9,5	9,5	9,5	10,5
Unemployment	**6,0**	**6,0**	**4,5**	**4,0**	**4,0**	**3,5**	**3,0**	**1,5**	**1,0**
- Employer	5,0	5,0	3,5	3,0	3,0	2,5	2,0	1,0	0,5
- Employee	1,0	1,0	1,0	1,0	1,0	1,0	1,0	0,5	0,5
CASS – health insurance contribution	**14,0**	**14,0**	**13,5**	**13,5**	**13,5**	**13,5**	**12,5**	**11,5**	**10,7**
- Employer	7,0	7,0	7,0	7,0	7,0	7,0	6,0	5,5	5,2
- Employee	7,0	7,0	6,5	6,5	6,5	6,5	6,5	6,0	5,5
Total	**55,0**	**55,0**	**52,5**	**49,0**	**49,0**	**46,3**	**44,5**	**41,8**	**43,0**
- Employer	35,3	35,3	35,5	32,0	32,0	29,3	27,5	25,8	26,5
- Employee	19,7	19,7	17,0	17,0	17,0	17,0	17,0	16,0	16,5

Through out the time, there is a strong downward tendency between 2001-2009, with a slight increase from 2008 in 2009-2011, both for employers and employees, but their share in GDP is increased in relation to employees and authorized physical entities (Table 2).

The European Commission published online the report "Taxation trends in the European Union - 2011 Edition", under which the tax revenues in Romania are as follows[1]:

[1]http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_structures/2011/report_2011_en.pdf.

Table 2. The evolution of tax revenues in Romania, in the structure -% of GDP

Romania	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indirect taxes	12,2	11,3	11,6	12,3	11,7	12,9	12,8	12,6	12,0	11,0
VAT	6,5	6,2	7,1	7,2	6,7	8,1	7,9	8,1	7,9	6,7
Excise duties and consumption taxes	3,0	2,8	2,6	3,5	3,6	3,3	3,2	3,0	2,7	3,2
Other taxes on products (incl. import duties)	2,2	1,6	1,3	1,0	1,0	1,0	1,2	0,7	0,6	0,4
Other taxes on production	0,5	0,6	0,6	0,6	0,5	0,5	0,6	0,8	0,8	0,7
Direct taxes	7,0	6,4	5,8	6,0	6,4	5,3	6,0	6,7	6,7	6,5
Personal income	3,5	3,3	2,7	2,8	2,9	2,3	2,8	3,3	3,4	3,5
Corporate income	3,0	2,5	2,6	2,8	3,2	2,7	2,8	3,1	3,0	2,6
Other	0,6	0,5	0,4	0,3	0,3	0,3	0,3	0,4	0,3	0,4
Social contributions	11,1	10,9	10,7	9,4	9,1	9,6	9,7	9,7	9,3	9,4
Employers´	8,1	7,1	6,5	6,2	5,9	6,4	6,3	6,2	6,0	6,0
Employees´	3,0	3,8	4,2	3,1	3,0	3,0	3,3	3,3	3,2	3,3
Self- and non-employed	0,0	0,0	0,1	0,2	0,2	0,2	0,1	0,2	0,1	0,2
Total	**30,2**	**28,6**	**28,1**	**27,7**	**27,2**	**27,8**	**28,5**	**29,0**	**28,0**	**27,0**
Seasonally adjusted data	32,6	30,1	29,2	28,4	26,8	27,3	27,0	26,7	24,5	26,5
Real GDP growth (annual rate)	**2,4**	**5,7**	**5,1**	**5,2**	**8,5**	**4,2**	**7,9**	**6,3**	**7,3**	**-7,1**

Tabel 3. Evolution of tax revenues on administration levels - % of total tax revenue

Central government	59,5	59,7	60,1	62,8	63,4	63,0	63,0	62,2	62,9	61
Local government	3,9	3,8	3,1	3,5	3,4	3,1	3,4	4,0	3,2	3,5
Social security funds	36,6	36,5	36,8	33,7	33,2	33,9	33,6	33,0	32,9	34,6
EU institutions	-	-	-	-	-	-	-	0,9	0,9	0,8

According to table 2, the Report of fiscal revenues in gross domestic product (GDP) of Romania was 27% in 2009, almost nine percentage points lower than the average of the 27 European Union countries. Evolving over the last 10 years, larger oscillations are found in the years 1999, 2000, with 30-31% share, in 2001 so far has maintained a relatively similar share, between 27-28% and 29% only in 2007, even if there were, in time, important changes in the tax system referring to tax basis, the level of rates or the way of establishing them - progressive or unique rate, further increases in indirect taxes, mainly VAT and excise duties etc. Large developments of GDP, as annual rate (Table 2) emphasize this effect, and the increase of taxes can be considered one of the causes of GDP reduction. This situation is reflected in the structure of tax revenues as a percentage of GDP, so that indirect taxes were constant between 11 and 12%, the European average is between 13 and 14%, so quite a small difference. In comparison, **direct taxes** have a contribution of 7% in 2000 and only 5.3% in 2005, when it was introduced the unique rate, up to 6.5% in 2009. EU 27 Average indicates a share of direct tax of

GDP of 11.5% in 2004 and 2009, to 12.3 and 12.4% in 2008 and 2007, almost double comparing to Romania. (Chart 1.)

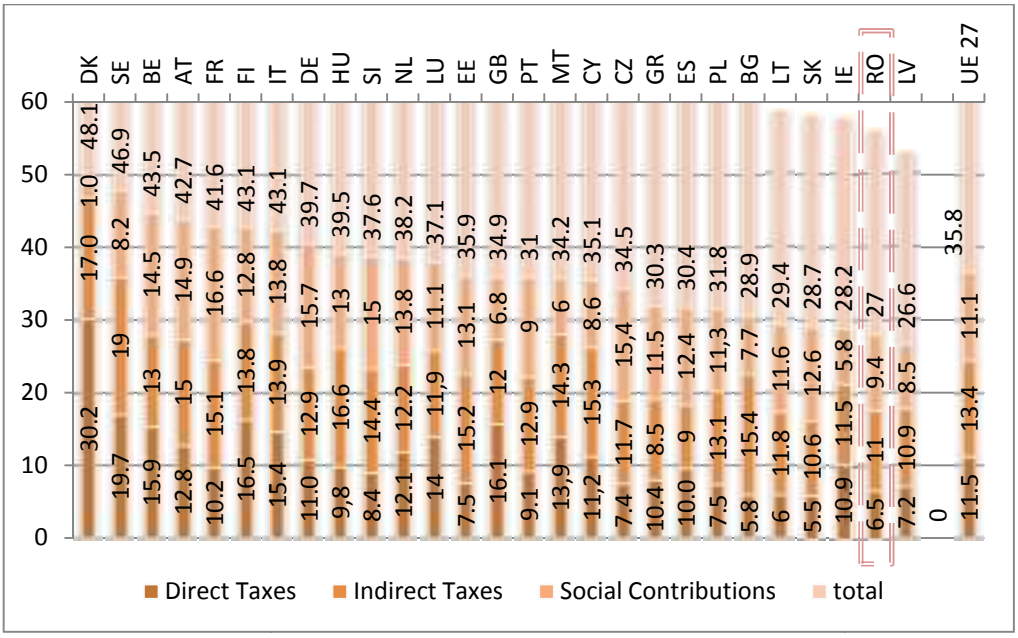

Chart 1 – Statement of tax revenues, in structure, in EU countries - 2009 -% of GDP[1]

It is interesting to observe the position of Romania in the EU area, as being one of the top states with the highest recorded results; we find the following[2]:

- Total Taxes as % of GDP - Romania ranks 26 - so very little share compared to other European countries, the next position being occupied by Latvia.
- Direct Taxes as% of GDP - position 24, and also a low share and the Direct Taxes as % of Total Taxation - position 20 - comparable.
- Direct Taxes as% of GDP - *Corporate income tax* - the position 8, reflecting a higher position in the ranking compared to the total weight of taxation.
- Direct Taxes as% of GDP - *Personal income taxes* - position 25, again very low.
- Indirect Taxes as% of GDP - position 24 - while in terms of share of Indirect Taxes as% of Total taxation, Romania ranks 9, that is the indirect taxes represent a large share of indirect taxes in total taxation, compared to other EU countries. It shows such a feature of taxation in Romania, which relies more on indirect taxes

[1]http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_structures/2011/report_2011_en.pdf,
http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_6047_en.htm
[2]http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_structures/2011/report_2011_en.pdf

than on the direct taxes which may have high tax efficiency, even in economically difficult situations. If direct taxes have a high sensitivity to fluctuations in the economy, when the economy does not work, the most reliable source of income for the state remains consumption taxation.

Overall, however, by 2009, the level of taxation in Romania is among the lowest in the EU and significantly lower than that of neighboring countries, Bulgaria and Hungary. However, Romanians' perception is that taxation is excessive and burdensome, with more negative effects than benefits, an idea fueled by the existence, over time, of a large number of taxes, being the responsibility of physical and legal entities, an inefficient administration which leaves the entire tax burden on the shoulders of taxpayers, and legislative instability that characterizes the Romanian fiscal system.

Year 2010 already brought a series of tax increases at the level of budgetary pressure and in the same sense, the construction budget for 2011 and 2012 to 2014 horizons is considering an increase to over 30% of GDP in tax revenue, declared based on the reduction fiscal evasion and subterranean economy.[1] Unfortunately, the threat of global crisis continues, based on the so damaged economic and social space in Romania, so that business environment support, as alleged in the present to be necessary, is expected to achieve only surface measures of reduced effects, such as "re-scheduling the legal framework for granting installments for paying the mandatory taxes, the establishment of legislative, administrative and operational measures in order to simplify customs formalities."[2]

According Table 3, the central government allocated share of total income is less than half of the entire analyzed period, while the local administration share is on an average of about 3.5%, compared to an average of over 10% at EU level.

The share allocated to **social insurance funds** increased from 32.9% in 2008 to 34.6% in 2009, about four percentage points above the EU 27 Average.

However, as a percentage of GDP (Table 2), the revenues allocated to social security funds are of approximately 1.7% lower than the EU 27 average, the causes are diverse, including the situation on the labor market, namely high unemployment.

[1] http://ec.europa.eu/europe2020/pdf/nrp/cp_romania_ro.pdf
[2] http://discutii.mfinante.ro/static/10/Mfp/buget2011/RAPORT_BUGET2011.pdf

4. Differences of Total Taxation in the EU

Despite the high tax rate, in the year 2009, 13 Member States registered shares of total tax revenues under 35% of GDP, of which 6 under 30% (Bulgaria, Ireland, Latvia, Lithuania, Slovakia and Romania with 27%). Seven EU countries have a higher share of 40% total taxes to GDP, among them three states with the largest tax are Denmark (48.1%), Sweden (46.9%) and Belgium (43.5%). One can notice a difference of over 20% between Romania and Denmark, so the tax burden in the country with the highest tax is 70% higher than the lowest fees. The data are presented in Table 4.

These differences are mainly due to taken social policy measures such as pension, health and education, public employment, etc., measures that the states can afford, given the fact that their economic policies are effective.

Technical factors also play a role: some countries provide social or economic assistance through tax cuts and not through public spending, while social transfers are exempted from tax and social contributions in some Member States but not in others. It should be noted that the GDP value taken into account in determining the tax rate include also the estimation of informal sector production ("gray or black economy"); so the high tax evasion can lead to a lower rate of taxation.

As a general rule, the rate of tax revenue / GDP is significantly higher in the 15 old member states (countries that joined the Union before 2004) compared to the 12 new Member States, as shown in the following table:

Table 4. Total tax revenues in EU countries (including social contributions)

1999 - 2009, as% of GDP[1]

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
BE	45.3	45.0	45.0	45.1	44.6	44.7	44.7	44.3	43.9	44.3	43.5
BG	30.6	32.5	30.9	29.6	32.2	33.1	34.0	33.2	34.2	33.3	28.9
CZ	34.0	33.8	34.0	34.8	35.7	37.4	37.1	36.7	37.2	36.1	34.5
DK	50.1	49.4	48.5	47.9	48.0	49.0	50.8	49.6	49.0	48.2	48.1
DE	41.7	41.9	40.0	39.5	39.6	38.7	38.8	39.2	39.4	39.3	39.7
EE	32.5	31.0	30.2	31.0	30.8	30.6	30.6	31.1	32.3	32.2	35.9
IE	31.9	31.6	29.8	28.5	29.0	30.3	30.8	32.3	31.4	29.3	28.2
GR	33.3	34.6	33.2	33.7	32.1	31.2	31.8	31.7	32.4	32.6	30.3
ES	33.6	33.9	33.5	33.9	33.9	34.5	35.6	36.4	37.1	33.1	30.4
FR	44.9	44.1	43.8	43.1	42.9	43.2	43.6	43.9	43.2	42.8	41.6
IT	42.5	41.8	41.5	40.9	41.3	40.6	40.4	42.0	43.1	42.8	43.1
CY	28.0	30.0	30.9	31.2	33.0	33.4	35.5	36.5	40.9	39.2	35.1

[1] ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_structures/2011/report_2011_en.pdf

LV	32.0	29.5	28.5	28.3	28.5	28.5	29.0	30.4	30.5	28.9	*26.6*
LT	31.7	30.1	28.6	28.4	28.1	28.3	28.5	29.4	29.7	30.3	29.3
LU	38.3	39.1	39.8	39.3	38.1	37.3	37.6	35.6	35.7	35.6	37.1
HU	38.2	39.0	38.2	37.8	37.9	37.4	37.5	37.2	39.8	40.4	39.5
MT	27.3	28.2	30.4	31.5	31.4	32.9	33.9	33.7	34.6	34.5	34.2
NL	40.4	39.9	38.3	37.7	37.4	37.5	37.6	39.0	38.9	39.1	38.2
AT	44.0	43.2	45.3	43.9	43.8	43.4	42.3	41.9	42.2	42.8	42.7
PL	34.9	32.6	32.2	32.7	32.2	31.5	32.8	33.8	34.8	34.3	31.8
PT	34.1	34.3	33.9	34.7	34.8	34.1	35.1	35.9	36.8	36.7	31.0
RO	31.0	30.2	28.6	28.1	27.7	27.2	27.8	28.5	29.0	28.0	27.0
SI	38.2	37.5	37.7	38.0	38.2	38.3	38.6	38.3	37.8	37.3	37.6
SK	35.4	34.1	33.1	33.1	32.9	31.5	31.3	29.2	29.3	29.1	28.8
FI	45.8	47.2	44.6	44.6	44.0	43.5	44.0	43.5	43.0	43.1	43,1
SE	51.8	51.8	49.9	47.9	48.3	48.7	49.5	49.0	48.3	47.1	46.9
GB	36.2	36.7	36.4	34.9	34.7	35.1	36.0	36.8	36.5	37.3	34.9
EU 27	40.8	40.6	39.7	39.0	39.0	38.9	39.2	39.7	39.7	39.3	38.4

Despite these great differences, over the years, until 2007 the tax rates tended to converge, the difference between the highest and the lowest rate declined during 2001-2007. In 2008, however, the rates again departed easily, possibly because of differences between the decreases registered in the Member States.

In 2008, under the impact of the recession, the tax rate fell below the rising trend during the last four years. However, the decline brought the rate where it was in 2006 and on long term slightly below the level of 2000. Years 2008 and 2009 were characterized by a quasi-general decrease of tax revenues and fees, with major differences to the extent that some countries had great falls (e.g. Spain, Bulgaria, Cyprus, Ireland, Belgium, Latvia, Poland) while in others the effect was limited or conversely, showed slight increases in 2009 (Estonia, Germany, Luxembourg).

In the EU, the GDP progress was relatively upward, deterioration being especially sharp in the second half of 2008; however, although the actual rate of growth decreased by more than 2 points to 0.5%, the weighted average of the 27 Member States, some states have had a relatively good average growth for the entire year. For example, Romania, Bulgaria and Slovakia have recorded growth rates in 2008, the decrease being strongly felt in 2009. When it comes to GDP per capita, the highest recorded level in Europe, in the countries with high taxation, namely Luxembourg (GDP per capita: $ 89,562), Norway (GDP per capita: $ 56,920), Switzerland (GDP per capita: $ 46,424), Netherlands ($ 42,447) and Austria ($ 39,711), except for Ireland ($ 39,999 and taxation in 2009 under 30% of GDP).

5. Conclusions

The European Union compared to other developed areas of the world and the potential of emerging countries, is a high tax area. In 2009, the rate of income tax, that is the sum of all taxes and social security contributions in the 27 EU Member States increased to 35.8% of the GDP average, while in 2008 and in previous years it was majority over 39%, more than a third above the levels registered in the U.S. (24%) and Japan (28.1%).

Overall, the tax rate has decreased since 2000, but, on average, only a few years. The requirement to reduce public deficit, still threatening with repeated and strong global crisis, has not allowed an endorsement of efforts to reduce taxes. Moreover, even countries that were located, apparently at least, in its low tax states such as Romania, project an increase in the next fiscal period and the public debt crisis emphasizes this need. The economy is left to the will and ability of managers and of external developments, while the tax affects consumption and production. The real interest declared by public policies, to boost the economy seems to be knocking against the priorities of the moment, regarding the immediate insurance of public revenues to the level required by European demands and emphasized prudence that the current baneful events induce that the important European countries face.

Tax harmonization with EU states practices, from Romania's perspective cannot be achieved simply by legislative adjustments, accompanied by increased taxation and cosmeticizing the business environment with "makeup" that fade from one day to another. Measures as Restructuring tax liability or their exemption seems to be the place they always reach in difficult moments, proving the state's inability to look ahead and to find the most appropriate long-term remedies. The public policy should focus primarily on the directions that can achieve this goal, namely a functional market economy and not by "saving" the moment, as there were the incomes of the working abroad Romanians or a favorable climate for a good agricultural year. We believe that the increase in tax revenues must be a consequence of solid economic and financial policies, real and lasting, accompanied by fiscal discipline, reducing tax evasion, of the subterranean economy. In addition, the EU's poorest countries, lowering the rates of taxation are among the few arguments that can attract foreign investment and encourage the local entrepreneurs.

If we speak of tax harmonization, the conclusion is that we can report both the technical aspects or quantifiable, compared with the best results in Europe, as their implementation is not a guarantee of similar results. Tax harmonization may remain on the major directions set by the European treaties and the tax level, on the total and in structure is a problem generated by the policy mix in regional and global context.

6. Acknowledgement

The work of Mariana Trandafir was supported by the project "Post-Doctoral Studies in Economics: training program for elite researchers - SPODE" co-funded from the European Social Fund through the Development of Human Resources Operational Programme 2007-2013, contract no. POSDRU/89/1.5/S/61755".

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Alternatives for Adjusting the Debts towards Banks of the Companies facing Financial Difficulties and their Implications

Bogdan Florin Filip[1]

Abstract: The paper approaches the issue of restructuring of bank loans, under conceptual aspects, but, mainly, in an applicative manner, as financial phenomenon, which manifests itself, particularly within the context of the debtor companies confronted with financial difficulties, especially on the background of the recession and economic crisis. There are analyzed the premises of triggering and technical modalities of making (implementing) restructuring of bank loans, the author identifying perfectible elements and specific implications of it both at micro and macro level.

Keywords: restructuring of bank loans; changing loans' timetable; bank loans' rescheduling; bank loans' refinancing

JEL Classification: G30; G31; G32

1. Introduction

Adjusting the debts towards banks of the companies facing financial difficulties implies a restructuring of bank loans, which are considered the basic products offered by the commercial banks, represents a financial phenomenon less studied, although it is a distinctive issue of great interest. Such difficulties of the companies are not excluded even during the economical boom period, but they are amplified and exacerbated, especially on the background of economic recession or financial crisis (Munchau, 2010), the kind that manifested themselves in recent years, affecting more deeply and wide extended the companies activity and their financial status.

Moreover, it must be remarked that the existence of bank credit in the economy is materialising a typical process, which is done primarily within the context of the relations between banks and companies. But the running of this lending process collides, organically, with the pursuit of real economic processes and the decisions regarding lending for each bank's client must be substantiated by objective consideration of the interdependencies between the two categories of processes ensuring their correlation, primarily in terms of credit granting-repayment

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operations. Such an assumption appears to be essential and should be taken into consideration even from the stage of decision elaboration regarding lending the companies, starting with the analysis and forecast of the client's development, in economic and financial plan, for the entire period of credit reimbursement. Later, as the economic entities (beneficiaries of bank loans) are carrying on financial and economic activities and these are corresponding to the forecasted evaluations from the moment of establishing the original decision by the bank, credit operations, including repayments and interest payments for those granted loans, can be performed without major difficulties and there are not necessary any other re-evaluations likely to lead to any changes of operation.

Often, however, there occur in the evolution of economic and financial activities of the bank's clients significant changes, generated by objective or subjective factors, which naturally are reflected towards the progress of the lending process, making necessary sometimes reviews, under various aspects, of the decisions initially taken, including on resizing and restructuring the repayment or rescheduling payments to banks etc. In this context, we consider, however, that these changes can be designed, in principle, as possible in both directions, they manifesting themselves also as result of inaccuracy of forecasts, but mostly, as expression of different dynamics of the determined variables, which gives to their appearance a normal nature, which should be taken into account, admitting even the need for continuous adapting of the ongoing credit processes.

Therefore, it results as possible, useful and, under certain circumstances, absolutely necessary, the reconsideration of some defining elements that characterize the ongoing bank loans, known in practice under its technical, more general, name of loans' restructuring.

2. Defining and Sphere of Manifestation

In a broader sense, such a concept means changes in the development of credit processes regarding loans previously granted by the bank, starting from the observation of different manifestation of some impact factors against the forecasted evolution that reflects over the economic and financial state of the companies (Moinescu & Codirlasu, 2009). Such changes may occur in both directions and may regard both the global dimensions, structured on the categories (forms) of bank loans, and various other features of these loans. As result, finding the mutations occurred during the lending process of companies, is forcing banks to undertake economic analysis and reviews, to carry out a possible restructuring of loans, according to economic and financial condition that has been reached or is supposed to be reached by the bank customer, in a determined period of time. On this basis, it becomes possible for the bank, in agreement with the borrower and not

only at his request to modify some features of the loans in progress, which means restructuring of these loans.

Approached, however, in a narrow sense, the restructuring of bank loans is conceived as a financial phenomenon typical for bank's relations with those companies, which are unable to make the planned payments on loans and interest repayments under credit contracts.

Such a conception is promoted, especially on the background of the current recession, respectively that of the recent economic and financial crisis. According to this, it appears in the foreground the idea of restructuring the bank loans of the companies in default situations for relatively long periods of time, or threatened by the spectre of bankruptcy.

Obviously, in such cases, the restructuring of bank loans appears to be, in principle, necessary both in terms of immediate interests of the debtor and of the creditor and of the objective interdependencies involved in the economic and financial processes progress, including the lending of companies. Thus, it cannot be ignored the interest of the debtor companies for restructuring their loans, compared with the possibilities of revival their own business and make further the corresponding payments, avoiding the forced execution of the collaterals by the banks, respectively bankruptcy, assuming accompanying losses (Crouhy, Galai & Mark, 2005). Simultaneously, the creditor banks maintain their possibilities to recover such amounts, including earning of some revenues even on the restructured loans, as borrowers succeed to revive or amplify their activities, generating new sources of money. By default, restructuring of bank loans favour at the level of the companies the implementation of new real economic processes, which are, finally, a prerequisite for resumption of the specific flows of the bank credit and fulfil its role in the economy.

It is interesting to note that the restructuring of bank loans has emerged, particularly as a process initiated at the request of the debtor company facing financial difficulties, rather than the creditor banks, but it also requires the review, based on updated analysis, of the decisions(previously taken by the bank) of lending the companies. Thus, it involves also another decision making process, focused on the new realities characterizing the financial-economic activity of the client, with the significance of relaxing the payments regarding the bank loans in progress, which should be made by the debtor companies. However, it has to be noticed that the restructuring process itself can and should be designed differently, especially in terms of technical ways of restructuring applicable, starting from accurate knowledge and assessment of present and future situation of the debtor company, including of the economic and financial environment, internally and externally, in which the company evolves. In this sense, such a restructuring process is justified to be triggered only if the debtor company demonstrates that

encounters real financial difficulties, in a temporary negative context, and easing repayment of bank loans is likely to help it to avoid financial blocking and recovery of activity, which would ensure resuming the payments towards the banks. This process helps, so, to avoid forced execution of the credit collaterals, which would have a major negative impact not only for the company, but also for the bank, which may not be able to recover the loan in an unfavourable economic situation, such as drastic reduction in demand and prices on the real estate market in Romania.

Simultaneously, we think that is natural the design of some alternative ways of achieving the restructuring of bank loans and also their judicious selection for implementation, taking into consideration the real economic and financial states of the debtor company and the accurate assessment of positive or negative effects that may occur both for the customer (debtor) and for the commercial bank (lender). Moreover, from the same angle, we consider it necessary that the modalities to implement the restructuring of bank loans have to be converging with the decisions of monetary and credit policies pursued by the Central Bank. This is necessary, having in mind, especially the implications of bank (overall) lending practice on monetary equilibrium in the economy because they manifest themselves differently in relation with the modality of restructuring of bank loans, which is applied in one case or another.

3. Modalities of Implementing and their Implications

In the context of the current economic and financial circumstances, we note also that banks have started to implement some modalities (methods) for restructuring of loans formerly granted to companies facing later financial difficulties, which cannot meet corresponding payment obligations to banks. They have features and generate implications that differ significantly, and between them, the most relevant appear to be: changing loans' timetable, rescheduling of loans, refinancing (reactivation) of loans. As possible solutions, but applicable in a much smaller measure, there can be mentioned also the transfer of claims, subrogation, novation or delegation and an overview of the restructuring of bank loans process can result also from figure no.1.

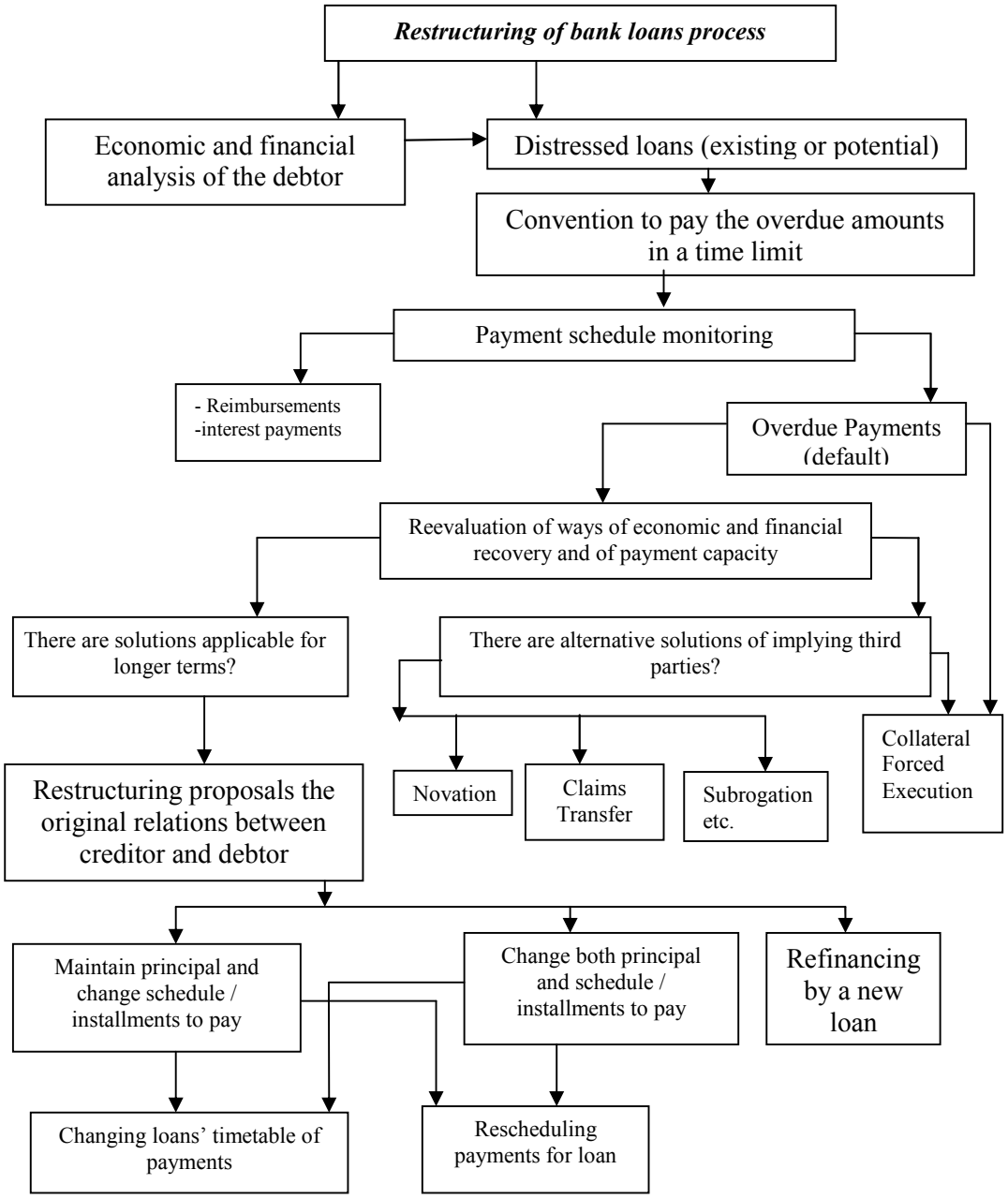

Figure 1. An overview of the restructuring of bank loans process

According to this figure, as a main modality of restructuring the bank loans, may be considered the change of the loan's timetable, which contains as essential technical element the change of payment dates for the overdue amounts for a loan in progress, provided it does not exceed the duration established on the initial granting of that credit. It involves a decrease of short-term financial effort of the debtor, although it may increase the overall amount paid as a result of increased lending period (Dănilă, Anghel & Radu, 2010). Applying the change of loan's timetable can lead to a financial relaxation of the debtor, giving him the opportunity to better manage his available financial resources to overcome some constraints of shorter duration and having subsequent recovery perspective of its optimal financial structure.

In turn, overcoming financial trouble by the company, through changing of loans' timetable, becomes a prerequisite to recovery the debts by the banks, due to resume and amplify of the debtors' economic activity, which can positively influence also the balance and financial monetary economy.

In light of the component elements of changing of loans' timetable, we consider that some of them have, undoubtedly, a strong impact on the results obtainable by its application, as is the case of an appropriate elaboration of a new repayment schedule. Others, however, such as granting of high grace periods (12 months), in which the debtor must repay the outstanding loans, appear to us to be questionable in terms of level of companies self interest to urge the implementation of economic and financial recovery measures, enhancing the new risk assumed by the bank resulted from restructuring the previous granted loan. At the same time, it appears possible the generation of an effect of disorder of the correlation between money supply in circulation and the real size of goods and services offered on the market, with implications on the purchasing power of money.

In turn, the method of restructuring of bank loans by rescheduling payments to be made by the firms in difficulty means to modify the maturity and / or of the scheduled outstanding amounts as liabilities in the balance, but with the possibility of exceeding the initial reimbursement period established for such loan and implicitly, its enrolment to another term category (medium or long term), without being able to overcome, however, maximum term for the specific credit product.

Many of the technical elements of rescheduling resemble those of changing of loans' timetable, including the possibility of granting a full grace period (12 months), while the debtor is not obliged to make any payment to the bank for the rescheduled loan. However, such an element is likely to generate managerial disinterest or ineffectiveness (Saunders & Marcia, 2010), inclusively through delays in implementation of measures to revive economic and financial activities of the companies, beneficiary of rescheduling of bank loans, not being neglected any potentially negative influences of this on the movement of its currency.

The third way to implement the restructuring of bank loans is known as the refinancing (by other credits) and assumes that the bank, having to recover previous loans (with attached interest), has to proceed to the granting of a new loan, to be used by the debtor company for the reimbursement of the ongoing loan and having the size equivalent to the outstanding and overdue amounts of the previous loans, called "overdue loans" or "bad loans".

From the perspective of the elements that compose the refinancing method currently applied for the restructuring of bank loans it is remarkable, in first place, concluding of a new credit agreement (the restructuring one) having specific clauses, involving cancellation of the previous loan contract or contracts which were in progress. Moreover, in this case, there is the possibility of including within the new loan also of the amount of any debts to the state budget more than 90 days old, accumulated by the company and of granting of a grace period by the bank, during which the beneficiary customer is not obliged to make any repayments.

In relation to its content, is appears clearly the positive impact of the application of "refinancing the ongoing loans" by granting of new loans, with the result of companies' financial flows unlock, but we consider that this method includes itself the seeds of some disturbance of balance in the financial and monetary sphere, considered at macroeconomic level. In this respect, we believe that, in particular, including the amount of old debts towards the state budget in the amount of the new refinancing loan, granted to the company by the bank, without having a clear counterpart in certain real values can lead to over sizing money supply into circulation, on the background of carrying out the issue function of the bank lending activity, with the possible effects of depreciation of the currency and boost of inflation.

In the context of restructuring methods of bank loans, to which we are referring, a distinctive place is taken by the assignment of claims, subrogation, novation etc. Thus, assignment of debt, which is materialized into the transfer by the bank of its receivables (its customers debts) to third persons, the bank receiving from third parties the amounts owed by its debtors, on the occasion of signing the transfer contract. By its content, this method involves recovery of the specific loan and no other changes of loan's characteristics. Similarly, if the application of subrogation a third party , pays to creditor bank the debts of its client, taking over, in turn, all the rights (claims) for the amounts that the debtor should have paid or has to pay to the bank. Bigger differences appear when applying the "novation", which involves changing of the original debtor to another, the latter being the person who assumes the former debts towards the bank. It occurs, so, a transfer of a loan in progress between two borrowers, but which maintains the same relations, only between the new debtor and the same creditor bank. The application of such methods of restructuring of bank loans is less significant, although it brings advantages,

especially for the lending banks, but they assume the existence of third parties, financial potent, interested to be involved in such transactions.

A general scheme clarifying the procedures for analysis and decision (in terms of the bank), involved by the restructuring of bank loans that suggests also the possibility to carry out a decision making process conducted by electronic means, assuming the completion of some characteristic phases, can be structured as in figure no.2.

According to the exposed figure, in a first step, there is made an analysis and it is adopted a decision (approval or rejection) for the loan restructuring requested by a debtor company, which takes place in the local banking unit (front-office).If the decision taken at this level is of approval of the requested restructuring, in another step, this is transmitted (as proposal) to the headquarters of the lending bank. At the central level of the bank it will be taken a final decision (after the reconsideration of the received proposal, especially taking into consideration the risk aspects), which can also be a decision of approval or rejection. Based on the subsequent communication of the decision taken by the bank (towards the bank's customer and local bank's branch), it will follow the proceeding to its implementation by applying the modalities of loan restructuring, as they were approved.

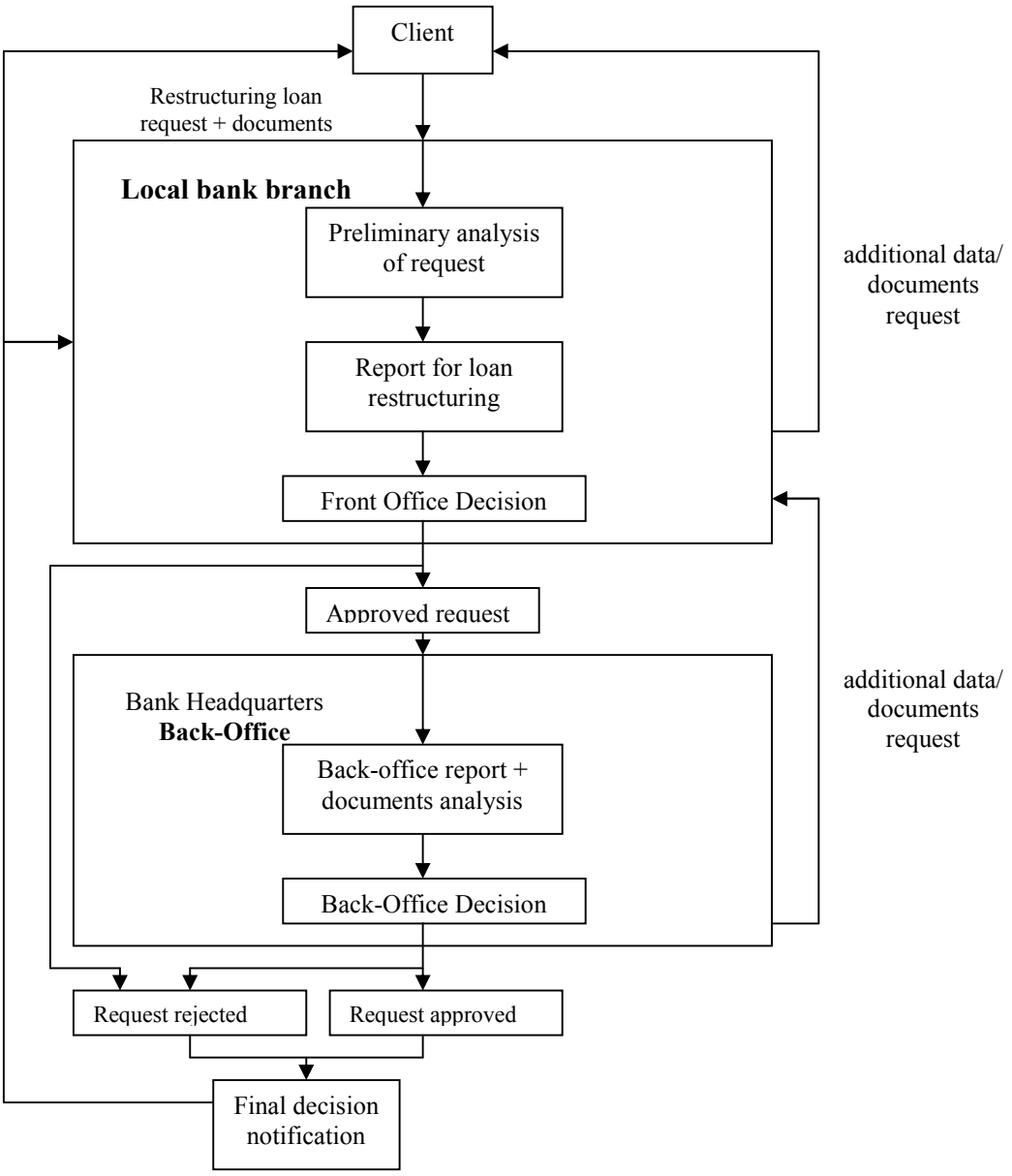

Figure 2. The analysis and decision process of a loan restructuring request

4. Conclusions

In relation to the specific issues and the way of manifestation of the phenomenon of restructuring bank loans it is of particular importance the appreciation that its application does not mean the acceptance, in principle, to extend the state of default or insolvency of the companies, it being a solution, with an exception character, generated by unpredictable reasons, including recession and crisis (Williams, 2010). Its application requires serious analysis and assessments of financial and economic activity of each debtor company, including of the prospects for economic recovery and restoration of its ability to pay, ensuring on this basis also the continuous progress of the payments towards creditor banks. At the same time, we appreciate that, it must be taken into consideration also the existence of some objective prerequisites of this phenomenon and, implicitly, the need for some common concerns from the debtor companies and the banks, in order to permanently pursue the running of the lending process, and to observe the real needs for restructuring of bank loans. From the same perspective, given the objective interdependence and the indicative nature of the projections that characterize the development of the process of bank lending for companies, in our opinion, restructuring of loans may be conceived also as a possible bringing forward of the reimbursements compared to the original maturities. As consequence, there might be permitted early repayments of loans, at the request of the debtor companies (borrowers), with greatly improved financial status, they coming to have sufficient financial resources, including by the faster growth of their equity, without being obliged to bear any possible interest or commissions having penalty meaning.

At the same time, the analysis of the content and of the implications of the main modalities (methods) of implementing the restructuring of bank loans outlines the presence of some similar effects. Out of these, it appears, primarily, the one regarding the relaxation of the payments to be made towards the banks, respectively of the reimbursements, which manifests itself at the level of the debtor companies, these ones being able to run other financial flows in order to continue and develop their activity.

However, from the analysis result also sensitive differences between the alternatives of the loans' restructuring regarding both the necessary premises and the impact potentially negative, determined by the application of each method. In this respect, refinancing of some previous granted loans, including, in the new refinancing loan to be granted, of some other liabilities of the debtor companies, as those towards the state budget, may influence negative the monetary equilibrium of state economy. This, because the use of the refinancing loans, in such conditions, may lead to the abnormal growth of the money supply in circulation and, implicitly, to the depreciation of the currency, respectively to amplifying of inflation.

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Accounting and Auditing

Auditors' Assessments of Materiality Between Professional Judgment and Subjectivity

Saher Aqel[1]

Abstract: Materiality has been and continues to be a topic of importance for auditors. It is considered as a significant factor in the planning of the audit procedures, performing the planned audit procedures, evaluating the results of the audit procedures and issuing an audit report. Recently, there has been a renewed interest in the concept of materiality motivated by concerns at the Sarbanes-Oxley Act, Securities and Exchange Commission and International Auditing and Assurance Standards Board issuance of proposed standards on materiality. The objective of this paper is to discuss and analyze comprehensively the concept of audit materiality including how materiality threshold is determined by auditors. Auditing standards settings bodies pointed out that auditor's determination of materiality threshold is a matter of professional judjment. As a judgmental concept, however, materiality is susceptible to subjectivity. Furthermore, the absence of audting standards on how materiality is determined has highlighted the significance of this issue and indicated that guidance for materiality professional judgments must come from other non-authoritative sources such as empirical researches. A number of new and important areas of materiality are in need of further investigation.

Keywords: materiality threshold; quantitative and qualitative materiality factors; expectation gap

JEL Classification: M40; M42

1. Introduction

Materiality is considered as a key concept in the theory and practice of accounting and auditing. It is a significant factor in the planning of the audit procedures, performing the planned audit procedures, evaluating the results of the audit procedures and issuing an audit report **(**International Standards on Auditing, ISA 320, Statement of Auditing Standards, SAS 107; AU 312).

The American Institute of Certifies Public Accountants (AICPA) and the International Auditing and Assurance Standards Board (IAASB) pointed out that the auditor's determination of materiality is a matter of professional judgment (ISA

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320, 4, SAS No. 108; AU No. 312, 4). This indicates that the guidance for individual materiality professional judgments must come from other non-authoritative sources such as empirical researches. The absence of uniform standards or set of standards for materiality has highlighted the significance of this issue and encouraged many of the researchers to conduct studies in this area.

Holstrum and Messier indicated that three main problems with a user approach to materiality (Holstrum & Messier, 1982, p. 48). First, very little is known about the ways the financial Statement are used by users in making their credit and investment decisions. Second, materiality decisions are made by prepares auditors, and users; these heterogeneous groups are likely to have dissimilar view concerning materiality. Third, limited knowledge is available on how materiality judgments made by preparers and auditors affect users' decision making. These same problems regarding users prospective continue to be relevant after two decades (Messier et al. 2005).

Empirical studies in materiality area started in the early 1950s. However, materiality continues to be a topic of significance for researchers. The objective of this paper is to discuss and analyze comprehensively the concept of audit materiality. The remainder of this paper is organized as follows. The second section introduces accounting and auditing concepts of materiality. Section three presents the application of materiality in the audit process. The fourth section discusses quantitative and qualitative factors that are used in order to make materiality judgments. Section five presents the expectation gap regarding materiality and the last section concludes.

2. Accounting and Auditing Concepts of Materiality

The concept of materiality is directly linked to the decision-making requirements of financial statement users. Materiality has been defined by the Financial Accounting Standards Board (FASB, 1980) in Statement of Accounting Concepts No. 2, "Qualitative Characteristics of Accounting Information" as follows **(**Messier et al. 2005, p. 155**)**:

" The omission or misstatement of an item is material in a financial report, if, in light of surrounding circumstances, the magnitude of the item is such that it is probable that the judgment of a reasonable person relying upon the report would have been changed or influenced by the inclusion or correction of an item".

Thus, the accounting concept of materiality addresses decision usefulness of the financial statements users. The financial statements – which are the responsibilities of the management – are prepared using accounting estimates and the management has to make those estimates accurately. Therefore, the accounting concept of materiality is related to the minimum amount of omission or misstatement that

would influence the judgment of the reasonable user depending on the financial statements prepared by the management as pointed out by the FASB.

To define materiality in an auditing concept we need to define auditing first. Auditing is defined as follows (Botha & Gloeck, 1998):

"An audit is performed in reaction to an assignment given by a person or a group who has delegated certain responsibilities to others. The audit is performed by an independent third party (who is professionally competent to perform the assignment) on the results of an entity or an event, which results have to be in conformity with an identified set of criteria. The objective of an audit is to gather audit evidence by performing a structured process and forming an opinion on the degree to which the relevant results compare to the stated set of criteria".

According to Botha and Gloeck, there are seven postulates for auditing that considered as the generally accepted prerequisites that serve as a basis for making deductions and drawing conclusions in order to describe an intellectual discipline, such as auditing. These postulates are as follows:

1. Information which is subjected to audit, is verifiable;
2. The information which is subjected to audit, is compiled or prepared inaccordance with an identified set of criteria (e.g. an identified reporting framework) ;
3. When the auditors examines information with the objective of expressingan independent opinion, they are acting solely in thier capacity as auditors;
4. An audit must be conducted by a person who is independent from the entity being audited and who is able to objectively take decisions, make deductions and draw conclusions;
5. The process of opinion forming consists of collecting convincing audit evidence in accordance with a risk based approach;
6. The auditor's opinion is expressed in the form of a report on the audited information;
7. Auditors accept professional obligations in exchange for the Professional status of their occupation.

