

cea Journal of economics.....



ISSN 1857-5250
UDK 33

Price: 300 MKD (5 EUR)

Volume 10
Issue 1
1-114 pages

Skopje, Macedonia
June 2015



CEA Journal of Economics

ISSN 1857-5269

UDK 33

Volume 10, Issue 1

Skopje, June 2015

International Journal

Published since 2006

International editorial Board and Reviewers:

Marjan Nikolov, Ph.D.,

President of CEA (Editor-in-Chief)

Bryan Roberts, Ph.D.

Senior economist at Econometrica Inc USA

King Banaian, Ph.D. Professor in the Department
of Economics at St. Cloud State University USA

Giorgio Brosio, Ph.D. Professor of Public
Economics, University of Turin, Italy.

Nevenka Hrovatin Ph.D. Professor of Public
Economics, University of Ljubljana, Slovenia

Dubravka Jurlina Alibegovic, Ph.D. Director of
the Institute of Economics, Zagreb, Croatia

Borko Handziski,

Senior Economist at the World Bank, USA

Borce Trenovski, Ph.D.

Faculty of Economics-Skopje, UKIM Macedonia

DISCLAIMER:

The opinions put forth in this publication represent
the views of their authors.

Contents

Call for Papers	3
Open and transparent budget process in Western Balkan countries - Marjan Nikolov, Borce Trenovski, Gabriela Dimovska	5
Does Inward Foreign Direct Investment Increase Imports To Turkey? An Instrumental Variables Approach - Bulent Esiyok	23
The impact of economic crisis on inflation convergence in the European Union. A panel data approach - Mihaela Simionescu	37
Estimation of the “normal” credit growth in the Republic of Macedonia with regards to the economic fundamentals - Elena Naumovska, Mihail Petkovski, Iskra Stanceva - Gigov	47
Measuring attitudes and behavior towards different formats of online banner on Macedonian market - Ezeni Brzovska, Marija Trpkova-Nestorovska, Snezana Ristevska Jovanovska ..	57
Knowledge Specialization as a Barrier for Social Business/IT alignment - Nikola Levkov, Blagoja Gjorgijovski	69
Tobin’s q and R&D investment in CESEE countries - Dushko Josheski, Cane Koteski, Marija Magdinceva-Sopova	81
The Global Economic Crisis - What Should Not Be Forgotten - Borce Trenovski, Biljana Tashevskaa, Suzana Makreshanska	99

CEA Journal of Economics
Volume 10, Issue 1
1 - 114 pages
Skopje, Macedonia
June, 2015

Call for Papers

Dear Authors,

CEA announces a call for papers for publication in the 20th edition of the CEA Journal of Economics (Volume 10, Issue 2). The papers can come from any area of economics. CEA Journal of economics is EconLit, Ebsco and J-Gate listed and it is international.

Although not strictly limited to them, please observe the following guidelines. In case of submitting theoretical papers, please include: abstract, introduction, extensive literature review, theoretical ramifications, conclusion and bibliography. In case of submitting empirical papers, please include: abstract, introduction, short literature review, methodology, empirical findings, conclusion with policy implications and bibliography.

Format: electronic version, A4, Times New Roman, no indentation, single space, one space between paragraphs, APA style, maximum 20 pages.

Deadline: 25 December 2015

Submit to: makmar2000@yahoo.com

.....

UDC 336.146:303.6(497-15)

OPEN AND TRANSPARENT BUDGET PROCESS IN WESTERN BALKAN COUNTRIES

Marjan Nikolov, PhD,
CEA President, Senior expert

Borce Trenovski, PhD,
Assistant Professor, Faculty of Economic – Skopje, UKIM

Gabriela Dimovska,
CEA Economist

Abstract

Budget openness and transparency are key elements of the effective management of public finances, determining the fiscal risks, rational financial decision-making, increasing accountability by policy makers and improving fiscal policies. It is difficult to define budget transparency, and also its measurement is an exceptional challenge. This is because different researchers / institutions use different ways (mostly questionnaires or surveys) to measure the fiscal transparency. Our research is mainly focused on elaborating the openness of budget processes in Western Balkan countries (as a specific group of countries consisted of: Albania, Bosnia and Herzegovina, Montenegro, Macedonia, Kosovo and Serbia) dominantly based on a globally accepted methodology designed by Open Budget Partnership (Open Budget Index and Open Budget Survey Tracker), and partly on our own analysis.