Materiality is a concept of auditing and is specifically associated with postulate five that adopts the risk based approach in conducting the audit. The concept of materiality is important through out auditing process. In conducting the audit the auditor should apply materiality both in planning and performing the audit, and in evaluating the results of audit testing **(**ISA No. 320 P. 5**)**. During the audit planning process, audit evidence is gathered and evaluated in such a way to support an opinion that the annual financial statements are not materiality misstated.

When an auditor expresses his opinion about the annual financial statements of a specific company, audit materiality represents the maximum amount of

misstatements the auditor believes in the financial statements and still fairly represents - with a high degree of assurance - the firm's results of operations, financial positions and cash flows information in conformity with applicable financial reporting framework.

3. The Use of Materiality in the Audit Process

The concept of materiality is important throughout the audit process, but is particularly relevant to planning the audit and in evaluating the results of audit testing. The assessment of what is material at each of these phases of the audit is a matter of professional judgment.

In planning the engagment, an auditor decides early in the audit the combined amount of misstatements in the financial statments that would be considered material. SAS No.107, AU 312 defines the amount as preliminary judgment about materiality. This judgment need not be quantified but often is. It is called preliminary judgment about materiality because it is a proffesional judgment and may change the engagment if circumustances change. The preliminary judgment about materiality is thus the maximum amount by which the auditor believes the statments could be misstated and still not effect the decision of reasonable users. SAS 107, AU 312 called it tolreable misstatments. (conceptually, this could be the amount that is $1 less than materiality as defined by th FASB. Preliminary materiality is difined in this manner as a convenience in application). This judgment is one of the most important decisions the auditior make and it requires considerable professional judgment.

The reason for setting a preliminary judgment about materiality is to help the auditor plan the appropriate evidence to accumulate becuase there is an inverse. relationship between the amounts in the financial statements that the auditors consider to be material and the amount of audit work necessary to provide and opinion about the fairness of the financial statements. For example if the auditor sets low level of materiality, more evidence is required rather than for a high amount.

The auditor will often change the preliminary judgment about materiality during the audit. When that is done the new judgment is called a revised judgment about materiality as stated in SAS 107 and ISA 320. The reason why the auditor may revise his judgment about materiality is due to a change in one of the factors used to determine preliminary judgment about materiality or the auditor may decide that the preliminary judgment was too small or too large. For example, the preliminary judgment about materiality is often determined before year end, therefore this preliminary judgment must be set based on prior years' financial statements or interim financial statement information.

In planning the audit auditors must give careful consideration to the setting of preliminary judgment about materiality because if the amount materiality is judged too low unnecessary audit work will be expended. On the other hand if the amount of materiality is set too high, the auditors might overlook a significant misstatements and express openion about financial statements that are materially misstated.

Generally, auditors ‘‘allocate’’ a portion of the planning materiality to account balances or classes of transactions. This allocated amount is referred to as ‘‘tolerable misstatement,’’ and represents the amount by which the account or class of transactions can be misstated and not be considered material. The allocation of preliminary judgment about materiality to accounts (segments) is necessary because auditors accumulate evidence based on balances rather than for the financial statements as a whole. Therefore, if the auditor has a preliminary judgment about materiality for each balance account, it helps him/her decide the appropriate audit evidence to accumulate. For instance if an auditor is auditing an account receivable balance of $1.000.000 he is likely to accumulate more evidence when a misstatements of $45,000 in the account is considered material rather than if $ 450,000 were material. The auditor can allocate materiality to either income statement or balance sheet accounts. However, in practice most auditors allocate materiality to balance sheet rather than income statement accounts because most income statement misstatements.

have an equal effect on the balance sheet due to the double-entry accounting system. Besides, there are fewer balance sheets than income statement accounts in most audits. Since most audit procedures focus on balance sheet accounts, allocating materiality to balance sheet accounts is considered most appropriate alternative.

Actually, allocating preliminary judgment about materiality to account balances is a difficult task. It is often difficult to expect which accounts are most likely to be misstated and whether any misstatement will lead to overstatements or understatements of certain accounts. In addition to that, relative costs of auditing different accounts usually can’t be determined. In practice, several auditing firms have developed rigorous guidelines and sophisticated statistical methods for allocating materiality to individual account balances.

After allocating preliminary judgment about materiality to individual accounts balances, the auditor will estimate the total misstatement in each account or" projection” as referred to in SAS 111, AU 350 (Audit Sampling). That is because only a sample rather than the whole populated was audited. The misstatements which are found in the sample will be used in estimating the total misstatements in each account. One technique to calculate this estimate of misstatements is to make a direct projection from the sample to the population and add an estimate for

sampling error. In addition to that the auditor will estimate sampling error using an appropriate approach because the auditor has sampled only a proportion of the population. The estimate sampling error and the direct projection estimate of misstatement form total estimated misstatement. In the next step the projected misstatments amounts for each accounts are combined on worksheet. Finally total estimated misstatement will be cpmpared with the amount of preliminary judgment about materiality (tolerable misstatements) that was determined before. If the total estimated misstatements are below the tolerable misstatements, the auditor probably would not need to expand audit tests. However, If the total estimated misstatement is significantly greater than preliminary judgment about materiality the auditor ask the client to make adjustments to the estimatrd misstatments or perform additional audit proceures to make sure that total estimated misstatement exceeds tolerable misstatements.

Although applying audit materiality is important in both planning and evaluation processes, the practice issues related to materiality, for the most part, involved evaluation materiality and not planning materiality as concluded by the Big Five Audit Materiality Task Force. The task force beliveed that problem is not related to the level of materiality used to plan the scope of audits. The problem comes with the application of appropriate audit judgment to the evaluation of the significance of detected misstatements. A good example of this issueis the $51 million adjustment that was waived by Arthur Andersen on Enron's 1997 audit case. Andersen argued that this amount was not material, using an average of annual reported earnings. While various government sources were critical of this materiality judgment and show that much of the professional materiality guidanc supports Andersen's decision to waive the adjustment as immaterial (Messier et al. 2005, p. 156).

4. Determining Materiality Threshold

The ISA No. 320 "Materiality in Planning and Performing an Audit" and SAS No. 107, AU 312 "Audit Risk and Materiality in Conducting an Audit" pointed out that the auditor's consideration of materiality is a matter of professional judgment and is influenced by the auditor's perception of the needs of users of financial statements. Therefore, the standard setting bodies have not set definite authoritative guidance concerning making judgment about materiality. The reason behind that is an amount that is material to the financial statements of one entity may not necessarily be material to the financial statements of another entity of a different size or nature. Further, what is material to the financial statements of a particular entity might change from one period to another (Vadivel, 2004, p. 725).

The decision of materiality involves both quantitative and qualitative factors as stated in SAS 107 and ISA 320. In response to this fact, a number of materiality

calculations methods "rule of thumb" have emerged within both practice and academic research. In this section a number of quantitative materiality measures suggested by prior researches and emerged from the practice will be presented. Moreover, qualitative considerations of materiality will be discussed.

4.1. Quantitative Materiality Measures

Previos research that investigated the significance of various factors in the materiality judgment indicated that the percentage effect of the item on income was the most important quantitative factor (Messier et al. 2005; Iskandar & Iselin, 1999; Holstrum and Messier, 1982). A distant second in importance was the effect of the item on earnings trend that explained small amount of judgment variance. However, the effect of the working capital (or the current ratio) and effect on total assets (or net assets) were the least significant (Holstrum & Messier, 1982).

Different methods, however, for determining materiality have emerged from prior researches and practices. In this paper these methods are summarized as follows:

1. Absolute size of the item;
2. Constant percentage method;
3. Canadian Institute of Chartered Accountants method;
4. Blend method.

4.1.1. Absolute Size Criteria

This measure dictates that the amount potential misstatement can be important regardless of any other considerations. This measure is not widely used by auditors because it might not be convenient for many situations. For example a given amount, say $50000 may be appropriate in one case but too large or too small in another. Yet, some auditors have been known to say “1 million (or more other large number) is material, no matter what” (Robertson, 1996, p.155).

4.1.2. Constant Percentage Methods

In this measure the relation of potential misstatement to a relevant base number is often used. But the question is about the most appropriate base for making materiality decisions. Holstrum and Messier (1982) in their thorough review of the findings of empirical research on materiality indicate that that the percentage influences of an item on income is the most important factor to materiality judgments as stated before. They also conclude that items become material at some point between approximately five percent and ten percent of income. Similarly, Leslie 1985 proposed a level of five percent for "larger incomes," and ten percent for "smaller incomes." He also presents methods related to gross profit, total assets, equity and revenues. Quantitative materiality measures suggested by Leslie 1985 are as follows **(**Pany & Wheeler, 1989, p. 72**)**:

- 5% of pre-tax income;
- 1/2% of total assets;
- 1% of total equity;
- 1/2% of total revenues.

4.1.3. Canadian Institute of Chartered Accountants Method

The Canadian Institute of Chartered Accountants (CICA) recommended a method that uses a changing percentage of gross profit as follows **(**Pany and Wheeler, 1989 p. 72**)**:

- 2%-5% of gross profit if between $0 and $20,000;
- l%-2% of gross profit if between $20,000 and $1.000.000;
- l/2%-l% of gross profit if between $1.000.000 and $100.000.000;
- 1/2% of gross profit if over $100.000.000.

This provides basis for a new measure for calculating materiality. However, there is drawback for this measure. That is when using discrete category rule such as this it is it is possible for a given company to calculate a higher materiality threshold than another company in the next largest category. For example, an auditing firm using the second scale (l%-2% if between $20,000 and $1.000.000) for materiality judgment decision for a company with gross profit of $99.999.999 would calculate materiality at $1.000.000, but using a 1/2% rate for a company with a gross profit of $1.000.000.001 would calculate materiality at $500,000. This may result for large differences of judged materiality for approximately equal values.

4.1.4. Blend Method

This method "blend" that was suggested by Leslie 1985 provides other measures of materiality. In this approach materiality is calculated based on more stable amounts such as assets or equity. Although available researches indicate that that the percentage effect of the items on income is the most important factor to materiality judgments, income tends to fluctuate more than assets or equity. Therefore, in the absence of authoritative guidance on materiality determination, using Blend method provides a more stable, as well as defensible judgment of materiality **(**Pany & Wheeler, 1989 p. 77**)**. This method typically take four or five individual rules of thumb and then either weight each rule according to some proportion or average them. An example of averaging method would be to take the previosly four single rules and average them.

Hypothetical Case Illustration:

In order to illustrate the previous materiality methods. The following summary financial statments of Z company are given:

Table 1 Summary financial statments of Z company

Balance Sheet		Income Statement	
Assets	4.500.000	Total Revenu	13.500000
Liabilities	13.000.000	Cost of Goods Sold	7.500.000
Owners Equity	1.500.000	Selling& Other Expenses	4.800.000
		Gross Profit	6.000.000
		Net Income Before Tax	1.200.000
		Net Income	450.000
		Net Income After Tax	750000

The preliminary materiality judjment is determined according to the above methods as follows:

- **Constant Percentage Method:**

Table 2 Determining materiality judjment using constant percentage method

Scale	Computation	Materiality Amount
5% of pre-tax income	5% * 1.200.000	60.000
½% of total assets	½%* 4.500.000	22.500
1% of total equity	1% * 1.500.000	15.000
½% of total revenues	½%* 13.500.000	67.500

- **Canadian Institute of Chartered Accountants Method:**

Table 3 Determining materiality judjment using Canadian Institute of Chartered Accountants method

Scale	Computation	Materiality Amount
½%	½% * 6.000.000	30.000
to	to	
1% of gross profit	1% * 6.000.000	60.000

- **Blend Method:**

Table 4 Determining materiality judjment using Blend Method

Scale	Computation	Materiality Amount
5% of pre-tax income	5% * 1.200.000	60.000
½% of total assets	½%* 4.500.000	22.500
1% of total equity	1% * 1.500.000	15.000
½% of total revenues	½%* 13.500.000	67.500
	165000/ 4 = 41250	

The previous determination of materiality amount indicates that differnt auditors may make differnt materiality judgments given the same set of facts and conditions when using Constant Percentage Method and the Canadian Institute of Chartered Accountants Method. The reason for setting a preliminary judgment about materiality is to help the auditor plan the appropriate evidence to accumulate in order necessary to provide and opinion about the fairness of the financial statements. Therefore, the variability in determining the amount of materiality using the previous two methods could result for auditors doing widly differnt amount of work for the same client. In order to eliminate the variability resulting by these two methods the auditing firm might decide to adopt the Blend method.

4.2. Qualitative Materiality Measures

The concept of materiality as defined by FASB (SFAC No.2, 1980) is directly linked to the decision-making usefulness of the financial statement users. Certain types of qualitative misstatements are likely to be more important to users than others even though their values are the same. In his famous speech ‘‘Numbers

Game'', the Chairman of Securities and Exchange Commission (SEC) Arthur Levitt addressed this issue when he argued that companies and their auditors were abusing the concept of materiality in order to ''manage'' earnings. Commissioner Levitt stated that:

''Some companies misuse the concept of materiality. They intentionally record errors within a defined percentage ceiling. They then try to excuse that fib by arguing that the effect on the bottom line is too small to matter. If that's the case, why do they work so hard to create these errors? May be because the effect can matter, especially if it picks up that last penny of the consensus estimate. When either management or the outside auditors are questioned about these clear violations of GAAP, they answer sheepishly... ''it doesn't matter. It's immaterial. In markets where missing an earnings projection by a penny can result in a loss of millions of dollars in market capitalization, I have a hard time accepting that some of these so-called non-events simply don't matter.'' (Messier et al. 2005, p. 153):

In response to Commissioner Levitt speech, the SEC (1999) issued Staff Accounting Bulletin (SAB) No. 99, Materiality which states that strict reliance on quantitative measures to assess materiality is inappropriate practice and required auditors to consider qualitative factors in determining materiality (Messier et al. 2005 p. 154). The Overreliance on quantitative materiality thresholds (such as 5 percent of net income) may cause auditors to waive quantitatively immaterial but qualitatively material audit differences (or detected misstatements), thus undermining the quality of audited financial reports. Such concerns have led to the issuance of more explicit guidance on materiality-in addition to SAB No. 99- Such as SAS No. 107 (AICPA) in the United States, and a review of the international auditing standard on materiality by the (IAASB) **(**Bn-Peow & Hun-Tong, 2007, p. 1171**)**.

On the other hand it is not practical to design procedures to detect misstatements that could be qualitatively material. For instance, the famous Enron collapse case that has occurred recently has revealed that exclusive reliance on quantitative criteria for assessing materiality is inappropriate. Materiality amounts derived using quantitative approaches may be increased or decreased on the auditor's professional judgment about the possible effect of qualitative factors. Therefore, key component of overall materiality judgments is consideration of qualitative materiality.

Examples for qualitative factors that may affect materiality include the followings (Elder et al. 2010, p. 253):

- Amounts involved fraud is usually considered more important than unintentional errors of the same amounts because fraud reflects on the honesty and reliability of the management or other personnel involved. For instance,

most users would consider an intentional misstatement of inventory as being more important than clerical errors in inventory of the same amount.

- Misstatements that are otherwise minor may be material if there are possible consequences arising from contractual obligations. An example is when net working capital included in the financial statements is a little bit greater than the required minimum in a loan agreement. If the correct net working capital were less than the required minimum, putting the loan in default, the current and noncurrent liability classifications would be materially affected.
- Misstatements that are otherwise immaterial may be material if they affect the trend in earnings. For example, if reported income has increased 3 percent annually for the past five years but income for the current year has declined 1 percent, that change of trend may be material. Similarly, a misstatement that would cause a loss to be reported as profit would be of concern.

5. Expectation Gap Concerning Materiality

The financial statements preparation is the responsibility of the management that should report these statements for stakeholders such as shareholders, boards of directors, regulators and other third parties who depend on the financial statements for making relevant decisions. However, management can have goals that differ from the goals of the shareholders. The management (agent) may be motivated by factors such as financial rewards, labor market opportunities and relationship with other parties that are not directly relevant to shareholders (principal). This is referred to as agency theory (Jensen & Meckling, 1976).

Because of this conflict of interests between agents and principals, users of the financial statements can not just rely on the financial statements prepared by the management without being verified by an independent third party who is the auditor. The auditor's task is to assess on behalf of the principal whether the agent prepares the financial statements in conformity with applicable financial reporting framework by expressing opinion about the fairness of the financial statements.

However, the widespread litigation against auditors indicates that there is a gap between society's expectations of auditors and auditors' performance, as perceived by society. This gap is defined as expectation gap (Porter, 1993, p. 49). As defined by Porter the expectation gap has two main components:

1. **The reasonableness gap** that exists because the society has unresonable expectations of auditors. However, the auditor cannot fulfil all of society's needs because of limited control methods and control techniques and because a cost-benefit analysis needs to be taken into account.

2. **The performance gap** that is the gap between what society can reasonably expect of auditors and what it perceives they deliver. This may be subdivided into:
   - **A. Deficient standards gap** which is the gap between the duties which **can reasonably be expected of auditors and auditors' existing duties as** defined by the law and Professional promulgations.
   - **B. Deficient performance gap** a gap between the expected standard of performance of auditors' existing duties and auditors perceived performance, as expected and perceived by society. In other word, the auditor does not always seem to be able to recognize what thereasonable expectations of society about the auditor's performance are, or he simply fails in doing his job.

Expectation gap regarding materiality seems to exist. Little information is known on how materiality judgment made by prepares and auditors will affect the users' decision making because limited knowledge is available on how financial statements are utilized by users in investment and credit decision making (Holstrum and Messier, 1982, p. 48). However, some studies have observed that investors' materiality threshold based on their reactions to new earnings announcements. Cho et al., 2003 for example investigated empirically investors' perceptions of materiality in the context of several materiality criteria that include percentage of pretax earnings, percentage of sales, and percentage of total assets by observing stock price reactions when unexpected information is revealed to stock market participants. The study pointed out that users demonstrate lower materiality thresholds than auditors (Cho et al. 2003, p. 63). This indicates the existence of expectation gap regarding materiality.

In addition to that many users expect that auditors guarantee that audited financial statements were completely accurate and that the auditor has performed one hundred percent check for auditees whose financial statements received an unqualified audit report. This is due to society's lack of knowledge about auditor's responsibilities which is referred to as "knowledge gap" by (Gowthorpe & Porter, 2002).

The FASB definition of materiality explicitly addresses decision usefulness of the financial statements users. However, in practice users are not involved in the concept at all. Users don't have enough knowledge about auditors' responsibilities (Gowthorpe & Porter, 2002). Furthermore the auditor's report does not include detailed information related to materiality. What is more, the role of the auditor in verifying financial statements and providing an opinion in relation to those statements is one which relies on too much judgment, is too subjective and creates greater possibilities of widening the expectations gap (Ojo, Marianne, 2006).

The audit expectation gap is a detrimental issue to the auditing profession as "the greater the gap of expectations, the lower is the credibility, earning potential and prestige associated with the auditors' work". They also claim that the audit expectation gap is harmful to the public, investors and politicians because in a capitalist economy, the process of wealth creation and political stability depend heavily upon the confidence in the processes of accountability (Lee et al. 2009, p. 8). Therefore, the existence of an expectation gap regarding materiality, might contribute to a reduction of the perceived value of the auditor's opinion as regards to the true and fair view of the financial statements of a company which is not in the interest of users and auditors. Hence, it is important to know whether a relevant expectation gap regarding materiality exists and if so, how to narrow it.

According to Sikka et al. the nature of the components of the expectations gap makes it difficult to eliminate (Ojo & Marianne, 2006). However, the gap could be bridged by the adoption of the long-form audit report, augmentation of the auditing framework, strengthening of the auditor's integrity, and educating users on the nature and functions of audit (Dixon et al. 2006, Lee et al., 2009). Moreover the gap could be narrowed by asking shareholders to decide the level of assurance they are willing to pay for each year. This would serve not only to educate investors to an audit's inherent limitations but also o enlighten them to the relative costs for audit work that would lead to increased levels of assurance (Epstein and Geiger, 1994). Another recommendation is the expansion of auditors' responsibilities and enhancement of auditors' performance. For example, The Institute of Chartered Accountants in Australia (ICAA), in their report 'Financial Report Audit: Meeting the Market Expectation' (2003) recommended that the auditing profession should expand the scope of audit so that the services provided by the auditors are able to meet the demands of the public (Lee et al. 2009, p. 28).

6. Conclusion

The most significant point regarding materiality is determining materiality threshold. The review of the materiality studies shows that the dominant factor in making materiality decision is percentage effect of an item on net income since 1950s. However, qualitative factors such as the effect of the item on meeting consensus forecasted earnings; trend in earnings is found to be important in making materiality judgment.

Furthermore, prior researches pointed out that there is a lack of consensus in materiality thresholds between auditors, preparers and users. In general, users demonstrated lower materiality thresholds than prepares and auditors. In addition to that many users expect that auditors guarantee that audited financial statements were completely accurate. Based on this belief, the concept of materiality should be

totally abolished. This in turn indicates the existence of the expectation gap concerning materiality between financial statements users and auditors.

However, some may argue that "why don't the profession set materiality standards that include quantitative and consider qualitative factors, in addition to disclose information about materiality determinations in the auditors report in order to solve this problem radically?" Actually, the issue is not so straightforward like that. Setting materiality standards is difficult since qualitative, as will as quantitative, characteristics may be relevant in an ideal conceptualization of materiality (Jennings et al. 1987, p. 114). An amount that is material to the financial statements of a small service firm may not necessarily be material to the financial statements of a huge manufacturing one. Further, what is material to the financial statements of a particular firm might change from one period to another.

Furthermore, disclosing of materiality thresholds in the auditor's report would improve the interface of users and prepares and capital markets could more easily assess the information presented **(**Jennings et al., 1987, p. 114**)**. However, auditing professions refuse to disclose information about materiality judgment in the auditors report and satisfied by the terms "material respects" and "reasonable assurance". This is referred to by Roberts and Dwyer, 1998 as "unjustified professional paternalism" because the professional's refusal to disclose information about key audit inputs arises from a self-interested need to maintain secrecy about the amount of audit work performed. In other words, the profession refuses to reform practice in these areas because the profession benefits (at the cost of client and the public) by mystifying these practices. This interpretation is obviously contradicts the alleged public interest orientation of the profession (Roberts & Dwyer, 1998, p. 576).

The earlier discussion in this paper argues strongly for the significance of materiality issue and the importance of its resolution. However, a straightforward resolution such as formalizing materiality practice into one uniform standard is not expected to come from the profession as stated earlier. Moreover, the auditing profession refuses to disclose materiality threshold in the auditors report because of its benefits by mystifying these practices at the cost of client and the public. Therefore, the entire issue of the use of materiality concept in auditing should subject to research. The future research in this area should proceed in testing factors influencing materiality judgments especially significant qualitative factors. Furthermore, future research should examine expectation gap regarding materiality and try to provide recommendations to bridge this gap.

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Evolutions and Trends in Presenting. The Balance Sheet as a Financial Position Picture of an Entity

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Abstract: In this article we proposed to achieve a synthesis of the key moments in the evolution of the concept of balance, of the theories formulated over time, of the presentation forms of the balance sheet, a taxonomy of balance sheets, supplemented by a breakdown of the concept of financial position and of the structures related to the assessment of the financial position. In other words, we will consider a gradual presentation of the concept of balance sheet over time and a presentation of the balance as the main tool for highlighting the patrimonial situation, of the assets of enterprise owners and of the picture on the financial position of an economic entity.

Keywords: balance sheet; financial position; patrimonial situation; financial situations; assessment

JEL Classification: M40; M41

1. The Main Moments in the Evolution of the Concept of Balance Sheet

Within the information system of an economic entity, its financial – accounting data and information are aggregated at the highest level and systematic in its financial statements.

As in the case of an aircraft that moves from one destination A to another destination B, an economic entity is "moving" from on economic state M to an economic state N. Both the aircraft and the economic entity follow this path in a period of time, on a certain track, passing through intermediate points, which implies certain instruments of some parameters that to give us a picture on the *position* in which it is at a given time.

In the case of the *aircraft* there can be used special sensor to display on a control panel all the information related to height, indoor and outdoor temperature, its distance and position on the map. Through these information and representations of the reality are offered to pilots possibilities of control over the aircraft and even a greater confidence of the crew and passengers during the journey. By analogy, the

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control panel/dashboard to allow the "mastery" of the economic entity by the management team, but also by its owners is found as the *balance sheet*. The balance sheet is presented as an instantly image on the financial position that it occupies an economic entity at certain points on the temporary track between M and N.

1.1. The Concept of Balance Sheet

The concept of *balance sheet* comes from Italian language from *bilancio* and it was introduced in the circuit of the accounting literature as a *key of double accounting* (Rusu, 1972) by Luca Paciolo through his paper *"Summa de Arithmetica, Geometria, Proportioni et Proportionalita"* from 1494, as specific instruments of the double entry accounting. At that time the concept of balance sheet was confused with the one of balance, due to the way of its preparation and structure, with the two sides in balance, and of the fact that at its turn the *bilancio* came from Latin from *bis* and *lanx*, which meant a balance taler in balance.

Currently, the concept of balance sheet refers to that synthesis documents from the composition of the financial situation through which the economic entity is presented from the perspective of the assets owned and operated, but also from the perspective of the sources of financing of these assets. It comprises two parts, namely: one destined to the resources or assets and other one destined to the sources of funding from the part of owners and creditors (Stolowy, 2006).

The Emergence and Development of the Concept of Balance Sheet

Most experts agree with the idea that the emergence of the concept of balance sheet is lost in time. Thus, *in Egypt* in public accounting the information from the synthetic accounts were systematized in a form of account that was later highly requested by the Roman occupation to establish the annual tribute (Robu).

At Greeks, the Budget of the sacred House from Athens was published on boards, every month, it being exposed in the public markets to be known by citizens. Even Aristotel in his works, *Rhetoric* and *Policy* presents some rules/ norms related to the preparations of these budgets and of the related render accounts (Robu). According to R. Obert (1999-2000)[1], the Greeks bankers were making a simplified balance sheet, close to the form of account after the relation, Initial sold, inputs, outputs, final sold, with a breakdown of receipts and payments, followed by a complete inventory of the assets owned.

At Romans there isn't identified the use of own balance sheet, but the so called synthesis *"Breviarum"* regarding the management of the public patrimony. Later, in 1340, in the Italian city Genova, we identify the Ledger of the common usage of

[1] http://robert.obert.pagesperso-orange.fr/La_construction_du_droit_comptable_2011.pdf, p. 44.

the balance sheet account under the name of *Billantium* (Demetrescu, 1972, p. 56), which means that this instrument was used in practice and in the previous period of this year. The same *Billantium* is found in 1408 as a management tool within the Bank of St. George from Genova.

The French literature emphasizes the use of the *account of a construction* or of so – called *site logs* to build some castles, journals that can be considered *"honorable balance sheets"* even are not entirely correct (Beck, 2010)[1]. Enlightening in this respect, are the codices drawn with the occasion of (re)construction of the castle between the years 1400 – 1404 by the Duke of Bourgonge.

The father of the double entry accounting, Luca Paciollo, in 1494 through his work "…" give meaning that the balance sheet was not a tool used in the practice of accounting, but also insists on the necessity of using such a balance sheet. Luca Pacili's idea is continued by other Italian authors, such as Domenico Manzonni (1554), by Miossa and Radonichi (1581) and by Ludovico Flori (1636) to use as a tool the balance sheet on a superior level of abstraction after the trial balance of the master. The technique of preparing the balance sheet starting from the Ledger is summarized by Pierre Savonne in 1567 through his paper *"Instructions et manieres de tenir les livred de raison et de comptes en parties doubles"*, through which was reducting the balance sheet from two essential posts, namely: debtors and creditors. Later, in 1678, Claude Irson in *"Methode pour bien dresser toutes sortes de comptes a parties doubles"* adds to the two series of accounts debtors and creditors, the accounts to be resulted and substitutes the closing balance sheet with the *balance*, to who it wasn't assigned a role in highlighting the wealth, but an instrument to avoid the falsification of entries from the previous periods.

In Netherlands in the sixteenth century, the Italian accounting practice is promoted through the writings of Jean Ympyn (1485 – 1564), which imposed the balance sheet as a tool for prediction and assessment.

At the same time the Dutchman Claes Peters de Deventer, on its real name *Nicolaum Petri Daventriensem*, in its accounting works after the Italian method brings improvements related to closing the accounts in order to prepare a closing balance sheet, as the next stage of systematization of the accounting data from the trail balance, while the Belgian Simon Stevin (1608) through his works assigns to the balance sheet a role of annual tool in the scientific literature of the time.

Giovanni Domenico Peri, through the work *Il negociante*, published in 1638 introduces for the first time the *aziends* term. Through his paper *Tratto del modo di tenere il libro droppio domestic col sue essemplare*, it is who introduces in practice the complex accounting items being also who makes the difference for the first

[1] http://comptabilites.revues.org/76

time between balance and balance sheet. The balance sheet is in fact a summary of all the account balances.

In 1682, Bertrand Francois Barreme through his paper *"Livres de comptes faites"* introduces the concept of balance sheet flier or *air balance sheet*, ie an balance sheet outside of a register, on separate sheets.

A milestone in the accounting regarding the content of the balance sheet is Mathieu de La Porte (1685), that establishes in 1685 the asset components (Doit) and of passive (l'Aooir) of the balance sheet, components with which is known to nowadays. The idea of establishing to the balance sheet a tool role of highlighting the mathematical expression between the obtained results in report with the capital employed comes to the authors Eugene Leautey and Adolphe Guibault in their paper *"La sciences des comptes"*, considered as those who have established to the balance sheet a fixed structure.

In the Netherlands, after Louis the fifteenth conquers a part of them, after the battle from Fontenoy from 1745, the Benoit – Marie Dupuy is responsible to handle by the incomes taken from these territories. Thus after an inspection of the areas concerned Dupuy introduces a "statement of balance sheet" (Legay, 2010)[1] for a monthly reporting by the French Ministry of resort in orders to manage very efficiently of the receipts and payments (figure no. 1). Even if this extracted balance sheet contains elements specific of an income statement, in the conditions of cash accounting, it can be considered a significant step in the accounting evolution of the balance sheet concept.

In the Romanian Principalities only after 1800 emerged the first papers in which the accounting as techniques is taken from the writings of German and French. For example, in Iasi in 1917 appeared the paper in Greek *"Didascalia"* with the first accounting rules, and in Brasov, in 1837, Emanoil Ion Nechifor systemized in *"Commercial Code of Laws"* the practice from the accounting domain as it has evolved from the "codices of storehouse" to the forms of balance sheet after the Venetian method taken from the European literature and especial from the German one. Thus, through "Commercial Code of Laws" E. I. Nechifor supports the idea of annual preparation of the balance sheet, as instrument of knowledge of the "state of asset and capital" but and of financial result. Seven years late, in 1844, Dimitrie Jarcu by publishing his paper *"Doppia Skriptura"* it actually translates in the book of J. Jaclot *"La tenue des livres enseignee en vingt et une lecons"*.

The first accounting course (Ionaşcu, 1997, p. 187), in the true sense of the word, published in our country, is that of Theodor Ştefănescu with the name "*Double – entry accounting course*", which was published in Bucharest in 1873. Th. Ştefănescu sees in balance sheet a *fair mirror* of the past and a *safe guide* of the

[1] http://comptabilites.revues.org/156.

future "*a summary overview of the inventory meaning of the assets and liabilities situation of an enterprise and the operation through which a trader confronts its assets with its liability, pursuing the accurate accounting punctuality the result obtained during the year*" (Ştefănescu, 1881, p. 372).

The personification of the balance sheet, as being a general accumulation of the debtors in asset and a general gathering of the creditors in liability, is made in Europe in 1898 by L. Barrachin through his paper *"Compatibilite personelle"*, through which the final results of the enterprise wasn't highlighted. Later, in 1919, Edouard Julhiet by his paper *"Course de finance et compatibilite dans l'industrie"*, established the need that the balance sheet to be closed after the inventory in the shortest time from the end of the financial year, to provide an accurate information about the entire activity of the enterprise.

In Iasi, in 1901, the Professor Constantin Petrescu, in his paper "Accounting and administration", believes that the balance sheet *is "the situation of the accounts of accounting that after agreeing with the findings of the inventory shows the economic position of the lease owner, as well as and the result of the closed exercise"*. Thus, Petrescu C-tin insists on two important characteristics that the balance sheet must meet them regarding the clarity and sincerity.

The German accounting school is represented by the professor Schmalenbach (1908 – 1953), who develops and refines the dynamic theory on the balance sheet through his paper *"Dynamiche Bilanz"* (which has known until 1953 eleven editions) and by the professor Osbahr (1918), subsequently sustained by the Nicklich (1920) in his theory on the static balance sheet.

The Professor Spiridon Iacobescu in his works published after 1923, including the volume III of the course *"General and trade accounting"*, insists on the definitive patrimonial situation through the presentation from accounting perspective both the asset and liability of the patrimony, together with the results of the period. In 1927 are published in Paris a series of papers in the accounting domain through which to the balance sheet is assigned an important role in the financial analysis (L'Quisnot[1]) to highlight *"the situation of a society",* through which the balance sheet expresses twice the same capital (A. Calmes[2]), an through which to the balance sheet is established the own equation[3] A= P + C (Ed. Folliet[4]), but and a role of information both for the owners of the enterprise, and for third parties concerning the economic and financial situation of the company.

[1] According to the paper „Administration financiere – Methodes comptables et bilan/Financial Administration - Accounting methods and balance sheet".
[2] According to the paper „La comptabilite industrielle/The accounting industry".
[3] A- Asset, P – Liability (Pasive), in the sense of debts to third parties and C – Capital.
[4] According to the paper „Le bilan dans les societes anonymes au point de vue juridique et comptable/The balance sheet in the anonymous societies from the legal point of view".

The Professor D. Voina, in his paper *"General Accounting"* published in 1947, believes that the balance sheet includes *"the economic and legal situation of an enterprise at a given time"* of which are highlighted the asset elements and the liability elements in summary under the form of account, but also interim (Voina, 1947, p. 293). At his turn I. Evian, in the same year 1947, in his paper *"Unitary balance sheet of the enterprise"*, sustains the idea that the balance sheet is *"an instrument of knowledge of how evolved from year to year the structure of the wealth and capital, as well as and the results"* (Evian1947, p. 12).

It is interesting and the opinion the Romanian professor C. G. Demetrescu, with outstanding contributions in the field of accounting, through which sustains that the balance sheet *"as situation under accounting form of the patrimony, contains what is analytical an inventory, with the difference that in inventory, excepting the value, we have specified and the quantity of the patrimonial elements"* (Demetrescu, p. 329).

Nowadays, the main task of the accounting of an economic entity is to provide to the external and internal users information about the financial situation and the level of performance achieved by this entity. To achieve this task, the accounting information system from an entity accesses, collects, generates, processes, deposit and supplies data and information from accounting perspective under different forms of presentation, either in classic format or in electronic format. If we watch from accounting perspective, the balance sheet is the accounting document with the highest degree of abstraction, placed on the top of the informational pyramid of the accounting as it is observed in Figure 2.2.

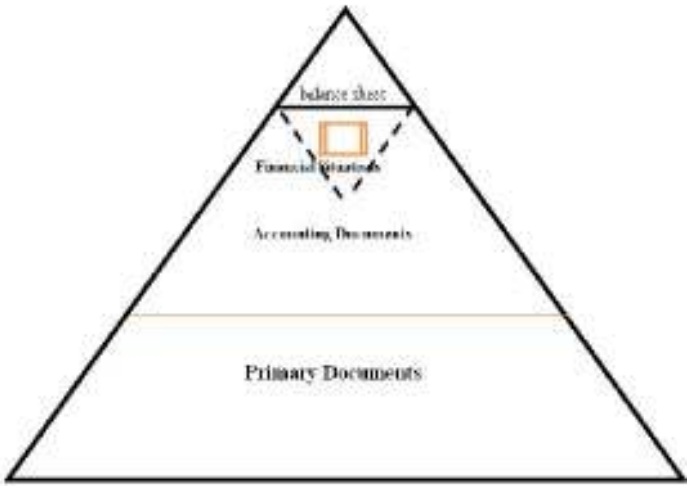

Figure 1. Informational scaffolding of the accounting

2. Theories of the Balance Sheet

From conceptual point of view, over time, for the balance sheet there were formulated different definitions by renowned specialists from accounting domain. Starting with 1918 there were made even theories of the balance sheet, that were proposing to explain the purpose of the balance sheet and not to base its preparation technique of it, among which we exemplify: the theory of dynamic balance sheet, theory of the static balance sheet, theory of the integral balance sheet, theory of the golden balance sheet, theory of the nominal balance sheet, theory of the eudynamic balance sheet, theory of the pagatoric balance sheet, theory of the balance sheet's reality. All these theories proposed to explain the purpose of the balance sheet and depending on this purpose "*to substantiate its contents and how to assess this conten*t" (Petris, 1998, p. 383).

To understand how it evolved the concept of balance sheet, we will briefly each of the above theories.

The theory of the static balance sheet is part of the category of monist theories and was formulated[1] by the German teacher *H. Nicklisch* in his paper *Wirtschaftliche Betriebslehre* (1922). According to the static approach, the balance should provide the image when drawing the structure and situation of wealth and capital of the company. Regarding the result, it was determined through the *Profit and losses* account. The professor R. Petris underlines in particular that in the static optic the assessment of the elements must be made at the cost/purchase price, which for assets means brute values in asset and corrections/adjustments in liability. The main proponents of this theory were Friedrich Leitner and Mainfred Berliner. From this theory of the balance sheet we identify as important components the patrimony (assets, debts and capitals) and the capital of the company at gross values.

The theory of dynamic balance sheet is part of the monistic theories and was founded by the E. Schmalenbach since 1906 in his magazine "*Zeitschrift fur handels wissenschaftliche Forschung*",, because in 1919 to be published the book "*Grundlagen Dynamischer Bilanzlehre*". The only purpose (Petris, 1998, p. 384) given to the balance sheets, was to compute the result, but in a continuous manner, and on its components to highlight how is developed and act the forces from the company. Thus, in the dynamic balance the means and resources were considered transitional jobs (Demetrescu, pp. 330-331), they being intended to be modified from a period to another. Regarding the assessment base, it must be unitary for the same category of values and constant in time to ensure the comparability of results,

[1] Professor M. Ristea sustained the idea that the static theory of the balance sheet would be developed by Walter le Coutre (see Ristea, 1989, p. 41). After a careful review of the literature in the field we think that Walter le Court it isn't the one who developed this theory, him being the promoter if the idea … in accounting.

but and on the analyses in dynamic of the means and resources. The main advocates of the theory of dynamic balance sheet are Mahlberg, Wald and Heplenstein

Note: Means and resources. The assessment base: constant criteria

Eudynamic balance sheet theory is also a monistic theory being in fact a development of the dynamic theory by the H. Sommerfeled in 1936 in its work "Eudynamische Bilanzlehre". The key word of this theory is the *prudence* in assessment which leads to assessments of the assets at safe and achievable values. Regarding the calculation of the result, there were considered reliable only those sure revenues (excluding those sales on credit) to which there were brought adjustments related to the effective losses and probable losses induced by eventual potential risks, such as the inflationist/ deflationist one.

Pagatoric balance sheet theory, as the eudynamic theory, is presented as a monistic theory developed from the dynamic on by **E. Kosiol** as a natural continuation of the theory of pagatoric accounting. This theory established to balance sheet the role of *total determination of the result* after the base formula Total receipts – total payments. In line with the basic concept of the pagatoric accounting (*"pagare"* meant *to pay* in Vulgar Latin), at receipts it was taking into account and by what was representing the exploitation claims, while the financial lending operations of and repayments were considered neutral, and therefore were not taken into account, and the operations that were supposed anticipated revenue and expenditure were taken into account at anticipated payments and expenditure.

The theory of organic balance sheet is a dualistic theory, because it established two basic purposes, namely: establishing the results and knowledge the structure of the structural components of the resources and means. The theory was launched by **Fr. Schmidt** in 1921 in his paper with the name "*Die organische Bilanz im Rahem der Wirtschaft*", through which was sustained the need to calculate the results and in balance sheet to be used the market value, through relating to the resupplying price, which leads to the calculation of the real result as a difference between the selling price and resupplying one. In this way the company was organically linked to its specific market and depends in its results by the existent market conjunctures. The professor Schmidt was sustained in this theory by specialist such as: Hauck, Niderauer and Pape.

The theory of the integral balance sheet or of the total balance sheet was developed by **W. Le Coutre** starting from the static theory of the balance sheet. Thus, through the balance sheet it must be put in highlight the relation of the company with the third parties and with the entrepreneurs concerning the capital made available, at the earning achieved and wealth exploited. Essentially, such a balance sheet pronounced with technical character must offer information about

exploitation on four components, and namely: wealth and capital, dever, expenditures and revenues and profit or loss.

The theory of the gold balance sheet is the result of the hyperinflationary periods after the First World War, when the balance sheet could no longer fulfill the purpose for which it was drawn. The disadvantages of the price increases were making felt the presence on several important levels, namely: the one of losing value for the depreciation fond and the reserves already set up and unused, the one of the relation with the owners of capitals, especially on the line of fictitious dividends, etc and of changes between partners/shareholder.

It was imposed since 1923, the legal obligation of preparing a balance sheet in constant currency for the countries facing with high inflation, countries were the wages were paid three times per day, including Germany, Poland, Hungary (reader Petris, 1988, p. 387). The promoters of this theory are the professors E. Schmalenbach, W. Prion, Fr. Schmidt, Sp. Iacobescu, V. Slavescu, V. M. Ioachim. The essence of this theory consisted in converting the value of the balance sheet items expressed in current currency at the date of preparing the balance sheet in gold value, taking into account by the report between that currency and gold standard, without taking into account the fluctuation of the gold price caused by various factors.

The theory of the nominal balance sheet was developed in 1928 through the paper "*Einfuhrung in die Privatwirtschaftslehre*" at Nuerenber by the Whilhem Rieger and supported even by the E. Schmalenbach in 1936 torugh the paper "*Dynamische Bilanz*". The central idea of this theory consisted in the fact that the balance sheet represented the expression of some intermediate settlements, with the exception of the balance sheets ended at liquidation fusion, selling, occasion with which is total settled all the operations that generate preliminary revenue and expenditure. In other words this theory focuses on converting the asset into cash and of liability in immediately sources.

The theory of balance sheet reality is based by the Professor D. Rusu in his studies after 1967 and later systematized in his paper *"Bases of Accounting"* (Rusu, 1980, pp. 244-245). The essence of this theory consists in seeing the balance sheet as a summary calculation that allows seeing from a single glance the *economic and judicial situation of the company,* through the means, of the own resources and foreign ones an finally the result of the period.

In other words, the balance sheet must be an integral instrument to view all of the problems and phenomena both from economic perspective, and from judicial perspective. The professor D. Rusu insists on the multiple function of the balance sheet, of control, of analysis and of guidance of the company's activity based on some real data. The reality of the data is assured by the accounting methods and techniques applied to the processes and phenomena from the accounting perimeter

of the company, such as: adequate calculation method, inventory methods specific to the domain, highlighting the expenditure on phases of the economic circuit, correct assessment in accounting.

Theory of multiple balance sheet was developed by Professor M. Ristea and it was based on the fact that the balance sheet was putting into practice a double representation of the patrimony, it becoming *"a global and structural model, a model of state and motion,..., a model based on the open and management economic calculation a model of reflecting of control and prediction, a model based on the cost of production and reproduction of the heritage"* (Ristea, 1983, pp. 95-97) (Ristea, 1989, pp. 52).

In our opinion we consider that this theory is a hybrid one with a high degree with redundancy with other theories, but especially with the one of the reality developed with about 20 years before, by the professor D. Rusu from Iasi. In addition, from structural point of view, as we will see in the following paragraph, table nr…, this theory is a unfortunate combination for the accounting of the twentieth century, between the trial balance and balance sheet.

Besides the theories already presented the literature in the field (Demetrescu, 1972) (Petriș, 1988) (Robu) reveals and a number of theories such as:

a. *theory of the financial balance sheet*, which was developed by Ernst Walb in 1966 and that derives from the dynamic theory of the balance and that emphasizes the necessity of real reflecting of the capital starting from a purchase value at which is added and the subsequent oscillations;

b. *the theory of profitability calculation*, which was developed by M.R. Lehmann and insisted on the idea of assessing at the current price of the components from the balance sheet, including of the capital. Within the balance sheet, Lehmann adds and the evolution of the receipts and payments between two successive balance sheets, which is an idea taken up in the international normative referential;

c. *the theory of projection balance shee*t, which was developed by Wolfram Engels in 1962 and which gives to the balance sheet of function of perspective by using some standards in the domain;

d. *the theory of the synthetic balance sheet*, which was developed by Horst Albach in 1965 and that emphasizes the role of element of clearing of the parties of benefits made during the balance sheet period.

e. *the theory of analytical function of the balance sheet* was developed by Wolfgang Stutzel, who believes that the amounts appear in balance sheet by counting (inventory) through legal operations (trading) and by assessment (the ones that weren't the subject neither of the inventory nor of trading). Stutzel insists with

predilection on the necessity of real establishment of the wealth by assessment, so that the creditors can know the real state of the company.

f. *the theory of multiple whole goals*, that was developed in 1969 by E. Henien and through which it was attributed to the balance sheet the main purpose of ensuring to take some optimal decisions by the managerial tram of the company. At this main purpose with static character it was completing with a dynamic one, ie with a supplementary component called balance sheet of movements, through which were confronting the provisions with the achievements in order to determine the deviations. This dynamic component would be destined to cover several purposes of management nature.

The literature of specialty highlights different criteria of grouping the theories about the balance sheet, including: the criterion of the purpose (mono, dual or multiple), the criterion of the economic content and of the way of organization of the data in the balance sheet, the criteria of assessment methods (with one price and several prices). For our purpose we considered necessary to enumerate them and briefly introduce on the main theories and no to approach the doctrinal side of those.

3. Forms of Presenting the Balance Sheet

Over the time the concept of balance sheet was used to gain an overview on the whole, as *"a model of synthesis in money expression at some point of the relation of balance between the asset and liability of the heritage"* (Ristea, 1989, p. 24), but and with components for assessing the financial result as a part of the heritage situation. In this respect the basic relation of the model of balance sheet is:

Assets – Obligations = Net assets

We mention that over time each balance sheet theory emphasized a certain basic relation but and a structure afferent to the concept of balance sheet. In the following table we make a synthetic presentation of the main models and relations of balance on the most representative theories of the balance sheet, systematized by the professor M. Ristea in two papers of his published in Academy of Socialist Republic Romania Publishing House (Ristea, 1983, pp. 95-97).

Table 1. Presentation forms of the balance sheet on balance sheet theories

Theory	Asset	Liability
Static theory	1 Fixed assets 2 Circulating assets 3 Loss	1 Own sources 2 Obligations 3 Profit
Dynamic theory		
	1 Payments that have not yet become expenditure 2 Payments which have not yet become revenue	1 Expenditure that have not yet become payments 2 Revenues that have not yet become results or benefits

Theory	Asset	Liability
	3 Economic results of benefits that have not yet become revenue 4 Economic results of benefits that have not yet become expenditure 5 The balance of cash 6 Result – loss	3 Revenues that have not yet become payments 4 Expenditure that have not yet vet become results or benefits 5 Own sources 6 Result – profit
	1 Expenditure paid in the respective period 2 Expenditure paid in the previous period 3 Expenditure paid for the future period 4 Total expenditure 5 Result – profit	1 Revenue collect during the respective period 2 Revenue collected during the previous period 3 Revenue collected during the future period 4 Total revenue 5Result– loss
Eudynamic theory	Fixed assets Circulating assets Substance threatened Loss	Own sources Obligations Substance threatened Profit
Organic theory	Current account	Own sources Modification the value of goods Profit
Patrimonial theory	I. Property values II. Debtor people III. Losses IV. Values in payments and other records	I. Net pecuniary rights II. Obligations III. Benefits IV. Owners of possessions and other records
Economic theory	Fixed wealth Circulating wealth	Total own capital Foreign capital
Nominal theory		
	1 Potential revenue (preliminary) 2 Negative result	1 Potential expenditure (preliminary) 2 Positive result
	Asset available at dissolution, liquidation, sale Negative result	Liability outstanding at the dissolution, liquidation, sale Positive result
Pagatoric theory	Cashing on types Sold of unit's commitments compared to third parties at the end of year Negative financial result	Payments by destinations Sold of unit's claims at the end of the period Positive financial result
Theory of financial balance sheet	Financial fixed assets of the funds	Sources of financing of the funds
Theory of perspective calculation	Inputs of goods, services and cashing expected to occur in the following period	Output of goods, services and payments expected to occur in the following period Positive sold.
Theory of forecasting	Standard assets	Passive standard

Theory	Asset					Liability				
balance sheet										
Theory of profitability calculation	Fixed and circulating asset, assessed at the price of the day Assets concerning the benefits, of which financial mean					Own and foreign existent liability, assessed at the price of the day Positive financial result				
	Expenditure: Unfavorable sold from reassessment The remaining of costs, of which payments					Revenue: Favorable sole from reassessment The remaining revenues, of which receipts				
Theory of multiple balance sheet	Asset	Initial sold	Turnover		Final sold	Liability	Initial sold	Turnover		Final sold
	Fixed and circulating funding		D	C		Funding from own, borrowed and foreign financial sources		D	C	
	Expenditure on types					Revenues by source of formation				
	Losses		X	X		Benefits		X	X	

Today we can speak of a tradition regarding the organization of the positions in the accounting balance sheet on two recognized geographical areas of accounting. The Continental Europe has opted for a increasing sorting of the liquidity degree of the assets (Tugui, 2002, p. 34), while in the North America has opted for a presentation of the assets in the decreasing order of the liquidity degree afferent to the component elements.

Regarding the balance liability, it is ranked by the degree of chargeability of the funding sources, ascending in Continental Europe and descending in North America. In the lower table we present these balance sheet structures on the two traditional areas (Stolowy, Lebas & Langlois, 2006, p. 66).

According to the Fourth Directive – the balance sheet is a component of the annual accounts together with the profit and loss account and annexes. Regarding the presentation form of the accounting balance sheet, the Directive, in Article 9[1], highlights the account type of it, as we present in the table below.

[1] 4th Council Directive of 25 July 1978 at the link http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31978L0660:EN:NOT

Table 2. Presentation forms of the accounting balance sheet in France after 1990

Asset	Liability
A. Subscribed unpaid capital B. Constitution expenditure C. Fixed asset D. Circulating asset E. Regularization accounts - Asset F. Loss of the exercise	A. Own capital B. Provisions for liabilities and charges C. Debts D. Regularization accounts - Passive E. The benefit of exercise

The Anglo – Saxon countries prefer the presentation as a list of the accounting balance sheet, such as it is structured through the 10 article from the Fourth Directive of the EEC Council, establishes the following structure:

Table 3. Presentation forms of the accounting balance sheet in France after 1990

A. Subscribed unpaid capital B. Constitution expenditure C. Fixed asset D. Circulating asset E. Regularization accounts - Asset F. Current debts G. Circulating assets/Net current debts H. Total asset minus Current debts I. Debts to be paid over a period longer than one year J. Provisions for risks and expenditure K. Regularization accounts - Liability L. Capital and reserves

At international level, the *General Framework for the Preparation and Presentation of the Financial Situations*, from within the International Standards of Financial Reporting, sets as the *"objective of the financial situation to provide information about the financial position, performances and changes of the company's financial position, that are useful to a broad scope of users in making economic decisions"*.

4. Conclusions

Some authors consider the balance sheet as a summary of the repeated equalities of change, which in their totality get to present the integral structure of the heritage, and others see in balance sheet the summary of inventory presented in account form. The theory of balance sheet demands that the set of problems and phenomena to be considered integral, whether they are of socio – economic nature, whether they have legal character.

The balance is a system that represents the correlation between the economic means and constitution resources of these, in a relation of balance between asset and liability, provided through financial results – profit or loss – obtained in the reference period.

In the market conditions or competitive, the data contained in the balance sheet can provide a comprehensive and effective imagine over the economic and financial situation of each economic agent. Such information is equally useful for both the company itself, and for third parties (represented by suppliers, clients, banks, investors, competitors and state administration). The periodic preparation of the balance sheet as being the state at some point of the company's situation is stated in all the countries in the world.

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Behavior Analysis (Motion) of the Prices before and after Applying of Value Added Tax (Vat) in Kosovo

Ramadani Kemajl[1]

Abstract: This paper contains the analysis of price movement for the year of 2000 until the introduction of value added tax in Kosovo (1 July 2001), and after applying of the VAT, where will be included sec half of year 2001 and complete year of 2002. Also the price movements will be analyzed for the year 2008 and 2009 since is known that scale of taxes of added value has been increased from 15% to 16%. 16% norm has been being applied from 01.01.2009. During the analyses of price movements will be given special importance issues that have substantial effects of bring specific conclusions. In this paper will be analyzed also the cause of price increasing and decreasing in Kosovo in the periods mentioned above.

Keywords: behavior analysis; value added tax; Kosovo

JEL Classification: G01; G13; G14

1. Introduction

Value added tax is a form of taxation by which taxable value that the seller has added to the purchase price, sales, production and services taxed at each stage of the cycle of circulation. The tax base of this tax is the difference between selling price and the supplier price. So the value added tax is a tax on consumption. (Daliq, 2008, p. 280)

One of the conditions states must meet to become a member of the European Union is obligated the introduction of this tax (VAT) on their tax system VAT is spreading very quickly, as in many infectious diseases other countries. Thus, in the 70s of the twentieth century this tax in its tax systems have introduced the 28 states in the 80 - 48 countries in 90 years more than 100 countries.

This number does not end with that, but growing every year, therefore, according to Mark Bloomfield and Margo Thorning, not only the VAT tax is really simple, but it is the most popular tax in the world. (Williams, 1996)

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It is thought that in terms of taxation, the end of XIX century and first half of the twentieth century is characterized by the income tax on income, and VAT is the biggest innovation in the field of taxation in the last decades of the last century (Shoup, 1989, p. 250).

2. Oscillation of Prices, in Kosovo in the Period 2000/2009

Consumer Price Index (CPI) is a relative indicator which shows the changes or the movement of retail prices for products and services and services consumed by households in the period of time, involved in groups and subgroups, classified according to the nomenclature called the International Classification of individual consumption by destination (COICOP) (SOK, Jul 2009, p. 1).

This statistical parameter has a special significance for the economic, financial, country, financial policy development, measurement of living standards, harmonization of personal income, trade flows, etc.

Consumer Price Index (CPI) is constructed according to European standards and methodologies and these data regularly used by local and international institutions. Statistical Office of Kosovo (SOK) consumer price index (CPI) began to publish in September 2002. Consumer prices have started to gather in May of 2002, which is considered the base month. CPI is calculated by taking into account the observation of price movements of various commodities were grouped and given different weights.

At first we analyze the price movement 2000-2008. And we will continue with the analysis of price movement for the year 2000 to the application of value added tax in Kosovo (1 July 2001), and after the implementation of VAT in Kosovo, which will include the second half of 2001 and 2002 in its entirety. Also, the price movement will analyze for 2009, considering that the tax rate of VAT in Kosovo increased from 15% to 16%, which rate (16%) began to be implemented on January 1, 2009.

When analyzing price movement we should note two issues that have substantial impact on the conclusions should be taken:

- Less than one has to do with the availability of data and their source. Given that the Statistical Office of Kosovo has begun the publication of the CPI as of May 2002, the 2000/2001 period and the time period January-April 2002, before and after implementation of VAT. The data is reliable in this respect seem to be those published by the Ministry of Economy and Finance (in cooperation with the Central Fiscal Authority) in Monthly Macroeconomic Monitor, (Daliq, S.et.al., 2008).

- Under the two has to do with the quality and comparability of these data. Unlike the CPI, calculated by SOK based on data collected on a regular basis for a large number of articles, the price index published by the MEF includes a smaller number of items.

The data from the table and chart below show a significant increase in prices (index 128.26 in December 2008) throughout the postwar period, despite the fact that this increase was not uniform from year to year. Secondary period is characterized by two years of high growth of prices (2001-8.76% and 2007 - 10.50%), two years with a lower rate of price increase than the previous two years (2000 - 3.92% and 2002 - 3.82%), four years had the lowest rate of price increase (2003 to 0.50%, 2005 to 0.70%, 2006 - 1.10% and 2008 to 0.50%) and one year we reduce price (2004 - with negative rate of 3.80%).

Table 2. Increase in prices (index 128.26 in December 2008)

Year	Index (January 2000 = 100)	Annual percent change
2000	103.92	3.92
2001	113.02	8.76
2002	117.34	3.82
2003	117.93	0.50
2004	113.45	-3.80
2005	114.24	0.70
2006	115.50	1.10
2007	127.62	10.50
2008	128.26	0.50

3. Oscillation Price Prior to the Implementation of VAT

Based on macroeconomic data from the Monthly Monitor (MMM), 2000 is characterized by low-price increases of 3.9% (monthly rate of increase/decrease the price for January 2000 is not taken into account for the lack of data). As seen from the table and graph (below), the year 200 was characterized by large swings in the monthly rate of price movement, and the discount of 2.95% in March and 31.2% increase in December.

Table 2. Macroeconomic data from the Monthly Monitor (MMM), 2000

YEAR	MONTH	Index (January 2000=100)	Annual percent change
2000	January	100,00	-
	February	98.69	-1.31
	March	95.77	-2.95
	April	96.02	0.26
	May	97.38	1.42
	June	98.22	0.86
	July	98.10	-0.12
	August	98.73	0.46
	September	99.73	1.02
	October	99.83	0.10
	November	101.57	1.74
	December	103.92	2.31

The price rise has continued with increased intensity during the first half of 2001, before the implementation of values added tax (VAT), resulting in one of my high annual rates of prices during the post war period this level of 6.95% (June 2001 or December 2000).

As seen from the table the first half of 2001 is characterized by a continued increase of prices in each month compared with December 2000. The highest increases have in May, to 5.64%, and June, 6.95%. This shows that the highest increases in prices have existed in the past two months before the application of VAT. Oscillation prices in Kosovo in the period of before implementing of VAT, where period inclusive January 2000 – June 2001, rising the price is too high, where the index is 111.14% (June 2001, January 2000), an increase of 11.14%.

The reasons for these increases are manifold, but we will mention a few:

- Increased prices in this period more are imported, unfortunately it imports most of the items, and Kosovo has extremely high import prices. This support with the data that the imports share of final Consumption of households in, in 2004 (44.6%), 2005 (46.6%), 2006 (47.7%) and 2007 (49.6%) (SOK- Gross domestic product, 2004-2007, page 10);
- Due to fear the application of VAT, this was due to ignorance of the functioning and lack of proper education implementers of VAT;
- Psychological aspect;
- Speculative aspect.

Table 3. The imports share of final Consumption of households

Half of the first year	Month	Kosovo		Eurozone	
		IND. (December 2000=100)	Annual change on %	IND. (December 2000 = 100)	Monthly Annual change on %
2001	January	102.74	2.74	99.81	-0.19
	February	102.91	0.17	100.09	0.28
	March	104.16	1.21	100.65	0.56
	April	103,86	-0.29	101.30	0,65
	May	105.64	1.71	101.77	0.46
	June	106.95	1.24	101.96	0.18

From the above table it is evident that in the first half of 2001 prices have increased each month compared with December of 2000 in Kosovo, as well as in Euro zone (Date from Eurozone, Eurostat). However, this price increase is significantly higher in Kosovo, which is 6.95%, than in the Euro zone, where growth was only 1.96%, which means that in Kosovo in the first 6-month period of 2001, prices increased by 4.9% more than in the euro area countries.

4. Oscillation Prices after VAT Implementation

Obviously that any conclusion on price movement during before implementations of the value added tax should be drawn with reservation, given the different economic developments each year and the lack of reliable data. We here will do the analysis of price movement for the second period of 2001, when he started the application of VAT (1-July - 2001), and for 2002, which year is the first year after application VAT.

As seen from the table and graph below, the second half of 2001 is characterized by:

- Increased price almost invisible for the second half of 2001 and this increase was only 1.69%. During this 6-month period in two months (August and September 2001) is decreased (-1.38% and -0.17%), while in four other months have increased, in July (0.41%), October (0.07%), November (0.50%) and December (1.69%).

Whereas, if you look at price trends in the second half of 2001 in Kosovo, it is obvious that raising the price is much lower than in the first half of this year, which is 1.69% over that part, and in compared to raising prices in the euro area, is higher by 1.60% in the Euro zone, where growth was only 0.09%.

The data published by Euro stat show clearly that its impact on the monthly trend of rising prices has been between - 0.27% in July 2001 and 0.65% for the month of April was of that year.

Euro zone CPI Index is expressed through the so-called MUICP (Monetary Union Index Price of Consumer Prices). From this we can conclude that the increase in prices in Kosovo application of VAT has not had quite an impact.

Although the experiences from other countries indicate that in the initial application of this tax is associated with immediate price increase, as a reflection of tax payers, tax effects to convey to the consumer. International Monetary Fund (IMF) has done research in 35 countries where the comparison of price movements in the first two years and two years after the application of VAT.

These researches have shown that the implementation of VAT has caused the following effects (Daliq & Nesic, Nr. 2/96, p. 220):

1) the immediate establishment of prices in seven (7) states;
2) increase the acceleration of inflation in five (5) states;
3) the immediate establishment of prices has been due to increasing the speed of the consumer price index in (1) state;
4) For the 22 countries research has shown that the application of VAT has had little or no impact on price changes;
5) In Croatia, prices have risen by 2.4% in January 1998 (introduction of VAT has started on 1.01.1998), after that prices have stabilized and inflation that year was 5.4%. In 1996 inflation in Croatia was 3.4%, 1997 - 3.8%, while in 1999 - 4.4% (EBRD, Transition report, London, 2003).

From these data indicate that in Croatia in the four years mentioned above inflation has been higher in 1998, started implementation of VAT.

Table 4. The data published by Euro stat, period 2001

First of the half year	Month	Kosovo		Eurozone	
		IND.(June 2001=100)	Annual change on %	IND.(June 2001=100)	Monthly Annual change on %
2001	July	100.41	0.41	99.73	-0.27
	August	99.03	-1.38	99.63	-0.10
	September	98.85	-0.18	99.90	0.28
	October	100.07	1.23	100.00	0.10
	November	100.50	0.43	100.00	0.00
	December	101.69	1.18	100.09	0.09

From the above table and graph that compares prices rate growth in Kosovo and the euro area for 2001, can be observed that:

- The general level of prices in Kosovo is on the general level of prices in the euro area as a result of higher monthly rates of price increases, especially in the first half of 2001;
- Monthly price changes are characterized by large swings and highlighted in Kosovo, especially in the first half of 2001, which cannot be said for the second half of 2001, when began the implementation of value – added. But in the Euro zone these oscillations are significantly lower and softer.

Year 2002 is the first year that the VAT is applied, so will do an analysis of prices in this year. The total index of consumer prices in Kosovo in 2002 reached 103.82% compared with December of 2001, which shows an increase of 3.82%. During monitoring the movement of prices in 2002 clearly observed two trends:

- The year was concluded with the general price increase of 3.82%;
- Shaking significant monthly price movements;
- Two opposite trends during the year, seen from the following table: in the first quarter coupled with rising prices, then have a price drop in five months, with the exception of May, and again last year period (September – December) is characterized by constant growth of prices.

Table 5 Movement of prices in 2002

YEAR	MONTH	INDEX (DECEMBER 2001-100)	Monthly Annual change on %
2002	January	101.14	1.14
	February	101.24	0.09
	March	102.42	1.17
	April	101.06	-1.33
	May	102.28	1.31
	June	100.74	-1.60
	July	99.21	-1.52
	August	99.11	-0.10
	September	100.95	1.86
	October	102.59	1.62
	November	103.00	0.40
	December	103.82	0.80

Price movement in Kosovo in the period after implementation of VAT which is included the period June 2001 – December 2002. In this period, we drop the price to 2.03%, which makes it concluded that:

- The implementation of VAT has no influence in raising prices, rather have a noticeable drop them from 2.03%.

5. Oscillation of Prices For 2009

Value added tax in Kosovo has started to be implemented by July 1, 2001 and chargeable at the rate of 15% on the taxable value. This tax rate is applied to the end of 2008. From a January 2009, the tax rate increased for 15% to 16%, which means increased 1%. During 2009 the price after the shaking rate increased the value added tax by 1%. The total index of consumer prices in Kosovo in 2009 compared with 2008, decreased to an average of – 2.4% (Consumer price index (2002-2009), statistical office of Kosovo, page 9).

As seen from the table and graph below, since 2009 are characterized by:

- Drop the price for each month of 2009 compared with December 2008, with the exception of December, when there is an increase only to 0.09%, the largest falls we have in the month of May (-2.1%), July (-2.2%) and August (-2.3%);

- Based on these data, we can conclude that raising the tax rate of VAT has done nothing to increase prices, as seen from the table above.

Table 6 the total index of consumer prices in Kosovo in 2009 compared with 2008

Year	Month	Index (dec.2008-100)	Monthl annual change on %	Annual percent change
2009	January	100.0	0.0	-0.5
	February	99.8	0.2	-1.2
	March	100.0	0.2	-2.0
	April	98.2	-1.8	-3.5
	May	97.9	-0.3	-4.4
	June	98.1	0.2	-4.0
	July	97.9	-0.2	-3.7
	August	97.7	-0.2	-3.0
	September	98.1	0.4	-2.7
	October	99.1	1.1	-2.6
	November	99.4	0.3	-1.3
	December	100.9	0.6	-0.1
Aver. Year 2009		98.9	-2.4	

6. Conclusion

On the basis of these data listed above, one can conclude that:

- In the before implementation of VAT have a significant increase in prices, which is 11. 14%;
- In the after application of VAT have a price reduction for 2. 03%; and
- In the building tax rate of VAT have an invisible increase prices, it is only 0.

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Mathematical and Quantative Methods

Analysis of the Evolution of the Gross Domestic Product by Means of Cyclic Regressions

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Abstract: In this article, we will carry out an analysis on the regularity of the Gross Domestic Product of a country, in our case the United States. The method of analysis is based on a new method of analysis – the cyclic regressions based on the Fourier series of a function. Another point of view is that of considering instead the growth rate of GDP the speed of variation of this rate, computed as a numerical derivative. The obtained results show a cycle for this indicator for 71 years, the mean square error being 0.93%. The method described allows an prognosis on short-term trends in GDP.

Keywords: GDP; cycle; Fourier; regression

JEL Classification: E17; C25; C65

1. Introduction

In the literature, the economic cycle designate the fluctuations which accompany the evolution of a nation or, sometimes, it simply is associated with the increasing and decreasing of an economy. Throughout history, many states were faced and have experienced economic fluctuations, most tested being the United States.

Given the complexity of economic phenomena, in practice there are as many types of economic cycles or economic fluctuations. We can say that almost any segment of the economic life is subject to the fluctuations that, sometimes, may include periods of more than a year.

Throughout history, the world economy, unfortunately, has experienced difficult periods of recession or depression during which economic activity was marked by unemployment, contractions of the monetary, financial markets, stock exchanges and other imbalances.

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AUDŒ, Vol 7, no 4, pp. 114-126

According to literature, the theoretical economic cycle is linked on the one hand, by changes in aggregate demand with all components (public consumers, private consumers, investors) or, on the other hand, of the change in supply aggregates (changes in production costs).

A more comprehensive approach to the problem of the economic cycle requires knowledge of all aspects of the market economy.

Regardless of the factors that have influenced and favored economic cycles, their approach involves different points of view.

The first analysis of the economic cycle through the prism of the phenomenon of recurrence is due to the French economist Clement Juglar, who has studied the fluctuations of the interest rate and price and on the basis of which was discovered in 1860 an economic cycle with alternate periods of prosperity and depression for 8-11 years.

Economists who have a thorough analysis of Clement Juglar's cycle and, in particular Joseph Schumpeter, have concluded that in it there are four phases: the expansion, the crisis, recession and the renascence.

Several years later, in 1878, William Stanley Jevons, in the "Commercial crises and Sun Spots" examines the phenomenon of cyclicity, trying as Clement Juglar explaining the periodicity of the economic activity. Jevons believed that such phenomena are random and crises on the basis of statistical studies, the author is of the opinion that there is a link between them and some extrinsic random variable in the economy ([2]).

At the beginning of the 20th century, another English engineer named Joseph Kitchin based on analyses of interest rates and other variables (the analysis being performed on the economies of the United States of America and United Kingdom) discovers a short economic cycle, approximately 40 months. Discovered by Joseph Kitchin the cycle has two phases: expansion and economic downturn, the transition from the phase of expansion to the slowdown by without the appearance of any crisis.

After the Great Depression in the years 1929-1933, the economists have focused much more on macroeconomic phenomena that determine the appearance of the economic cycle, looking for patterns of prediction.

Thus, in the "The Major Economic Cycles", which appeared in 1925, the Russian Economist Nikolai Kondratieff mark out an economic cycle much longer, about 50-60 years. On the basis of statistical researchs on long-term fluctuations in prices (the analysis being performed on the same economies of the United States of America and United Kingdom), Kondratieff observed periods of accelerated growth of branches of Economics, alternate with slower growth. Within this cycle, Kondratieff identified the expansion phase, the phase of stagnation and recession

phase. Without finding a universally accepted explanation, he believes that the basis of these cycles long stay technological progress, confirmed later by Schumpeter, which considers "the bunch of related innovations" that generates each cycle.

Other analysis devoted to the economic cycle have been made by Wesley Clair Mitchell in the work "Business Cycle" (1913) and "Measuring Business Cycles" (1927) in which the author discusses some methods of determination and analysis of economic cycle. Mitchell puts emphasis on the differences between the capitalist societies and the pre-capitalist, considering that a course of business would not be possible in a society pre-capitalist, but can occur in one capitalist ([1]).

John Maynard Keynes - the economist of the Great Depression, lay the groundwork for a new economic theory which reveals a close connection between consumption and investment. According to the keynesian theory and its adherents, any additional expenditure (consumption) generates an income a few times higher than the expenditure itself. This relationship between consumption and investment, known as the investment multiplier, can not produce, considered Keynes, cyclical movements in the economy, but it can lead to an upward trend.

Russian research economist Simon Kuznet, in 1930 put the bases of a cycle lasting on average, over a period of 15-20 years, called "demographic cycle" or "the cycle of investment in infrastructure". Kuznet considers that a factor that influence the emergence and evolution of an economic cycle is the demographic processes, in particular the phenomenon of migration having disturbing effects in the buildings sector.

The Austrian School sees the economic cycle through its representatives, notably to Ludwig von Mises, as a natural consequence of the massive growth of bank credit, an inappropriate monetary policy conducive to relaxing the conditions of crediting and finally the accumulation of toxic assets. Growth of loans generates, in turn, a rise in prices and a fall in interest rates below the optimum level, and the crisis occurs when manufacturers can't sell the production because of the very high prices. In the same stream of thought, Friedrich Hayek considers the phenomenon of over-investment as a factor determining the onset of a new economic cycle, while Joseph Schumpeter considers that the emergence and the onset of the economic cycle is based on the existence of investments with high efficiency carried out in a short period and a low demand for new products.

After attempts at explanation of the economic cycle from the early 1970's of Milton Friedman and Robert Lucas, the work of Finn E. Kydland and Edward C. Prescott "Time to Build And Aggregate Fluctuations" ([3]) launches real business cycle theory, the economic cycles being determined by the fluctuations in the rate of growth of total productivity of factors of production.

Over time, many economists have attempted, through analysis of available statistical data, to develop specific models of foresights of changes taking place in the economy to come to the aid of the decision-makers to act according to actual economic conditions.

2. Cyclic Regressions

Let a function f:$\mathbf{R}\to\mathbf{R}$, with f and f' piecewise continuous on $\mathbf{R}$ and periodic of period T, so $f(x+T)=f(x)\ \forall x\in\mathbf{R}$.

Considering the Fourier series associated with the function f:

$$F(x)=\frac{a_0}{2}+\sum_{k=1}^{\infty}\left(a_k\cos\frac{2k\pi x}{T}+b_k\sin\frac{2k\pi x}{T}\right)\ \text{where:}\ a_k=\frac{2}{T}\int_{-\frac{T}{2}}^{\frac{T}{2}}f(x)\cos\frac{2k\pi x}{T}dx\ ,\ k\geq 0,$$

$b_k=\frac{2}{T}\int_{-\frac{T}{2}}^{\frac{T}{2}}f(x)\sin\frac{2k\pi x}{T}dx$, $k\geq 1$ is observed that $F(x+T)=F(x)\ \forall x\in\mathbf{R}$ so S it is also a periodic function of period T

The Dirichlet's theorem (Spiegel, 1974) states that in the above conditions, the Fourier series converges to f in every point of continuity of it and to $\frac{f(x+0)+f(x-0)}{2}$ in the other points.

Considering the partial sum of order n, corresponding to the series of function F, we obtain the Fourier polynomials of order n:

$$F_n(x)=\frac{a_0}{2}+\sum_{k=1}^{n}\left(a_k\cos\frac{2k\pi x}{T}+b_k\sin\frac{2k\pi x}{T}\right)$$

It is obvious that $F_n(x)=F_n(x+T)\ \forall x\in\mathbf{R}$.

The Fourier polynomials have the property of approximating the function through one periodical with the observation that the absolute error tends to zero (due to the convergence) with the rise of n.

Due to the existence of an important number of cyclical phenomena in many scientific fields, we intend, below, to approximate their development by means of Fourier polynomials of degree conveniently chosen.

Let therefore a set of data: (x_i,y_i), $i=\overline{1,m}$ and the Fourier polynomial $F_n(x)=\frac{a_0}{2}+\sum_{k=1}^{n}\left(a_k\cos\frac{2k\pi x}{T}+b_k\sin\frac{2k\pi x}{T}\right)$. We shall determine the coefficients a_k, $k=\overline{0,n}$ and b_k, $k=\overline{1,n}$ using the least squares method.

Let therefore:

$$\varepsilon(a_0,a_k,b_k)=\sum_{i=1}^{m}\left(\frac{a_0}{2}+\sum_{k=1}^{n}\left(a_k\cos\frac{2k\pi x_i}{T}+b_k\sin\frac{2k\pi x_i}{T}\right)-y_i\right)^2$$

In order to $\varepsilon(a_0,a_k,b_k)$ take the minimum value, it must:

$$\begin{cases}\dfrac{\partial\varepsilon}{\partial a_0}=\sum_{i=1}^{m}\left(\dfrac{a_0}{2}+\sum_{k=1}^{n}\left(a_k\cos\dfrac{2k\pi x_i}{T}+b_k\sin\dfrac{2k\pi x_i}{T}\right)-y_i\right)=0\\ \dfrac{\partial\varepsilon}{\partial a_j}=\sum_{i=1}^{m}\left(\dfrac{a_0}{2}+\sum_{k=1}^{n}\left(a_k\cos\dfrac{2k\pi x_i}{T}+b_k\sin\dfrac{2k\pi x_i}{T}\right)-y_i\right)\cos\dfrac{2j\pi x_i}{T}=0,\ j=\overline{1,n}\\ \dfrac{\partial\varepsilon}{\partial b_j}=\sum_{i=1}^{m}\left(\dfrac{a_0}{2}+\sum_{k=1}^{n}\left(a_k\cos\dfrac{2k\pi x_i}{T}+b_k\sin\dfrac{2k\pi x_i}{T}\right)-y_i\right)\sin\dfrac{2j\pi x_i}{T}=0,\ j=\overline{1,n}\end{cases}$$

Noting: $A_{ik}=\cos\frac{2k\pi x_i}{T}$, $B_{ik}=\sin\frac{2k\pi x_i}{T}$, $i=\overline{1,m}$, $k=\overline{1,n}$, we can write the system in the form:

$$\begin{cases}\dfrac{n}{2}a_0+\sum_{k=1}^{n}\left(a_k\sum_{i=1}^{m}A_{ik}+b_k\sum_{i=1}^{m}B_{ik}\right)=\sum_{i=1}^{m}y_i\\ \dfrac{\sum_{i=1}^{m}A_{ij}}{2}a_0+\sum_{k=1}^{n}\left(a_k\sum_{i=1}^{m}A_{ik}A_{ij}+b_k\sum_{i=1}^{m}B_{ik}A_{ij}\right)=\sum_{i=1}^{m}y_iA_{ij},\ j=\overline{1,n}\\ \dfrac{\sum_{i=1}^{m}B_{ij}}{2}a_0+\sum_{k=1}^{n}\left(a_k\sum_{i=1}^{m}A_{ik}B_{ij}+b_k\sum_{i=1}^{m}B_{ik}B_{ij}\right)=\sum_{i=1}^{m}y_iB_{ij},\ j=\overline{1,n}\end{cases}$$

Let denote now, again, for simplicity:

$$\alpha_k=\sum_{i=1}^{m}A_{ik},\ \beta_k=\sum_{i=1}^{m}B_{ik},\ \gamma_{kj}=\sum_{i=1}^{m}A_{ik}A_{ij},\ \delta_{kj}=\sum_{i=1}^{m}B_{ik}B_{ij},\ \varepsilon_{kj}=\sum_{i=1}^{m}A_{ik}B_{ij},$$

$$\mu=\sum_{i=1}^{m}y_i,\ \nu_j=\sum_{i=1}^{m}y_iA_{ij},\ \lambda_j=\sum_{i=1}^{m}y_iB_{ij},\ k,j=\overline{1,n}.$$

The system becomes:

$$\begin{cases} \frac{n}{2}a_0 + \sum_{k=1}^{n}\left(\alpha_k a_k + \beta_k b_k\right) = \mu \\ \frac{\alpha_j}{2}a_0 + \sum_{k=1}^{n}\left(\gamma_{kj} a_k + \varepsilon_{jk} b_k\right) = \nu_j,\ j = \overline{1,n} \\ \frac{\beta_j}{2}a_0 + \sum_{k=1}^{n}\left(\varepsilon_{kj} a_k + \delta_{kj} b_k\right) = \lambda_j,\ j = \overline{1,n} \end{cases}$$

Considering the system solution a_k, $k=\overline{0,n}$ and b_k, $k=\overline{1,n}$ we have that for a given period $F>0$ and $n\geq 1$, the Fourier polynomial $F_n(x)= \frac{a_0}{2} + \sum_{k=1}^{n}\left(a_k \cos\frac{2k\pi x}{T} + b_k \sin\frac{2k\pi x}{T}\right)$ represents the best cycle approximation for the point of view of the method of least squares. We shall call F_n so determined, the cyclic regression of order n and period T.

3. The Analysis of GDP from the Point of Cyclicity

In what follows, we intend to study a possible cycle in the evolution of the Gross Domestic Product of a country.

Considering a period of m consecutive years and GDP_k, $k=\overline{1,m}$ - the real GDP in the period k, let the growth rate of GDP: $r_k=\frac{GDP_k - GDP_{k-1}}{GDP_{k-1}}$. Considering now r_k we have:

$$GDP_k=(1+r_k)GDP_{k-1},\ k=\overline{2,m}$$

The analysis of the growth rate of GDP for the US economy in the period 1793-2010 does not provide, however, relevant results. For this reason, we consider for our analysis the speed of variation of r_k.

Given a function $f:(a,b)\to\mathbf{R}$ and $x_0\in(a,b)$, let $h>0$ and the points $(x_0-h,f(x_0-h))$, $(x_0,f(x_0))$, $(x_0+h,f(x_0+h))$. The numerical derivative in x_0 (relative to increase h) is, by definition:

$$f'(x_0)=\frac{f'(x_0-0)+f'(x_0+0)}{2}=\frac{\frac{f(x_0)-f(x_0-h)}{h}+\frac{f(x_0+h)-f(x_0)}{h}}{2}=$$

$$\frac{f(x_0+h)-f(x_0-h)}{2h}$$

We then consider, the speed of variation of r_k as: $v_k=\frac{r_{k+1}-r_{k-1}}{2}$, $k=\overline{3,m-1}$.

As a result of this indicator, we obtain: $r_{k+1}=r_{k-1}+2v_k$ therefore:

$$GDP_{k+1}=(1+r_{k-1}+2v_k)GDP_k,\ k=\overline{3,m-1}$$

Let consider now, for our analysis, the Gross Domestic Product of the U.S. in the period 1792-2010:

Table 1. The Gross Domestic Product of the U.S. in the period 1792-1865

Year	GDP	r_k	v_k	Year	GDP	r_k	v_k
1792	4.58	-	-	1829	20.30	0.03836	0.03908
1793	4.95	0.08079	-	1830	22.16	0.09163	0.02211
1794	5.60	0.13131	-0.00825	1831	23.99	0.08258	-0.01205
1795	5.96	0.06429	-0.04972	1832	25.61	0.06753	-0.02587
1796	6.15	0.03188	-0.02239	1833	26.40	0.03085	-0.02524
1797	6.27	0.01951	0.00559	1834	26.85	0.01705	0.01102
1798	6.54	0.04306	0.02542	1835	28.27	0.05289	0.00633
1799	7.00	0.07034	0.00704	1836	29.11	0.02971	-0.02198
1800	7.40	0.05714	-0.01085	1837	29.37	0.00893	0.00592
1801	7.76	0.04865	-0.01311	1838	30.59	0.04154	0.00829
1802	8.00	0.03093	-0.01558	1839	31.37	0.02550	-0.01934
1803	8.14	0.01750	0.00358	1840	31.46	0.00287	-0.00147
1804	8.45	0.03808	0.01788	1841	32.17	0.02257	0.01442
1805	8.90	0.05325	0.00456	1842	33.19	0.03171	0.01357
1806	9.32	0.04719	-0.02609	1843	34.84	0.04971	0.01256
1807	9.33	0.00107	-0.02253	1844	36.82	0.05683	0.00679
1808	9.35	0.00214	0.03797	1845	39.15	0.06328	0.01220
1809	10.07	0.07701	0.02674	1846	42.33	0.08123	0.00238
1810	10.63	0.05561	-0.01593	1847	45.21	0.06804	-0.02381
1811	11.11	0.04516	-0.00801	1848	46.73	0.03362	-0.02707
1812	11.55	0.03960	0.00599	1849	47.38	0.01391	0.00651
1813	12.21	0.05714	0.00109	1850	49.59	0.04664	0.03328
1814	12.72	0.04177	-0.02464	1851	53.58	0.08046	0.03435
1815	12.82	0.00786	-0.02089	1852	59.76	0.11534	0.00068
1816	12.82	0.00000	0.00777	1853	64.65	0.08183	-0.04043
1817	13.12	0.02340	0.01830	1854	66.88	0.03449	-0.02006

1818	13.60	0.03659	-0.00214	1855	69.67	0.04172	0.00285
1819	13.86	0.01912	0.00155	1856	72.47	0.04019	-0.01831
1820	14.41	0.03968	0.01716	1857	72.84	0.00511	0.00016
1821	15.18	0.05344	-0.00074	1858	75.79	0.04050	0.03367
1822	15.76	0.03821	-0.00864	1859	81.28	0.07244	-0.01515
1823	16.33	0.03617	0.01060	1860	82.11	0.01021	-0.02733
1824	17.30	0.05940	0.00417	1861	83.57	0.01778	0.05700
1825	18.07	0.04451	-0.01199	1862	93.95	0.12421	0.02959
1826	18.71	0.03542	-0.00676	1863	101.18	0.07696	-0.05642
1827	19.29	0.03100	-0.01097	1864	102.33	0.01137	-0.02417
1828	19.55	0.01348	0.00368	1865	105.26	0.02863	-0.02863

* GDP-US $ billion 2005

Source: http://www.usgovernmentrevenue.com

Table 2. The Gross Domestic Product of the U.S. in the period 1866-1938

Year	GDP	r_k	v_k	Year	GDP	r_k	v_k
1866	100.43	-0.04589	-0.00575	1903	481.80	0.02905	-0.04336
1867	102.15	0.01713	0.04243	1904	464.80	-0.03528	0.04185
1868	106.13	0.03896	0.00505	1905	517.20	0.11274	0.03814
1869	109.02	0.02723	-0.00444	1906	538.40	0.04099	-0.04356
1870	112.30	0.03009	0.00999	1907	552.20	0.02563	-0.07455
1871	117.60	0.04720	0.02705	1908	492.50	-0.10811	0.02333
1872	127.50	0.08418	0.01876	1909	528.10	0.07228	0.05945
1873	138.30	0.08471	-0.03305	1910	533.80	0.01079	-0.01994
1874	140.80	0.01808	-0.04307	1911	551.10	0.03241	0.01802
1875	140.60	-0.00142	0.01159	1912	576.90	0.04682	0.00356
1876	146.40	0.04125	0.02564	1913	599.70	0.03952	-0.06177
1877	153.70	0.04986	-0.00469	1914	553.70	-0.07671	-0.00613
1878	158.60	0.03188	0.03340	1915	568.80	0.02727	0.10771
1879	177.10	0.11665	0.02556	1916	647.70	0.13871	-0.02599
1880	191.80	0.08300	0.00424	1917	631.70	-0.02470	-0.02424
1881	215.80	0.12513	-0.01486	1918	688.70	0.09023	0.01635
1882	227.30	0.05329	-0.04893	1919	694.20	0.00799	-0.04980
1883	233.50	0.02728	-0.03478	1920	687.70	-0.00936	-0.01549

1884	229.70	-0.01627	-0.01190	1921	671.90	-0.02298	0.03251
1885	230.50	0.00348	0.04870	1922	709.30	0.05566	0.07726
1886	249.20	0.08113	0.03458	1923	802.60	0.13154	-0.01238
1887	267.30	0.07263	-0.01176	1924	827.40	0.03090	-0.05405
1888	282.70	0.05761	-0.02199	1925	846.80	0.02345	0.01720
1889	290.80	0.02865	0.01986	1926	902.10	0.06530	-0.00691
1890	319.10	0.09732	-0.00853	1927	910.80	0.00964	-0.02689
1891	322.80	0.01160	-0.02310	1928	921.30	0.01153	0.02541
1892	339.30	0.05112	-0.03483	1929	977.00	0.06046	-0.04886
1893	319.60	-0.05806	-0.04919	1930	892.80	-0.08618	-0.06266
1894	304.50	-0.04725	0.08601	1931	834.90	-0.06485	-0.02225
1895	339.20	0.11396	0.01537	1932	725.80	-0.13067	0.02595
1896	333.60	-0.01651	-0.03540	1933	716.40	-0.01295	0.11978
1897	348.00	0.04317	0.06300	1934	794.40	0.10888	0.05091
1898	386.10	0.10948	0.01261	1935	865.00	0.08887	0.01082
1899	412.50	0.06838	-0.04226	1936	977.90	0.13052	-0.01882
1900	422.80	0.02497	-0.00758	1937	1028.00	0.05123	-0.08248
1901	445.30	0.05322	0.01323	1938	992.60	-0.03444	0.01479
1902	468.20	0.05143	-0.01209				

* GDP-US $ billion 2005

Source: http://www.usgovernmentrevenue.com

Table 3. The Gross Domestic Product of the U.S. in the period 1939-2010

Year	GDP	r_k	v_k	Year	GDP	r_k	v_k
1939	1072.80	0.08080	0.06108	1975	4879.50	-0.00213	0.02958
1940	1166.90	0.08771	0.04496	1976	5141.30	0.05365	0.02406
1941	1366.10	0.17071	0.04842	1977	5377.70	0.04598	0.00106
1942	1618.20	0.18454	-0.00350	1978	5677.60	0.05577	-0.00737
1943	1883.10	0.16370	-0.05189	1979	5855.00	0.03125	-0.02925
1944	2035.20	0.08077	-0.08745	1980	5839.00	-0.00273	-0.00294
1945	2012.40	-0.01120	-0.09510	1981	5987.20	0.02538	-0.00835
1946	1792.20	-0.10942	0.00111	1982	5870.90	-0.01942	0.00991
1947	1776.10	-0.00898	0.07670	1983	6136.20	0.04519	0.04564
1948	1854.20	0.04397	0.00193	1984	6577.10	0.07185	-0.00190

1949	1844.70	-0.00512	0.02174	1985	6849.30	0.04139	-0.01861
1950	2006.00	0.08744	0.04122	1986	7086.50	0.03463	-0.00470
1951	2161.10	0.07732	-0.02457	1987	7313.30	0.03200	0.00324
1952	2243.90	0.03831	-0.01564	1988	7613.90	0.04110	0.00186
1953	2347.20	0.04604	-0.02231	1989	7885.90	0.03572	-0.01117
1954	2332.40	-0.00631	0.01298	1990	8033.90	0.01877	-0.01903
1955	2500.30	0.07199	0.01304	1991	8015.10	-0.00234	0.00759
1956	2549.70	0.01976	-0.02592	1992	8287.10	0.03394	0.01543
1957	2601.10	0.02016	-0.01440	1993	8523.40	0.02851	0.00341
1958	2577.60	-0.00903	0.02579	1994	8870.70	0.04075	-0.00169
1959	2762.50	0.07173	0.01690	1995	9093.70	0.02514	-0.00167
1960	2830.90	0.02476	-0.02421	1996	9433.90	0.03741	0.00971
1961	2896.90	0.02331	0.01791	1997	9854.30	0.04456	0.00307
1962	3072.40	0.06058	0.01020	1998	10283.50	0.04355	0.00185
1963	3206.70	0.04371	-0.00135	1999	10779.80	0.04826	-0.00108
1964	3392.30	0.05788	0.01025	2000	11226.00	0.04139	-0.01873
1965	3610.10	0.06420	0.00364	2001	11347.20	0.01080	-0.01163
1966	3845.30	0.06515	-0.01946	2002	11553.00	0.01814	0.00705
1967	3942.50	0.02528	-0.00837	2003	11840.70	0.02490	0.00880
1968	4133.40	0.04842	0.00289	2004	12263.80	0.03573	0.00283
1969	4261.80	0.03106	-0.02326	2005	12638.40	0.03055	-0.00450
1970	4269.90	0.00190	0.00126	2006	12976.20	0.02673	-0.00457
1971	4413.30	0.03358	0.02561	2007	13228.90	0.02142	-0.01118
1972	4647.70	0.05311	0.01218	2008	13228.80	-0.00001	-0.02280
1973	4917.00	0.05794	-0.02931	2009	12880.60	-0.02632	-0.00033
1974	4889.90	-0.00551	-0.03004	2010	13248.20	0.02854	-

* GDP-US $ billion 2005

Source: http://www.usgovernmentrevenue.com

The analysis procedure will be to determine the Fourier regressions of best approximation on the interval [1794, 2009], for the data set (k,v_k). We calculate thus, for each $n=\overline{1,20}$ (number of terms of Fourier development) and $T=\overline{10,100}$ (the development period) the mean square error:

$$\varepsilon_{n,T}=\sqrt{\frac{\sum_{k=1}^{m}\left(v_k-\overline{v}_k\right)^2}{m}}$$

where $\overline{v}_k = F_n(k)$, $k=\overline{1,m}$, determining the period and the number of terms of development, corresponding to the mean square error lower. Finally we will select the period T and n for the lowest $\varepsilon_{n,T}$. In our analysis we found that for n=20, T=71: $\varepsilon_{20,50}$=0.009286 (0.93%) is the lowest mean square error. For a better accuracy of results, we will determine again the Fourier development corresponding to the interval [1939,2009], therefore for a period of 71 years and n=20.