Key Words: budget transparency, Western Balkans, open budget index

Introduction

Budget (fiscal) transparency ensures openness of Governments to the public about the structure and functions of governments, fiscal positions, potential risks, benefits versus costs of fiscal actions and fiscal projections. Fiscal transparency allows for a better informed debate by both policymakers and the public about the design and results of fiscal policy, and *provides legislatures, markets, and citizens with the information*

they need to hold governments accountable. It helps to highlight risks to the fiscal outlook, allowing an earlier and smoother fiscal policy response to changing economic conditions and thereby reducing the incidence and severity of crises. According to the IMF, OECD and numerous other studies fiscal transparency and accountability in public finances is one of the main prerequisites for better macroeconomic and fiscal stability, better credit ratings and better fiscal discipline (lower public debt and deficits), reduced levels of corruption and determinant for higher rates of economic growth (see *IMF factsheet*, 2014)

It is difficult to define budget transparency, and also is an exceptional challenge its measurement. This is because different researchers / institutions use different ways (mostly questionnaires or surveys) to measure the fiscal transparency. In addition briefly will be presented internationally accepted methodologies and documents that constitute the pillars on which are based the dominant part of the research in this area. In this respect we will just point out the most important guidelines for measuring budget transparency, i.e.:

- *IMF's - Code of Good Practices on Fiscal Transparency.* First published in 1998 and last updated in 2007, the IMF's Code of Good Practices on Fiscal Transparency and accompanying Manual and Guide are the centerpieces of global fiscal transparency standards (see IMF 2007, . Over the years, the Code provided the framework for conducting assessments of countries' fiscal transparency, as part of the IMF's Reports on the Observance of Standards and Codes (ROSC) initiative published results for over 93 countries). In 2014, IMF reviewed the state of fiscal transparency in the wake of the recent financial crisis and proposed a series of improvements to existing international fiscal transparency standards and monitoring arrangements¹ (see IMF 2014, Cottarelli, 2012).
- *OECD's – Best Practices for Budget Transparency.* At its 1999 annual meeting, the OECD Working Party of Senior Budget Officials asked the OECD Secretariat to draw together a set of best practices related to budget transparency based on member countries' experiences. The "OECD Best Practices for Budget Transparency" are designed as a reference tool for governments to use in order to increase the degree of budget transparency in their respective countries². Its important to note that the document covers transparency at the central government level only, and so does not provide guidance regarding subnational government. The best practices are in three parts:- lists the principal budget reports that governments should produce and their general content; -describes specific disclosures to be contained in the reports, including both financial and non-financial performance information; - highlights practices for ensuring the quality and integrity of the reports (see OECD, 2002).
- *IBP's – Guide to the Open Budget Questionnaire:* An Explanation of the Questions and the Response Options³. The Open Budget Survey 2012 (2006-2012) examines 100 countries from around the world, measuring three aspects of how governments are managing public finances: Budget transparency – the amount, level of detail, and timeliness of budget information governments are making publically available. Each country is given a score between 0 and 100 that determines its ranking on the Open Budget Index. Budget participation – the opportunities governments are providing to civil society and the general public to engage in decisions about how public resources are raised and spent. Budget oversight – the capacity and authority of formal institutions (such as legislatures and supreme audit institutions) to understand and influence how public resources are being raised and spent.

These documents represent methodological pillars for measuring budget transparency on a global level. Taking in to account previous methodological pillars the aim of our research in this direction is initially focused at: elaborating the openness of budget processes in Western Balkan countries dominantly based on

1) Новиот Водич за фискална транспарентност на ММФ е структуриран во четири главни столбови чиј што фокус е ставен на потребните информации и податоци за ефективен фискален менаџмент и надзор . (види детално IMF, 2014)

2) According this document budget transparency is defined as the full disclosure of all relevant fiscal information in a timely and systematic manner. The best practices are based on different countries' experiences in each area and are organised around specific reports for presentational reasons only.

3) See un details: <http://internationalbudget.org/what-we-do/open-budget-survey/research-resources/guides-questionnaires/>

globally accepted methodology designed by Open Budget Partnership (because some of the countries are still not part of OBI report), which every year calculate Open Budget Index for over one hundred countries. Beside analyze of fiscal transparency based on Open Budget Index as well known measure for budget openness, we will also present a newest measure of the level of fiscal/budget transparency implemented by OBP, named as Budget Tracker. Countries part of our analysis are: Albania, Bosnia and Herzegovina, Montenegro, Macedonia, Kosovo and Serbia.

ALBANIA

Executive, legislative and judiciary power. Albania is a parliamentary democracy as defined by the Constitution of Albania⁴. The Prime Minister is the head of the government, and of a multiparty system (Part I of the Constitution). Executive power is exercised by the government. Legislative power is vested in both the government and parliament, the Assembly of the Republic of Albania. The court system, consist of a Constitutional Court, the Court of Cassation, appeals courts and district courts. The Public Finances are also regulated by the Albanian Constitution. Public Finances are included in Part Thirteen-Public Finances and defined in the following Articles: 155, 156, 157, 158,159, 160 and 161.