The Fourier coefficients thus determined are:

Table 4. The Fourier coefficients for n=20 and T=71

a_0	$-1.192538\cdot10^{-03}$						
a_1	$-2.233183\cdot10^{-04}$	a_{11}	$3.103659\cdot10^{-03}$	b_1	$2.178501\cdot10^{-04}$	b_{11}	$-8.27152\cdot10^{-03}$
a_2	$4.439536\cdot10^{-04}$	a_{12}	$1.340319\cdot10^{-04}$	b_2	$4.527911\cdot10^{-04}$	b_{12}	$-9.438256\cdot10^{-03}$
a_3	$2.34559\cdot10^{-03}$	a_{13}	$-8.517535\cdot10^{-03}$	b_3	$1.434893\cdot10^{-03}$	b_{13}	$-4.030202\cdot10^{-03}$
a_4	$3.236102\cdot10^{-03}$	a_{14}	$5.9386\cdot10^{-04}$	b_4	$-1.943463\cdot10^{-03}$	b_{14}	$3.670609\cdot10^{-03}$
a_5	$2.601004\cdot10^{-03}$	a_{15}	$-5.273752\cdot10^{-03}$	b_5	$-5.831661\cdot10^{-05}$	b_{15}	$8.056044\cdot10^{-04}$
a_6	$2.778745\cdot10^{-03}$	a_{16}	$-2.599379\cdot10^{-03}$	b_6	$3.83987\cdot10^{-04}$	b_{16}	$2.648987\cdot10^{-05}$
a_7	$-4.762545\cdot10^{-03}$	a_{17}	$-2.808314\cdot10^{-03}$	b_7	$-1.958835\cdot10^{-03}$	b_{17}	$-7.070958\cdot10^{-03}$
a_8	$-9.197807\cdot10^{-03}$	a_{18}	$-1.595883\cdot10^{-03}$	b_8	$-6.166687\cdot10^{-03}$	b_{18}	$1.147\cdot10^{-03}$
a_9	$-2.676535\cdot10^{-3}$	a_{19}	$4.790776\cdot10^{-03}$	b_9	$-7.567441\cdot10^{-03}$	b_{19}	$1.169301\cdot10^{-03}$
a_{10}	$3.218776\cdot10^{-03}$	a_{20}	$-6.507447\cdot10^{-04}$	b_{10}	$-6.535201\cdot10^{-03}$	b_{20}	$1.051339\cdot10^{-02}$

Substituting in the expression of F_{20}, the values $k=\overline{1,71}$ we obtain the new values, by periodicity, of $\overline{v}_k$.

Table 5. The new values for the speed of variation for n=20 and T=71

k	$\overline{V}_k$	k	$\overline{V}_k$	k	$\overline{V}_k$	k	$\overline{V}_k$	k	$\overline{V}_k$
1	0.05714	16	0.02126	31	-0.0132	46	0.00601	61	-0.005
2	0.05809	17	0.003	32	-0.0024	47	-0.0198	62	-0.0136
3	0.03131	18	-0.0258	33	0.02405	48	-0.009	63	-0.0129
4	0.00552	19	-0.0056	34	0.01322	49	0.00841	64	0.0036
5	-0.0452	20	0.02038	35	-0.0288	50	0.0007	65	0.01294
6	-0.1041	21	0.00849	36	-0.0271	51	-0.0154	66	0.00183
7	-0.0842	22	-0.0056	37	0.0204	52	-0.0129	67	-0.0061
8	0.00821	23	0.00344	38	0.03383	53	0.00452	68	-0.004
9	0.05373	24	0.01058	39	0.00024	54	0.01403	69	-0.0143
10	0.02564	25	0.00748	40	-0.0188	55	0.00639	70	-0.021
11	0.01371	26	0.00539	41	-0.0126	56	-0.0034	71	0.0126
12	0.02792	27	-0.0016	42	-0.0138	57	-0.0005		
13	0.00128	28	-0.0113	43	-0.0091	58	0.00706		
14	-0.0375	29	-0.0088	44	0.01978	59	0.00654		
15	-0.0162	30	-0.0061	45	0.03365	60	0.00122		

otherwise having $v_k=v_s$ where $s=k-71\left[\frac{k}{71}\right]$ for k not dividing by 71 and $v_k=v_{71}$ for k multiple of 71, where [a] is the highest integer less than $a\in\mathbf{R}$.
The comparative graphs of the evolution v_k and of the new indicators after Fourier regression are:

The Fourier regression for T=71 between 1939-2009

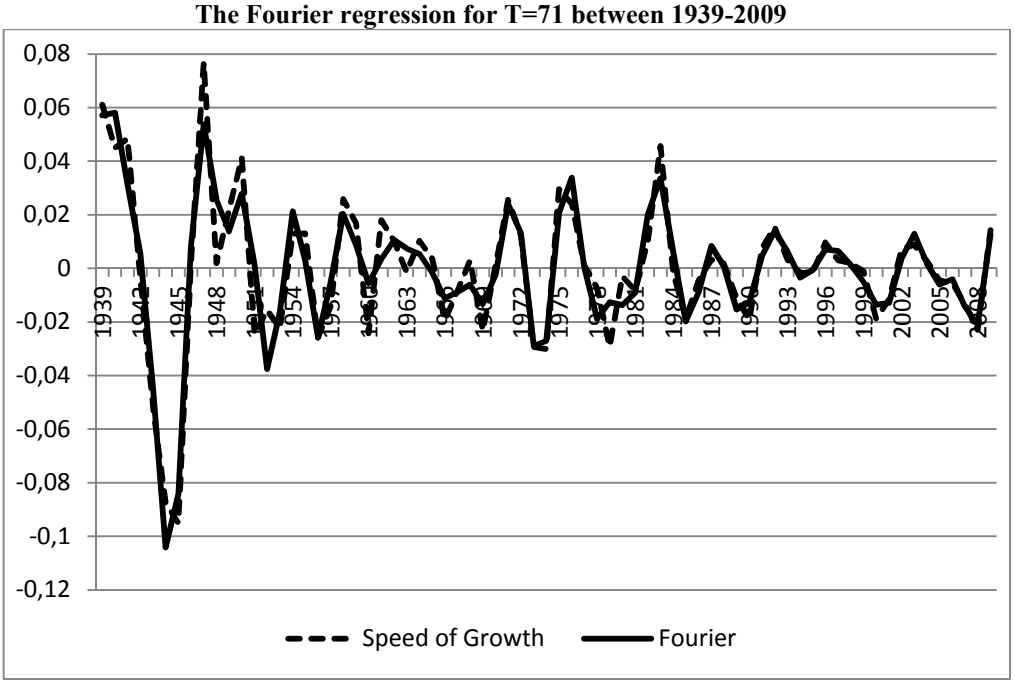

Figure 1

In annual terms, we have: $v_k=\overline{v}_{k-1938}$ for any $k\geq 1939$. The GDP's estimate is:

$$GDP_{k+1}=(1+r_{k-1}+2\,\overline{v}_{k-1938})GDP_k$$

In particular:

$GDP_{2010}=(1+r_{2008}+2\,\overline{v}_{71})GDP_{2009}=(1-0.000007+2\cdot 0.0126)\cdot 12880{,}60=13205.10$

with a relative error towards the real value of 0.33%.

Conclusions

The method of cyclic regressions used in this article is particularly useful in the situation analysis of periodic phenomena, providing a possible law of evolution. In the present case, the analysis of the evolution of GDP in the light of the speed of variation of the GDP's rate, reveals a periodicity of 71 years, the mean square error recorded being 0.93% which is a very good approximation. The method described allows, on the basis of the conclusions obtained, making forecasts, we appreciate at

the short term, due to the occurrence of factors which can change significantly the predicted data.

On the other hand, for greater accuracy of the forecasts, will be recalculated every time the coefficients of Fourier series, for the last 71 years.

It should be noted also that the method is based exclusively on the numeric data without taking account of causal factors. On the other hand, the classical models of cyclicity are based on a series of observations, but does not strictly mathematical the determination of the periodicity.

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An Empirical Study of Correlation and Volatility Changes of Stock Indices and their Impact on Risk Figures

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Abstract: During world financial crisis it became obvious that classical models of portfolio theory significantly under-estimated risks, especially with regard to stocks. Instabilities of correlations and volatilities, the relevant parameters characterizing risk, led to over-estimation of diversification effects and consequently to under-estimation of risks. In this article, we analyze the relevant risk parameters concerning stocks during different market periods of the previous decade. We show that parameters and risks significantly change with market periods and find that the impact of fluctuations and estimation errors is ten times larger for volatilities than for correlations. Moreover, it turns out that diversification between sectors is more efficient than diversification between countries.

Keywords: Model Evaluation; Portfolio Optimization; Risk Management

JEL Classification: C 52; G 11; G 32

1. Introduction

Efficient risk management and portfolio optimization are central tasks of the financial sector but are also important for private investors. In this context, asset allocation aims to share a given amount of money optimally between different assets, considering the crucial parameters of expected return and possible loss. Of particular importance is the diversification between different stock indices.

The model by Markowitz (1952) represents a milestone in development of modern theories in the area of risk management and portfolio optimization and was rewarded the Nobel prize in Economics in 1990. According to this model, any investor should put his money into efficient portfolios only, i.e. portfolios which have the smallest risk for a given return defined by the investor, or portfolios having a maximal return for a predefined acceptable risk. The risk of the portfolio is given by its volatility, i.e. the standard deviation of its returns. Correlations between the assets may decrease the risk for the overall portfolio significantly compared to investments into single assets.

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As shown in numerous works strategic asset allocation makes up for the majority of performance of an investment. Brinson/Hood/Beebower (1986) and Brinson/ Singer/Beebower (1991) quantify the influence as 90% to 94%, while Ibbotson/Kaplan (2000) give values between 82% and 88%, both demonstrating significance of strategic asset allocation. Additional factors, such as timing and strategy realization, are only of minor importance.

Reliable estimation of the relevant parameters, i.e. return, volatility and correlation, is of major importance for optimal portfolio selection as well as risk management and therefore future success of the investment. Different studies show that return is the most important parameter in the Markowitz model. Chopra/Ziemba (1993) demonstrates that, for mean tolerated risk levels, wrong return estimators have an eleven times larger impact than wrong risk estimators. Analogously, Kallberg/Ziemba (1984) and Schäfer/Zimmermann (1998) demonstrate that estimation problems in the Markowitz model are mainly related to the return.

Nevertheless, the current situation at the financial markets shifts the focus on the risk perspective. Volatilities and correlations strongly increased during the financial crisis, as reflected by increased risk numbers. Zimmermann/ Drobetz/Oertmann (2002) named this effect "Correlation Breakdown". Campbell/Forbes/Koedijk/Kofman (2008) even described this phenomenon initially as "Diversification Meltdown". Obvisiously, volatilities and correlations of different assets are positively correlated in times of crisis, and the diversification approach does not work - in particular when required to prevent losses.

In this paper, we empirically analyze the effects of changing parameters to risk figures of stock indices during different market periods. This is done by means of daily and monthly market data. To this end, the resulting risk numbers for different market periods are compared. From the results we draw conclusions on stability of diversification effects and risk estimators in classical portfolio theory. We are able to show that risks are significantly under-estimated, especially if historical mean values are used as parameter estimators. Besides, we find that the impact of fluctuations and estimation errors is ten times larger for volatilities than for correlations. Additionally, we determine how these effects influence diversification between countries and between sectors, demonstrating that diversification effects are more stable between the latter.

2. Classical Portfolio Theory

The model by Markowitz (1952) represents a milestone in development of modern theories in the areas of risk management and portfolio optimization. It assumes the existence of N assets with normally distributed return r_i for the i-th asset. Optimal

selection of the portfolio weights (ω_1, ω_2,… , ω_N) is intended where ω_i is the fraction which is invested into asset i.

Up to now, the Markowitz model is broadly used by investors to optimize portfolios and control risks. The crucial parameters for portfolio selection are the expected return of the portfolio (r_P) and the risk of the portfolio, which is defined by the standard deviation (σ_P). According to Markowitz theory efficient portfolios, which are attractive investments, should have a combination (r_P, σ_P), which is not dominated by a portfolio with smaller standard deviation for the same return or a portfolio with a larger return for the same standard deviation.

The consideration of correlation effects offers the advantage that investments into assets, which seem to be disadvantageous on the first sight, may decrease the overall risk of the portfolio. This is e.g. illustrated by a portfolio containing 80% of an asset with an expected return of 5% and a volatility of 3% and 20% of a more risky asset having an expected return of 10% and a standard deviation of 6%. This combination results in an expected portfolio return of 6%. If both assets are not correlated, the overall volatility of the portfolio is only 2.7%., i.e. the expected return of the overall portfolio is larger than the expected return of the more secure asset. Moreover, the risk is significantly smaller than for each single asset. Figure 1 illustrates the effect of different correlations and portfolio weights ($\omega_i \in [0,1]$) for both assets showing returns and volatilities of the portfolio.

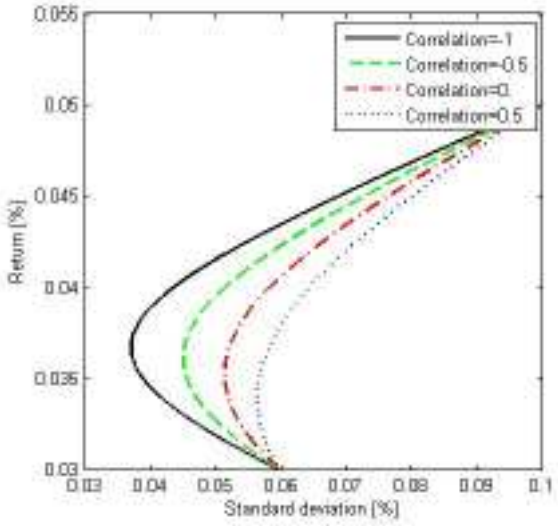

Figure 1. Efficiency frontiers for portfolios consisting of two stocks with returns and standard deviations of (5%, 3%) and (10%, 6%) for different correlations between the stocks

The assumptions within this model are that the returns are normally distributed and that the parameters of the assets, i.e. returns, correlations and volatilities, can be reliably estimated. Moreover, it is assumed that the parameters do not change during the investment period. In the previous years, the reliable estimation of parameters became significantly more difficult: On the one hand, it became obvious that correlations and volatilities depend on time so that both tend to increase when markets decrease and vice versa. On the other hand, there are strong indications that volatilities and correlations depend on each other as it is shown by Frennberg/Hansson (1993), Zimmermann/Drobetz/Oertmann (2002) and Andersen/Bollerslev/Diebold/Ebens (2001).

3. Correlation Breakdown

In recent discussions concerning correlations and volatilities in risk management and portfolio optimization, the terms "Correlation Breakdown" and "Diversification Meltdown" were introduced and describe the phenomenon that correlations and volatilities tend to increase, if the market decreases and also the other way round. Moreover, there is a strong positive relation between correlations and standard deviations. Thus, diversification effects are particularly overestimated during nervous market periods for which they are of high importance. Hence, the permanent changing pattern of market parameters complicates selection of an optimal risk strategy.

The stock market crash in October 1987 and the 2008 financial crisis revealed, that the structure of correlations reflects extreme situations on markets. In both cases correlations strongly increased to a high level remaining constantly high for a certain period.

Meric/Meric (1997) confirms this situation from a European perspective: Average correlations between 13 European stock markets increased from 0.37 before the crash in 1987 to a value of 0.5 afterwards. Rey (2000) describes similar events: Average correlations based on data from Switzerland, USA, UK, Canada, Germany, Italy, France and Japan increased from 0.40 measured from January 1973 to December 1986 to 0.55 between January 1988 and December 1999. During October 1987, the average correlation between international stock markets was, according to Rey (2000), even 0.68. A result by Longin/Solnik (1995) generally confirms that volatilities and correlations are stronger connected when volatility is on a high level.

These results make it necessary for investors to have a critical look on the idea of diversification: Assumptions, which should minimize the overall risk, collapse exactly when markets decrease. Hence, regarding the two great financial crisis of

the last decade, it is questionable if classical portfolio theory is able to generate reliable risk estimators.

4. Empirical Analysis

This section analyzes the development of correlation structures and volatilities of stock markets during four different phases of the last decade. The complete period of analysis covers March, 31st 1999 to February, 26th 2010 for sectors and January, 1st 2001 to February, 26th 2010 for countries. The differentiation concerning these periods is due to data availability. Additionally, two bear markets (dot-com crisis, 31.03.2000 (sectors) respective 01.01.2001 (countries) to 31.03.2003 and financial crisis, 30.04.2008 to 31.03.2009) and a bull market (30.04.2003 to 31.03.2008) are analyzed separately. Figure 2 clarifies the temporal sequence of these periods.

Figure 2. Schematic illustration of the analyzed periods at the example of the development of EURO STOXX 50.

4.1 Data base

Monthly and daily final quotes of selected important stock indices are used to determine the relevant parameters of each asset class differing between subsectors (10) and country indices (5). Especially the following stock indices are taken into account for analysis:

- EURO STOXX OIL & GAS;
- EURO STOXX BASIC MATERIALS;
- EURO STOXX INDUSTRIALS;
- EURO STOXX CONSUMER GOODS;
- EURO STOXX HEALTH CARE;
- EURO STOXX CONSUMER SERVICES;
- EURO STOXX TELECOM;
- EURO STOXX UTILITIES;
- EURO STOXX FINANCIALS;
- EURO STOXX TECHNOLOGY;
- MSCI EMERGING MARKETS;
- MSCI USA;
- MSCI JAPAN;
- STOXX EUROPE 50;
- MSCI WORLD.

Time series were obtained from Thomson Reuters Datastream and collected in Excel, which was used for all computations and analyses.

4.2 Calculation of Relevant Parameters

In this section, we describe calculation of the relevant parameters based on monthly data. We investigate for each index a ($a \in \{1, \dots, m\}$) continuous returns. These are determined as:

$$r_a(j) = \ln\left(\frac{\textit{index at the end of the } j\textit{-th month}}{\textit{index at the end of the } (j-1)\textit{-month}}\right).$$

For sake of simplicity, the following characteristic numbers, especially volatilities and Value-at-Risks, are given for an one-year investment period. The expected average annual return is $\hat{R}_a(J) = 12 * \overline{r_a(J)}$, where $\overline{r_a(J)}$ represents the average monthly return in the respective period. The corresponding months are summarized by the index set J.

From the returns $r_a(j)$ for asset a follows the estimator for the variance of returns:

$$\hat{\sigma}_a^2(J) = 12 * \left[\frac{1}{n-1}\sum_{j\in J}(r_a(j) - \overline{r_a(J)})^2\right],$$

where n is the number of months in the respective period. Volatility is calculated as the square root of the variance. Analogously, we determine estimators for the correlation between two assets a and b ($a, b \in \{1, \dots, m\}$):

$$\hat{\rho}_{a,b}(J) = \frac{12}{n-1}\sum_{j\in J}\left(\frac{r_a(j)-\overline{r_a(J)}}{\sqrt{\hat{\sigma}_a^2(J)}}\right)\left(\frac{r_b(j)-\overline{r_b(J)}}{\sqrt{\hat{\sigma}_b^2(J)}}\right).$$

And the estimator for the corresponding covariance:

$$\hat{\sigma}^2_{a,b}(J) = \sqrt{\hat{\sigma}^2_a(J)\hat{\sigma}^2_b(J)} * \hat{\rho}_{a,b}(J).$$

The estimated return $\hat{R}_a(J)$ and variance $\hat{\sigma}^2_a(J)$ yield a parametric estimation of the 99%-Value-at-Risk of an asset with the 1%-quantile of the standard normal distribution $q_{0.01} = -2.326$ as:

$$VaR_{a,99\%}(J) = \hat{R}_a(J) - 2.326 * \sqrt{\sigma^2_a(J)}.$$

The $VaR_{a,99\%}$ can be split into a component $VaR^{ex}_{a,99\%}$, which is given by the expected return (respectively the corresponding estimator) and a "stochastic" component, $VaR^{st}_{a,99\%} = -2.326 * \sqrt{\sigma^2_a(J)}$ which is calculated from the (estimated) volatilities. As shown below, correlations also influence the Value-at-Risk of a portfolio because they are required to calculate the overall volatility of a portfolio. Based on the estimated parameters of the different assets it is possible to calculate return and risk of a portfolio using the portfolio weights $(\omega_1, \ldots, \omega_m)$. For a period J, the expected return is given by:

$$\hat{r}_P(J) = \sum_{a=1}^{m} \omega_a \hat{R}_a(J).$$

And its variance is:

$$\hat{\sigma}^2_P(J) = \sum_{a,b=1}^{m} \omega_a \omega_b \hat{\sigma}^2_{a,b}(J).$$

Finally, we determine the 99%-Value-at-Risk $VaR_{P,99\%}(J)$ of the portfolio over a period J as:

$$VaR_{P,99\%}(J) = \hat{r}_P(J) - 2.326 * \sqrt{\sigma^2_P(J)}.$$

Hence, the stochastic component is given by:

$$VaR^{st}_{P,99\%} = -2.326 * \sqrt{\sigma^2_P(J)}.$$

Calculations based on daily data are performed in a similar way. For the sake of simplicity, we assume a year to have 250 trading days.

4.3 Parameters during Different Market Periods

Tables 1 resp. 2 and Tables 3 resp. 4 summarize average correlations and volatilities for different market periods sorted by sectors respectively countries showing strong fluctuations of volatility over time. Comparison of parameters during the bull market and the financial crisis, which followed immediately afterwards, shows an alarming increase of volatilities by a factor of 1,5 to 3 for monthly data. Based on daily data, the fluctuations are even stronger. Only

exemptions from this are the TELECOM and HEALTH CARE sectors calculated from monthly data. While volatilities in the TELECOM sector strongly increased during the dot-com crisis, they remained on a constant level for the HEALTH CARE sector over the complete observation period.

Moreover, it is quite interesting to compare values based on monthly and daily data. With the exception of the financial crisis, volatilities are rather similar for both frequencies. However, during the financial crisis, volatilities based on daily data are significantly larger than their counterparts determined from monthly data. This is caused by the fact that if monthly data is used, a significant fraction of the variability in the data is smoothed out. Hence, in order to capture the full amount of variability during a time of crisis, it is preferable to use daily data for computation of the volatility.

Surprisingly, it can be observed that the average correlation between all sectors remained constant over all periods, i.e. there was no "Correlation Breakdown" even not during the financial crisis. Thus, diversification between sectors appears to remain stable even during crisis. For country indices, this result does not turn out to be true. Average correlations on a monthly basis were on a constant level until upset of the crisis. More precise, the average correlation between countries increased by 0.21 during financial crisis. Even the smallest value was 0.84. This shows a clear "Correlation Breakdown".

Again, it is interesting to consider differences between results based on daily respectively those based on monthly data. Whereas these differences are rather negligible for sector based indices, they are much more significant for country based indices. Here, correlations based on daily data are much smaller than expected and in particular than those based on monthly data. This is due to the different time zones covered by the individual country based indices, which leads to differences in the point (and the subsequent interval) of time, during which they are traded. In consequence, different amounts of information are available to the investor during trading time and hence included in the final quote, which is a problem nearly non-existing for the sector based indices. From this, it is not recommendable to use daily data to determine correlations of country based indices, which do not belong to the same time zone. Nevertheless, even on a daily basis there was a significant increase of correlations during the financial crisis between country indices.

For correlations between single indices, even higher fluctuations can be observed. This turns out to be true for sectors as well as for countries, e.g. the correlation between TELECOM and HEALTH CARE decreased between bull market and financial crisis by 0.47, while correlation between Japan and the US increased by 0.44. Complete correlation matrices can be requested by the authors.

These surprising results demonstrate that diversification effects between sectors remain constant during crisis but not between countries, where structures of correlations change. Thus, diversification within the asset category "stocks" between countries seems to be impossible and the true risks are significantly larger than expected. Apart from that, correlations between stock indices are per se quite high. Hence, an asset allocation solely based on stocks is always risky.

Table 1. Volatilities during different market periods (sectors) – Monthly/Daily

Index/Period	Total	Dot-com	Bull Market	Financial Crisis
Oil & Gas	18,1% / 22,7%	18,2% / 28,2%	15,1% / 17,2%	26,8% / 49,5%
Basic Materials	21,5% / 21,7%	24,9% / 25,0%	16,0% / 17,7%	33,0% / 46,9%
Industrials	21,3% / 20,4%	22,8% / 21,5%	15,5% / 16,9%	34,2% / 46,9%
Consumer Goods	19,0% / 20,4%	21,5% / 24,1%	14,5% / 15,1%	23,7% / 45,8%
Health Care	16,2% / 21,2%	19,5% / 28,6%	14,1% / 16,2%	17,9% / 33,8%
Consumer Services	18,8% / 19,1%	25,3% / 28,2%	13,5% / 14,3%	20,3% / 32,4%
Telecom	26,4% / 25,8%	36,0% / 38,2%	14,4% / 14,8%	15,0% / 33,2%
Utilities	17,4% / 19,1%	16,8% / 22,2%	12,7% / 14,6%	24,4% / 43,1%
Financials	24,2% / 23,7%	28,2% / 29,2%	16,1% / 17,1%	42,3% / 55,6%
Technology	31,4% / 31,2%	48,7% / 51,9%	22,1% / 23,2%	36,2% / 42,3%

Table 2. Volatilities during different market periods (countries) – Monthly/Daily

Index/Period	Total	Dot-com	Bull Market	Financial Crisis
Emerging Markets	21,1% / 17,7%	22,0% / 15,1%	15,8% / 14,3%	33,1% / 34,2%
USA	16,4% / 21,6%	18,8% / 23,5%	9,1% / 12,9%	27,1% / 44,8%
Japan	18,6% / 23,3%	15,6% / 22,2%	14,6% / 18,7%	31,7% / 42,8%
Europe	17,3% / 23,2%	20,7% / 29,5%	11,2% / 14,6%	21,2% / 40,3%
World	17,0% / 17,7%	17,4% / 18,5%	9,7% / 10,9%	28,8% / 36,1%

Table 3. Average correlations for different market periods (sectors) – Monthly/Daily

Index/Period	Total	Dot-com	Bull Market	Financial Crisis
Oil & Gas	0,53 / 0,61	0,52 / 0,57	0,45 / 0,63	0,53 / 0,74
Basic Materials	0,66 / 0,55	0,61 / 0,65	0,64 / 0,74	0,64 / 0,74
Industrials	0,73 / 0,61	0,68 / 0,72	0,71 / 0,75	0,71 / 0,77
Consumer Goods	0,68 / 0,64	0,69 / 0,76	0,69 / 0,76	0,48 / 0,40
Health Care	0,46 / 0,59	0,36 / 0,59	0,39 / 0,57	0,47 / 0,60
Consumer Services	0,69 / 0,49	0,67 / 0,74	0,69 / 0,75	0,66 / 0,76
Telecom	0,50 / 0,63	0,40 / 0,64	0,55 / 0,66	0,38 / 0,70
Utilities	0,63 / 0,52	0,52 / 0,66	0,65 / 0,65	0,70 / 0,71
Financials	0,69 / 0,59	0,71 / 0,76	0,69 / 0,77	0,68 / 0,71
Technology	0,63 / 0,65	0,61 / 0,65	0,54 / 0,66	0,67 / 0,71
Average	0,62 / 0,59	0,58 / 0,68	0,60 / 0,69	0,59 / 0,68

Table 4. Average correlations for different market periods (countries) – Monthly/Daily

Index/Period	Total	Dot-com	Bull Market	Financial Crisis
Emerging Markets	0,78 / 0,57	0,71 / 0,45	0,69 / 0,54	0,87 / 0,67
USA	0,82 / 0,50	0,77 / 0,49	0,71 / 0,43	0,92 / 0,53
Japan	0,66 / 0,35	0,47 / 0,28	0,54 / 0,36	0,89 / 0,42
Europe	0,79 / 0,54	0,77 / 0,47	0,70 / 0,51	0,84 / 0,64
World	0,85 / 0,68	0,80 / 0,62	0,77 / 0,65	0,93 / 0,73
Average	0,78 / 0,53	0,71 / 0,46	0,68 / 0,50	0,89 / 0,60

4.4 Effects of changing parameters on the VaR

To illustrate and quantify the effects of changing parameters, we consider risk numbers of five different portfolios for each period. Three portfolios reflect sectors whereas two are diversified by countries. A large variability of correlations and volatilities leads to a strongly varying stochastic component (VaR_{stoch}) of the overall Value-at-Risk (VaR). Since changes in the stochastic component are based on variability of correlations and volatilities, we restrict our analysis to this component as it also represents the effect of diversification which can be achieved for a portfolio. This component on its own leads to a strong change of the overall VaR.

Two of the portfolios use a naive diversification and all indices hold the same share of the overall portfolio, one being diversified by sectors and the other one by countries. Also two funds, based on sectors (AriDeka CF, Deka-Institutionell Aktien Europa I (T)), and one fund, based on different countries (Deka-bav Fonds), are analyzed. Exact diversification of the portfolios is given in Tables 5 and 6. For sake of simplicity, we assume that the asset categories contained in the portfolio are perfectly reflected by the respective index. Hence, we obtain realistic estimations for the behavior of risk numbers of real portfolios although they are not exactly replicated, which is not in the scope of this work. Furthermore, we assume an investment of 100,000,000€ to provide the VaR in €.

Table 5. Portfolio weights (sectors)

Index/Portfolio	Naive	AriDeka CF	Deka-Institutionell
Oil & Gas	10,00%	12,32%	15,60%
Basic Materials	10,00%	10,89%	9,01%
Industrials	10,00%	8,49%	4,29%
Consumer Goods	10,00%	14,23%	10,88%
Health Care	10,00%	13,76%	16,92%
Consumer Services	10,00%	6,70%	1,98%
Telecom	10,00%	7,78%	9,45%
Utilities	10,00%	4,31%	5,60%
Financials	10,00%	19,02%	23,74%
Technology	10,00%	2,51%	2,53%

Table 6. Portfolio weights (countries)

Index/Portfolio	Naive	Deka-bav Fonds
Emerging Markets	20,00%	0,67%
USA	20,00%	44,70%
Japan	20,00%	6,20%
Europe	20,00%	35,30%
World	20,00%	13,80%

Tables 7 to 11 show the stochastic component VaR_{stoch} for all portfolios. Our results strongly indicate that by solely varying correlations and volatilities the VaR is dramatically fluctuating. Thus, the VaR increased by a factor of approximately $2 * VaR_{stoch}$ for all portfolios upon exchange of the bull market parameters by values holding for the financial crisis. Even during the dot-com crisis, the risk was significantly larger than during the bull market.

Comparing sector-based to country-based portfolios, fluctuations are marginally smaller for the first. During bull market, the risk for sector based portfolios was slightly larger whereas it was similar during the financial crisis. Comparing risk figures based on monthly and daily data, they are quite different for times of crisis. This is due to the fact that volatilities based on daily data are much larger and changes of volatilities are the main reason for fluctuations of the VaR_{stoch} as shown in the next paragraph.

Table 7. VaR_{stoch} naive diversification (sectors) – Monthly/Daily

Period/	In %	In €
Total	-40,64% / -43,41%	-33,4 Mio. € / -35,2 Mio. €
Dot-com	-48,60% / -57,97%	-38,5 Mio. € / -44,0 Mio. €
Financial Crisis	-52,56% / -84,58%	-40,9 Mio. € / -57,1 Mio. €
Bull market	-28,57% / -33,04%	-24,9 Mio. € / -28,1 Mio. €

Table 8. VaR_{stoch} AriDeka CF – Monthly/Daily

Period/	In %	In €
Total	-39,66% / -42,97%	-32,7 Mio. € / -34,9 Mio. €
Dot-com	-45,71% / -55,39%	-36,7 Mio. € / -42,5 Mio. €
Financial Crisis	-53,62% / -86,50%	-41,5 Mio. € / -57,9 Mio. €
Bull market	-28,27% / -32,95%	-24,6 Mio. € / -28,1 Mio. €

Table 9. VaR_{stoch} Deka-Institutionell – Monthly/Daily

Period/	In %	In €
Total	-39,21% / -43,41%	-32,4 Mio. € / -35,2 Mio. €
Dot-com	-44,89% / -56,28%	-36,2 Mio. € / -43,0 Mio. €
Financial Crisis	-53,98% / -88,09%	-41,7 Mio. € / -58,6 Mio. €
Bull market	-27,65% / -32,79%	-24,2 Mio. € / -28,0 Mio. €

Table 10. VaR_{stoch} naive diversification (countries) – Monthly/Daily

Period/	In %	In €
Total	-38,16% / -37,51%	-31,7 Mio. € / -31,3 Mio. €
Dot-com	-38,80% / -38,18%	-32,2 Mio. € / -31,7 Mio. €
Financial Crisis	-63,16% / -75,26%	-46,8 Mio. € / -52,9 Mio. €
Bull market	-24,07% / -25,30%	-21,4 Mio. € / -22,4 Mio. €

Table 11. VaR_{stoch} Deka-bav Fonds – Monthly/Daily

Period/	In %	In €
Total	-37,47% / -42,88%	-31,3 Mio. € / -34,9 Mio. €
Dot-com	-42,40% / -48,99%	-34,6 Mio. € / -38,7 Mio. €
Financial Crisis	-57,79% / -84,41%	-43,9 Mio. € / -57,0 Mio. €
Bull market	-21,72% / -25,72%	-19,5 Mio. € / -22,7 Mio. €

We performed another data analysis to investigate whether the changes in risk are caused by changing correlations or by changing volatilities (or to find out which are their respective contributions). Here, we assumed for all market periods the average volatilities solely changing correlation matrices. Hence, changes of the covariance matrix result from changing correlations. Based on these covariance matrices, volatilities of the naively diversified portfolios were determined for all market periods. Results are given in Table 12.

For sector indices the increased risk is completely explained by increased volatilities. If the portfolio volatility only changed due to changes of the correlation matrix, it would remain constant over different market periods being consistent to results in the prior section, showing that the average correlation did not change. This holds true for both monthly and daily data.

Considering country based indices, it turned out that the volatility increased by approximately 1,5% during the financial crisis due to increased correlations. If we also took the changes of volatilities into account, the increase would be about 18% (daily data) respectively 13% (monthly data) between countries, i.e. the effect of changing volatilities on the risk is about ten times larger than that of changing correlations. To draw a conclusion, fluctuations in volatilities have a significantly stronger impact on diversification effects and risk figures than changes in correlations, whose impact is negligible. Hence, the terms "Correlation Breakdown" and "Diversification Meltdown" seem to be very deceptive for portfolios solely consisting of stocks. In contrast to that, "Volatility Burst" would be a much more reasonable term.

Table 12. Resulting volatilities using average volatilities for single indices and changing correlation matrices by period – Monthly/Daily

Period/Volatility	Sectors	Countries
Total	17,47% / 18,66%	16,41% / 16,13%
Dot-com	17,03% / 18,92%	15,75% / 15,46%
Financial Crisis	17,21% / 19,10%	17,26% / 16,88%
Bull market	17,14% / 19,12%	15,58% / 15,82%

5. How to Deal with Changing Parameters

Results of the last sections show that risks of the individual portfolios differ strongly in dependence of the time period which is used for parameter estimation. These differences in risk are important to consider for institutional as well as for private investors. Thus, it is of great interest to analyze how these risks can be minimized or at least be appropriately measured. It is demonstrated that correlations and volatilities cannot be estimated simply from historical data due to large estimation errors in some cases.

To illustrate this effect, Figure 3 represents the different temporal evolution of estimators of correlation between the sectors TELECOM and FINANCIALS. Here, the correlation was estimated by means of historical data using different moving averages.

Figure 3. Moving averages of the correlation between TELECOM and FINANCIALS for a history of 1-year, 2-years and 5-years

Figure 3 shows that fluctuations of the estimators decrease with an increase of the time period used for analysis. This implies the problem that a long time period leads to very inflexible estimators, due to its strong smoothing of the results. If only short time periods are used for estimation this may lead to drastic estimation errors because of strong variability of the estimators. In current research, there exist different approaches to deal with changing parameters. Although this is not in focus of the present analysis, we will briefly describe two methods and refer to comprehensive sources. A promising approach for the timely recognition of parameter changes is testing for structural breaks, i.e. changes in parameters which define a time series. Aue/Hörmann/Horváth/Reimherr (2009) proposed a test to detect changes in the covariance structure, while Wied/Krämer/Dehling (2011) and Wied/Arnold/Bissantz/Ziggel (2011) present methods to test for changes in the correlations structure and of variances, respectively. These tests can be used in various ways. First, it is possible to determine appropriate subsets of data which are used to estimate the different parameters. Second, the tests can be used as an alert system in order to recognize unfavorable parameter changes. Finally, optimal points in time for a re-optimization can be determined, because an optimal solution for the portfolio is no longer valid if input parameters have changed. Apart from fluctuation tests, time series models (e.g. GARCH models) are of special interest with regard to parameter estimation, because they adapt to changing data structures in a very flexible way (McNeil/Frey/Embrechts (2005)).

6. Acknowledgement

The work of the first author was supported by DFG (Sonderforschungsbereich 823, Project C4) and the BMBF (Project 03BIPAH4 im Verbund INVERS).

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The Analysis of the Evolution of the Gross Domestic Product by Means of Fourier Development

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Abstract: In this article, we will carry out an analysis on the regularity of the Gross Domestic Product of a country, in our case the United States. The method of analysis is based on the consideration of the development in the Fourier series of a function and testing in terms of the average absolute error of the nearest polynomial Fourier of real data are considered. The obtained results show a cycle for 13 years, the average absolute error being 3.69%. The method described allows an prognosis on short-term trends in GDP.

Keywords: GDP; cycle; Fourier

JEL Classification: C65; E17

1. Introduction

In the literature, the economic cycle designate the fluctuations which accompany the evolution of a nation or, sometimes, it simply is associated with the increasing and decreasing of an economy. Throughout history, many states were faced and have experienced economic fluctuations, most tested being the United States.

Given the complexity of economic phenomena, in practice there are as many types of economic cycles or economic fluctuations. We can say that almost any segment of the economic life is subject to the fluctuations that, sometimes, may include periods of more than a year.

According to literature, the theoretical economic cycle is linked on the one hand, by changes in aggregate demand with all components (public consumers, private consumers, investors) or, on the other hand, of the change in supply aggregates (changes in production costs).

A more comprehensive approach to the problem of the economic cycle requires knowledge of all aspects of the market economy.

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Regardless of the factors that have influenced and favored economic cycles, their approach involves different points of view.

The first analysis of the economic cycle through the prism of the phenomenon of recurrence is due to the French economist Clement Juglar, who has studied the fluctuations of the interest rate and price and on the basis of which was discovered in 1860 an economic cycle with alternate periods of prosperity and depression for 8-11 years.

Economists who have a thorough analysis of Clement Juglar's cycle and, in particular Joseph Schumpeter, have concluded that in it there are four phases: the expansion, the crisis, recession and the renascence.

At the beginning of the 20th century, Joseph Kitchin based on analyses of interest rates and other variables (the analysis being performed on the economies of the United States of America and United Kingdom) discovers a short economic cycle, approximately 40 months.

The economists, after the Great Depression in the years 1929-1933, have focused much more on macroeconomic phenomena that determine the appearance of the economic cycle, looking for patterns of prediction.

In the "The Major Economic Cycles", which appeared in 1925, the Russian Economist Nikolai Kondratieff mark out an economic cycle much longer, about 50-60 years. On the basis of statistical researches on long-term fluctuations in prices (the analysis being performed on the same economies of the United States of America and United Kingdom), Kondratieff observed periods of accelerated growth of branches of Economics, alternate with slower growth. Within this cycle, Kondratieff identified the expansion phase, the phase of stagnation and recession phase. Without finding a universally accepted explanation, he believes that the basis of these cycles long stay technological progress, confirmed later by Schumpeter, which considers "the bunch of related innovations" that generates each cycle.

Other analysis devoted to the economic cycle have been made by Wesley Clair Mitchell in the work "Business Cycle" (1913) and "Measuring Business Cycles" (1927) in which the author discusses some methods of determination and analysis of economic cycle. Mitchell puts emphasis on the differences between the capitalist societies and the pre-capitalist, considering that a course of business would not be possible in a society pre-capitalist, but can occur in one capitalist ([1]).

John Maynard Keynes - the economist of the Great Depression, lay the groundwork for a new economic theory which reveals a close connection between consumption and investment. According to the Keynesian theory and its adherents, any additional expenditure (consumption) generates an income a few times higher than the expenditure itself. This relationship between consumption and investment,

known as the investment multiplier, can not produce, considered Keynes, cyclical movements in the economy, but it can lead to an upward trend.

Russian research economist Simon Kuznets, in 1930 put the bases of a cycle lasting on average, over a period of 15-20 years, called "demographic cycle" or "the cycle of investment in infrastructure". Kuznets considers that a factor that influence the emergence and evolution of an economic cycle is the demographic processes, in particular the phenomenon of migration having disturbing effects in the buildings sector.

The Austrian School sees the economic cycle through its representatives, notably to Ludwig von Mises, as a natural consequence of the massive growth of bank credit, an inappropriate monetary policy conducive to relaxing the conditions of crediting and finally the accumulation of toxic assets. Growth of loans generates, in turn, a rise in prices and a fall in interest rates below the optimum level, and the crisis occurs when manufacturers can't sell the production because of the very high prices. In the same stream of thought, Friedrich Hayek considers the phenomenon of over-investment as a factor determining the onset of a new economic cycle, while Joseph Schumpeter considers that the emergence and the onset of the economic cycle is based on the existence of investments with high efficiency carried out in a short period and a low demand for new products.

After attempts at explanation of the economic cycle from the early 1970's of Milton Friedman and Robert Lucas, the work of Finn E. Kydland and Edward C. Prescott "Time to Build And Aggregate Fluctuations" ([3]) launches real business cycle theory, the economic cycles being determined by the fluctuations in the rate of growth of total productivity of factors of production.

Over time, many economists have attempted, through analysis of available statistical data, to develop specific models of foresights of changes taking place in the economy to come to the aid of the decision-makers to act according to actual economic conditions.

The objective of this paper is to determine a possible historical influence on the evolution of GDP in strictly numerical terms. For this, we will consider data sets of given length, then determining the corresponding Lagrange polynomial interpolation. Considering the function resulting from pasting the above functions, we will build the Fourier development of the different values of periodicity and having starting point an arbitrary value. The period appropriate to the smallest average absolute error between the values and actual Fourier will give an indication of a possible periodicity of the phenomenon.

2. Mathematical Considerations on the Fourier Development

Let a function f:$\mathbf{R}\to\mathbf{R}$, with f and f' piecewise continous on **R** and periodic with period T, therefore f(x+T)=f(x) $\forall x\in\mathbf{R}$.

Considering Fourier series associated with the function f: F(x)= $\frac{a_0}{2}+\sum_{k=1}^{\infty}\left(a_k\cos\frac{2k\pi x}{T}+b_k\sin\frac{2k\pi x}{T}\right)$ we have the following:

Lemma 1 $\int_{-\frac{T}{2}}^{\frac{T}{2}} f(x)\cos\frac{2n\pi x}{T}dx=\frac{a_n T}{2}$, n≥0, $\int_{-\frac{T}{2}}^{\frac{T}{2}} f(x)\sin\frac{2n\pi x}{T}dx=\frac{b_n T}{2}$, n≥1.

Proof. $\int_{-\frac{T}{2}}^{\frac{T}{2}} f(x)\cos\frac{2n\pi x}{T}dx=$

$$\int_{-\frac{T}{2}}^{\frac{T}{2}}\left(\frac{a_0}{2}+\sum_{m=1}^{\infty}\left(a_m\cos\frac{2m\pi x}{T}+b_m\sin\frac{2m\pi x}{T}\right)\right)\cos\frac{2n\pi x}{T}dx=$$

$$\int_{-\frac{T}{2}}^{\frac{T}{2}}\frac{a_0}{2}\cos\frac{2n\pi x}{T}+\sum_{m=1}^{\infty}\left(a_m\cos\frac{2m\pi x}{T}\cos\frac{2n\pi x}{T}+b_m\sin\frac{2m\pi x}{T}\cos\frac{2n\pi x}{T}\right)dx=$$

$$\int_{-\frac{T}{2}}^{\frac{T}{2}}\frac{a_0}{2}\cos\frac{2n\pi x}{T}dx+\sum_{m=1}^{\infty}\int_{-\frac{T}{2}}^{\frac{T}{2}}a_m\cos\frac{2m\pi x}{T}\cos\frac{2n\pi x}{T}dx+\sum_{m=1}^{\infty}\int_{-\frac{T}{2}}^{\frac{T}{2}}b_m\sin\frac{2m\pi x}{T}\cos\frac{2n\pi x}{T}dx$$

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If n=0, then: $\int_{-\frac{T}{2}}^{\frac{T}{2}} f(x)\cos\frac{2n\pi x}{T}dx=$

$$\int_{-\frac{T}{2}}^{\frac{T}{2}}\frac{a_0}{2}dx+\sum_{m=1}^{\infty}\int_{-\frac{T}{2}}^{\frac{T}{2}}a_m\cos\frac{2m\pi x}{T}dx+\sum_{m=1}^{\infty}\int_{-\frac{T}{2}}^{\frac{T}{2}}b_m\sin\frac{2m\pi x}{T}dx=$$

$$\frac{a_0 T}{2}+\sum_{m=1}^{\infty} a_m \frac{T}{2m\pi}\sin\frac{2m\pi x}{T}\Bigg|_{-\frac{T}{2}}^{\frac{T}{2}}-\sum_{m=1}^{\infty} b_m \frac{T}{2m\pi}\cos\frac{2m\pi x}{T}\Bigg|_{-\frac{T}{2}}^{\frac{T}{2}}=$$

$$\frac{a_0 T}{2}+\sum_{m=1}^{\infty} a_m \frac{T}{2m\pi}2\sin m\pi=\frac{a_0 T}{2}.$$

If n≥1 then:

$$\int_{-\frac{T}{2}}^{\frac{T}{2}} f(x)\cos\frac{2n\pi x}{T}dx=\frac{a_0}{2}\frac{T}{2n\pi}\sin\frac{2n\pi x}{T}\Bigg|_{-\frac{T}{2}}^{\frac{T}{2}}+\sum_{m=1}^{\infty}\int_{-\frac{T}{2}}^{\frac{T}{2}}\frac{a_m}{2}\left(\cos\frac{2(m+n)\pi x}{T}+\cos\frac{2(m-n)\pi x}{T}\right)dx+$$

$$\sum_{m=1}^{\infty}\int_{-\frac{T}{2}}^{\frac{T}{2}}\frac{b_m}{2}\left(\sin\frac{2(m+n)\pi x}{T}+\sin\frac{2(m-n)\pi x}{T}\right)dx=$$

$$\frac{a_0}{2}\frac{T}{2n\pi}2\sin n\pi+\sum_{m=1}^{\infty}\frac{a_m}{2}\frac{T}{2(m+n)\pi}\sin\frac{2(m+n)\pi x}{T}\Bigg|_{-\frac{T}{2}}^{\frac{T}{2}}+\sum_{\substack{m=1\\ m\neq n}}^{\infty}\frac{a_m}{2}\frac{T}{2(m-n)\pi}\sin\frac{2(m-n)\pi x}{T}\Bigg|_{-\frac{T}{2}}^{\frac{T}{2}}+\frac{a_n T}{2}-$$

$$\sum_{m=1}^{\infty}\frac{b_m}{2}\frac{T}{2(m+n)\pi}\cos\frac{2(m+n)\pi x}{T}\Bigg|_{-\frac{T}{2}}^{\frac{T}{2}}-\sum_{\substack{m=1\\ m\neq n}}^{\infty}\frac{a_m}{2}\frac{T}{2(m-n)\pi}\cos\frac{2(m-n)\pi x}{T}\Bigg|_{-\frac{T}{2}}^{\frac{T}{2}}=$$

$$+\sum_{m=1}^{\infty}\frac{a_m}{2}\frac{T}{2(m+n)\pi}2\sin(m+n)\pi+\sum_{\substack{m=1\\ m\neq n}}^{\infty}\frac{a_m}{2}\frac{T}{2(m-n)\pi}\sin 2(m-n)\pi+\frac{a_n T}{2}=\frac{a_n T}{2}.$$

The proof is analogous for the other claim. **Q.E.D.**

From Fourier series expression, it is observed that F(x+T)=F(x) $\forall x\in\mathbf{R}$ so its sum is also a periodic function of period T.

The Dirichlet's theorem (Spiegel, 1974) states that in the conditions above, the Fourier series converges punctually to f in the points of continuity and to $\frac{f(x+0)+f(x-0)}{2}$ in the discontinuity points.

Considering the partial sum of order n corresponding to the series of function F, the n-th Fourier polynomials are:

$$F_n(x)=\frac{a_0}{2}+\sum_{k=1}^{n}\left(a_k\cos\frac{2k\pi x}{T}+b_k\sin\frac{2k\pi x}{T}\right)$$

It is obvious also that $F_n(x)=F_n(x+T)\ \forall x\in\mathbf{R}$.

The Fourier polynomials have the property of approximating the function through one periodical with the observation that the absolute error tends to fall (due to the convergence points) with the rise of n.

Due to the existence of an important number of cyclical phenomena in many scientific fields, we intend, below, to approximate their development by means of Fourier polynomials of degree conveniently chosen.

In the case of the discretized phenomenons, we put the problem in the generation of functions that will pass through a series of data points. A very useful tool is the Lagrange interpolation polynomial. Therefore, considering a set of data (x_i,y_i), $i=\overline{1,k+1}$, the Lagrange interpolation polynomial has the form:

$$L_n(x)=\sum_{i=1}^{k+1}\frac{(x-x_1)...(x-x_{i-1})(x-x_{i+1})...(x-x_n)}{(x_i-x_1)...(x_i-x_{i-1})(x_i-x_{i+1})...(x_i-x_n)}y_i$$

and is the polynomial of minimum degree (k) passing through the data points.

We will demonstrate, first, the following:

Lemma 2 Let $f(x)=a_kx^k+...+a_0\in\mathbf{R}[X]$. Then:

$$\int f(x)\cos\frac{2n\pi x}{T}dx=2(-1)^n\sum_{\substack{i=1\\ i=\text{impar}}}^{k-1}\left(\frac{T}{2}\right)^i\sum_{j=0}^{\left[\frac{k-i}{2}\right]}(-1)^j(2j+1)!C_{i+1+2j}^{2j+1}\left(\frac{2n\pi}{T}\right)^{2j+2}a_{i+1+2j}$$

$$\int f(x)\sin\frac{2n\pi x}{T}dx=2(-1)^n\sum_{\substack{i=1\\ i=\text{impar}}}^{k}\left(\frac{T}{2}\right)^i\sum_{j=0}^{\left[\frac{k-i}{2}\right]}(-1)^{j+1}(2j)!C_{i+2j}^{2j}\left(\frac{2n\pi}{T}\right)^{2j+1}a_{i+2j}$$

Proof. Let first: $\int\sum_{i=0}^{k}a_ix^i\cos\frac{2n\pi x}{T}dx=\sum_{i=0}^{k}b_ix^i\cos\frac{2n\pi x}{T}+\sum_{i=0}^{k}c_ix^i\sin\frac{2n\pi x}{T}$.

If we derivating in both terms:

$$\sum_{i=0}^{k} a_i x^i \cos\frac{2n\pi x}{T} =$$

$$\sum_{i=0}^{k} b_i\left(i x^{i-1}\cos\frac{2n\pi x}{T} - \frac{2n\pi}{T} x^i \sin\frac{2n\pi x}{T}\right) + c_i\left(i x^{i-1}\sin\frac{2n\pi x}{T} + \frac{2n\pi}{T} x^i \cos\frac{2n\pi x}{T}\right)$$

from where: $\sum_{i=0}^{k} a_i x^i \cos\frac{2n\pi x}{T} =$

$$\sum_{i=-1}^{k-1}\left(b_{i+1}(i+1)x^i \cos\frac{2n\pi x}{T} + c_{i+1}(i+1)x^i \sin\frac{2n\pi x}{T}\right) +$$

$$+\sum_{i=0}^{k}\left(-b_i \frac{2n\pi}{T} x^i \sin\frac{2n\pi x}{T} + c_i \frac{2n\pi}{T} x^i \cos\frac{2n\pi x}{T}\right)$$

After the identification of the coefficients, we obtain:

$$\begin{cases} c_i = \dfrac{T}{2n\pi}(a_i - (i+1)b_{i+1}), i = \overline{0,k-1} \\ b_i = \dfrac{T}{2n\pi}(i+1)c_{i+1}, i = \overline{0,k-1} \\ b_k = 0 \\ c_k = \dfrac{T}{2n\pi} a_k \end{cases}$$

After induction, follows:

$$b_s = \sum_{j=0}^{\left[\frac{k-s-1}{2}\right]} (-1)^j (2j+1)! C_{s+1+2j}^{2j+1} \left(\frac{T}{2n\pi}\right)^{2j+2} a_{s+1+2j},\ s = \overline{0,k-1},\ b_k = 0,$$

$$c_s = \sum_{j=0}^{\left[\frac{k-s}{2}\right]} (-1)^j (2j)! C_{s+2j}^{2j} \left(\frac{T}{2n\pi}\right)^{2j+1} a_{s+2j},\ s = \overline{0,k}.$$

Analogously, let: $\int \sum_{i=0}^{k} a_i x^i \sin\frac{2n\pi x}{T} dx = \sum_{i=0}^{k} d_i x^i \cos\frac{2n\pi x}{T} + \sum_{i=0}^{k} e_i x^i \sin\frac{2n\pi x}{T}$.

Derivating in both terms:

$$\sum_{i=0}^{k} a_i x^i \sin\frac{2n\pi x}{T} =$$

$$\sum_{i=0}^{k} d_i\left(i x^{i-1}\cos\frac{2n\pi x}{T} - \frac{2n\pi}{T} x^i \sin\frac{2n\pi x}{T}\right) + e_i\left(i x^{i-1}\sin\frac{2n\pi x}{T} + \frac{2n\pi}{T} x^i \cos\frac{2n\pi x}{T}\right)$$

from where: $\sum_{i=0}^{k} a_i x^i \sin\frac{2n\pi x}{T} =$

$$\sum_{i=-1}^{k-1}\left(d_{i+1}(i+1)x^i \cos\frac{2n\pi x}{T} + e_{i+1}(i+1)x^i \sin\frac{2n\pi x}{T}\right) +$$

$$+\sum_{i=0}^{k}\left(-d_i \frac{2n\pi}{T} x^i \sin\frac{2n\pi x}{T} + e_i \frac{2n\pi}{T} x^i \cos\frac{2n\pi x}{T}\right)$$

Also, after the identifying the coefficients, we have:

$$\begin{cases} d_i = \dfrac{T}{2n\pi}\left(-a_i + (i+1)e_{i+1}\right), i = \overline{0,k-1} \\ e_i = -\dfrac{T}{2n\pi}(i+1)d_{i+1}, i = \overline{0,k-1} \\ e_k = 0 \\ d_k = -\dfrac{T}{2n\pi} a_k \end{cases}$$

After induction, follows:

$$d_s = \sum_{j=0}^{\left[\frac{k-s}{2}\right]} (-1)^{j+1}(2j)!C_{s+2j}^{2j}\left(\frac{T}{2n\pi}\right)^{2j+1} a_{s+2j},\ s=\overline{0,k},$$

$$e_s = \sum_{j=0}^{\left[\frac{k-s-1}{2}\right]} (-1)^{j}(2j+1)!C_{s+2j+1}^{2j+1}\left(\frac{T}{2n\pi}\right)^{2j} a_{s+2j+1},\ s=\overline{0,k-1},\ e_k=0$$

We finally have:

$$\int_{\alpha}^{\beta} f(x)\cos\frac{2n\pi x}{T}dx = \sum_{i=0}^{k} b_i x^i \cos\frac{2n\pi x}{T}\Big|_{\alpha}^{\beta} + \sum_{i=0}^{k} c_i x^i \sin\frac{2n\pi x}{T}\Big|_{\alpha}^{\beta} =$$

$$\sum_{i=0}^{k} b_i\left(\beta^i \cos\frac{2n\pi\beta}{T} - \alpha^i \cos\frac{2n\pi\alpha}{T}\right) + \sum_{i=0}^{k} c_i\left(\beta^i \sin\frac{2n\pi\beta}{T} - \alpha^i \sin\frac{2n\pi\alpha}{T}\right).$$

$$\int_{\alpha}^{\beta} f(x)\sin\frac{2n\pi x}{T}dx = \sum_{i=0}^{k} d_i x^i \cos\frac{2n\pi x}{T}\Big|_{\alpha}^{\beta} + \sum_{i=0}^{k} e_i x^i \sin\frac{2n\pi x}{T}\Big|_{\alpha}^{\beta} =$$

$$\sum_{i=0}^{k} d_i\left(\beta^i \cos\frac{2n\pi\beta}{T} - \alpha^i \cos\frac{2n\pi\alpha}{T}\right) + \sum_{i=0}^{k} e_i\left(\beta^i \sin\frac{2n\pi\beta}{T} - \alpha^i \sin\frac{2n\pi\alpha}{T}\right).$$ **Q.E.D.**

From Lemma 2, we shall study a number of particular cases, i.e. for any $\alpha,\beta\in\mathbf{R}$:

k=0 In this case, the function is considered to be constant over the interval $[\alpha,\beta]$, therefore: $f(x)=a_0$.

From the above, it follows: $b_0=0$, $c_0=\frac{T}{2n\pi}a_0$, $d_0=-\frac{T}{2n\pi}a_0$, $e_0=0$ and finally:

$$\int_{\alpha}^{\beta} a_0 \cos\frac{2n\pi x}{T}dx = \frac{T}{2n\pi}a_0\left(\sin\frac{2n\pi\beta}{T} - \sin\frac{2n\pi\alpha}{T}\right)$$

$$\int_{\alpha}^{\beta} a_0 \sin\frac{2n\pi x}{T}dx = -\frac{T}{2n\pi}a_0\left(\cos\frac{2n\pi\beta}{T} - \cos\frac{2n\pi\alpha}{T}\right)$$

k=1 In the case of a linear function: $f(x)=a_1x+a_0$, we have: $b_1=0$, $b_0=\left(\frac{T}{2n\pi}\right)^2 a_1$, $c_0=\frac{T}{2n\pi}a_0$,

$c_1=\frac{T}{2n\pi}a_1$, $d_0=-\frac{T}{2n\pi}a_0$, $d_1=-\frac{T}{2n\pi}a_1$, $e_0=a_1$, $e_1=0$ therefore:

$$\int_{\alpha}^{\beta}(a_1x+a_0)\cos\frac{2n\pi x}{T}dx =$$

$$\left(\frac{T}{2n\pi}\right)^2 a_1\left(\cos\frac{2n\pi\beta}{T} - \cos\frac{2n\pi\alpha}{T}\right) + \frac{T}{2n\pi}\sin\frac{2n\pi\beta}{T}(a_1\beta+a_0) - \frac{T}{2n\pi}\sin\frac{2n\pi\alpha}{T}(a_1\alpha+a_0)$$

$$\int_{\alpha}^{\beta}(a_1x+a_0)\sin\frac{2n\pi x}{T}dx =$$

$$a_1\left(\sin\frac{2n\pi\beta}{T} - \sin\frac{2n\pi\alpha}{T}\right) - \frac{T}{2n\pi}\cos\frac{2n\pi\beta}{T}(a_1\beta+a_0) + \frac{T}{2n\pi}\cos\frac{2n\pi\alpha}{T}(a_1\alpha+a_0)$$

k=2 If f is polynomial of second degree: $f(x)=a_2x^2+a_1x+a_0$ follows, analogously:

$b_2=0$, $b_1=2\left(\frac{T}{2n\pi}\right)^2 a_2$, $b_0=\left(\frac{T}{2n\pi}\right)^2 a_1$, $c_2=\frac{T}{2n\pi}a_2$, $c_1=\frac{T}{2n\pi}a_1$, $c_0=$

$\frac{T}{2n\pi}a_0-2\left(\frac{T}{2n\pi}\right)^3 a_2$, $d_2=-\frac{T}{2n\pi}a_2$, $d_1=-\frac{T}{2n\pi}a_1$,

$d_0=-\frac{T}{2n\pi}a_0+2\left(\frac{T}{2n\pi}\right)^3 a_2$, $e_2=0$, $e_1=2a_2$, $e_0=a_1$ therefore:

$$\int_\alpha^\beta f(x)\cos\frac{2n\pi x}{T}dx=$$

$$\left(\frac{T}{2n\pi}\right)^2(a_1+2a_2\beta)\cos\frac{2n\pi\beta}{T}-\left(\frac{T}{2n\pi}\right)^2(a_1+2a_2\alpha)\cos\frac{2n\pi\alpha}{T}+$$
$$+\frac{T}{2n\pi}(a_0+a_1\beta+a_2\beta^2)\sin\frac{2n\pi\beta}{T}-\frac{T}{2n\pi}(a_0+a_1\alpha+a_2\alpha^2)\sin\frac{2n\pi\alpha}{T}-$$
$$-2\left(\frac{T}{2n\pi}\right)^3 a_2\left(\sin\frac{2n\pi\beta}{T}-\sin\frac{2n\pi\alpha}{T}\right)$$

$$\int_\alpha^\beta f(x)\sin\frac{2n\pi x}{T}dx=$$

$$-\frac{T}{2n\pi}(a_0+a_1\beta+a_2\beta^2)\cos\frac{2n\pi\beta}{T}+\frac{T}{2n\pi}(a_0+a_1\alpha+a_2\alpha^2)\cos\frac{2n\pi\alpha}{T}+$$
$$+(a_1+2a_2\beta)\sin\frac{2n\pi\beta}{T}-(a_1+2a_2\alpha)\sin\frac{2n\pi\alpha}{T}+$$
$$+2\left(\frac{T}{2n\pi}\right)^3 a_2\left(\cos\frac{2n\pi\beta}{T}-\cos\frac{2n\pi\alpha}{T}\right)$$

3. The Discrete Data Analysis using Fourier Development

Consider a discrete data set: $Y=(y_1,...,y_n)$. Considering a fixed k, $0\le k\le n-1$, we shall consider sequential data sets: $(y_1,...,y_{k+1})$, $(y_{k+2},...,y_{2k+2})$ etc. and we shall build the corresponding Lagrange interpolation polynomial, where the independent variable would be the sequence number of the corresponding date.We build the partial sum of order n (conveniently chosen) corresponding to the series of Fourier functions determined above, where the intervals $[\alpha,\beta]$ will be of the form: [1,k+1], [k+2,2k+2] etc. After Fourier polynomials determinations, the different values of $n\ge1$, we will select that polynomial such that the absolute average error between

the data calculated by periodicity and the actual is the smallest. In the present analysis, we consider the starting point of the data of any year, a period of polynomial Fourier between 10 and 100 years and an order of between 1 and 9.

4. The Analysis of GDP's Cyclicity

In what follows, we intend to study a possible cycle in the evolution of the gross domestic product of a country.

Considering a period of m consecutive years and GDP_k, $k=\overline{1,m}$ the real value of GDP, consider the real GDP growth rate: $r_k=\frac{GDP_k-GDP_{k-1}}{GDP_{k-1}}$. We then have: $GDP_k=(1+r_k)GDP_{k-1}$, $k=\overline{2,m}$.

Consider now, for analysis, gross domestic product of the U.S. in the period 1792-2010:

Table 1

Year	GDP	r_k	Year	GDP	r_k	Year	GDP	r_k	Year	GDP	r_k
1792	4.58		1847	45.21	0.0680369	1902	468.20	0.0514260	1957	2601.10	0.0201592
1793	4.95	0.0807860	1848	46.73	0.0336209	1903	481.80	0.0290474	1958	2577.60	-0.0090346
1794	5.60	0.1313131	1849	47.38	0.0139097	1904	464.80	-0.0352844	1959	2762.50	0.0717334
1795	5.96	0.0642857	1850	49.59	0.0466442	1905	517.20	0.1127367	1960	2830.90	0.0247602
1796	6.15	0.0318792	1851	53.58	0.0804598	1906	538.40	0.0409899	1961	2896.90	0.0233141
1797	6.27	0.0195122	1852	59.76	0.1153415	1907	552.20	0.0256315	1962	3072.40	0.0605820
1798	6.54	0.0430622	1853	64.65	0.0818273	1908	492.50	-0.1081130	1963	3206.70	0.0437118
1799	7.00	0.0703364	1854	66.88	0.0344934	1909	528.10	0.0722843	1964	3392.30	0.0578788
1800	7.40	0.0571429	1855	69.67	0.0417165	1910	533.80	0.0107934	1965	3610.10	0.0642042
1801	7.76	0.0486486	1856	72.47	0.0401895	1911	551.10	0.0324091	1966	3845.30	0.0651505
1802	8.00	0.0309278	1857	72.84	0.0051056	1912	576.90	0.0468155	1967	3942.50	0.0252776
1803	8.14	0.0175000	1858	75.79	0.0404997	1913	599.70	0.0395216	1968	4133.40	0.0484211
1804	8.45	0.0380835	1859	81.28	0.0724370	1914	553.70	-0.0767050	1969	4261.80	0.0310640
1805	8.90	0.0532544	1860	82.11	0.0102116	1915	568.80	0.0272711	1970	4269.90	0.0019006
1806	9.32	0.0471910	1861	83.57	0.0177810	1916	647.70	0.1387131	1971	4413.30	0.0335839
1807	9.33	0.0010730	1862	93.95	0.1242073	1917	631.70	-0.0247028	1972	4647.70	0.0531122
1808	9.35	0.0021436	1863	101.18	0.0769558	1918	688.70	0.0902327	1973	4917.00	0.0579426

1809	10.07	0.0770053	1864	102.33	0.0113659	1919	694.20	0.0079861	1974	4889.90	-0.0055115
1810	10.63	0.0556107	1865	105.26	0.0286329	1920	687.70	-0.0093633	1975	4879.50	-0.0021268
1811	11.11	0.0451552	1866	100.43	-0.0458864	1921	671.90	-0.0229751	1976	5141.30	0.0536530
1812	11.55	0.0396040	1867	102.15	0.0171264	1922	709.30	0.0556630	1977	5377.70	0.0459806
1813	12.21	0.0571429	1868	106.13	0.0389623	1923	802.60	0.1315381	1978	5677.60	0.0557673
1814	12.72	0.0417690	1869	109.02	0.0272308	1924	827.40	0.0308996	1979	5855.00	0.0312456
1815	12.82	0.0078616	1870	112.30	0.0300862	1925	846.80	0.0234469	1980	5839.00	-0.0027327
1816	12.82	0.0000000	1871	117.60	0.0471950	1926	902.10	0.0653047	1981	5987.20	0.0253811
1817	13.12	0.0234009	1872	127.50	0.0841837	1927	910.80	0.0096442	1982	5870.90	-0.0194248
1818	13.60	0.0365854	1873	138.30	0.0847059	1928	921.30	0.0115283	1983	6136.20	0.0451890
1819	13.86	0.0191176	1874	140.80	0.0180766	1929	977.00	0.0604580	1984	6577.10	0.0718523
1820	14.41	0.0396825	1875	140.60	-0.0014205	1930	892.80	-0.0861822	1985	6849.30	0.0413860
1821	15.18	0.0534351	1876	146.40	0.0412518	1931	834.90	-0.0648522	1986	7086.50	0.0346313
1822	15.76	0.0382082	1877	153.70	0.0498634	1932	725.80	-0.1306743	1987	7313.30	0.0320045
1823	16.33	0.0361675	1878	158.60	0.0318803	1933	716.40	-0.0129512	1988	7613.90	0.0411032
1824	17.30	0.0593999	1879	177.10	0.1166456	1934	794.40	0.1088777	1989	7885.90	0.0357241
1825	18.07	0.0445087	1880	191.80	0.0830040	1935	865.00	0.0888721	1990	8033.90	0.0187677
1826	18.71	0.0354178	1881	215.80	0.1251303	1936	977.90	0.1305202	1991	8015.10	-0.0023401
1827	19.29	0.0309995	1882	227.30	0.0532901	1937	1028.00	0.0512322	1992	8287.10	0.0339359
1828	19.55	0.0134785	1883	233.50	0.0272767	1938	992.60	-0.0344358	1993	8523.40	0.0285142
1829	20.30	0.0383632	1884	229.70	-0.0162741	1939	1072.80	0.0807979	1994	8870.70	0.0407467
1830	22.16	0.0916256	1885	230.50	0.0034828	1940	1166.90	0.0877144	1995	9093.70	0.0251389
1831	23.99	0.0825812	1886	249.20	0.0811280	1941	1366.10	0.1707087	1996	9433.90	0.0374105
1832	25.61	0.0675281	1887	267.30	0.0726324	1942	1618.20	0.1845399	1997	9854.30	0.0445627
1833	26.40	0.0308473	1888	282.70	0.0576132	1943	1883.10	0.1637004	1998	10283.50	0.0435546
1834	26.85	0.0170455	1889	290.80	0.0286523	1944	2035.20	0.0807711	1999	10779.80	0.0482618
1835	28.27	0.0528864	1890	319.10	0.0973177	1945	2012.40	-0.0112028	2000	11226.00	0.0413922
1836	29.11	0.0297135	1891	322.80	0.0115951	1946	1792.20	-0.1094216	2001	11347.20	0.0107964
1837	29.37	0.0089316	1892	339.30	0.0511152	1947	1776.10	-0.0089834	2002	11553.00	0.0181366
1838	30.59	0.0415390	1893	319.60	-0.0580607	1948	1854.20	0.0439727	2003	11840.70	0.0249026
1839	31.37	0.0254985	1894	304.50	-0.0472466	1949	1844.70	-0.0051235	2004	12263.80	0.0357327
1840	31.46	0.0028690	1895	339.20	0.1139573	1950	2006.00	0.0874397	2005	12638.40	0.0305452

1841	32.17	0.0225683	1896	333.60	-0.0165094	1951	2161.10	0.0773180	2006	12976.20	0.0267281
1842	33.19	0.0317066	1897	348.00	0.0431655	1952	2243.90	0.0383138	2007	13254.10	0.0214161
1843	34.84	0.0497138	1898	386.10	0.1094828	1953	2347.20	0.0460359	2008	13312.20	0.0043835
1844	36.82	0.0568312	1899	412.50	0.064000	1954	2332.40	-0.0063054	2009	12990.30	-0.0241808
1845	39.15	0.0632808	1900	422.80	0.0249697	1955	2500.30	0.0719859	2010	13038.70	0.0037259
1846	42.33	0.0812261	1901	445.30	0.0532167	1956	2549.70	0.0197576	-	-	-

* PIB-US $ billion 2005

Source: http://www.usgovernmentrevenue.com

By analysing the data set (k,r_k), corresponding to the period 1793-2010, the minimum average absolute error 4.63% is obtained as a result of applying Fourier Analysis for T=13 years and k=1. The qualitative analysis of the recalculated graph, following the result model, does not allow its acceptance, in the sense of Fourier analysis, the model being totally coherent with real data only occasionally.
For this reason, we have chosen for analysis, the differences $s_k=r_k-r_{k-1}$ which signifies the rate of change of rate of growth of real GDP. In this case, the results are spectacular, gaining for the T = 13 years and k = 3 the minimum mean absolute error of 3.69%.
The recalculated values of s_k are:

Table 2

k	s_k	k	s_k	k	s_k
1	0.0149028	6	0.0093186	11	-0.0026318
2	-0.0000676	7	-0.0097969	12	-0.0048919
3	-0.0143265	8	-0.0144272	13	0.0084500
4	-0.0046977	9	-0.0007267		
5	0.0129542	10	0.0059407		

The comparative graphs of the development of s_k and the indicators recomputing after the Fourier regression are:

The Fourier analysis for the coefficients s(k) between 1794-1850

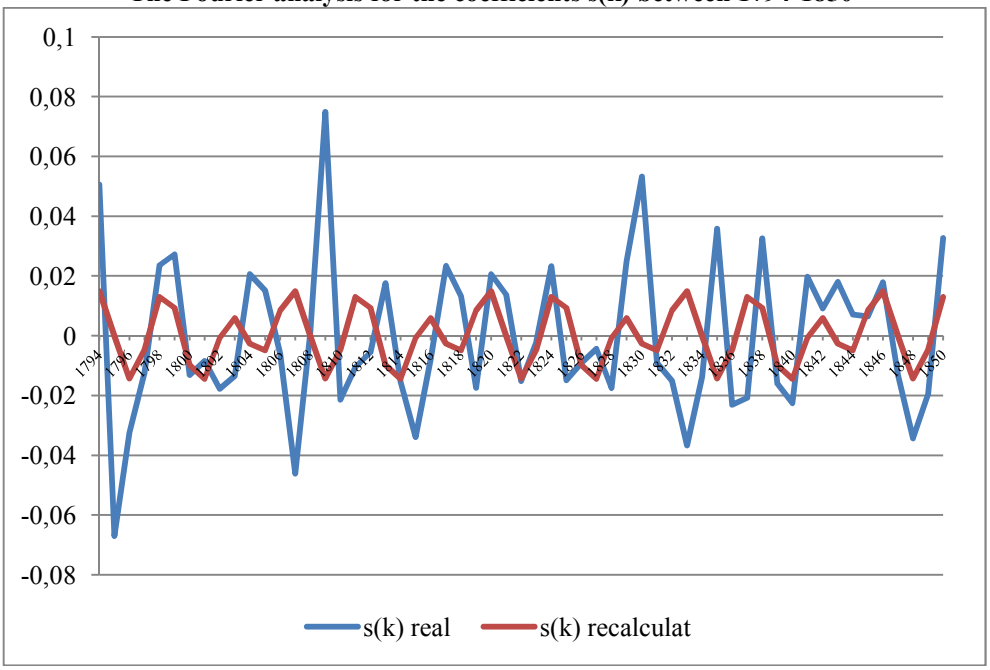

Figure 1

The Fourier analysis for the coefficients s(k) between 1851-1900

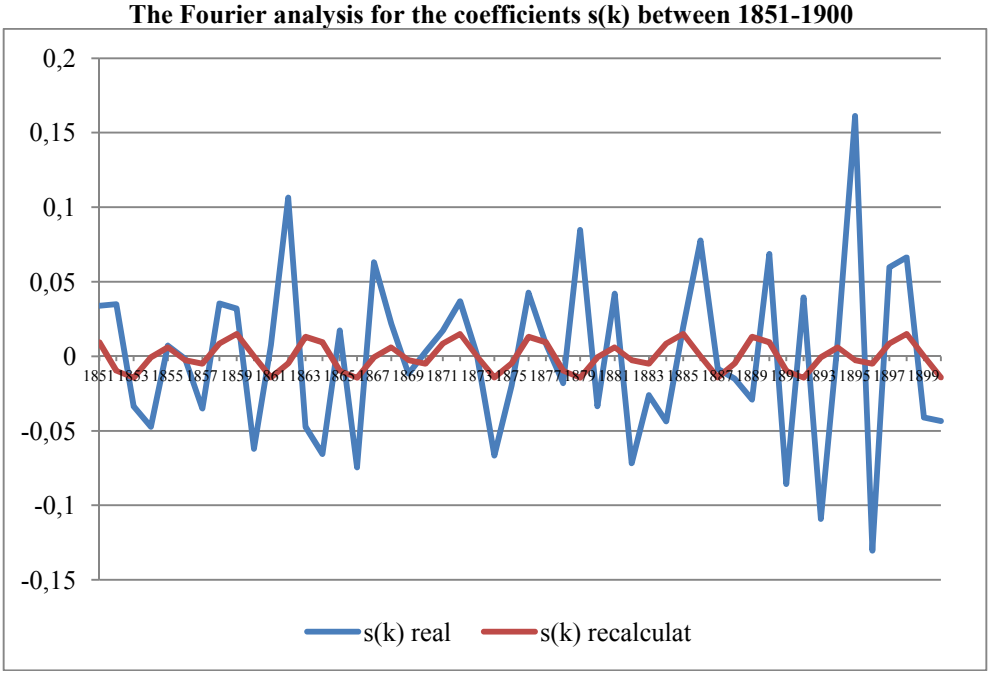

Figure 2

The Fourier analysis for the coefficients s(k) between 1901-1950

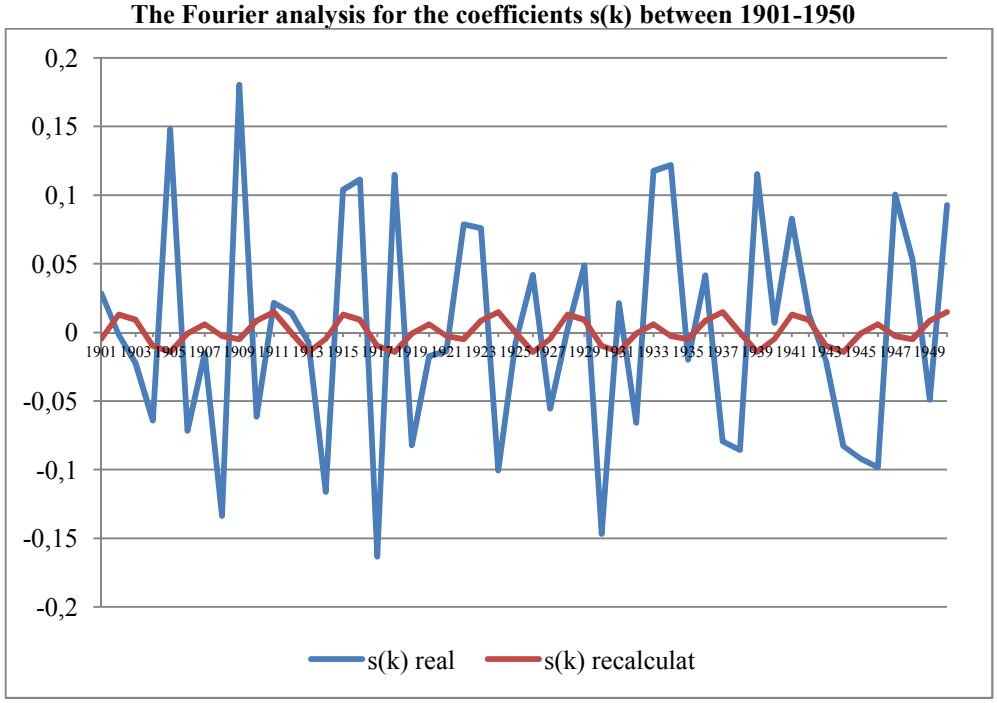

Figure 3

The Fourier analysis for the coefficients s(k) between 1951-2010

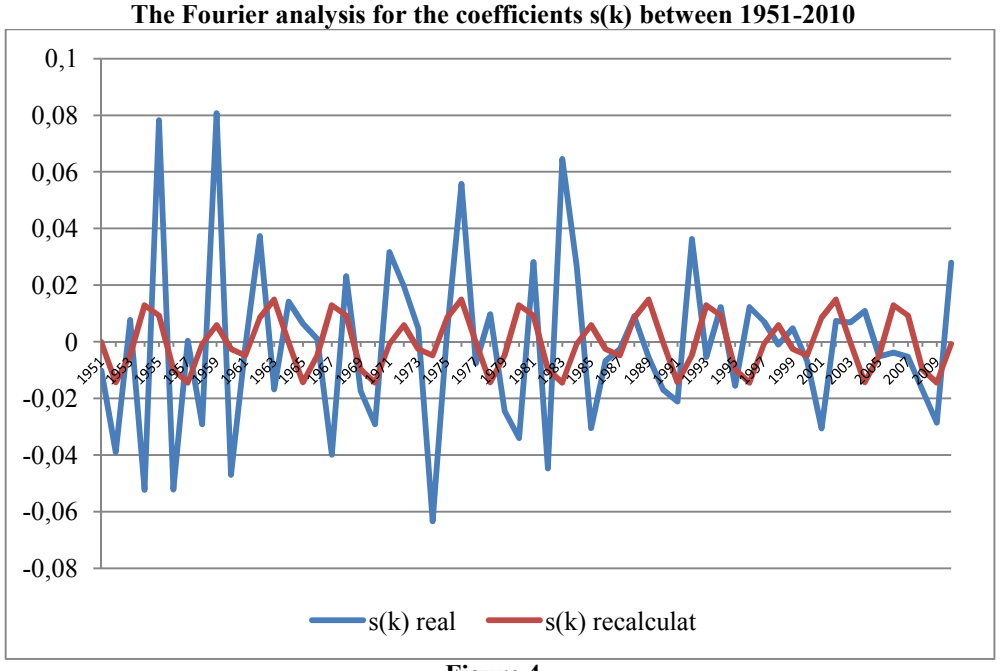

Figure 4

5. Conclusions

The graphical analysis of data resulting from application of the method of Fourier type, reveals a satisfactory correlation with actual phenomena, extreme points being off, usually with no more than a year against the real phenomenon. Due to the fact that $r_k = r_{k-1}+s_k$, one obtains that: $r_{k+13}=r_k+(s_{k+1}+...+s_{k+13})$. On the other hand, from the values recalculated of s_k it is observed easily that their sum is zero, so $r_{k+13}=r_k$. Therefore, we can assert a tendency of periodicity of the rate of growth of real GDP of 13 years.

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Analysis of GARCH Modeling in Financial Markets: An Approach Based on Technical Analysis Strategies

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Abstract: In this paper we performed an analysis in order the make an evidence of GARCH modeling on the performances of trading rules applied for a stock market index. Our study relays on the overlap between econometrical modeling, technical analysis and a simulation computing technique. The non-linear structures presented in the daily returns of the analyzed index and also in other financial series, together with the phenomenon of volatility clustering are premises for applying a GARCH model. In our approach the standardized GARCH innovations are resampled using the bootstrap method. On the simulated data are then applied technical analysis trading strategies. For all the simulated paths the "*p*-values" are computed in order to verify that the hypothesis concerning the goodness of fit for GARCH model on the BET index is accepted. The processed data with trading rules are showing evidence that GARCH model is a good choice for econometrical modeling of financial time series including the romanian exchange trade index.

Keywords: conditional heteroscedasticity; volatility clustering; conditional variance; bootstrap; trading strategies

JEL Classification: C 52; G 11; G 32

1 Introduction

In finance and especially in financial markets, one of biggest challenge is to find a best trade-off between the return and the risk associated to a certain traded asset. There are several approaches for measuring the risk with implications to transaction's profit, but none of them is working all the time. Thus, a non linear model is much closer to the real phenomena encountered in the financial markets. One good measure for the risk of an asset is the volatility. Volatility itself is a very complex measure and it is often hard to measure it with high precision. This is why a lot of investors and financial institution are using complex approaches, in order to model the volatility. Modeling and forecasting volatility or, in other words, the covariance structure of asset returns, is therefore important. The fact that volatility

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in returns fluctuates over time has been known for a long time. Since the distributions of the return series were found to be leptokurtic and the returns were modeled as independent and identically distributed over time, the idea of modeling the variable volatility over time was not fully incorporated in models. As a matter of fact, in a classic work, (Mandelbrot & Taylor, 1967) applied the so-called stables Paretian distributions to characterize the distribution of returns. An informative discussion of stable *paretian* distributions and their use in finance and econometrics is presented in (Rachev & Mittnik, 2000).

The daily and intraday observations from a return series of financial assets are in fact not independent. While observations in these series are uncorrelated or nearly uncorrelated, the series contain higher order dependence. Thus, models having the form of the Autoregressive Conditional heteroscedasticity (ARCH) are some of the most popular way to parameterize this dependence. Hence, *GARCH* stands for Generalized Autoregressive Conditional Heteroscedasticity and it can be seen as a modified *ARCH* model. Generally speaking, one can think of heteroscedasticity as time-varying variance (i.e. volatility). Conditional implies a dependence on the observations of the immediate past, and autoregressive describes a feedback mechanism that incorporates past observations into the present. *GARCH* then is a mechanism that includes past variances in the explanation of future variances.

In the financial, statistical and econometrical literature, several procedures were developed for the characterization of financial data using *GARCH*. The critics of *GARCH* are saying that the Brock-Dechert-Scheinkman test (*BDS*) can be used as general test for nonlinearities in financial series without using too many specifications (Brocks & Heravi, 1999). Since the *BDS* test have a strong power against *GARCH* models, they were widely used like a diagnostic method for the back testing of *GARCH*. In case of non-linear structures when using an "adjusted" *GARCH* model the innovation processes are tested with *BDS*. If the *BDS* tests cannot reject the null hypothesis by using the outcome values from driven simulation, then the adjusted *GARCH* model is fitted well on the data.

The main reason of using the other tests for heteroscedasticity is due to the easy access to a large numbers of software and computers utilities which implement them. On the other hand the *GARCH* software has been intensively used only in the last decade. Using other classical tests can raise a multiple of issues since their asymptotical distribution cannot do an accurate approximation of the applied statistics by those tests in respect to *ARCH*, *GARCH* and *Exponential GARCH* residuals (Hsieh, 1991).

The *GARCH* model can be simulated for every resampled dataset. Different statistics can be then computed on the standard innovations of the model, the results showing that the unspecified filter effect of *GARCH* is more present when the resampling process of the data is non-linear (Durbin & Koopman, 2000).

Therefore, we used as a statistic for GARCH model – the "*p*-value" indicator related to technical analysis trading rules applied on the resampled data. In the following sections of this paper will be presented the completed methodology which performs these tests, but first a brief presentation of the characteristics of *GARCH* model will be made.

2 Model Specifications

2.1 Modeling Financial Time Series with GARCH Model

The *GARCH* models are based at the same time on the previous autoregressive models (the *ARMAX/ARIMA* models) and on the conditional heteroskedasticty models (the ARCH models). Bollerslev in his work (Bollerslev, 1986) developed the *GARCH* like a more general model of the original *ARCH* model (Engle, 1982). Both of them are modeling the volatility but the *GARCH* model is using a reduced number of parameters which also decrease the computational effort time.

Hence, in order to express some of the characteristics that are commonly associated with statistical characteristics of financial time series like *fat tails* and *volatility clustering*, a good choice for modeling is the to use the *GARCH* specifications.

Probability distributions for the asset returns often exhibit fatter tails than in the case of standard normal, distribution. The fat tail phenomenon is known as excess kurtosis. Time series that exhibit a fat tail distribution are often referred to as leptokurtic. A part of the fat tail effect can also result from the presence of non-Gaussian asset return distributions that just happen to have fat tails. Heteroscedasticity explains some of the fat tail behavior, but typically not all of it. Fat tail distributions, such as *Student-t*, have been applied in *GARCH* modeling with good results, but often the choice of distribution is a matter of trial and error.

GARCH models are parametric specifications that operate best under relatively stable market conditions (Gourieroux, 1997). These stable conditions could not be present on every market and in practice it is well known that errors made in predicting markets are not of a constant magnitude. There are periods when unpredictable market fluctuations are larger and periods when they are smaller. This behavior, known as heteroscedasticity, refers to the fact that the size of market volatility tends to cluster in periods of high volatility and periods of low volatility. This phenomenon is called volatility clustering, which means that the large changes tend to follow large changes, and small changes tend to follow small changes. In either case, the changes from one period to the next will typically have an unpredictable sign. Volatility clustering, or persistence, suggests a time series model in which successive disturbances, although uncorrelated, are nonetheless serially dependent.

2.2 Correlation in Financial Time Series

If a financial time series are treated as a sequence of random observations, this random sequence, or stochastic process, may exhibit some degree of correlation from one observation to the next. This correlation structure can be used to predict future values of the process based on the past history of observations. Exploiting the correlation structure, if any, allows the decomposition of the time series into a deterministic component (i.e., the forecast), and a random component (i.e., the error, or uncertainty, associated with the forecast). There are used these components in order to represent a univariate model of an observed time series y_t : $y_t = f(t-1, X) + \varepsilon_t$ where :

- $f(t-1, X)$ represents the deterministic component of the current return as a function of any information known at time $t-1$, including past innovations (residuals) $\varepsilon_t \{\varepsilon_{t-1}, \varepsilon_{t-2}, ...\}$, past observations $\{y_{t-1}, y_{t-2}, ...\}$, and any other relevant explanatory time series data, *X*.

- ε_t is the random component. It represents the residuals in the mean of y_t. These can be also an interpretation of the random disturbance, or shock, ε_t, as the single-period-ahead forecast error.

Usually the returns at time *t* are less correlated with return at time t-$_1$. That means the close past observations cannot be used to predict future returns. If on a market the financial assets are less correlated then this market is characterized by a weak informational efficiency – one cannot use the past information to make future profits.

2.3. Conditional Variances

The key insight of GARCH lies in the distinction between conditional and unconditional variances of the innovations process $\{\varepsilon_t\}$. The term conditional implies explicit dependence on a past sequence of observations. The term unconditional is more concerned with long-term behavior of a time series and assumes no explicit knowledge of the past.

If the values for returns have random values then a daily distribution can be used. The unconditioned distribution refers to asymptotic repartition – the repartition to which the daily return tends. Thus, the unconditioned mean is the simple mathematic moving average of the returns. It is called unconditioned because supposing that all the possible value can be realized, and an infinite number of data

is available then a single return distribution for periods of time can be computed. This distribution assumes that return process is an i.i.d. process.