Budget documents⁵

Documents	Yes/No	Comment ⁶
Pre-budget statements	Yes	These documents provide information that links government policies and budgets and typically sets forth the broad parameters that will define the budget proposal that is presented to the legislature.
Executive budget proposal	Yes	Albania should increase the comprehensiveness of the Executive's Budget Proposal.
Supporting budget documents (mid-term budget framework, fiscal strategy, EU PEP-pre-accession program, etc)	Partially	Albania do not produce Mid-term budget framework but has produced and published fiscal program 2014-2016 ⁷ . Does not publish the EU PEP-pre-accession program.
Citizens budget	No	If Albania provides and publishes the Citizens budget, the Albania's score will be increased for a few points.
Enacted budgets	Yes	
End-year reports	Yes	Albania provides these reports only for internal use.
Audit reports	Yes	According to the recommendations from Open Budget Survey, Albania should improve the quality of the Audit report by including an executive summary along with the Audit report and publishing reports listing actions taken by the executive to address audit recommendations.

4) <http://www.ipls.org/services/constitution/const98/contents.html>

5) The budget documents are presented as a minimum required documents to represent best practices in the public finances and exercising fiscal transparency as per the International budget partnership: <http://internationalbudget.org/budget-analysis/>.

6) <http://internationalbudget.org/wp-content/uploads/OBI2012-AlbaniaCS-English.pdf>

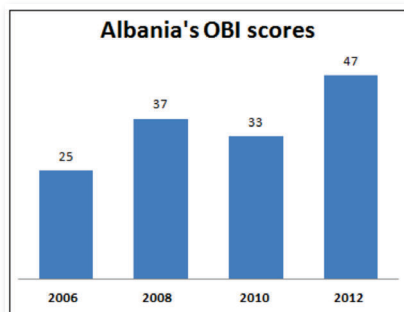
7) http://www.financa.gov.al/files/userfiles/Programimi_EkonomikoFiskal/Programi_Ekonomik_e_Fiskal/EFP_2014_english_FINAL.pdf

Fiscal transparency in Albania⁸

Albania has increased the fiscal transparency in the last few years. According to the Open Budget Index, Albania's score in 2012 is 47 out of 100, which is increased for 14 points from its OBI score of 33 in 2010. Albania's score indicates that the government provides the public with only some information on the national government's budget and financial activities during the course of the budget year. With the score that Albania has in 2012, the government has the potential to greatly expand budget transparency by introducing a number of short-term and medium-term measures, some which can be achieved at almost no cost to the government.

According to the recommendations of OBI, Albania should take some further steps to improve its budget transparency. Some of them are the following:

- Publication of a Year-End Report, which is currently produced for internal use;
- Producing and publishing a Citizens Budget;
- Producing and publishing a Mid-Year Review;
- Increasing the comprehensiveness of the Executive's Budget Proposal and so on.



Also, there is a space where the budget oversight can be improved. The international Budget Partnership recommends that:

- the legislature should have a specialized budget research office to assist it with budget analysis,
- the legislative should scrutinize all audit reports,
- and the executive should be required to seek approval from the legislature prior to shifting funds between administrative units and between line items and prior to using contingency funds.

BOSNIA AND HERZEGOVINA

Constitutional and legal arrangement

Executive, legislative and judiciary power. According to the Constitution of Bosnia and Herzegovina⁹ (Article IV-Parliamentary Assemble, Article V-Presidency and Article VI-Constitutional Court) the politics takes place in a framework of a parliamentary representative democratic republic, whereby the Council of Ministers of Bosnia and Herzegovina is the head of government, and of a multi-party system. Executive power is exercised by the government. Legislative power is vested in both the government and parliament. Members of the parliament are chosen according to a proportional representation system. The Judiciary is independent of the executive and the legislature. The system of government established by the Dayton Accord is an example of consociationalism, as representation is by elites who represent the country's three major groups, with each having a guaranteed share of power.

Public finances are also regulated by the Constitution more concrete in **Article VIII: Finances**: "1.The Parliamentary Assembly shall each year on the proposal of the Presidency, adopt a budget covering the expenditures required to carry out the responsibilities of institutions of Bosnia and Herzegovina and the international obligations of Bosnia and Herzegovina. 2. If no such budget is adopted in due time, the budget for

⁸) <http://internationalbudget.org/wp-content/uploads/OBI2012-AlbaniaCS-English.pdf>

⁹) http://www.ccbh.ba/public/down/USTAV_BOSNE_I_HERCEGOVINE_engl.pdf

the previous year shall be used on a provisional basis. 3. The Federation shall provide two-thirds, and the Republika Srpska one-third, of the revenues required by the budget, except insofar as revenues, are raised as specified by the Parliamentary Assembly”.