GARCH models characterize the conditional distribution of ε_t by imposing serial dependence on the conditional variance of the innovations. Specifically, the variance model imposed by *GARCH*, conditional on the past, is given by

Equation 1 **Conditional Variance of a time series**

$$Var_{t-1}^2(y_t) = E_{t-1}(\varepsilon_t^2) = \sigma_t^2$$

Equation 2 **Variance of a time series described by *GARCH*(*P*,*Q*) parameters**

$$\sigma_t^2 = K + \sum_{i=1}^{P} G_i \sigma_{t-1}^2 + \sum_{j=1}^{Q} A_j \varepsilon_{t-1}^2 \; K > 0, \; G_i \geq 0, \; A_j \geq 0$$

The σ_t^2 is the forecast of the next period's variance, given the past sequence of variance forecasts, σ_{t-i}^2, and past realizations of the variance itself, ε_{t-j}^2.

When $P=0$, the *GARCH*(*0,Q*) the model becomes the original *ARCH*(*Q*) model (Engle, 1982).

Equation 3 **Variance of a time series described by ARCH parameters**

$$\sigma_t^2 = K + \sum_{j=1}^{Q} A_j \varepsilon_{t-j}^2$$

When $P = Q = 0$, the variance of the process is simply white a noise with variance *K*.

Since in practice, is needed a large lag Q for *ARCH* modeling, and estimation for a large number of parameters. Bollerslev (Bollerslev, 1986) extended Engle's *ARCH* model by including past conditional variances. This results in a more parsimonious representation of the conditional variance process.

Large disturbances, positive or negative, become part of the information set used to construct the variance forecast of the next period's disturbance. In this manner, large shocks of either sign are allowed to persist, and can influence the volatility forecasts for several periods. The lag lengths *P* and *Q*, as well the magnitudes of the coefficients G_i and A_j, determine the degree of persistence.

2.4 Serial Dependence in Innovations

A common assumption when modeling financial time series is that the forecast errors (i.e., the innovations) are zero-mean random disturbances uncorrelated from one period to the next. In fact, an explicit generating mechanism for a *GARCH*(*P,Q*) innovations process, $\{\varepsilon_t\}$, is: $\varepsilon_t = \sigma_t z_t$, where σ_t is the conditional standard deviation, and z_t is a standardized, independent, identically distributed (i. e., i.i.d.) random draw from some specified probability distribution. The *GARCH* literature (Nelson, 1998; Bollerslev, 1986) uses several distributions to model GARCH processes, but the vast majority of research assumes the standard normal density such that $\varepsilon_t \sim N(0, \sigma_t^2)$. The *GARCH* innovations process $\{\varepsilon_t\}$ simply rescales an i.i.d. process $\{z_t\}$ such that the conditional standard deviation incorporates the serial dependence.

The GARCH models are consistent with various forms of efficient market theory, which state that asset returns observed in the past cannot improve the forecasts of asset returns in the future. Since *GARCH* innovations $\{\varepsilon_t\}$ are serially uncorrelated, *GARCH* modeling does not violate efficient market theory.

2.4 Homoskedasticity of the Unconditional Variance

The GARCH model is strictly related to the conditional variance as a standard process with Gaussian innovations. It can be used a general *GARCH*(*P,Q*) form with Gaussian innovations for the conditional variance. The model conditional variance is described by the Equation 2 presented above.

To have a stationary process are imposed the following parameter constraints on the conditional variance parameters.

Equation 4 **Constraint inequality for the *GARCH* parameters parameters**

$$\sum_{i=1}^{P} G_i + \sum_{j=1}^{Q} A_j < 1;\ G_i \geq 0,\ A_j \geq 0$$

The first constraint, a stationarity constraint, is necessary and sufficient for the existence of a finite, time-independent variance of the innovations process $\{\varepsilon_t\}$. The remaining constraints are sufficient to ensure that the conditional variance $\{\sigma_t\}$ is strictly positive.

The GARCH model used in this study is the simple conditional mean model with *GARCH(1,1)* normal innovations. It is completely described by two equations, the first one called the mean equation and the second one called the variance

Equation 5 **The GARCH model equations**

$$y_t = C + \varepsilon_t$$

$$\sigma_t^2 = K + G_1\sigma_{t-1}^2 + A_1\varepsilon_{t-1}^2$$

In the conditional mean equation, the returns y_t, consist of a simple drift, plus an uncorrelated, white noise disturbance, ε_t. In the conditional variance equation, the variance forecast, σ_t^2, consists of a constant plus a weighted average of last period's forecast, σ_{t-1}^2, and last period's squared disturbance, ε_{t-1}^2. Although financial return series, typically exhibit little correlation, the squared returns often indicate significant correlation and persistence. This implies correlation in the variance process and it could be an indication that the data is a candidate for *GARCH* modeling. Although simplistic, the default model, on which the current study is focused on, has the benefit of representing a parsimonious model that requires you to estimate only four parameters (C, K, G_1 and A_1). According to (Box & Jenkins, 1994) the fewer parameters to estimate, the less that can go wrong. Some researchers are stating that elaborate models often fail to offer real benefits when forecasting (Hamilton, 1994).

The simple *GARCH*(1,1) model captures most of the variability in most return series. Small lags for P and Q are common in empirical applications. Typically, *GARCH*(1,1), *GARCH*(2,1), or *GARCH*(1,2) models are adequate for modeling volatilities of different assets even over long sample periods (Bollerslev & Chou, 1992).

3 Methodology

The objective of determining the parameters for the underlying process applied to the index price evolution is to allow the development of better stock pricing (index) models. In this study, the parameters of the model are all calculated on data basis before performing the simulations. In order to see the effects of applying the *GARCH* model on the data, the bootstrap simulation technique is used. It is straightforward to apply the bootstrap to derive some estimates of standard errors and confidence intervals for the complex estimators of the distribution parameters. One standard choice for an approximating distribution is the empirical distribution of the observed data. In the case of a dataset which is assumed to be an independent and an identically distributed process, the bootstrapped distribution can be simulated by constructing a number of samples from the observed dataset (and of equal size to those related to original data). Each of them is obtained by random sampling with replacement from the original dataset.

Hence, for testing the benefits of using the *GARCH* model, we used two of the technical analysis strategies: the filter strategy and the moving average strategy.

The filter strategy takes implies the usage of percentage value (called filter), which is then compared with the change in the current stock (asset) price. If the increase in the stock' price is bigger than the filter, then a buy signal is generated. Usually this kind of behavior is associated by the investors with the bullish market. If the decrease in the stock' price is bigger than the filter, then a sell signal is generated. The decreasing price in a stock market is associated with the concept of bearish market.

The second strategy is using two moving averages and it is called the Moving Average strategy. One of those moving averages is called the short moving average (SMA) and it uses a small number of past observation (e.g. from 1 to 10) and the other is called the long moving average (LMA) and it uses a bigger number of past observations (e.g. from 20 to 200). When the short moving average line is crossing from the downside the long moving average then a buy signal is generated, otherwise when the short moving average line is crossing from the upside the long moving average then a sell signal is generated.

The main fact of the described strategies (filter and moving average strategy without using bootstrap) is that they don't assume the hypothesis which state that the returns are not normally distributed. Some of the results could suggest that even the average return of these strategies is statistically bigger than a result for a simple buy-hold strategy. From some points of view the presented strategies could be considered similar. One of these aspects is related to the fact that the excess of return obtained when using these trading strategies has close values in both cases. In order to have the certitude that the particularities of the return series doesn't modify the distribution of statistical tests we used the bootstrap methodology. The main idea of this is to simulate the empirical distribution and calculate the associated "*p*-values" for both applied strategies. In order to achieve this we considered the next steps:

1) First we estimated the GARCH parameters related to both equations.
2) In the second step we performed the simulation for empirical distributions of returns.
3) In the final step we computed the "*p*-values" associated with each trading strategy.

All of these steps and also the analysis of the BET index were performed in an econometrical computer program. The third step is described in more details in the results sections since it is involving some considerations about the number of buy or hold signals and their statistical distribution.

4 The Data

For the simulation and analysis using *GARCH* model the used data is the BET index between years 1997 and 2010 (end of December). BET (Bucharest Exchange Trading) is the official index for the Bucharest Stock Exchange. It is a compounded weighted index which includes the 10 most liquid stocks from the market (the „blue chips"). The BET index is a price index which does not contains dividends, meaning that it s not a performance index. Since the dividends in Romania are in many years equals to zero, this index is considered to be representative for the purpose of the *GARCH* analysis.

Before proceeding with forward data processing, a quick statistical analysis is performed on the BET index in order to highlight its properties. These properties are taking into account when the GARCH model is applied.

In the next figure is represented the empirical distribution of the daily returns. As already stated it has not a gaussian distribution and it presents fat tails, being an asymptotic distribution with a mean with a value slightly greater than zero and with a daily standard deviation close to 2%.

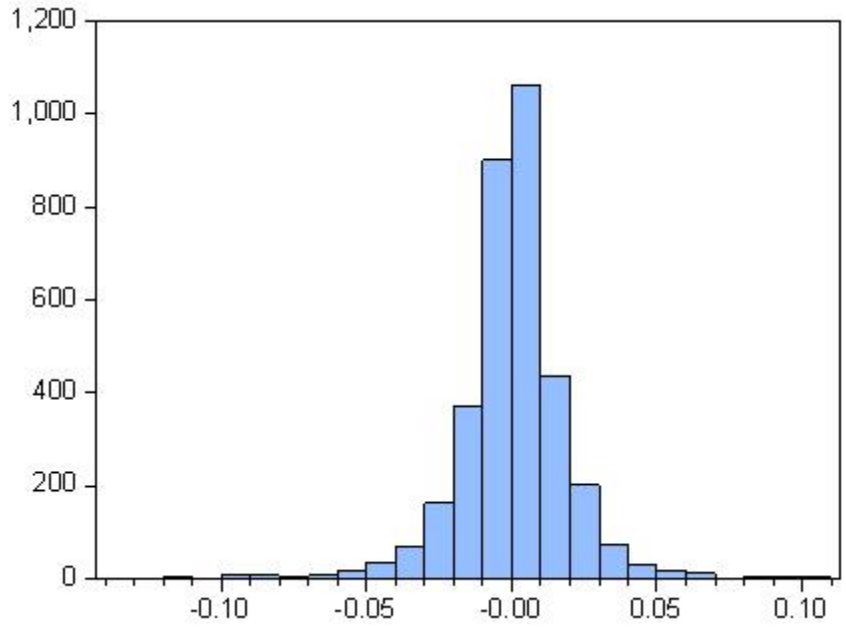

Figure 1 Distribution of daily returns for BET index

The next table presents some of the principal statistical characteristics of the BET return series, which are relevant for our study in order to apply the *GARCH* model.

Table 1 The principal statistical parameters of BET returns

Statistical characteristic	Value
Mean	0.000484
Median	0
Maximum	0.105645
Minimum	-0.13117
Std. Dev.	0.018848
Skewness	-0.3166
Kurtosis	9.083299

The Table 1 can be considered on of the starting point of our analysis and its reflect the described characteristics of financial time series, on which a heteroskedastic model can be applied. Therefore, the data presented here is used for estimation of *GARCH*(1,1) model.

5 Empirical Results

In the financial markets the investors are applying different rules when they make trades. Probably, one of the simplest and at the same time not the worst strategy from the performance point of view is the buy-and-hold strategy. This strategy implies that the investors buy a stock and it sells it at a different time in the future. There no special assumptions made on what the investors take these actions. In the technical analysis field, the next level is to apply on the asset time series some rules, regarding the buy and the sell moments.

Using the described methodology the *GARCH* model was applied to the BET index data. The empirical distribution of the parameters (the daily average return) is simulated in order to generate of the returns process. The *GARCH* null model is estimated starting from the initial return series. The model parameters are estimated by minimizing the error terms and by applying a *Student-t* law for testing the parameter significance. In the next table are presented the estimation results for the *GARCH*(1,1) model:

Table 2 The estimated GARCH parameters

Parameter Name	Value	Standard Erorr	T- Statistic
C	0.0011904	0.00025809	4.6124
K	1.387	1.402	9.8978
G1	0.75757	0.0097676	77.5600
A1	0.21814	0.012456	17.5135

Hence, for the analyzed data set the model equations are:

Equation 6 **The estimated parameters for the GARCH model applied for BET returns**

$$y_t = 0.00119 + \varepsilon_t$$

$$\sigma^2{}_t = 1.387 \cdot 10^{-5} + 0.75757 \cdot \sigma^2_{t-1} + 0.21814 \cdot \varepsilon^2_{t-1}$$

Then, the residuals from the first equation are resampled (randomly with replacement) for the purpose of obtaining the new returns and then the new price series. The empirical results are grouped in tables as it can be seen in the following sections. The first one is presenting the results for the filter strategy and the other the results related to moving average strategy.

The technical analysis strategies are applied to these resampled series and are calculated values for average daily returns for the buy sub periods and for the sell sub periods. Also the average return for the entire strategy is being computed. These steps are repeated for *N* times (number of resampling times) in order to obtain the empirical distribution of the average daily returns. Theses returns are then compared with the initial returns of the BET index in order to compute the "*p*-values". The "*p*-values" are presented in the next section and they represent the average percentage of the simulated index values which are greater than the initial values of the BET index. A value close to one for this "*p*-values" means that the null hypothesis which consists in the existence of the *GARCH* effect in the BET series is accepted. Otherwise, if "*p*-values" are close to zero the null hypothesis is rejected. When we performed this simulation we made usage of more parameters.

Thus, the used *GARCH* model is the "default" or the "basic" one: *GARCH*(1,1) and the number of bootstrapped sample paths is 1000. For both strategies we modified the parameters in order to show also the performance of strategy according for various values of the parameters. The results are grouped in two mail tables and depending on the investor position – long or short – the mean and the standard deviation of each simulated strategy are computed. When both positions are

combined together, there is possible to have an overall result. Thus, this is presented in last two columns of each table.

In the next table are shown results for the simulation using *GARCH*(1,1) and the described parameters when a moving average strategy is used. The first column is by definition the *Moving Average* having the values on the short term – *S* and the value for the long term – *L*.

Table 3 Empirical results for the bootstrap analysis using the moving average strategy

MA(S,L) parameters	μ(buy)	σ(buy)	μ(sell)	σ(sell)	μ(strategy)	σ(strategy)
(1, 10)	0.091	0.188	0.965	0.095	0.024	0.145
(1, 20)	0.085	0.173	0.941	0.106	0.021	0.140
(1, 50)	0.045	0.173	0.928	0.119	0.086	0.126
(2, 50)	0.076	0.183	0.910	0.115	0.142	0.123
(1, 150)	0.110	0.165	0.960	0.121	0.075	0.124
(2, 150)	0.126	0.188	0.959	0.115	0.087	0.119
(1, 200)	0.113	0.169	0.930	0.112	0.231	0.120

From the above table it can be seen that both the long and short values have an impact on the strategy profitability. The influence of long and short values is specially shown in daily average returns for the moving average strategy.

Table 4 Empirical results for the bootstrap analysis using the filter strategy

Filter value [%]	μ(buy)	σ(buy)	μ(sell)	σ(sell)	μ(strategy)	σ(strategy)
1%	0.087	0.131	0.901	0.134	0.045	0.131
2%	0.092	0.141	0.927	0.123	0.033	0.139
5%	0.117	0.203	0.943	0.082	0.055	0.134
8%	0.155	0.183	0.930	0.089	0.094	0.128
12%	0.200	0.127	0.775	0.193	0.424	0.136
20%	0.132	0.172	0.937	0.160	0.082	0.132
25%	0.199	0.168	0.932	0.155	0.106	0.123

In the above table, the "Filter value" column represent the percentage value on based it is taken the decision of generating a buy or a sell signal and μ(buy), μ(sell), μ(strategy) are the percentages for number of simulated *GARCH* data on which the strategy return is bigger than for the initial index values.

The "*p*-values" computed for both strategies, using different parameters are showing which one is more proper to be used together with *GARCH* model. The results from μ columns are the daily returns, and those for σ columns represent the result for standard deviations.

6 Conclusions

In this his paper was examined the original GARCH model contribution to our understanding of the stochastic process underlying index stock markets. Our approach tried to determinate if the movement of research in the *GARCH* modeling field is warranted.

Overall, our results demonstrate that, although previous research indicates that volatility clustering plays a role in determining stock price changes, it is not the primary factor generating these changes. Hence, *GARCH* models with normality assumptions provide a description of stock prices dynamics. The returns distributions show independence in the data after removing the *GARCH* effects. Over these returns (often called residuals), the technical analysis strategies, are powerful tools used to find out if the model is fitting well or not on the data. The results are showing that for some parameters of the trading strategies, their profitability combined together with the *GARCH* modeling is higher that a classical buy-and-hold strategy.

Although *GARCH* is explicitly designed to model time-varying conditional variances, *GARCH* models can capture sometimes the highly irregular phenomena, including wild market fluctuations (e.g., crashes and subsequent rebounds), and other highly unanticipated events that can lead to significant structural changes.

Future research can examine if other forms of the *GARCH* process might be used for testing the serial independences of residuals (i.e., *EGARCH*, *FIGARCH*, *MGARCH*). These models should also be tested to determine if they are superior to mean variance standardization approach. Since all forms of the *GARCH* process are similar in form, focusing on volatility clustering, it would be interesting to see if they are important improvements.

7 Acknowledgement

This paper was supported by the project "Doctoral studies in engineering sciences for developing the knowledge based society-SIDOC" contract no. POSDRU/88/1.5/S/60078, project co-funded from European Social Fund through Sectorial Operational Program Human Resources 2007-2013.

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An Empirical Analysis of the Effect of Stock Market Crisis on Economic Growth: The Nigerian Case

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Abstract: Stock market crashes are social phenomena where external economic events combine with crowd behavior and psychology in a positive feedback loop where selling by some market participants drives more market participants to sell. This study empirically established the relationship between stock market crisis and Nigeria's economic growth and also showed the relationship between stock market price crash and the crisis itself. In this light, this paper examined the interactive influence of movements in the major indicators of the performance of the Nigerian Stock Exchange Market such as the Market Capitalization (MK), All Share Index (ASI), Number of Deals (NOD), Volume and Value of Stock (VV), Total Number of New Issues (TNI) and Inflation (INFR) on the Nigerian Gross Domestic Product (GDP) using data from 1985-2009. To achieve the two objectives stated above, the Ordinary Least Square (OLS) method was employed. To correct for the OLS result biasness the log was applied to GDP and MK and also AR(1) was introduced to the first model. The result shows that stock market crisis has a highly significant effect on Nigeria's economic growth. The result also shows a significant relationship between stock market price crash and the market crisis itself. It is therefore recommended that in the face of the ongoing crisis in the global stock market, the Nigerian stock market authorities should aim at making the market meet a world class standard. Also, all the sectors of the economy should act in a collaborative manner such that optimum benefits can be realized from their economic activities in the Nigeria market even in the hub of global crisis.

Keywords: stock market crashes; value of stock; Nigerian stock exchange market

JEL Classification: C 52; G 11; G 32

1. Introduction

The stock market is an organized market where brokers meet to buy and sell stocks and shares. The stock market or equity or capital market is a public market (a loose network of economic transactions, not a physical facility or discrete entity) for the trading of company stock and derivatives at an agreed price, there are securities listed on a stock exchange as well as those only traded privately. The stock market

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is the aspect of the financial system which mobilizes and channels long term funds for economic growth. According to the Stock Market Investing Guide (2010), the irony of stock market is that companies live and die by their stock price, yet for the most part they don't actively participate in investing and in trading their stocks within the market.

There are factors that can affect the happenings in the stock market namely, global events, 'interest rates and inflation', human nature, company news and trends. Firstly, the major global events throughout the world can have an impact on stock prices and political unrest influence investor's confidence, which will have impact on what they do with their money. Changes in value of foreign currency will also affect foreign market which in turn will affect stock markets in the world. The global financial crisis has impact in various other sectors. The fact that a lot of Nigerian banks have taken foreign facilities to bolster their operations here cannot be discountenanced. These lines will no longer be available as the crisis bites harder. It will mean a drying up of credit for these banks. The banks will therefore be a lot more cautious in terms of businesses to which loans are extended, hence projects with long incubation periods are usually the first to suffer.

Secondly, interest rates and inflation tend to work in tandem. When they rise, investors often become more conservative in their approach. Instead of purchasing high risk, high reward stocks, they shift their focus to safer vehicles such as government-based securities. This portends that if interest rates are high, stock prices generally go down, because if people can make a decent amount of money, by keeping their money in banks, or buying bonds, they feel like they should not take the risk in the stock market. Among the largest forces that affect stock prices are inflation, interest rates, bonds, commodities and currencies. It is a common notion that when inflation rises, market shares and bond prices tend to fall because the purchasing power of payments is eroded. While Nigeria's inflation has largely trended within the double-digits band, the CBN is actively seeking to bring it down to single digits through its inflation targeting mechanism. And any changes in interest rates will have a definite impact on yields and alter trading patterns. It added that currency risk affects both investors and issuers to varying degrees, while issuers are exposed to the risk of a devaluation of its local currency, investors on the other hand are exposed to the risk of appreciation of the issuer's currency. With this in mind, stock prices should rise with falling interest rates because it becomes cheaper for companies to finance projects and operations that are funded through borrowing. Lower borrowing costs allow higher earnings which increase the perceived value of a stock.

Thirdly, as always, any understanding of markets begins with the familiar human traits of greed and fear along with perceptions of supply, demand, risk and value. The emphasis is on perceptions, where group and individual perceptions usually differ. Investors can be depended upon to seek the largest return for the least

amount of risk. Markets, representing group behavior, can be depended upon to over react to almost any new information. The subsequent price rebound or relaxation makes it appear that initial responses are much to do about nothing. But no, group perceptions simply oscillate between extremes and prices follow. It is clear that the general market, as reflected in the major averages, impacts more than half of a stock's price, while earnings account for most of the rest. However, human beings naturally react to rumors and gossip which have an impact on the stock market. If a rumor spread that a company is experiencing financial difficulty or facing a product recall, investors will quickly unload the company's stock. If a company's stock is suddenly hyped by a so called stock expert, investors will flock to it, and the price will soar.

Generally speaking, crashes usually occur under the following conditions: a prolonged period of rising stock prices and excessive economic optimism, a market where price-earning (P/E) ratio exceed long term averages and an extensive use of margin debt and leverage by market participants. There is no numerically specific definition of stock market crash but the term commonly applies to steep double-digit percentage losses in a stock market index over a period of prices decline. Bear markets are periods of declining stock market prices that are measured in months or years. While crashes are often associated with bear markets, they do not necessarily go hand in hand. Stock market crash can be catastrophic. In the history of stock trading, stock market crash has been a repetitive issue. A sudden drastic fall of stock prices not only creates agonies and anxieties among the investors and financial analysts but also it largely affects diverse economic factors. A prolonged tenure of rise in stock price can suddenly lead to a stock market crash, this happens after reaching the economic optimism. Psychology of the shareholders changes and a massive change in the crowd behavior become prominent during a market crash. A stock market boom can come to an end with a market crash. So, it is prudent to keep an eye on the market trends.

In Nigeria, the stock market, before the recent crash happened to be one of the most profitable investment havens in the economy (George, 2008). It accumulated about ₦12.6 trillion (about $84 billion) around first quarter of 2008. Public and private sectors trooped to the market to raise fund. The global economic meltdown and other peculiarities have seen the capitalization eroded about ₦5.14 trillion ($36 billion) in the fourth quarter of 2009 (Aluko, 2008). The crash saw share indices cascading from 31450.78 to 23206.23 points for the same period. This crash has led to the 'opening of cans and worms and black boxes'. The negative complexion of the global economic downturn and other intrinsic factors on the capital market and the attendant effects on banks and other market players would have been curtailed if there had been discipline, ethical practices and diversification of the market. From the foregoing, the main research question of this study is stated thus: What are the general effects of the stock market crisis on Nigeria's economy? It is

the quest of providing an answer to the question posed above and giving further clarification with empirical evidence on the issue that primarily necessitated this study. Thus, the paper is focused on providing empirical findings on the relationship between stock market crisis and Nigeria's economic growth and the effect of decline in stock market prices on transactions in the stock market. This paper has five sections. Following this introductory section is the literature review in section 2. The theoretical foundation, empirical model and estimation technique are provided in section 3. Section 4 covers the results from the estimation process and discussion, while the last section is the conclusion.

2. Literature Review

A stock market crash is a sudden dramatic decline of stock prices across a significant cross-section of a stock market, resulting in a significant loss of paper wealth. Paper wealth means wealth as measured by monetary value as reflected in the price of assets. In the concept of stock market, an investor owns shares in a company and the worth or value of that investment increases, then the paper wealth of that investor is said to have increased. Crashes are driven by panic as much as underlining economic factors. They often follow stock market bubbles. Stock market crashes are social phenomena where external economic events combine with crowd behavior and psychology in a positive feedback loop where selling by some market participants drives more market participants to sell.

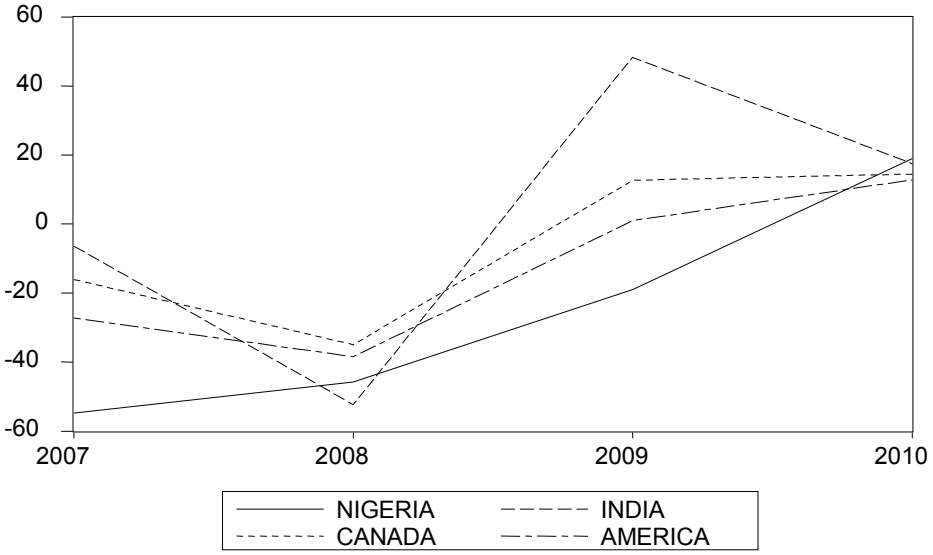
The recent global economic crisis with its roots in banking i.e. the sub-prime mortgage crisis, which commenced in the United States in 2007, soon resonated in other sectors of its financial system, and the economy, at large. It spread quickly to the developed economies in Europe, including the United Kingdom, and Asia with Japan becoming well affected. The emerging economies were not isolated. A transmission channel of the Global financial crisis, which has been referred to as the "Globalized Synchronizes Slowdown" is the stock market. In the case of the Nigerian stock market, following initial relative insulation, the speed of contagion and response was comparatively slower. However, the effects began to manifest in the first quarter of 2008. All markets indicators both around the world stock market not leaving out Nigeria's stock market commenced a downward spiral, and had a negative market growth which ensued. (Sere-Ejembi, 2008)

According to Olisaemeka, (2009), The meltdown of the Nigerian Stock Market was characterized by the crash of the market capitalization from a record of ₦ 13.5million in early 2008 to less than ₦ 4.5trillion in the corresponding period of 2009. This has manifested into the following cost and consequences: first, there was Loss of confidence in the Nigerian economy , as many investors prefer to convert their naira to foreign currencies, especially the dollar and hold them through their domiciliary account. This has in part led to the worsening exchange

rate against the naira currency. Secondly, there were mega losses by investors in the stock market whose total losses were not below two third of their investment before the meltdown , In other words, investors now have less than one third of the value of their investments before the free for all fall. Also, there was overexposure of investors and stock broking firms to banks. The market meltdown has also led to credit crunch in the economy as banks do not have enough to lend to the productive sector leading to high interest rate. Given that, interest rate cost of fund to manufacturers is a very significant component of cost of production; this translates to higher prices of goods and services, leading to inflation.

2.1 World Stock Market Review of 2010

The analysis made by Peninsula Asset management and Investment Company Limited shows the year 2010 returns of major stock exchange (in local currencies) for equity markets around the world. Summarily, the average country saw a major equity market index gain of 15.33% in 2010. Sri Lanka stock market gained the most at 96.01%, while Bermuda decline the most at -97.87%. Six other countries along with Sri Lanka gained more than 50% in 2010 namely Bangladesh (82.79%), Estonia (72.62%), Ukraine (70.20%), Peru (64.99%), Lithuania (56.49%) and Argentina (51.83%). Looking at just the G-7 countries, Germany did the best at 16.06%, followed by Canada 14.45%, US 12.87% and the UK 9%. The three other G-7 countries (France, Japan and Italy) all declined in the year. Of the BRICs, Russia gained the most at 22.70%, followed by India 17.43%, Brazil 1.04% and China -14.31%. The analysis further shows that Kenya was the best performing in Africa for 2010 financial year with a gain of 36.5%, followed by Ghana with a gain of 35.9%, Morocco 22.1%, Tunisia came forth with a gain of 19.1% while Nigeria was the fifth performing market in Africa with a gain of 18.9%.



This graph was constructed using the E-views software package and the figures for 2007-2010 for the Nigerian market, and figures gotten from world stock markets.

Note: The graph above shows global stock market performance four countries from when the global financial crisis started. This explains that in year 2007, Nigeria, US, Canada and India's stock market made a loss of 54.84%, 27.26%, 16.11%, and 6.44% respectively. In 2008, they also made a loss of 45.77%, 38.49%, 35.03%, and 52.45% respectively. In 2009, Nigeria Stock Market made a loss of 19.00% while US, Canada and India made a gain of 0.96%, 12.62%, 48.25% respectively. In 2010, the stock market of these four countries made a gain of 18.93%, 12,78%, 14.45%and 17.43% which indicates for all active stock markets that activities in the Global Stock market has improved.

3. Theoretical Foundation and Model Formulation

3.1 Theoretical Foundation of Stock Markets

3.1.1 Efficient Market Theory and the Stock Market Crisis

Efficient market hypothesis is a theory that suggests that it is not possible to beat the market because other reason that stock market efficiency propels existing share prices to assimilate every time and display all the appropriate data. This means that the stocks are always traded at their fair values on stock exchanges and so it is not possible for the investors to either buy undervalued stocks or sell stock prices at a higher value.

According to Grantham (2011), "the incredibly inaccurate efficient market theory caused a lethally dangerous combination of asset bubbles, lax controls, pernicious incentives and wickedly complicated instruments that led to our current plight". The EMH originally put forth by Fama (1970) states that the prices of securities reflect all known information that impacts their value. There are many definitions of EMH depending on the amount of information assumed, example, whether it is past prices, publicly available information, inside information etc. but no matter what definition is used, the hypothesis does not claim that the market price is always right. On the contrary, EMH implies that the prices in the market are mostly 'wrong in the sense if we were given all present and future information, the true rational price would always differ from the current market price'. Nevertheless, the EMH does imply that at any given moment, it is not easily determined whether the market prices are too high or too low. In other words, there are good economic reasons why prices are where they are, despite the fact that subsequent history may show these prices are terribly wrong. Whether the EMH is true or not, does not excuse the CEOs of the failed financial firms or the regulators for failing to that the risks that subprime mortgage-backed securities posed to the financial stability of the economy (Siegel, 2009).

3.1.2 Efficient Market Hypothesis and the Market

Some wrongly describe the EMH as meaning that the market prices are always right since it incorporates the forces of knowledgeable actors or the "wisdom of crowds", but if that were the case, the EMH would have been dismissed as false as soon as it was put forth as a theory of markets. There have been hundreds of bull and bear markets throughout history, and prices of securities at the bottom and top of these markets have been demonstrably wrong on the basis of future information. In fact, the internet and technology bubble of the 1999-2000 was a far more persuasive episode of "incorrect prices than the financial crisis"

Speculative bubbles are an obvious anomaly, in that the market often appears to be driven by buyers operating on irrational exuberance, who take little notice of underlying value. These bubbles are typically followed by overreaction of frantic selling, allowing shrewd investors to buy stocks at bargain prices. Rational investors have difficulty, profiting by shorting irrational bubbles because as John Keynes commented, "market can remain irrational far longer than you or I can remain solvent". Sudden market crashes as happened on 'Black Monday' in 1987 are mysterious from the perspective of efficient markets, but allowed as a rare statistical event under the weak-form of efficient market hypothesis (Siegel,2009).

3.1.3 Wealth Effect and Stock Market Crisis

As cited in the website (www.oppapers.com), The 'Wealth effect' refers to the propensity of people to spend more if they have more assets. The premise is that when the value of equities rise so does our wealth and disposable income, thus we feel more comfortable about spending. The wealth effect has helped power the U.S economy over 1999 and part of 2000, but what happens to the economy if the market tanks? The Federal Reserve has reported that every $1billion increase in the value of equities, Americans will spend an additional $40million a year. The wealth effect has become a growing concern because more and more people are investing; furthermore, the Federal Reserve has very little direct control over stock prices. When it comes to spending money, consumers take all their financial resources into consideration, from their income to their home. When an asset surges in value for a sustained period of time, such as the stock market in the 1990s, people feel flush and are willing to spend some additional money, perhaps by buying a fancy car or by taking a more expensive vacation. A good number of Wall Street analysts blame the wealth effect for today's negative savings rate.

The wealth effect from fluctuations in stock prices is another argument for why stock prices may lead the economy activity. Since, fluctuations in stock prices have a direct effect on aggregate spending; the economic can be predicted from the stock market. When the stock market is rising, investors are wealthier and spend more. As a result, the economy expands. On the other hand, if stock prices are declining, investors are less wealthy and spend less, these results in slow economic growth. Another possible explanation for why stock prices force economic activity is that the stock market is forward-looking. If investors are truly forward-looking, then stock prices reflect expectation about future economic activity. If a recession is anticipated, for e.g. then stock prices reflect these by reducing in prices. Likewise, in Nigeria and in relation to the crisis in the stock market, this crisis has devalued the shares and thus leading to a decrease in the wealth effect. Investors wealth effect has decreased because of the devaluation in shares, thus, investors in Nigeria prefer now to invest their money in real estate properties and oil industries rather than in shares due to decline in prices.

3.2 Model Specification and Estimation Technique

The main aim of this study was to examine the effect of the stock market crisis in the growth process of Nigerian economy. Thus, the model assumes an underlying relationship between some macroeconomic variables that can influence the economic growth of a nation measured as Gross Domestic Product (GDP). With regards to the merits of the Ordinary Least Square (OLS) modeling method, the multiple linear regression analysis was used with the dependent variable as Gross Domestic Product while the explanatory variables were Market Capitalization, All

Share Index, Volume and Value of Stocks, Number of Deals, and Inflation Rate. This paper therefore presents a model below relating *GDP* to some other macroeconomic variables.

$$GDP = f(MK, ASI, VV, NOD, INFR, U) \quad (1)$$

The explicit form of Equation 1 is represented as follows:

$$GDP = \beta_0 + \beta_1 MC + \beta_2 ASI + \beta_3 VV + \beta_4 NOD + + \beta_5 INFR + \mu_t \quad (2)$$

Where:

GDP= Gross domestic product

MK= Market capitalization

ASI= All Share index

VV= Volume and value of stocks

NOD= Number of deals

INFR= Inflation rate

μ_t= Error term

β_0= Constant term

β_1, β_2, β_3, β_4 and β_5 are regression coefficients.

To test the existence of a significant relationship among the variables expressed in equation 2, the null and alternative hypotheses are stated as follows:

H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$

(Stock market crisis does not have a significant effect on Nigeria's economic growth).

H_1: $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$

(Stock market crisis has a significant effect on Nigeria's economic growth).

On the basis of a priori specification;

$\beta GDP/\beta MK > 0$: There is a direct relationship between GDP and Market capitalization. A growth in MK is indicative of greater financial interest of the populace in the real sector, which will serve to boost GDP.

$\beta GDP/\beta ASI > 0$: There is a direct relationship between GDP and All share index. When the level of activities in the stock market is high, people will rather invest more in the real sector and as a result increases the GDP.

$\beta GDP/\beta INFR < 0$: There is a negative relationship between GDP and inflation rate; inflation is the general increase in the prices of goods so when inflation rate is high,

goods will become expensive, likewise stocks, people will buy less and this indirectly reduces the GDP.

βGDP/βVV>0: There is a direct relationship between GDP and the volume of value of stocks. When there is a large volume of stocks in the market and at a cheaper price with high returns, people will rush and buy these stocks and also the high value in stocks will make investors buy more, so this will affect the GDP positively.

βGDP/βNOD>0: There is a positive relationship. When the number of profitable deals in the real sector is high, it means people are buying and this will make d GDP positive.

4. Estimation and Discussion of Results

The paper employed the use of econometric tools in the analyses of the variables shown in the model. The data used in the estimation for the paper were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin for the period 1985 – 2009. The E-views package was used in the estimation process and results are presented in tables. The variables were taken in their log form to bring them to a comparative level.

4.1 Empirical Results

First running the regression using these variables at levels gave result that was not BLUE (best, Linear, Unbiased Estimator) and could not be relied upon. Hence, the variables are logged to bring them to comparative level. After logging the variables, there was presence of autocorrelation. To correct for this, the AR (1) is introduced. The result is presented in table 1.

Table 1. Regression (OLS) Result for variables for period 1985 - 2009

Dependent variable logGdp			
Independent Var.	Coefficient	T-stat	Probability
CONSTANT	12.12804	(64.52303)	0.00000
LOGMK	0.113900	(3.406922)***	0.0034
ASI	-2.16	(3.379544)***	0.0036
NOD	-1.16	(-2.571535)**	0.0198
VV	9.23	(3.022668)***	0.0077
INFR	-0.001027	(-1.375431)	0.1869
	R^2=0.983, Adjusted R^2= 0.977	F-stat=16.4625, Prob(F-stat)=0.0000	DurbinWatson=4.62

***, ** = 1% and 5% level of significance respectively, GDP = gross domestic product, MK = market capitalization, ASI = all share index (12 months average),

NOD = Number of deals, VV= Volume and value of shares, and INFR = inflation rate,

4.2. Discussion of Results

There is a positive relationship between market capitalization and the Gross Domestic Product of Nigeria. A unit increase in the market capitalization results in an increase in Gross Domestic Product by 11.39%. The implication of this is that the economy responds favorably to measures taken to increase the total market value of companies quoted on the Nigerian stock exchange. The market capitalization shows the level of capitalization on the stock exchange and this is the investors' perception of the market, it is affected among others by trading volume and the total value of amount traded on the stock market. There has been a rapid rise in the amount of MK over the years and this indicates that the populace has grown interests in the securities listed on the stock market, so more securities were sold which means more profit for Nigerian stock exchange, firms that sold these securities and for Nigeria as a country and this led to the positive effect on the GDP of Nigeria. Also, the overall market size is positively correlated with the ability to mobilize capital and diversify risk on economy-wide basis.

There is a negative relationship between all share index and Gross domestic product of Nigeria. This implies that the level of activity whether productive or non-productive on the stock exchange does not affect GDP because the prices of stocks moves in tandem with market capitalization and how investors demand for stocks, although looking at this result using the T-stat, we say it is significant, this can be so because ASI does not directly relate to GDP but it directly relates to Mk (which directly relates to GDP). The Nigerian stock exchange uses all share index that considers an aggregate of the market capitalization of all equities listed on the market and traded.

There is a negative relationship between number of deals in the stock market and Gross domestic growth of Nigeria. A 100% increase in NOD will reduce the GDP by 116%, and because of this gap, it won't be wise for the Nigerian government to use NOD to measure her performance and her economic growth due to the present cause of the crisis in the stock market. This implies that the number of deals, each listed company made in general on the Nigerian stock exchange reduced because of decrease in prices of the shares listed, low return on these shares etc and there was not enough profit to be added to the national income of Nigeria. So whether the number of transactions that have taken place in the stock market has increased or not, it will not affect GDP rather it will affect the ASI and MK.

There is a positive relationship between volume and value of shares and the Gross domestic product of Nigeria. This implies that the economy responds favorably to

the measures taken to increase the transactions in the stock market , it also implies that value of shares are high and it will add to the profit of the stock market which adds to the economic income of Nigeria. We can see that the volume and value of shares compared to Gross domestic products have increased over the years. This also means that the government can use and rely on the total transactions because it is high and productive at the Nigerian stock market to measure her performance and economic growth in this present era of the crisis at the stock market.

There is a negative relationship between inflation rate and Gross domestic product of Nigeria. When inflation rate is high, the general prices of goods and services will increase and this will make people buy fewer goods with more money. This thereby reduces the amount they can safe because they would want to buy their basic needs. Moreover, when people don't have enough money to provide for their basic needs, they will not bother investing the money they get, so this as a result will affect the buying of securities at the stock market thereby reducing it. An increase in demand will increase the price of a share and also a decrease in demand will lower the price of a share. With high inflation rate, the prices of shares tend to fall. When securities are quoted with their prices higher, it will attract investors, but when prices of securities fall, securities will not be demanded, according to investors, the returns on this securities will be low and this will make the profit of organizations reduce because the prices are low, and when this is so, the income of the country will reduce, so inflation rate has no impact on GDP. This implies that when inflation rises, market share prices tend to fall because the purchasing power of payments is eroded, so also, the number of investments in the stock market reduces which in the long run will reduce income of Nigeria on the part of the stock market contribution to her economic growth. The government cannot rely on rising inflation rate to measure her performance.

The Durbin-Watson statistics is used to test for the presence of autocorrelation in the variables. D.W calculated is equal to 4.62, which is strong enough. The F-statistics is used as measure for the overall significance of the model. Since the F-statistics is significant, the null hypothesis which states that stock market crisis do not have a significant effect on Nigeria's economic growth is rejected and the alternative hypothesis accepted. We therefore conclude from our regression analysis that the stock market crisis has significant effect on Nigeria's economic growth.

5. Conclusion

History has shown that prices of shares and other assets is an important part of the dynamics of economic activity and can influence or be an indicator of social mood. An economy where the stock market is on the rise is considered to be an up- and coming economy. The smooth functioning of the activities in any stock market is expected to facilitate economic growth, result in lower costs and reduce enterprise risk and promotes the production of goods and services as well as employment. This expectation motivated this paper. The paper employed econometric tools to analyze time series data sourced from CBN Statistical Bulletin (1985 – 2009) after reviewing the theoretical background on stock market effectiveness and crisis.

The results from the econometric analyses show that market capitalization, volume and value of shares in the Nigerian stock exchange has a direct relationship with gross domestic product. So with this, the Nigerian government can rely on market capitalization, volume and value of shares to promote her economic growth. Also, all share index, number of deals and inflation rate has a negative impact on the general national income of Nigeria. These may have been caused by erosion in the purchasing power of investors due to the high inflation rates, and loss of confidence by investors who were disappointed about the decrease in share prices. From the results, we can infer that stock market crisis has a significant effect on Nigeria's economic growth. This is indicative that its side effect on Nigeria's economy is negative but there could be a way out depending on the way Nigerian investors utilize the available economic opportunities and how the regulators of the Nigerian stock exchange make beneficial decisions in this present state of the crisis. This paper therefore recommends that the NSE should put in place newly-redesigned processes to ensure that market operators conform to minimum technology standards as part of their registration. Existing operators must comply within specified time period. Equally important is access to timely pricing information and analytics. To this end, the NSE should improve its current software to ensure that its analytics/systems provide timely and transparent pricing information to all stakeholders to increase transactions at the NSE. The stock market regulatory authorities need to speedily stimulate, revitalize and boost local investor confidence. This will deepen the market and as a result give a solid ground to market capitalization, all share index, and volume and value of shares. Moreso, the Security and Exchange Commission should explore the framework for the operation of inter-dealer brokers to facilitate price discovery by market participants and investors as a means of increasing market depth and liquidity.

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Tourism and Sustainable Development

Sustainability of Public Resources - International Debate

Nistor Cristina Silvia[1]

Abstract: Given that public resources are becoming increasingly limited, to discuss the international change of their approach is more and more necessary. Long-term fiscal sustainability is the government's ability to meet financial targets and commitments both now and in the future. Through an empirical approach ED "Reporting on the long term sustainability of public finances," affected by the IPSASB and responses made by respondents, this approach measurable impact on international public accounting system with direct implications on the public Romanian system. The results demonstrate the need to review elements of financial statements of public institutions, concluding that the current form does not provide the necessary information tailored to the principles of efficient, effective and rational use of public resources.

Keywords: public accounting system references; viability; exposure draft

JEL Classification: Q01

1 Introduction

During deliberations on the timing and size requirements on welfare benefits, the International Public Sector Accounting Standards Board (IPSASB) concluded that the traditional general purpose financial statements are not able to satisfy all user needs in assessing the future viability of programs that provide social benefits (IFAC, 2011). Doing some research IPSASB concluded that the information in general purpose financial statements (GPFS) should be supplemented with information on long-term fiscal sustainability of these programs, including their financing. Information on long-term fiscal sustainability enables national governments to improve both the information based on historical financial statements of general traditional (GPFS) and financial information provided in reports of general (GPFR).

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Although this Consultation Paper focuses mainly on reporting by national governments, the IPSASB believes that simpler forms of long-term fiscal sustainability reporting are also appropriate for the consolidated reports presented at sub-national levels (IFAC, 2011).

IPSASB considers it important that the information reported on the long-term financial sustainability to meet the qualitative characteristics of financial reporting: relevance, fair presentation of the information, timeliness, understandability, comparability and verifiability. Also revealed are important training bases, principles and methodologies underlying key forecast inputs and outputs. These disclosures would be preferable to include issues such as:

- The main demographic and economic assumptions;
- Sensitivity to changes in these key assumptions;
- The extent to which different modeling approach to forecast or programs focused on a specific age group.

Regarded as a whole report on long-term financial sustainability involves an assessment of the extent to which government policies in accordance with existing legal frameworks can be achieved in the future, assuming certain fiscal constraints, primarily the levels of taxation.

However there is still no definition of long-term fiscal sustainability, widely accepted in worldwide. Economic theory finds the public finance sustainability in the level of budget deficit that does not change (significantly) the ratio between public debt and budget incomes (Easterly et al., 1995). The economic agents have at least a rough idea of the income they will receive during their remaining lifetime and adjust their economic behavior accordingly (Manzke, 2002)

Long-term fiscal sustainability can be assessed by viewing the trend of expected future operations and capital expenditures, tax implications and the risk that the assumptions used to determine the trend will fluctuate significantly.

This information usually includes: the future cost of goods and services, payroll costs of entitlements programs, the cost of legal service obligations, fiscal and other resource inflows to finance these commitments and obligations. Long-term fiscal sustainability is usually related to issues such as predetermination of net debt to GDP ratio or the ratio of net or gross debt and GDP per capita and maintains a specific level of taxation to GDP. Something could be done also with promotion of high economic growth and low costs of public debt; the later could be achieved with a more active debt management (Dolenc, 2006)

Starting from identifying the need to ensure sustainability of public resources, in this study we detect the role IPSASB and its specific features (section 2). The content analysis of ED "Reporting on the long term public finances of

sustainability" (section 3) is base for empirical research (section 4), support on the validation of three hypotheses. Interpretation of responses offered by those involved in the debate ED (section 5) allows the formulation of relevant conclusions regarding the future approach to public sector financial resources.

2 IPSASB Scope

International Federation of Accountants (IFAC) comprises over 160 member bodies, 120 countries. Standards Board International Public Sector Accounting (IPSASB) was created in November 2004 and has a mandate to issue IPSASs (representing a "resource" with full rights).

Accounting IPSASB develops standards and guidelines for use by public sector entities. Structures and processes which support IPSASB work is provided by the IFAC. It functions as an independent normalized body.

IPSASB focuses on accounting and financial reporting needs, regional and local. It addresses these needs by issuing guidelines and promotion of reference and facilitates exchange of information among accountants and those working in the public sector or relies on his work.

Strategy IPSASB's is to convert IPSAS with International Financial Reporting Standards (IFRS) issued by the IASB. To facilitate this strategy, the IPSASB has developed guidelines or "rules of the road" for the change of IFRS for application by public sector entities.

The objective of the IPSASB is to serve the public interest by establishing standards of financial reporting for public sector and by facilitating the convergence of high quality international and national standards, thereby increasing the quality and consistency of financial reporting worldwide. Achieving this goal will improve the quality and transparency of public sector financial reports and provide more useful information for financial management and decision making in this sector.

IPSASB develops standards of international public sector accounting standards by which to communicate the public information sector and financial problems:

- have not been adequately treated in international financial reporting standards issued by the International Accounting Standards Board (IASB).
- for which there are not IFRSs.

It is important to note that the IPSASB will judge things in a professional manner to achieve some real conclusions. After reaching a conclusion, the IPSASB will apply the standard configuration process to create the final standards. The IASB

document review process is ongoing and will be evaluated regularly to see if changes are needed to enhance the process. IPSASB achieves its objectives by:

- issue IPSASs;
- promote their acceptance and convergence with international standards;
- publication of other documents that provide guidance on financial reporting issues and practices in the public sector.

3 The ED „Reporting on the long-term sustainability of public finances" analyze

The objective of the IPSASB is to serve the public interest by establishing standards of financial reporting for public sector and by facilitating the convergence of high quality international and national standards, thereby increasing the quality and consistency of financial reporting worldwide. Achieving this goal will improve the quality and transparency of public sector financial reports and provide more useful information for financial management and decision making in this sector.

Standards developed by the IPSASB are not binding, they may represent a starting point or inspiration for every state, will then substantiate their own reporting standards for public sector accounting. There are more than 80 countries worldwide that have adopted IPSAS references or an approximation of their shape. IPSASB adopts a process that builds IPSASs offering interested parties the opportunity to express their opinions on these standards or other problem on this topic. IPSASB Members meet three times a year to approve and develop standards meetings are open to the public. The process is to publish an Exposure Draft contains proposals IPSASB on IFAC's website. The period for submitting responses can be at least four months. After this period all responses are taken into account, and if appropriate, consultation document is restored and reissued. The document is then submitted to the council members vote and is approved if at least two thirds of them voted yes.

The exposure draft issued in November 2009's fiscal sustainability is defined as the ability of governments to continue, both present and future existing policy, without regard to changes in taxation and public services without causing debt to grow continuously as a share of GDP.

This consultation document puts forward a conception IPSASB Preliminary GPFR's order that must include financial forecasting and other information on the performance of business activities and reporting future objectives and the resources necessary to support this activity. The consultation paper also notes that the

purpose of financial reporting and information that may be provided by GPFR is developing and evolving in response to a number of factors, such as:

- Operating environment faced by firms that prepare GPFR site is constantly changing;
- User needs reliable and relevant information on new and innovative transactions affecting issues such as assessing the financial position and business performance, and addresses their responsibilities.

The issues raised in this consultation document are seven in number, and address the following issues:

1. Presentation of information on long-term fiscal sustainability (sustainable development of the tax system) is required to achieve the goals of the financial report (accounting and decision making) as proposed in the consultation paper IPSASB 'financial report for the conceptual framework of general objectives public sector entities ", issued in September 2008.

2. Directive IPSASB should advise that the information contained long-term fiscal sustainability in GPFR to be provided either by an additional statement to detail the projects, either through narrative reports summarizing projects.

3. IPSASB Directive should be based on the concept of entity should ensure the report and recommended practice for reporting a centralized set of all levels of government.

4. Directive IPSASB should guide that indicators of long-term fiscal sustainability should be chosen for: (a) their relevance to the entity. (B) the extent to which present or qualitative indicators of the financial report. (C) their ability to describe the problem arising from entities tax. In the same way would be to suggest that comparative information be provided, and the reasons for the discontinuation of the indicators report, if there is to be disclosed.

5. Directive IPSASB for reporting long-term fiscal sustainability GPFR suggests that the entity should disclose:

- Each departure from the principle that projects are based on current policies sustainability;
- The grounds on which projects for income taxes and other source material were made;
- Any key assumptions supporting the draft long-term fiscal sustainability;
- Details of key aspects of the laws and regulations, and macroeconomic policy and fiscal framework are based.

6. Directive IPSASB for reporting long-term fiscal sustainability GPFR suggests that the entity should disclose:

- The time range for fiscal sustainability projects GPFR presented and the reasons for changing time limits and published plans to alter those time limits;
- Rate reduction, together with reasons why they were chosen;
- Accurate analysis results.

7. IPSASB Guide for reports GPFR sustainable fiscal development sites should therefore recommend that:

- The development projects are being prepared or updated within the period of five years from the date of the report.
- Date of preparation or updating to be relevant.

4 Research Design

The main objective of the study is the possibility of increasing the portfolio assessment of IPSAS by creating a new one, on Reporting on the Long-Term Sustainability of Public Finances. So, we formulate the following hypotheses:

H1. To create an IPSAS regarding Reporting on the Long-Term Sustainability of Public Finances is considered useful by most professional bodies of respondent countries, members of IFAC.

H2. Defining specific notions of long term sustainability (e.g. long-term fiscal sustainability indicators, time horizons for fiscal sustainability projections, the form of financial reporting) is clear and concise.

H3. Information about the fiscal challenge is required in order to meet the accountability objective for financial reporting.

To validate or invalidate the formulated hypotheses, we will analyze and interpret the answers given by respondents with reference to the seven topics of discussion raised by the IPSASB on the final form of IPSAS XX Reporting on the Long-Term Sustainability of Public Finances.

In this approach we started from a theoretical approach of the problem of the public accounting regulations with focus on Reporting on the Long-Term Sustainability of Public Finances. Subsequently, through an empirical research we will determine the degree of acceptance of the standard on three levels: on each topic questioned (N=7), on each respondent country (N=32), and as whole. By quantifying 1 (YES) or 0 (NO) we will appreciate the acceptance or refusal of each point (N = 7) under

discussion. Subsequently, we will motivate positive or negative responses depending on specific public accounting system of responding countries.

The scientific research contributes to the efforts to deepen the knowledge required by retrospective nature imposed by the realized normative research, and by the prospective nature, given by the realized empirical research. Among the human socio science methods used in this approach, we can specify: analysis of documents, comparative method and observation method.

5 Results

New regulations on long-term sustainability of public resources are presented in the consultation document "Reporting on long-term sustainability of Public Finances" which is published on the official site of the IFAC issued in November 2009. Under the process adopted by the IPSASB date by which they could submit comments on this topic was in April 2010, following committee members to consider and make decisions based on them.

This consultation document has received 32 comments; those interested in addressing for professional bodies are representing the committees responsible for setting accounting standards in different countries, other entities or individuals. In terms of affiliation of respondents, the situation is as figure 1.

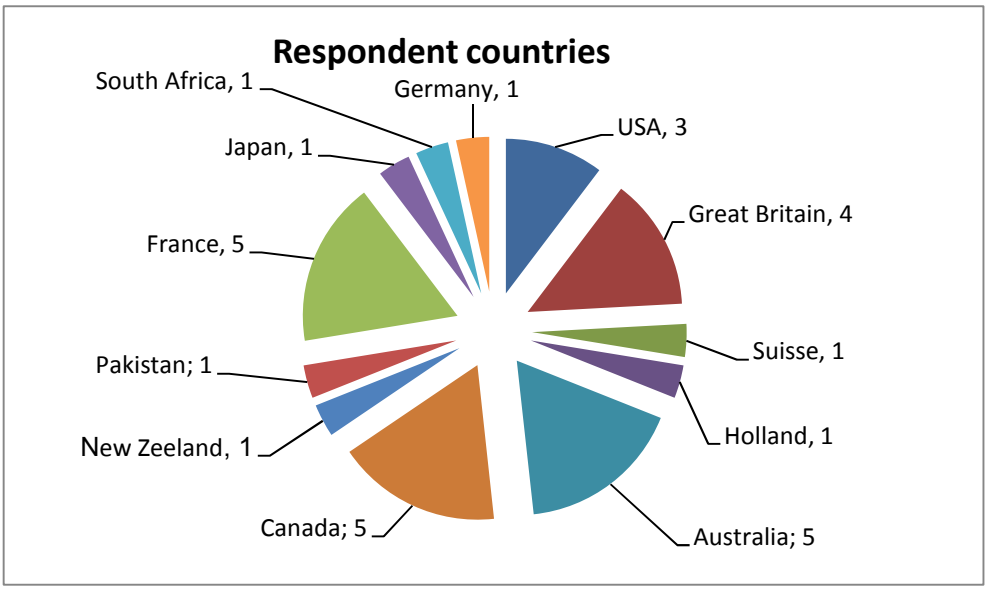

Figure 1. Answers ordered by respondent countries

Most respondents viewed the IPSASB proposals very seriously and argued giving complex answers. Structure responses were generally the same, starting with a letter of thanks for the opportunity given and a conclusion regarding the consultation document on long term fiscal sustainability aimed at IPSASB Technical Director and eventually annexed the detailed commentary on each proposal separately. This approach to problems has helped us centralize the assessment and classification of responses on each question presented in table1.

Tabel 1. Arrangement answers

Question	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Answer							
Yes	20	19	21	22	24	29	24
No	12	13	11	10	8	3	8

Overall notice a favorable assessment of the issues discussed by the ED (Figure 3), following the separate analysis of the seven points raised during the discussion to reveal the detailed analysis of responses (Figure 4).

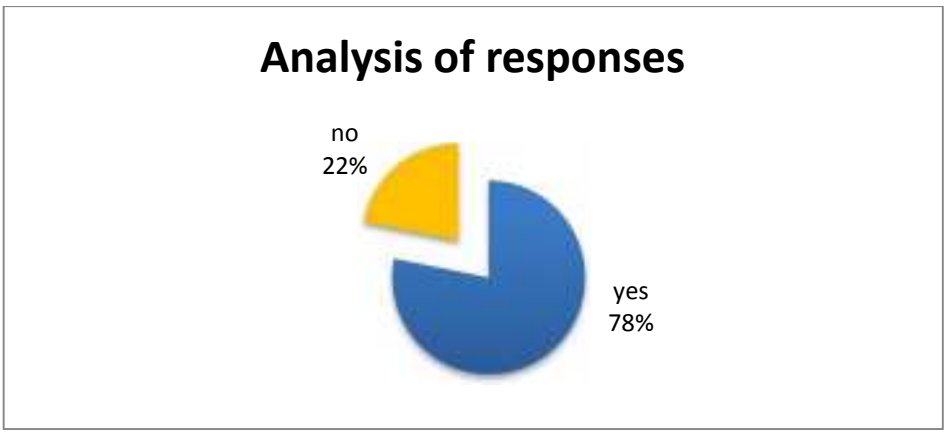

Figure 2. Reply share

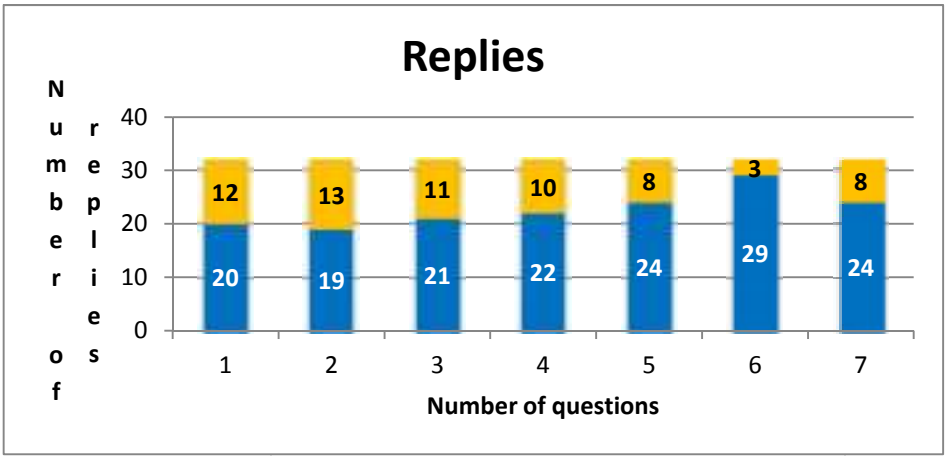

Figure 3. Replies / point under discussion

As can be seen in Figure 3, 78% of the respondents agree in principle with the proposals in the consultation document, although only 10 of them were fully agreed. Those who rejected the proposals have a combined share of 22% even if only three of the respondents rejected them entirely. From Figure 4 it follows that the first four questions were debated, the views of respondents are equally divided, while the vast majority of their last three agree.

IPSASB first proposal on reporting long-term sustainability of public resources is the inclusion of such information in the financial statements of a general nature. As mentioned above and some opinions were divided regarding this proposal as a major force in the sense that it will expand the scope of the information which users have access, while the combatants are of the opinion that such information have no place in a financial report as it relates more to the field of statistics than the accountant. For example ACCA (Association of Chartered Certified Accountants) UK believes that the information on long-term sustainability of public resources of the national government would increase transparency and to support decision making. But have little doubt that long-term financial reporting could help countries be better prepared in the future, but this information might be of interest to international bodies such as European Union, World Bank or FMI. General Directorate of Public Finance in France does not agree with the introduction of information on long-term fiscal sustainability in the report because its generally are not part of the area of accounting and IPSASB should deal with more regulation than the public sector accounting framework. As arguments they make the difference between the objectives of the two types of information and that accounting statements are based on events and facts, having an objective, while the projected data have a strong personality and a degree of uncertainty. General Directorate of Public Finance in France does not agree with the introduction of information on long-term fiscal sustainability in the report because its generally are

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The second proposal relates how to make the submission of data on the viability of public resources. The proposal that IPSASB Guide is based on the reporting entity concept and provide recommended practices for developing the consolidated reports prepared by all levels of government, some of the recommendations relate to the fact that information about LTFS (Long Term Fiscal Sustainability) shown in a GPFR should not include information on entities outside the boundary of the reporting entity. It should apply initially to the national government in time to be introduced at other levels because it would provide useful information.

Regarding the recommendation that long-term fiscal sustainability indicators should be selected based on their relevance to the entity, the degree to which indicators meet the qualitative characteristics of financial reporting and their ability to describe the scale of fiscal difficulties facing the entity, CIPFA (The Chartered Institute of Public Finance & Accountancy) UK considers that IPSASB should encourage a more standardized reporting format to facilitate comparability. They also agree that the indicators should be selected based on the extent to which they meet the quality attributes. They suggest that the high level of uncertainty due to economic and demographic data and level of costs necessary, would be helpful if the recommendations IPSASB should be clear regarding the fact that information on long-term sustainability is not within the fair basis under which financial statements are prepared and audited. As contra argument Social Security Council of France argues that by limiting the sustainability indicators, it will reduce the initiative of states to meet their information needs. Thus it is advisable to leave at the discretion of each State, with condition that indicators has to meet the requirements of relevancy and to be known by decision-making body.

The fifth proposal is supported by the vast majority of respondents, however, were brought here a number of amendments including: a first estimate would be based on existing policies, and the results of future policies would be outlined in a another version, and also the choice of indicators should be objective and based on key assumptions and scenarios to avoid political interference or managerial.

Regarding discounter rate that should be used in forecasting have been several complaints because the guide IPSASB has not shown in detail how their selection of respondents finding this very important subject.

Period of five years for predicting and updating long-term fiscal sustainability has been approved by the majority of respondents, combatants have argued that this period would be too long, and therefore would be expected inconclusive data, suggesting a period of three years.

6 Conclusions

IPSASB is an international body whose role is to ensure uniformity of international standards to ensure transparency and comparability of financial information not in the public sector. Even though the accounting regulations currently under effect don‘t provide a detailed presentation of the qualitative characteristics of financial statements, we must not forget that these are, in fact, the essential features based on which we establish the utility of the accounting information (Cozma Ighian, 2009:858). IPSASB Consultative Document issued in connection with long-term sustainability of public resources has sparked reactions to issues raised, particularly from countries using accounting standards based almost entirely on IPSAS (Canada, United States, France, New Zealand, etc.). We believe that other countries have not as yet be expressed views are in the process of adopting standards or adapt them to their own needs. The analysis made by us showed that most respondents agree with entering data about long-term financial sustainability in general purpose financial reporting, but although they were numerically inferior combatants brought very robust argument in support of their views. ISASB now has the task of analyzing the responses received and to decide on possible new standards adopted.

With reference to the assumptions we made, we mention that there is a generally accepted recognition of the need of designing an international reference standard on the sustainability of public resources, so that hypothesis one is validated. In terms of specific referential terms and conditions, the observations are many and complex, although the majority of responses addressed respondents generally accept capture. From this point of view we believe the need to reassess the question of accessibility IPSASB ED's content, consequently consider that hypothesis 2 was shown to be invalid. Hypothesis 3 according to which the information about the fiscal challenge is required in order to Meet the Objectives for Financial Accountability reporting is accepted by respondents, it proved to be valid.

7 Research Limits

To commensurate international implications of such an approach, the countries surveyed, IFAC member ought to be much higher. For the emerging countries (including Romania) notice a lack of interest in this topic, although important international institutions (WB, IMF) and gave their consent and support to implement such a referential. It demonstrates once again that the scope of accounting information users is a continuous diversification, while financial statements begin to be inadequate and their content.

8 Future Researches

Romania, as IFAC member country, must be permanently connected to the accounting profession's body (CECCAR) the expected evolution in the public accounting. In this context, proposals from the ED "Reporting on the long-term sustainability of public finances, the debate content and implications of such a reference standard would be extremely helpful for all participants involved in the regulation of public accounting system (the legislator), in making application of the provisions (practitioners) and in the interpretation and analysis of results (other users). Thus, we propose that future research using a questionnaire to solicit the views of representatives of these the three categories, order to finally assess Romania's position on this issue. This study represents a first step of the comprehensive research process namely the assessment of need and goal and content situation "Reporting on the long-term sustainability of public finances" in the emerging countries.

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Exploring the Nexus between Trade, Visitor Arrivals, Remittances and Income in the Pacific: a Study of Vanuatu

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Abstract: We explore the contributions of trade openness, remittance inflows and expansion in tourism towards improving income in Vanuatu over the periods 1983-2009 using the augmented Solow approach and the ARDL bounds test. The results show trade openness and remittances have a positive and statistically significant effect on the long run growth of the economy while tourism expansion is not statistically significant. For a broad-based development policy we propose: remittance inflows need to be encouraged and additional remittance markets to be explored; trade negotiations with specific focus on temporary movement of natural persons need to be prioritized; and ensuring access to financial services and technology to rural and outer islands in Vanuatu. To confine to diversity of the economy, there is a further need to develop tourism infrastructure besides putting policies in place to ensure that tourism sector operations benefit trickle down to the grassroots level of the society.

Keywords: economic growth; tourism expansion; ARDL Bounds Test; Vanuatu.

JEL Classification: F24; L83; N17

1 Introduction

Vanuatu is a developing Pacific Island country (PIC) with a population of some 240,000. The economy is growing at an average rate of 2.5 percent per year since 2001, and is categorized as a least developed country (LDC) among the five countries in the Pacific region. The relatively high subsistence nature of the economy has enabled Vanuatu to withstand the adverse effects of the recent global financial crisis.

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Although agriculture is the main driver of the economy, much of the agriculture is non commercial. The sector employs more than 70 percent of the working population and representing about 19 percent of the GDP. Moreover, kava used to be one of the major export commodities in the early 1990s. However, the ban imposed on kava export by the European Union (EU) has adversely affected the agricultural sector in Vanuatu. The economy is further characterized with poor and costly infrastructure, complex and outdated legal framework, limited access to services including finance, particularly in rural and remote areas, with difficulties in mobilizing land for economic and productive uses. Currently, only about 13 percent of the rural adults have bank accounts and an estimated 92,000 people (38 percent of the population) needs access to secure and convenient financial services without which many of the rural households remain dependent on subsistence farming. The bulk of the financial sector loans are also invested in real estate projects (ADB, 2010).

Nevertheless, over the last three decades, remittance inflows have gained momentum thus playing a critical role in the development process of the country. In 2006, an initiative by the New Zealand government to introduce the Recognized Seasonal Employer Scheme and later, the Australian government's introduction of the Seasonal Pilot Worker Scheme, have provided access to rural and island unskilled workers to participate in fruit picking work in the horticulture and viticulture industry. Therefore these schemes are expected to reduce population pressures and provide remittances to the islands (Bedford, Bedford and Ho, 2010) whilst providing some degree of resilience from external shocks.

In light of this, we explore the contribution of remittances, trade openness (Rose, 2004), and tourism expansion towards per worker income using the augmented Solow approach (Solow, 1956). The study is important in at least three ways. Firstly, we provide a formal approach to measuring factor contribution to per worker income; secondly, the importance of remittances is underscored; and thirdly we put forward some directions towards development discourse for the economy of Vanuatu. The rest of the paper is outlined as follows. A brief literature survey is provided followed by a brief discussion on trends relating to the variables under study. Thirdly, the data, method and model are discussed followed by the analysis. Finally, we conclude with some policy suggestions.

2. A Brief Literature Survey

Remittance inflows are defined as private income transfers from one or more family members living and working abroad back to the remaining family unit in the home country (Chami, Cosimano, & Gapen, 2006). Over the last four decades, remittances have surpassed official development assistance (ODA) of developing

countries, and have been growing substantially increasing from US$22 billion in 1985-1989 to US$308 billion in 2009 (World Bank, 2011a).

When relatively poor families use remittances to increase consumption and to some degree in capital investment, it has poverty reducing effect on the household (Buch and Kuckulenz, 2004; Connell, 2005; Maclellan & Mares, 2005; Ratha, 2007) and subsequently has higher tendency to enhance productive capacities of the economy. Further, remittances also provide income to support growth in human capital (education), healthcare needs, entrepreneurial development, and provide the much needed 'buffer cash' during economic crisis and natural disasters (Browne and Leeves, 2007; UNESCAP, 2010). Remittance expenditure on things like housing, sanitation, health care, food and schooling, results in improvement in welfare and human capital, which in turn have the possibility to increase productivity, freedom of choice and capacity to participate in public debate (De Haas, 2005; Sen, 1999).

A number of researches have been conducted on migration and remittances from development perspective. Subsequently, understanding the migration patterns in the Pacific provides some answers to the relatively uneven flow of remittances in the region as well as development.

In an IMF study, Browne (2006) identified three phases of emigrants' motivations to remit. In the first phase, remittances are used for meeting basic consumption needs of families living in home countries which also extends to the expenditures covering (mobile) phones, sound systems, computers and outboard motors among other things. The second phase is for human capital investment for the next generation, which includes support for schooling in the home country and later for support for higher education abroad. The last phase focuses on future retirement needs if migrants decide to return home, including long term needs such as real estate purchases and house building as well as for business investment purposes.

The most common means of sending remittances in the Pacific region are through postal mail, and via visiting migrant's or migrant's relatives or friends. Brown and Ahlburg (1999) in their study on PICs confirm that remittances sent are largely through informal channels than through formal channels. The formal channels used by the remitters in the region include Western Union money transfers, bank drafts and automated teller machines (ATM). The transaction costs involved in sending remittances to PICs through banking channels have been high (Irving, Mohapatra, & Ratha, 2010). A host of market factors have been said to influence the transaction cost of remittances. According to Ratha & Riedberg, (2005) and Irving, et al. (2010), some of these are: (a) the number of competitors (service providers), which depends on the size of that particular remittance corridor and legal regulations; (b) the cost of remittance providers, which depends on the method and technology available to them for use; (c) the needs and preferences of customers; and (d) the extent to which consumers are aware of the various choices of services

available to them. Further, the preferences of customers are equally dependent on the availability and accessibility of existing remittance-transfer services, the selection of which are largely based on the speed, the needs at the destination, and the sender's legal status.

Reviewing the migration history in the Pacific, it is noted that in the late nineteenth and early twentieth century, after a spate of outright abduction of men and women, referred to as 'black birding' there followed a period of greater surveillance by the British navy and a more regularized form of Pacific islander labour migration to Queensland, New South Wales, Fiji, and New Caledonia. However this labour migration primarily from Melanesian countries such as the Solomon Islands and Vanuatu ceased by the third decade of the century. So for most of the twentieth century, Melanesian countries unlike Micronesian and Polynesian countries were not engaged in labour migration or were recipients of any significant amount of remittances (Scarr, 1967; Shineberg, 1999).

Moreover, despite the argument that migration has become an outlet for many PICs including smallest islands states, such as Niue, Kiribati, Tuvalu, and Wallis and Futuna, which has been further exacerbated by globalization, in the past, Pacific access to Australia and New Zealand had been confined to only selected countries which had close historical ties (Appleyard & Stahl, 1995) with very little chances of migration and work for those who were unskilled (Maclellan & Mares, 2005; Naidu & Pillay, 2001). Later on, the introduction of the Pacific Access Category (PAC) allocated quotas to countries likes Tonga, Fiji, Kiribati and Tuvalu for permanent residence in New Zealand, with stringent conditions relating to employment (Bedford, et al., 2010).

However, the trends are changing now as the developing PICs have greater degree of access to international borders with some conditionality. Growth in out-migration in the Pacific therefore has been said to be compensated by growing remittance inflows which is likely to provide some resilience from external shocks and decline in other capital inflows (Connell, 2005). In a recent study of the PICs, using case studies of Tonga, Samoa and Fiji, Jayaraman et al. (2011, 2010, 2009) show that remittances and financial development are pertinent to the development discourse in these islands. However, integrating the two remains a critical challenge for many developing countries given the poor accessibility and high cost of financial services (Kumar, 2011a). Kumar (2011b) in a study on Vanuatu analyzed the impact of ODA, financial development and foreign direct investment (FDI) with trade openness and remittances, and concluded that only the latter two have a significant and positive effect on income.

In regards to trade openness, a study by Wacziarg and Welch (2008) show that trade liberalization has resulted in higher growth for many countries, and those which experienced negative or no effect were mainly due to political instability,

unfavorable macroeconomic policies, or high protection barriers. Winters, McCulloch & McKay (2004) argue that trade liberalization, if managed properly, can be an important component of a pro-poor development strategy. Kar, Peker, & Kaplan (2008) using Turkey as a case study finds that trade liberalization, financial development and the interaction between the two have positively contributed to economic growth in the long term.

International tourism is vital for many developing countries. Together with developments in information and communication technology, the industry has gained greater prominence over the past decades than the previous efforts invested in import substitution strategies and agriculture thus revolutionizing the structure and organization of tourism (Sheldon, 1997).

In a case study of Mauritius, Durrbarry (2004) estimates tourism effect on growth with real gross domestic investment (capital), secondary school enrolment (human capital), and disaggregated exports, such as sugar, manufactured exports and tourism receipts. Durbarry finds that tourism contributes to about 0.8 percent in the long run. Lee & Chang (2008) using a heterogeneous panel cointegration technique for OECD (Organization for Economic Co-operation and Development) and non-OECD countries find that tourism development has a greater impact on GDP in non-OECD countries than in the OECD countries. Nowak, Shali & Cortes-Jimenez (2007) using Spain as a case study, show that tourism exports when used to finance imports of capital goods can have positive effect on economic growth. Despite differences in methods used, several other studies also conclude that tourism has significant positive effect on economic growth (Brida & Risso, 2011; Brida, Carrera & Risso, 2008; Fayissa, Nsiah, & Tadasse, 2008; Seetana, 2011).

In a panel data analysis for selected PICs (Fiji, Tonga, Samoa and Solomon Islands), Narayan et al. (2010) show that overall, tourism exports contribute to about 0.7 percent to economic growth in the long run and 0.2 percent in the short run. In a recent study on Fiji Islands, Kumar & Kumar (2012) show that ICT development and tourism have significant positive effect on per worker income both in the long run and the short-run with the former having a relatively larger effect. Moreover, Holzner (2011) studied some 134 countries of the world and concluded that tourism dependent countries do not face real exchange rate distortion and deindustrialization but higher than average growth rates as a result of growth in tourism and transport infrastructure, and that investment in physical capital support tourism sector development. On the contrary, not all studies support the tourism-led-growth hypothesis. For examples, Katircioglu (2009) in a case study of Turkey using the bounds test and Johanesen approach, and Oh (2005) in a case study of Korea shows that tourism does not have any significant effect on output level.

2.1. Recent Trends of the Key Economic Drivers in the Developing PICs

It is interesting to note that Vanuatu has recorded a positive growth despite increasing population growth (Table 1). Using 2001-2005 growth rates as a guide, Fiji, Kiribati, and Tonga have negative or lower GDP growth rate relative to their respective population growth.

Table 1. Selected PICs: GDP growth rate versus population growth (%): 1961-2010[a]

Year	Fiji	Kiribati	PNG	Samoa	Solomon Islands	Tonga	Vanuatu
1961-1970	5.22	n.a.	6.88	n.a.	n.a.	n.a.	n.a.
	(2.83)	(1.84)	(2.02)	(2.63)	(3.05)	(3.65)	(2.94)
1971-1980	5.02	-0.50	2.57	n.a.	n.a.	n.a.	-11.40
	(1.97)	(1.72)	(2.25)	(0.85)	(3.54)	(-0.15)	(3.03)
1981-1990	1.55	1.68	1.29	1.18	n.a.	1.84	4.78
	(1.33)	(2.12)	(2.56)	(0.40)	(3.15)	(-0.24)	(2.37)
1991-2000	2.41	3.63	4.36	2.54	2.73	2.89	18.19
	(1.03)	(1.57)	(2.66)	(0.90)	(2.81)	(0.42)	(2.33)
2001-2005	2.44	1.77	1.64	5.04	1.21	1.99	1.13
	(0.65)	(1.81)	(2.54)	(0.27)	(2.62)	(0.66)	(2.64)
2006	1.90	1.90	2.58	2.15	6.95	0.13	7.19
	(0.64)	(1.67)	(2.45)	(0.02)	(2.53)	(0.60)	(2.61)
2007	-0.90	0.41	7.20	2.27	10.70	-0.90	6.74
	(0.64)	(1.61)	(2.41)	(-0.03)	(2.50)	(0.56)	(2.56)
2008	0.20	-1.10	6.70	4.99	7.30	2.60	6.34
	(0.64)	(1.56)	(2.37)	(-0.04)	(2.46)	(0.48)	(2.52)
2009	-3.00	-0.65	5.50	-5.53	-1.20	1.67	3.50
	(0.61)	(1.53)	(2.33)	(-0.01)	(2.42)	(0.39)	(2.49)
2010	0.11	1.80	8.00	1.00	7.00	-0.33	3.00
	(0.57)	(1.52)	(2.29)	(0.05)	(2.37)	(0.28)	(2.48)

a. Figures in parentheses denote population growth rate the interval years are averages calculated by the author.

Source: World Bank (2011b)

The aid inflow dynamics have been impressive for some countries. Using aid (as a percent of GDP) a measure of aid dependency, it is noted that Solomon Islands, Kiribati, Vanuatu, Samoa, and Tonga heavily depend on aid for their development (Table 2).

Table 2. Selected PICs: Aid (US$ millions): 1961-2009[a]

Year	Fiji	Kiribati	PNG	Samoa	Solomon Islands	Tonga	Vanuatu
1961-1970	4.9 (3.2)	n.a.	58.5 (12.3)	n.a.	n.a.	n.a.	n.a.
1971-1980	20.7 (3.2)	13.0 (37.8)	250.3 (17.0)	n.a.	21.4 (22.8)	n.a.	41.2 (35.5)
1981-1990	39.4 (3.3)	15.7 (58.3)	325.5 (11.5)	28.2 (27.4)	36.7 (15.0)	19.1 (24.7)	33.2 (26.1)
1991-2000	44.7 (2.6)	17.7 (30.4)	342.3 (7.9)	39.5 (24.4)	46.9 (10.4)	27.2 (15.3)	39.6 (17.3)
2001-2005	48.6 (2.0)	19.4 (22.0)	232.8 (6.4)	37.6 (12.4)	93.0 (24.1)	24.4 (11.7)	34.0 (10.4)
2006	55.7 (1.8)	26.9 (24.5)	278.9 (5.0)	47.1 (10.7)	204.5 (44.8)	21.4 (7.3)	48.8 (10.9)
2007	50.8 (1.5)	27.0 (21.1)	324.5 (5.1)	37.5 (7.6)	246.1 (42.0)	30.9 (10.1)	56.7 (10.4)
2008	45.3 (1.3)	27.1 (20.5)	304.4 (3.8)	40.3 (7.0)	224.4 (34.7)	25.9 (7.4)	92.3 (14.9)
2009	71.1 (2.5)	27.2 (21.2)	414.8 (5.2)	77.4 (15.6)	202.9 (33.7)	41.3 (12.7)	98.1 (15.9)

a. Figures in parentheses denote percentages to GDP; the interval years are averages calculated by the author.

Source: World Bank (2011b)

Remittances as a percent of GDP have been relatively high for Tonga, Samoa, Kiribati and Fiji. Interestingly, for Tonga, Samoa and Fiji, remittance has surpassed the aid inflows relative to their respective GDPs indicating the possible gains achieved from migration over time.

Table 3. Selected PICs: Remittances (US$ millions): 1971-2009[a]

Year	Fiji	Kiribati	PNG	Samoa	Solomon Islands	Tonga	Vanuatu
1971-1980	4.2 (0.4)	1.6 (4.7)	9.3 (0.5)	12.5 (n.a.)	n.a.	4.5 (16.2)	n.a.
1981-1990	18.8 (1.6)	3.6 (13.6)	6.9 (0.2)	29.0 (29.3)	n.a.	16.6 (21.8)	8.2 (6.5)
1991-2000	29.4 (1.6)	6.7 (11.3)	15.2 (0.3)	40.8 (22.5)	3.3 (0.7)	20.4 (15.0)	20.0 (8.3)
2001-2005	133.0 (5.7)	7.0 (8.2)	7.0 (0.2)	66.6 (20.2)	5.6 (1.5)	63.5 (30.6)	14.2 (5.0)
2006	184.7	7.0	4.4	108.0	1.9	78.9	5.0

	(6.0)	(6.4)	(0.1)	(24.5)	(0.4)	(26.7)	(1.1)
2007	160.5	7.0	7.6	119.8	2.1	101.3	5.5
	(4.7)	(5.5)	(0.1)	(24.3)	(0.4)	(33.2)	(1.0)
2008	123.4	9.0	14.8	135.0	1.7	94.1	7.0
	(3.5)	(6.8)	(0.2)	(23.3)	(0.3)	(27.1)	(1.1)
2009	153.6	8.2	12.0	124.4	2.4	86.8	6.5
	(5.4)	(6.4)	(0.2)	(25.1)	(0.4)	(27.9)	(1.0)

a. Figures in parentheses denote percentages to GDP the interval years are averages calculated by the author.

Source: World Bank (2011b)

Tourist arrival and tourism receipts (percent of GDP) have increased for Vanuatu, Samoa and Tonga over the years while Fiji experienced a decline in visitor arrival since 2006 (Table 4). Tourism receipts (as a percent of GDP) have increased for Vanuatu from 23 percent (1996-2000) to 26 percent (2007).

Table 4. Selected PICs: Tourist arrival (thousands): 1970-2009[a]

Year	Fiji	Kiribati	PNG	Samoa	Solomon Islands	Tonga	Vanuatu[b]
1996-2000	348.7	4.8	60.2	76.7	11.4	29.2	50.2
	(18.2)	(3.8)	(0.3)	(17.1)	(2.0)	(5.2)	(22.5)
2001-2005	445.2	4.4	58.4	93.8	7.2	38.4	55.0
	(21.4)	(5.0)	(0.2)	(17.9)	(1.1)	(4.7)	(24.8)
2006	549.0	4.4	78.0	116.0	11.0	39.0	68.0
	(22.0)	n.a.	(0.1)	(20.7)	(7.7)	(5.3)	(24.3)
2007	540.0	4.7	104.0	122.0	14.0	46.0	81.0
	(21.5)	n.a.	(0.1)	(21.0)	(6.4)	(5.0)	(26.1)
2008	585.0	3.9	114.0	122.0	16.0	49.0	91.0
	(23.6)	n.a.	(0.0)	(19.5)	(6.3)	(5.6)	n.a.
2009	542.0	3.9	n.a.	129.0	n.a.	51.0	101.0
	(21.5)	n.a.	(0.0)	(23.4)	(8.7)	n.a.	n.a.

a. Figures in parentheses denote tourism receipts as percentages of GDP the interval years are averages calculated by the author.

b. For Vanuatu, average number of visitor arrival for 1981-1990 was 28.3 thousand and for 1991-1995, it was 42.5 thousand.

Source: World Bank (2011b) and Vanuatu National Statistics Office, Port Vila, Vanuatu

Further, trade as a percent of GDP has increased for Samoa, Tonga and Vanuatu since 1991-2000 periods (Table 5). On average, between 30 to 40 percent of trade comes from trade in services for countries like Fiji, Samoa and Tonga. For Vanuatu, trade in services (as a percent of Trade) is comparatively high (around 55 percent), thus indicating the economy's heavy focus on service sector expansion. In exploring the sectoral contributions to income, Kumar and Kumar (2011) note that services (value added) as a percent of GDP is close to 68 percent for Fiji and

Vanuatu, indicating services sector expansion and the potential for long term growth in this sector.

Table 5. Selected PICs: Trade (%GDP) and Trade in Services Share (% Trade): 1970-2009[a]

	Fiji	Kiribati	PNG	Samoa	Solomon Islands	Tonga	Vanuatu
1961-1970	92.4 (n.a.)	n.a.	55.5 (n.a.)	n.a.	n.a.	n.a.	n.a.
1971-1980	96.0 (29.3)	100.6 (n.a.)	86.0 (15.9)	n.a.	n.a.	96.2 (28.0)	74.9 (n.a.)
1981-1990	98.8 (37.3)	139.1 (n.a.)	93.7 (17.3)	n.a.	99.9 (27.8)	93.2 (43.1)	104.2 (43.4)
1991-2000	118.9 (41.4)	78.6 (n.a.)	101.7 (23.5)	89.6 (53.6)	93.8 (31.1)	71.8 (40.6)	96.6 (57.5)
2001-2005	125.0 (34.5)	71.4 (n.a.)	125.7 (26.1)	95.3 (40.8)	64.6 (37.6)	72.9 (39.5)	89.5 (62.7)
2006	119.4 (36.0)	n.a.	147.9 (23.2)	93.8 (45.9)	93.4 (28.4)	68.6 (32.1)	87.7 (55.2)
2007	111.9 (36.3)	n.a.	149.1 (24.4)	94.0 (43.6)	93.1 (28.5)	65.6 (34.4)	85.5 (56.2)
2008	128.7 (34.3)	n.a.	136.4 (20.2)	85.8 (41.7)	95.1 (28.5)	70.1 (38.4)	98.0 (n.a.)
2009	108.8 (37.6)	n.a.	115.1 (23.3)	92.0 (49.8)	80.5 (32.4)	71.7 (n.a.)	n.a.

a. Figures in parentheses denote share of trade in services as a percentage of total trade; the interval years are averages calculated by the author.

Source: World Bank (2011b)

Vanuatu, whose key indicators are given in Table 6, is the focus of this paper. Noting the growth in remittances, expansion in trade (and trade in services), and tourist arrivals, we explore the long term impact on the income level.

Table 6. Vanuatu: Selected key indicators*

Land Area (Sq.km.'000)	12.2
Population (2010: '000)	239.7
Per Capita GDP (US$) Current Prices (2010)	3041.7
Aid Per Capita in US$ (2009)	419.4
Aid as percentage of GDP (2005-2009)	12.4
Annual Average Growth Rate in percent (2005-2009)	5.8
Annual Average Inflation in percent (CPI) (2005-2009)	3.4
Fiscal Balance of Central Government as percent of GDP (2004-2008)	2.1
Current Account Balance as percent of GDP (2004-2008)	-8.3

* interval periods are averages calculated by the author.

Source: World Bank (2011b), ADB (2009), UNESCAP (2007)

3. Data, Method and Results

The study looks into the nexus between remittances, trade openness, tourism and per worker income for a 27-year period (1981-2009). The capital stock utilized for the study has been built up by a perpetual inventory method.1 In regards to labour stock, annual population data is used as a proxy since there is no consistent time series data on employment.

Therefore, (i) remittances, expressed as percent of GDP (REM); (ii) trade (total of imports plus exports) as a percentage of GDP (TRDt) which is used as a measure of trade openness or liberalization (c.f. Dollar and Kraay, 2004), and the total tourist arrivals (TURt) (as a proxy of tourism expansion2 – c.f. Kim, Chen, and Jan, 2006; and Wang and Godbey, 1994), are used in the analysis. Data on annual aggregate tourist arrival is obtained from the Vanuatu National Statistics Office. All other variables are retrieved from the World Development Indicators and Global Development Finance database (World Bank, 2011b). All variables are duly transformed into log-form for estimation. Using the conventional Cobb-Douglas production function, with the Hicks–neutral technical progress, the per worker output (yt) is defined as:

$$y_t = A_t k_t^{\alpha}, \quad 0 < \alpha < 1 \tag{1}$$

where A = stock of technology and k = capital per worker, and α is the capital share. The Solow model assumes that the evolution of technology is given by

$$A_t = A_o e^{gT} \tag{2}$$

where A_0 is the initial stock of knowledge and T is time. It is also plausible to assume for our purpose that

$$A_t = f(T, TRD_t, REM_t, TUR_t) \tag{3}$$

where TRD_t = trade openness as a percent of GDP, REM_t = remittances as a percent of GDP, and TUR_t = tourist/visitor arrival.

The effect of TRD_t, REM_t, and TUR_t on total factor productivity (*TFP)* can be captured when they are entered as shift variables into the production function:

$$A_t = A_o e^{gT} TRD_t^{\beta} REM_t^{\lambda} TUR_t^{\delta} \tag{4}$$

$$y_t = (A_o e^{gT} TRD_t^{\beta} REM_t^{\lambda} TUR_t^{\delta}) k_t^{\alpha} \tag{5}$$

Since the number of observations is small, the bounds testing approach under autoregressive distributed lag (ARDL) procedure developed by Pesaran (Pesaran, Shin and Smith, 2001) is deployed. In bounds testing approach, pre-testing of unit roots is not required and it is possible to investigate cointegration of the levels of the variables, irrespective of their order. However, to ensure that variables are at

[1] Initial capital stock is assumed to be 1.1 times the real GDP at 1979 (in Vatu) with a depreciation rate of 8 percent.

[2] There is no consistent time series data available on tourism receipts.

most I(0) or I(1), we carried out the unit root tests using the ADF and Phillips-Perron (PP) test statistics. From the test results, all variables were nonstationary in their levels and, stationary in their first difference.[1]

The next step is to examine the existence of a long run relationship between per worker output,(y_t) capital per worker (k_t), trade (TRD_t), remittances (REM_t) and tourism (TUR_t) using the bounds test. The ARDL specification is given as follows:

$$\begin{aligned}\Delta Ly_t &= \beta_{10} + \beta_{11}Ly_{t-1} + \beta_{12}Lk_{t-1} + \beta_{13}LTRD_{t-1} + \beta_{14}LREM_{t-1} + \beta_{15}LTUR_{t-1} \\ &+ \beta_{16}TREND + \sum_{i=1}^{p}\alpha_{11i}\Delta Ly_{t-i} + \sum_{i=0}^{p}\alpha_{12i}\Delta Lk_{t-i} + \sum_{i=0}^{p}\alpha_{13i}\Delta LTRD_{t-i} \\ &+ \sum_{i=0}^{p}\alpha_{14i}\Delta LREM_{t-i} + \sum_{i=0}^{p}\alpha_{15i}\Delta LTUR_{t-i} + \varepsilon_{1t}\end{aligned} \quad (6)$$

There are two steps in examining the relationship between Ly_t, Lk_t, $LTRD_t$, $LREM_t$, and $LTUR_t$. First, Equation (6) is estimated by ordinary least squares techniques.[2] Second, the existence of a long-run relationship can be traced by imposing a restriction on all estimated coefficients of lagged level variables equating to zero. Hence, bounds test is based on the F-statistics (or Wald statistics) with the null hypothesis of no cointegration ($H_0 : \beta_{i1} = \beta_{i2} = \beta_{i3} = \beta_{i4} = \beta_{i5} = 0$) against its alternative hypothesis of a long-run cointegration ($H_1 : \beta_{i1} \neq \beta_{i2} \neq \beta_{i3} \neq \beta_{i4} \neq \beta_{i5} \neq 0$). The results of the bounds test are reported in Table 7, confirming the presence of a long run cointegration when only real output per worker (Ly_t) is set as the dependent variable. The computed F-statistics for Ly_t is 4.64 which is significant at 5 percent critical value upper bound.

Table 7. Results of Bound Tests

Dependent Variable		Computed F-statistic
Ly_t		4.64**
Lk_t		2.45
$LTRD_t$		2.35
$LREM_t$		2.44
$LTRU_t$		1.91
	Pesaran, Shin and Smith. (2001)[a]	
Critical Value	Lower bound value	Upper bound value
5 per cent	3.47	4.57
10 per cent	3.06	4.06

[a] Critical values are obtained from Pesaran, Shin and Smith. (2001), Table CI.iii: Case III with unrestricted intercept and no trend, p. 300. * indicates significance at 1% level

[1] To save space, unit root results are not provided here, however is available upon request to the corresponding author.

[2] To save space, we do not specify the other equations where Lk_t, $LTRD_t$, $LREM_t$ and $LTUR_t$ are specified as dependent variables however they are tested during the analysis and the results are given in Table 7.

Having confirmed the existence of a long-run relationship between y_t and k_t with TRD_t, REM_t, and TUR_t, the estimation of the long-run and short run equations are carried out. As the first step in the regression, the results for the ARDL estimates (Table 8) confirm the positive significance of remittances ($LREM_t$), capital accumulation (Lk_t) and lag one growth policy (Ly_{t-1}) respectively.

Before pursuing to the long-run and short-run estimates, the ARDL estimates diagnostic test results were inspected (lower panel of Table 8). These test includes (a) Lagrange multiplier test of residual serial correlation; (b) Ramsey's RESET test using the square of the fitted values for correct functional form; (c) normality test based on a test of skewness and kurtosis of residuals; and (d) heteroscedasticity test based on the regression of squared residuals on squared fitted values – all of which indicated that the equation performed well as the disturbance terms are normally distributed and serially uncorrelated with homoscedasticity of residuals thus confirming the models have correct functional forms. Besides, the CUSUM and CUSUM of Squares plot showed that the parameters of the models are relatively stable over time.[1]

Table 8. Autoregressive Distributed Lag (ARDL) Estimates

ARDL(1,0,1,0,0) selected based on Akaike Information Criterion

Dependent variable is Ly_t

30 observations used for estimation from 1980 to 2009

Regressor	Coefficient		Standard Error	t-Ratio
Ly_{t-1}	0.32445	*	0.17915	1.8111
Lk_t	0.21814	**	0.10045	2.1715
$LTRD_t$	0.13747		0.08430	1.6308
$LTRD_{t-1}$	0.25226	**	0.10384	2.4293
$LREM_t$	0.02837	**	0.01365	2.0781
$LTUR_t$	0.01198		0.03184	0.3762
C_t	3.69220	**	1.51380	2.4390

R^2	= 0.84664	$\bar{R}^2$	= 0.79821
S.E. of Regression	= 0.02559	F-statistics [F(6, 19)]	= 17.4823
Mean of Dependent Variable	= 12.2892	S.D. of Dependent Variable	= 0.05698
Residual Sum of Squares	= 0.01245	Equation Log-likelihood	= 62.4854
Akaike Info. Criterion	= 55.4854	Schwarz Bayesian Criterion	= 51.0820
DW-statistic	= 1.93270	Durbin's h-statistic	= 0.42141

[1] The CUSUM and CUSUM of Squares plots are not reported in order to conserve space. However, the results are available upon request.

Diagnostic Tests						
Test Statistics	LM Version			F Version		
			p-value			p-value
(A):Serial Correlation	$\chi^2(1)$ =	0.0110	0. 916†	F(1, 18) =	0.0076	0.931†
(B):Functional Form	$\chi^2(1)$ =	3.3315	0. 068‡	F(1, 18) =	2.6454	0.121†
(C):Normality	$\chi^2(2)$ =	0.9287	0. 629†	Not applicable		
(D):Heteroscedasticity	$\chi^2(1)$ =	4.0031	0.045‡	F(1, 24) =	4.3676	0.047‡

*, and **, refers to acceptance of coefficient at 1% and 5% level of significance respectively; † and ‡indicates rejection of null hypothesis of (A)-(D) biasness at 1% and 5% level of significance.

The long-run and short run estimates are presented in Table 9. The results show that remittances have been significant in contributing to the worker income. In the short-run, (long-run) a 1 percent increase in remittances will result in 0.03 (0.04) percent growth in per worker income. Notably, the impact of remittances on income level is positive, however small. This is largely the case for many developing countries and PICs are no exception. The reason for the small positive effect is due to the structural characteristics of the developing island nation such as Vanuatu which includes geographical isolation from the major international markets and a low capital absorption capacity of the economy over time (Betram, 1999; Tisdell, 2002, Cohn, 2000).

Tourism expansion is positive, however not statistically significant both in the short-run and the long-run, which is a concerning issue since Vanuatu is heavily dependent on tourism.[1] Therefore, one may assert that tourism plausibly would improve conspicuous consumption but not necessarily income level and hence the need to develop tourism infrastructure is vital.

Trade openness (measured by trade as a percent of GDP) is statistically significant and positive in the long-run, contributing to about 0.58 percent towards income. Trade is positive but not significant in the short run. This is plausible given that the benefits of trade is often realized over a long-term horizon for developing countries as they mature and develop over time and as capital investment in trade expansion takes time to materialize on the back of weak economic institutions.

The capital share is about 0.32, which is very close to the stylized value of one-third (Ertur & Koch, 2007; Rao, 2007). The error-correction term (ECT_{t-1}), which is the measure of reconciling short-run with long-run equilibrium, has a correct (negative sign) (-0.68) and significant at 1 percent level, indicating a reasonably speedy convergence to long-run equilibrium.

[1] Note that expansion in tourism might have indirect impact on income generation, however, the direct effects on income is not statistically significant.

Table 9. Dependent variable: Ly_t [ARDL(1,0,1,0,0)]

Long-run coefficients				Short-run coefficients			
Regressor	Coefficient	t-ratio		Regressor	Coefficient	t-ratio	
Lk_t	0.32291	3.1104	***	ΔLk_t	0.2181	2.1715	**
$LTRD_t$	0.57691	3.8988	***	$\Delta LTRD_t$	0.1375	1.6308	
$LREM_t$	0 .0420	2.8852	***	$\Delta LREM_t$	0.0284	2.0781	**
$LTUR_t$	0.01773	0.3576		$\Delta LTUR_t$	0.0120	0.3762	
C_t	5.4655	3.7860	***	C_t	3.6922	2.4390	**
				ECT_{t-1}	-0.6756	-3.7709	***

Error Correction Representation Statistics (Short-Run Dynamics)			
R^2	= 0.6651	$\bar{R}^2$	= 0.5594
S.E. of Regression	= 0.0256	F-statistics [F(5, 20)]	= 7.5472
Mean of Dependent Variable	= 0.0061	S.D. of Dependent Variable	= 0.05698
Residual Sum of Squares	= 0.0124	Equation Log-likelihood	= 62.4854
Akaike Info. Criterion	= 55.4854	Schwarz Bayesian Criterion	= 51.0820
DW-statistic	= 1.93270		

*** - Significant at 1% level, ** - significant at 5% level and * - significant at 10% level.

4. Conclusions and Policy Implications

The objective of this paper was to study the long and short run effects of TRD_t, REM_t, and TUR_t on the income level in Vanuatu using an augmented Solow growth model. We find that besides trade openness, remittance inflows are singled out as one of the critical contributors to per worker income. However, tourism expansion, although positive is not statistically significant.

Therefore, short-term migration and the consequent remittance prospects is part of a broad-based strategy for development in Vanuatu. Recently, Vanuatu government has signed a bi-lateral trade agreement with New Zealand government to participate in the Recognized Seasonal Employer Scheme. However, maximizing benefits from these schemes requires that remittances transfer back home is cost-effective, and that appropriate socio-cultural policies and trainings are in place at village and community levels primarily focused on housing development, remittance linked micro-finance initiatives and other productive small business initiatives.

Another important aspect is trade liberalization. Vanuatu has recently become the 154th member of the World Trade Organization (WTO) which means that the country has an opportunity to pursue its trade ambition in the multilateral arena.

Therefore, discussions on labour mobility would be a critical area in the development dialogues. While developing countries like Fiji, Vanuatu and other small island states in the Pacific region and India and China in the Asian context are supportive of this initiative and require developed countries to provide greater access under the Mode 4 commitments on labour mobility, the EU and the United States (US) are less enthusiastic given the security and immigration issues of the past. Many developing countries therefore have opted for bilateral agreements on labour mobility or have incorporated this concept in the regional commitments with the Association of East Asian Nations (ASEAN) and the Caribbean Forum on Africa, Caribbean and the Pacific (CARIFORUM).

Moreover, the focus needs to be in ensuring that barriers to trade are minimized and proper strategy is deployed to gain from trade, with greater emphasis on effective negotiation along sectoral lines under the Mode 4 of General Agreement on Trade in Services (GATS), which covers services provided through temporary movement of natural persons (TMNP) to another country.

Moreover, despite little evidence of tourism expansion having significant effect on per worker income in Vanuatu, it is vital for policy makers to ensure that any inherent loopholes in the sector be ironed out and that tourism infrastructure is well developed and linked to pro-growth and development initiatives. Consequently, re-looking tourism industry operations with a view to making it more effective and ensuring that the consequent real benefits are shared with the grassroots level is vital.

In regards to the commitments in the current Doha rounds, it is imperative that Vanuatu consider commitments in the tourism sector which will ensure that market access is granted to investors to have commercial presence in the economy. This as a result will boost the economy and give leverage to employment and infrastructural development.

At the regional trade front, Vanuatu being a member of the Melanesian Spearhead Group (MSG) also challenged with negotiating with other member countries including Fiji, PNG and Solomon Islands with specific focus on labour mobility of professionals within the MSG group. While successful negotiations on labour mobility will boost remittance profile for Vanuatu, it is vital to consider that the issue of brain-drain on the back of skilled migration and consequent remittances inflows do not hold back or retard in-country development as local people look for better opportunities internationally. A greater challenge looming ahead for Vanuatu is to successfully negotiate TMNP with the fourteen members of the Forum Island Countries (FICs).

Notably, the trade in services (as a percent of total trade) is relatively high for countries like Vanuatu and Fiji indicating the heavy reliance on services sector. Consequently, making this sector more effective and finding alternative ways to

expand the sector could be part of the development discourse. It would be of further interest to Vanuatu to refine its commitments in services to suit the economic needs of the present. For instances, opening up financial, tourism and ICT sector at a larger scale would be of benefit to the economy in the long run. Conclusively, financial and technology inclusion within the lexicon of growth, remittances, tourism and trade development, and capital accumulation and productivity can be part of a broader development strategy.

5. Acknowledgement

The authors' would like to thank the Vanuatu Statistical Office (Port Vila, Vanuatu) for providing data on tourist arrivals. Finally, the authors' are grateful to the comments and feedbacks from anonymous referees that helped in improving the paper from its earlier versions.

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Identifying Motivational Factors within a Multinational Company

Daniela Braduţanu[1]

Abstract: The aim of the study is to identify the main motivational factors within a multinational company. The first objective is to identify work functions, formulated on Abraham Maslow's pyramid, following the identification of the key characteristics that motivate an employee at the work place and last, but not least, the type of motivation that employees focus, intrinsic or extrinsic. The research method targeted a questionnaire based survey, including various company employees and an interview with the manager. The results confirmed that in Romania, employees put great emphasis on extrinsic motivation, a certain income and job security being primary. These results have implications for managers that in order to effectively motivate staff, first, must know their needs and expectations. To identify the main needs and motivational factors we had as a starting point Maslow's pyramid.

Keywords: Extrinsic motivation; intrinsic motivation; Maslow's pyramid; motivational factors

JEL Classification: G0; G1; G10

Introduction

Motivation is a concept explained in different ways. The origin is the latin word "mover", which means *what is set in motion*. Nicolescu O. and Verboncu I. (2002) define motivation as "an internal, personal and introspective process, which energizes, directs and sustains a certain behavior". Motivation is the mobile of performance in each organization, that is why the term is nearly ubiquitous in the literature. J.D. Chiffre and J. Teboul (1990) argue that "motivation is a dynamic process that links in a complex interaction a person or team with its environment."

The term motivation explains why people prefer a certain type of behavior in favor of another, sometimes keeping it even during unfavorable periods. Trying to explain the behavior of individuals in organizations, many authors have found that it is based on certain competences, more or less explicit. Therefore, the general definitions note concerns both the physical and psychological side of human actions.

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Often, motivation is presented as the essence of management philosophy, but for many managers it still remains an enigma. Unlike money, technology or other factors of production, people mean more for an organization. Their system needs, their degree of motivation and satisfaction will always lead to individual and organizational performance. Therefore, the manager must "agree, within organization, the economic performance with the individual talents of his employees", to act as a catalyst. Manager's ability to self motivate and to motivate others is an essential feature for ensuring the smooth operation of the company and obtaining performance. Motivation requires a balance between communication, structure and rewards (Lupuleac, 2009).

The manager's task - as the catalyst element of the group - is to identify and direct employees reasons to a specific performance. This process is however complicated and has a great subtlety. Individuals who make up a team are sensitive to different factors that change over time and that could even enter in a conflict. They have needs and expectations that are trying to satisfy in different ways.

Organizational behavior experts distinguish between intrinsic and extrinsic motivation, pointing out that there is only a weak consensus on precise definitions of these concepts and an even less agreement on the need to label some reasons to be intrinsic or extrinsic. However, the following definitions seem to capture the difference quite well (Nicolescu, Verboncu, 2002).

Intrinsic motivation refers to "psychological" rewards and comes from the direct relationship between worker and task, and is usually auto applied. Feelings of achievement, accomplishment, challenge and competence coming from fulfillment of duties are examples of motivational intrinsic factors, like interest in the activity itself.

Extrinsic motivation refers to "tangible" rewards as salaries and benefits, job security, promotion, contract services, environment and working conditions. This motivation comes from an external work environment and usually it is applied by someone other than the person who is motivated.

Abraham Maslow's Hierarchy of Needs

The hierarchy of needs or the pyramid of needs is one of the most known theories developed by the famous american psychologist Abraham Maslow. According to Maslow's theory, all human needs can be arranged in a hierarchy (*pyramid)* in order of importance. Human needs begin with physiological needs and progress until the achievement of higher needs, such as self-actualization and spiritual needs. Once a level is satisfied, the next level is the dominant factor in *a* behavior.

Figure 1. Maslow's Pyramid

At one point a person is motivated to meet a certain level of need in the hierarchy. To successfully motivate an employee or group of employees, managers must recognize their level of motivation.

The strongest needs are placed at the bottom of the pyramid. As a need climbs to the top of the pyramid, the more weak and specific it is. We observe that the primary needs, also called physiological are common to all. These include food, water, oxygen and shelter. In terms of an employee, these needs are satisfied with an appropriate salary.

The next level is the safety need**.** It includes the need for security and stability necessary to ensure the physical and emotional safety. The organizational conditions that could meet these needs include the right to join a union, job security, a comfortable working environment, emergency medical facilities, pension programs, as well as the ensure of an above the minimum level income.

Social needs, which include the need for love, affection and social interaction represent the third level. The organizational factors that might meet these needs include the ability to interact with others at work, the chance to work in teams, ability to develop new friendships as well as organizing events for employees. In a broad sense, the work environment and informal groups can meet these needs.

The next level is represented by the need of esteem, respect and gratitude received from others, and respect for yourself, respectively the feeling of being powerful, confident, competent. According to Richard Branson (2010) "*young workers are as important as those with experience. Staff should be praised, not criticized - they know when they did something wrong".* Thus, a manager must be able to encourage employees and provide them with a sincere appreciation for high performance.

This increases the confidence of employees and acts as a powerful stimulant of motivation. Not meeting the needs of esteem results in deterrence and long-term inferiority complex.

The two upper levels are represented by self-actualization and spiritual needs. These needs come from man's instinctive pleasure to fully capitalize on their skills to become better and better. They are the most difficult to understand and satisfy as they take different forms and vary from one individual to another. In his essay *The Farther Reaches of Human Nature*, Maslow writes that "people who have reached a state of self-actualization often enter a state of transcendence, in which they become aware not only of their personal potential, but also of the full potential of the human species".

Case Study: Identifying the motivational factors at work

This study's purpose is to identify the main motivational factors within a multinational company activating in the fashion industry, that has a commercial presence in Timişoara, Romania.

On-site data collection, analysis and literature research were carried out between march and june 2011.

A first objective was to identify work functions, formulated on the basis of Maslow's pyramid, following the identification of the key characteristics that motivate an employee to work, intrinsic or extrinsic.

After analyzing the needs hierarchy, we found that the main job functions are:

- Insurance of a necessary income;
- Job security;
- Contact with other people;
- Feeling of achievement, which includes esteem, self-actualization and spiritual needs.

We carried out an investigation based on a questionnaire, which focused on various company employees, and also an interview with the women's line department manager.

20 employees from all 3 departments of the store, aged 18 to 36 were interviewed.

All, but one of the survey participants (an 18-year old female part-time worker still attending high-school) studied economics while attending university or have a degree in the same field.

The store has 3 departments: Women's line, Men's line and Kids Line. Each department has a manager, who also has a master's degree in management. The

business functions of the respondents are: 3 sales managers, 3 assistant managers, 4 cashiers and 10 sales assistants.

Applying the questionnaire on those 20 respondents, we obtained the following results:

1. Work functions

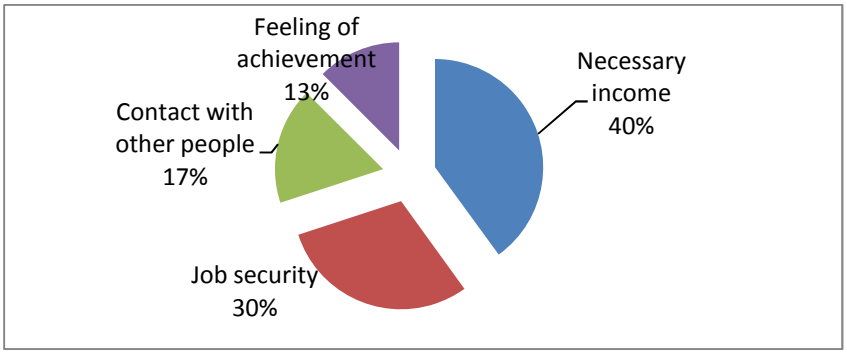

Figure 2. Work functions

It appears that income assurance is the employee's primary need, obtaining a value of 40%, followed by job security with a value of 30%. We note that the need for achievement and affiliation received a much smaller percent, which means that employees put more emphasis on extrinsic motivation than on the intrinsic one.

Sumrow (2003) considers Maslow's theory interesting and useful in the organizational area through the clarity with which a position can be determined in the hierarchy. He believes that the only thing that can be done is establishing a stimulating work environment that would bring satisfaction to employees, in this way contributing to satisfy the higher needs. He advises managers and all staff involved in assessing and directing human resources to use Maslow's theory principles as a starting point to identify personnel needs, specific to each organizational environment.

2. Motivational Factors

In multinational companies, it is very important for managers to continuously find new ways to motivate employees. Their goal is to find out what motivates people to work and what job features they appreciate the most (Figure 3):

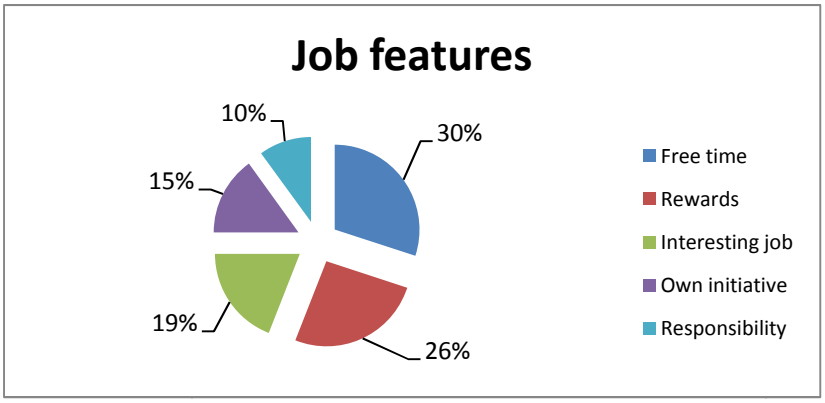

Figure 3. Motivational factors

Most employees are satisfied when their work schedule allows them to have time for other activities, are rewarded fairly and their work is interesting and exciting. Features such as responsibility and initiative are not considered important by all employees, which makes us think of Maslow's pyramid, satisfaction of primary needs being a priority.

3. Intrinsic motivation versus extrinsic motivation

After analyzing the two figures above (figure 2 and 3), we easily ascertain that an employee will perform more effectively when he will benefit both extrinsic and intrinsic motivation. As Sumrow (2003) stated in his study, *Motivation: a new look at an age-old topic*, "motivating staff is a shared responsibility and emphasizes that an employee must have a certain amount of intrinsic motivation to perform some tasks and if it is missing, it can not be created".

The following figure represents the importance of intrinsic motivation in relation with the extrinsic motivation, according to the surveyed employees age.

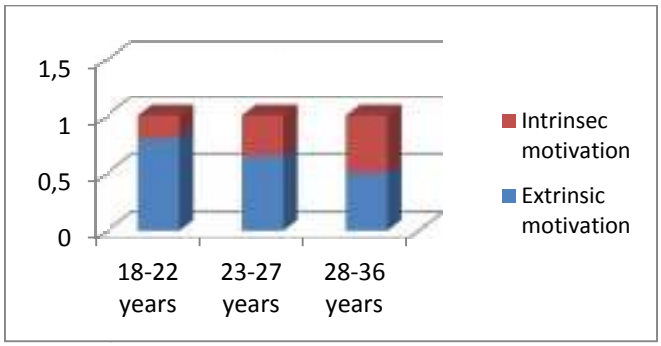

Figure 4. Extrinsic motivation versus intrinsic motivation

Companies employees put more emphasis on extrinsic motivation, but it's importance decreases when employees obtain more experience, moment in which they focus more on intrinsic motivation.

Following the interview with the manager, we found that the main methods to motivate employees in the company are:

- Payment of a salary above average;
- Internal promotion;
- Possibilities to attend training sessions in the country and abroad;
- Monthly programs awarded :"best employee", "best manager", "best shop";
- Bonuses at the end of the year.

Conclusions

The motivation process is essential if we want to achieve a high performance and meet organizational goals. Individual efficiency generates organizational performance , but personal efficiency is highly dependent on motivation. Basically, motivation is the essential ingredient for any person to make things work.

This study aimed to highlight the main motivational factors within a multinational company and it was found that employees put a great emphasis on extrinsic and intrinsic motivation. To have motivated employees and actively involved in works achievement, managers need to know their employees, their needs and try to meet them within limits.

Acknowledgments

This work was co-financed by the European Social Fund through the Sectoral Operational Programme - Human Resources Development 2007-2013, project number POSDRU/107/1.5/S/77213,, Ph.D. for a career in interdisciplinary economic research at the European standards".

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Considerations of Health Tourism in Braila

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Abstract: The author aims at highlighting the conditions that lead to exploitation of the region Lake Sarat spa. Located in the eastern part of Romania, in Baragan North, the resort is located at a distance of only 5.5 km from the city of Braila. Surrounded by a park of 40 ha (30 ha and 10 ha forest green area), which provides a framework both the monumentality very picturesque, and by old, Salt Lake Resort is a true oasis of greenery with beneficial effects on the human body. Building fund has grown over the past 30 years, achieving adequate facilities for tourism and spa treatment. As shown current zoning functions, the resort is only about 50% recovered in terms of space, ie to the northeast. Otherwise, there are areas that do not fulfill the role of recreational green spaces.

Keywords: water quality; environmental factors; climate changes; Salt Lake; quality of the factors of spa

JEL Classification: Q56; L 84; L80

1. Introduction

The Lacu Sarat has a rich content in salts due to the loss of waters from the river and of the changes of volume after strong evopotranspiration and of the low rainfall. Following the analysis of the lake water over time was noted that the hydrochemistry type consistency what was left at the character of sulfated sodium with passing to chloride sodium. The physicochemical and biotic particularities led to the formation of a mineralized slic mud, this finding in greater quantities in the northern section which determined and the construction of treatment baths in this sector.

Even from climatic point of view we are witnessing to changes, of the mud properties and of the water remained the same, but had much change the water volume from the lake. It is even said that the desertification of Baragan will lead to

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the definitive disappearance of the lake. Over 70% of the Lacu Sarat surface from the Braila County disappeared in the summer of 2008.

1.1. History

To promote national tourism resort in the circuit, in 1829, local authorities have taken a number of measures, so that in 1850 the therapeutic qualities of water and sludge were known throughout the country. In 1861, the initiative of the Romanian Ministry of Finance, George Rudeanu engineer made the first studies of lake water, and in 1870 the first baths were made after medical advice, doctors Braila providing support services. Knowledge of the therapeutic qualities of water and mud of the lake, and put into service in 1872, the railway Buzau - Galati, positively influenced the establishment of the first residential settlements in the area. Interest in therapeutic mud while materialized through the implementation of construction, equipment, facilities for tourism and balneaţie. Intense resort development known. Analysis are water, and bathrooms are built accommodation with a special architecture.

The first buildings were specially designed for bathrooms built in 1873 by citizens of Braila Iliescu and I. Oprea Thomas, who arranged for the barracks warm baths, with the heat source rocks girded with fire.

Until 1879, visitors were living in tents, huts or booths rudimentary reason Braila county leadership took a series of measures to systematize the area. Thus, in 1879, passed under the administration of the Ministry of lake areas, which allocated an area of 50 acres of the lake for the construction of modern buildings (at the time) and some specially equipped bathrooms.

The first works with reference to the miraculous effects of therapeutic Lake deposit, were published by John Apostolescu, in 1884 and 1889. The work was presented at the Congress of Hydrology and Climatology in Paris (1889). The work showed that Salt Lake qualities surpassing a number of similar lakes in Europe, confirming the European notoriety.

Table 1. Number of tourists in the period 1886 - 1890

	1886	1887	1888	1889	1890
Number of tourist arrived	627	855	1277	1312	1538

Source: Annals of Braila, Cap. III, p. 47

Peak period in the history of the resort spa is considered the interwar period, you know a large resort accommodation space and extension of research-intensive curative properties of therapeutic factors.

2. Characteristics of Balneary Resources of the Salt Lakes from Braila's Plain

These lakes are part of the meander lakes category, of left arm or course have formed after the movement, changing of the water course, erosion when meander portions were anatomized due to the alluvial deposits losing completely the connection with the river. This type of lakes have a rich content in salts due to the loss of connection with the waters from the river and of volume changes after strong evaporation and of low rainfalls.

Meander lakes and of left arm known in the Braila's Plain: Salt Lake Braila, Salt-Batogu, Brotacelul and the lakes on the numerous left courses in the connection area between the Buzau and Calamtui river. Brotacel lake, formed after the oscillation of Buzau course, situated near the Filipesti locality, had a surface of about 20 ha. The average depth of the lake was of 1, 2 m, length of 675 m, and wide of 252 m (Stoiu and colab., 1980) The Lake had a low salty character.

Since the 90's, after a prolonged drought and in the conditions of some precipitations under 400 mm/year, this lake has dried completely. On the margin of Brotacel Lake, located near the National Road 2B, in the period when the lake had water it was built the Halt Brotacelul with accommodation and alimentation places and a landing stage for recreation. Currently, when the lake is completely dry (and is no longer found its' filling, not even partial after the rain) its surface it was began to be used in agriculture. The landing stage was shut down, operating only Brotacelul Halt without existing and the attraction of some boat trip.

The oscillation of Calmatui river and creation on left arms and meanders allowed the formation of some lakes within this area. On the left side, on the ex left arm Batogu were formed the lakes Salt-Batogu and Bentu-Batogu. The Batogu Salt lake it was present in the early 70's as a lake with a surface of approximately 580 ha, wit with an average depth of over 0,8 m, having a salty charcter of chloro magnesian type (Popescu, 1980). In the 80's this lake began to dry, being recorded as a swamp area, being crossed by a draining channel. Currrently, this is completely dried, its surface being used in agriculture.

Bentu-Batogu Lake is situated in the noth side of Batogu locality, on the left course Batogu. The lake is quartered in an enlarged portion through abrasion of the left course and completely isolated of the water course at stream ends.

The lake has a surface of about 80 ha, with an average dept of about 0,7 m (Popescu, 1980). The lake contains salt water of the hydrochemistry chlorate sodium – magnesian type. The lake's salinity presents high variations depending on the volume of water from the lake (table nr. 4). In the works of specialty is specified that in normal climatic conditions of Braila's Plain, the lake basin of this lake is occupied by waters mainly in the east side which seems to have a bigger depth (Bentu), and in the years with higher humidity is covered and in the west side (Batogu).

In 1940, the high waters from Buzau invaded the lake Bentu-Batogu through the Buzoelelor inducing reductions of the salt contain by the increase of the water volume from the lake (Gastescu, 1971). The consequence was that the water was sweetened, the sludge from the bottom of the lake being covered with a thin layer of slits, allowing on a period of five years the development of a fish fauna. The Braila Salt Lake is located on the terrace of the Danube near the Braila city. On the origins of this lake there were issued several assumptions. Some researachers argue that its origin if of a left course of the Danube, and others say that the origin is related to the compaction depressions in loess. The depression form, almost under an arc of circle that leaves from north, right from the locality Varsatura and gets in south in past the Danube meadow at south of the Chiscani locality indicates a left course of Danube that was completely anatomies by alluviums at the two extremes. Subsequently, this resulted depression from the desolation of Danube of this small arm and complete isolation of the river waters was covered by loess deposits. The presence of compaction and suffusion phenomena allowed the emergence of depressions. These depressions were filled with water from rainfall and underground springs.

The fact that the lake is isolated from the Danube and does not show a hydrographic basin (completely lacked of tributaries) has determined the accumulation of mineral salts, and the water from rainfall and underground springs to strongly saline.

If the lake wouldn't be supplied by underground from the prelatic waters of terrace, it would exist the chance that this to completely dry. Currently, there is this danger because of some landslides of the borders and obstructions of marginal springs. The Salt Lake Braila, initially it was formed from two sectors. The southern sector is in irregular form, elongated. The northern has an almost round form and on its bank it's equipped the touristic resort.

The southern sector has temporarily water, while the northern sector due to the supply and from groundwater layer it has water all year around. In the spring and at the beginning of the summer, the lake has a large amount of water, came from rainfalls and snow melt, however, in the summer and at the beginning of the autumn, due to the high evaporation and of missing the rainfall periods, the water

level from the lake drops a lot (as we remember the southern compartment dries completely, an the northern area is circumscribed to a surface approximately (20-30 ha).

Among the two sectors of the lake it was built a road (which connects the resort Salt Lake with the nearby localities) and a railroad (build for the supply of Integrated Chemical Work from Chiscani). This intervention has blocked the connection channel between the two compartments, which was creating the possibility of balancing the hydro regime from the northern therapeutic compartment, creating the possibility as and in the prolonged drought periods this compartment to receive water from the northern section.

The lake is about 170 hectares, and its depth varies from 20 to 80 cm (Gastescu, Gruescu, 1973). Due of many variations of volume of the water from the lake are having place and very large oscillations of the degree of mineralization. The average salinity of the lake (and most common met) has values about 80g/l, but there was met and values around 50g/l and 220 g/l.

After the water analysis from the lake, over time it was observed the consistency of hydro chemical type that remained at the character of sodium sulfate with passing to sodium chloride (Gastescu, 1979). The physicochemical and biotic peculiarities led to the formation of a concentrated mineralized mud with thickness between 20 and 50 cm, this being found in large quantities of the northern sector what determined and the construction of treatment baths in this sector. This mud contains 55,1% water, 6,4% volatile substances through calcinations and 38,5% mineral substances (Florea, 1976).

From researches it has resulted that the mud volume is about 66000 m^3 and considering that it has a specific gravity of 2,4 implies that in lake are found about 92000 mud tones. The evaporation is favored by the high temperature in summer and of the warm and dried winds from the Braila's plain. On the bottom of the lake it is a layer of mud that increases in thickness from edge to center. P. Petrescu managed to discover the presence of a limestone layer from 0, 5 – 1 mm, that it divided. AS a result of intense evaporation, the salt concentration increases by laying on the bottom of the lake the mirabilit ($SO_4Na_2+10H_2O$) as a thin crust that covers part the mud or is mixing in it's mass.

3. Balneary Resort Braila Salt Lake

Although it is not recognized for its holiday destinations, the Braila county hides a resort that has a history of over a century, but a legend that comes up to Tepes Voda time. Salt Lake is where almost all residents have come at least once, but it's also on of the touristic attractions from Romanian Plain. For those who are to far from the sea-cost, is the ideal place to sunbathe. The Salt Lake is a resort open in

all seasons of the year, located in the south east of Romania, on the radius of Chiscani community (Braila county), in the north-east of Romanian Plain at the altitude of 25 m, on the bank of the namesake lake, at 5 km south west of the city of Braila. The climate is steppe continental, with high annual differences of temperatures. The average annual temperature is around 11^0C (the average in July is of 23^0C, in January – $2,3^0$C). The annual average of rainfall is low (less than 450 mm).

Salt Lake is actually composed of two lakes, separated by a road and railway line, lakes which communicate between them through an underground channel specially arranged. The first settlements for hot baths were constructed here since 1875. The further researches and chemical analyzes of the water of the lake had shown a strong concentration of mineral salts and that the mud from here has an effective therapeutic efficiency analogue to the lakes in Sweden, Italy or Austria. Buth the history of this place seems to be much older: it is said that the amazing therapeutic properties of the water and mud from here were discovered by Vlad Tepes around 1400. Here were healing the soldiers and horses wounded in battle.

The Salt Lake (1,72 km, maximum depth 1,5 m) shows significant reserves of vegetable slime and hypertonic mineral water, containing compounds of sulfur, chlorine, sodium, magnesium, bromine (mineralization 70-84 g/liter), used for the treatment of regenerative rheumatic diseases, inflammatory, gynecological, dermatological, endocrine, but and in affections of the peripheral nervous system, of posttraumatic states (after operations on muscles, tendons and articulations, after sprains and fractures) and respiratory (chronic bronchitis, laryngitis). The resort offers and facilities for warm baths in mineral waters in tubs, applications of hot mud, aeroheliotherapy and applications of cold mud followed by baths in the lake, installations for electro and hydrotherapy, gym, pool for kineto-therapy. In all these methods of treatment are used chemical compounds found in the mud of Salt Lake: sulfur, chlorine, sodium, bromine and magnesium. The resort is connected by bus and tramway lines of Braila city, where it can be gone in trips with the boat on Danube, towards the Danube Delta and Black Sea.

After the affirmation of some local inhabitants, there were years like 1872, when the lake was completely drained. During the intense evaporations, on the basin emersion to lake is deposited an appreciable crust of white salts which by far gives the impression of a soil covered with thick dust. The last period of 90's was characterized by a prolonged drought in this area of Romanian Plain and had as consequence the drastic decrease of the water levels, its surface being recorded annually in the Statistic Yearbook with only 30 – 40 ha. In the same time, in the area of dried basin were deposited solid salt crusts.

The experts say that the desertification of Baragan will lead to the final disappearance of the lake. Over 70% of the Salt Lake's surface from Braila has

disappeared in the summer of 2008. It is contradictory and also representative the affirmation of the administrator of the treatment base and of the beach from the Salt Lake resort, Ion Tanase which says that a phenomena like this it was noted in 1947, when the lake drought completely, but the situation was recovered. "The lake supplies from the underground waters and depends entirely on their status. In 1947 it has completely drought and still recovered". The local inhabitants have another explication, saying that the lake springs are blocked and that the old man that know their places and was taking care of supplying it, has died, motive for which the lake will disappear soon.

Tabel 2. Component analysis of tourism activity

Total	Hotels	Tourist Stops	Motels	Turistic vilas	City pensions	Camps for students and preschool		Tourist cabins
				NUMBER OF TOURISTS				
Total county	61.955	54.886	1.040	2.156	1.263	171	2.177	262
Braila	34.48	32.01	-	2.156	146	171	-	-
Lacu Sărat	24.97	22.87	1.040	-	-	-	1.058	-
Other cities and tourist routes	2.498	-	-	-	1.117	-	1.119	262
				NUMBER OF NIGHTS				
Total county	297.7	285.055	1.788	3.801	1.263	588	4.867	318
Brăila	86.13	81.586	-	3.801	146	588	-	-
Lacu Sărat	207.9	203.469	1.788	-	-	-	2.602	-
Other cities and tourist routes	3.700	-	-	-	1.117	-	2.265	318

Source: Statistics Braila County

Tourism development has attracted the attention of government circles in Braila, which began to draw major benefits from this activity. However, tourism promotion issue was left entirely to private initiative account without the central coordinating the efforts of institutions and companies participating in tourism development (rail and shipping companies, hotel companies, associations of propaganda, Turing-clubs etc). In recent years there have been no investments made to modernize the facilities of treatment, accommodation and food. Most sensitive to this state of affairs are foreign tourists who are accustomed to certain standards for accommodation and treatment. So many foreign tourists, especially

Westerners, have abandoned the practice of health tourism in Romania to other Eastern European countries such as Hungary, Czech Republic, Slovakia, that provides much better accommodation and treatment.

The number of tourists and the number of overnight stays in tourist accommodation structures with functions of tourist accommodation on tourist destinations and types of structures

As can be seen from the above data, the county's main tourist destinations are the city of Braila (55.7% of the number of tourists and 28.9% of overnight stays) and Salt Lake tourist resort (40, 3% of the number of tourists and 69.8% of the number of overnight stays)

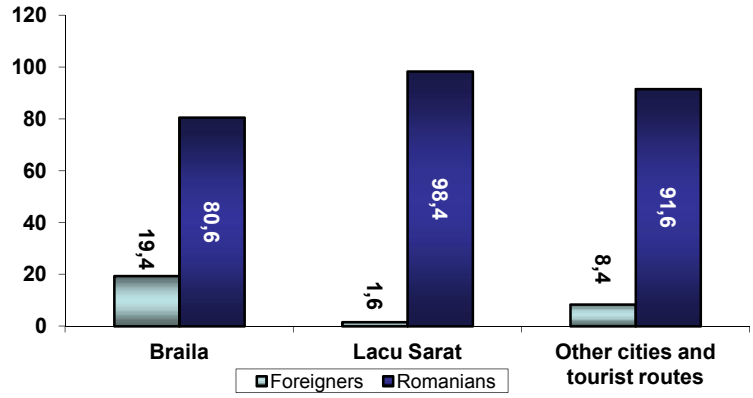

Figure 1 Structure of the tourists stay in Braila County, tourist destinations

Regarding the distribution of the destinations of foreign tourists, it differs a lot. Thus, the existence of units with a high degree of comfort, but also because the city lends itself to various forms of tourism, some with great impact on foreign tourists (business tourism, cultural tourism), the international tourists are weight Braila 19.4% of the total, as opposed to 1.6% of total for Salt Lake resort and 8.4% for other cities and tourist routes.

Given the relatively high market share that has in total health tourism in the county tourism economy, particularly interesting for this analysis is the share of tourists coming to the treatment offered by CNPAS tickets.

Tabel 3. The share of tourists comes by tickets in total tourist arrivals treatment in Braila County

2005		2006	2007	2008	2009
Total tourists Braila County	55.473	59.334	59.207	59.169	61.955
Treatment of which the tickets (Salt Lake)	8217	7885	7959	8067	6172*
Share (%)	14,8	13,3	13,4	13,6	10,0

Source: Ministry of Labour, Social Solidarity and Family, INS

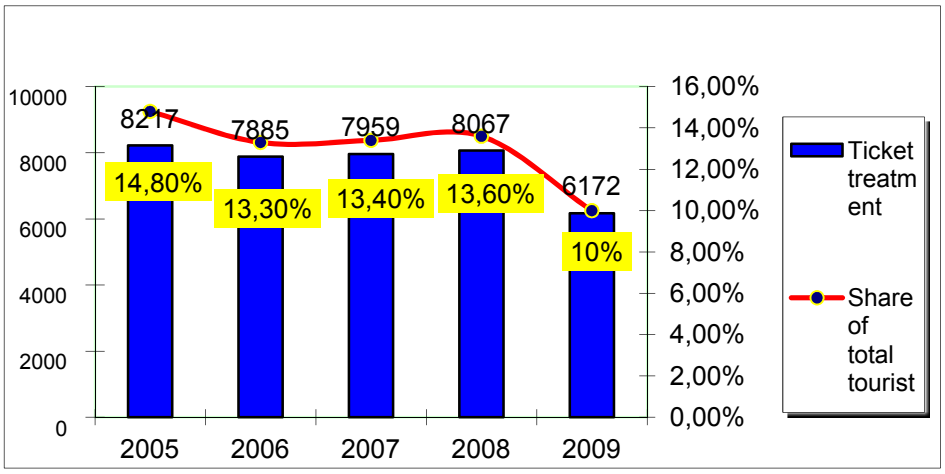

Figure 2. Tourists arriving by airline CNPAS treatment

The data above notes that the share of tourists coming to treatment tickets total number of tourists decreased continuously from 14.8% in 2005 to 10.0% in 2009, and this can only be worrying accommodation units in Salt Lake resort, which are misfits modern spa tourism.

The average length of stay is the average number of days of stay of tourists in a given area and expressed in a somewhat qualitative side of tourism.

In this case, the average length of stay in the county of Braila (2009) is higher than for the total country (4.80 days 2.95 days compared), but this is not due to quality services, but especially that 40% of the total number of tourists come for treatment, and this form of tourism requires a greater period of stay. Thus, neither the quality of accommodation and recreational opportunities have not increased the stay, but the undeniable value of spas resources.

Tabel 4. Average duration of stay in the county of Braila, the tourist destinations and accommodation types

	Total	Hotels	Tourist stops	Motels	Villas	City pensions	Camps for students and preschool	Bungalow
Total countys	**4,80**	**5,19**	**1,72**	**1,76**	**1,00**	**3,44**	**2,24**	**1,21**
Brăila	2,50	2,55	-	1,76	1,00	3,44	-	-
Lacu Sărat	8,32	8,89	1,72	-	-	-	2,46	-
Other cities and tourist routes	1,48	-	-	-	1,00	-	2,02	1,21

Source: Data from the Braila County Statistics

In tourist destinations, there is a big difference during your stay in Salt Lake tourist resort (8.32 days) and length of stay in the city of Braila (2.5 days) and in other cities and tourist routes (1.48 days).

4. Conclusions

In the current conditions of the global crisis any opportunity of expanding the touristic market, of attracting of a new segment of tourists is welcome. Especially if this it can be done on an existing infrastructure and material basis already existent. It is imposed profound study of all these natural balneary resources from the area Braila's Plain and also of the possibilities of capitalization of these in the spirit of sustainable development. Although the vast majority of lakes from Braila's Plain have therapeutic properties, the only arranged in balneary purposes is the Salt Lake Braila.

Braila Municipality Development Strategy includes the following measures needed to boost the city's cultural life during the summer and aimed at Salt Lake:

- Need to extend and upgrade structures Salt Lake tourist resort Braila, in order to attract an increased number of tourists, both domestic and abroad;

- Developing cultural and educational programs for children and young people during holidays (local government takeover of the camp children from Salt Lake and organizing holiday workshops for ceramics, theater, poetry, music, etc.).

- Encouraging the implementation of cultural events in public spaces (streets, parks, squares), concerts, popular games, dance, entertainment, theater, poetry recitals;

- Promotion of performances made by high school graduates Hariclea Darclee Art.

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