Budget documents

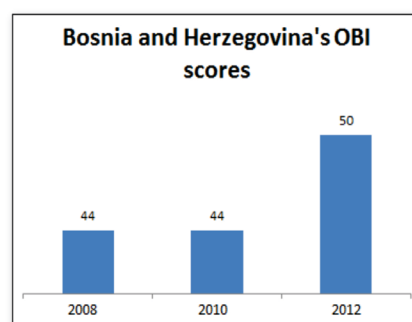
Documents	Yes/No	Comment ¹⁰
Pre-budget statements	Yes	
Executive budget proposal	Yes	
Supporting budget documents (mid-term budget framework, fiscal strategy, EU PEP-pre-accession program, etc)	No	B&H does not produce these documents.
Citizens budget for a few points.	No	If B&H provides and publishes CB the OBI score will be increased
Enacted budgets	Yes	B&H should provide program-level details in enacted budgets.
End-year reports	Yes	B&H should increase the level of detail of explanation of the differences between original nonfinancial and performance information and enacted levels of funds intended to benefit the poor in the country and their actual outcomes.
Audit reports	Yes	

Fiscal transparency of Bosnia and Herzegovina¹¹

Bosnia and Herzegovina provides the public only some information on the national government's budget and financial activities during the course of the budget year. B&H has increased its score since the last round of the Open Budget Survey which is an encouraging development and for which the government is congratulated. With a score of 50 out of 100 on the OBI 2012, the government of B&H has the potential to greatly expand budget transparency by introducing a number of short-term and medium-term measures, some of which can be achieved at almost no cost to the government.

According to the recommendations of the International Budget Partnership, the government should undertake some steps to improve its transparency:

- to produce and publish Citizens Budget;
- to produce and publish a Mid-Year Review;
- to increase the comprehensiveness of the Executive's Budget Proposal (especially in: expenditures for the budget year by functional classification and aggregate level of expenditures presented for a multi-year period; expenditures for the year preceding the budget year by functional classification; anticipated revenues for at least two years beyond the budget year and for the year prior to the budget year...);



10) <http://internationalbudget.org/wp-content/uploads/OBI2012-BosniaHerzegovinaCS-English.pdf>

11) <http://internationalbudget.org/wp-content/uploads/OBI2012-BosniaHerzegovinaCS-English.pdf>

- to increase the comprehensiveness of the Enacted Budget by providing program-level details in it;
- to increase the comprehensiveness of the In-Year Reports by providing information on the composition of government debt and actual borrowing in them;
- to increase the comprehensiveness of the Year-End Report by auditing outcomes, by increasing the level of detail of explanation of the differences between original nonfinancial and performance information and enacted levels of funds intended to benefit the poor in the country and their actual outcomes.

About the budget oversight the IBP also recommends B&H undertake some further steps to improve the budget oversight. According to that, the legislature in B&H should have internal capacity to conduct budget analyses and have a formal pre-budget policy debate prior to the tabling of the executive's Budget Proposal.

KOSOVO

Constitutional and legal arrangement

Executive, legislative and judiciary power: In the Republic of Kosovo the legislative power is exercised by the Assembly of the Republic of Kosovo. As such, the Assembly of the Republic of Kosovo is the highest representative and legislative institution in Republic of Kosovo directly elected by the people (Constitution of Kosovo¹², Chapter IV- Assembly of the Republic of Kosovo). The Government of Kosovo exercises the executive power in accordance with the Constitution and with law. The Government of Kosovo is composed by the Prime minister, vice-prime ministers and ministers. The Government implements the laws and acts ratified by the Assembly of Kosovo, and carries out other activities within the responsibilities defined by the Constitution and law (Chapter VI- Government of the Republic of Kosovo). Judicial power in the Republic of Kosovo is exercised by the courts (Chapter VII- Justice System).

Budget documents

Documents	Yes/No	Comment ¹³
Pre-budget statements	No	
Executive budget proposal	Yes	
Supporting budget documents (mid-term budget framework, fiscal strategy, EU PEP-pre-accession program, etc)	Partially	Kosovo publishes only Mid-term plan of revenues on municipal level, but publishes the Budget plan for next 2 years.
Citizens budget	No	
Enacted budgets	Yes	
End-year reports	Yes	
Audit reports	/	Not available on English language

Fiscal transparency of Kosovo¹⁴

The Budget process requires the establishment of transparent practices for budget management and a sound degree of accountability in the collection of budget revenue and its distribution. The Institute for Development Research has made research about the budget system in Kosovo, and they have developed some proposals for improving the fiscal transparency in Kosovo. According to the research, series of sensi-

12) <http://www.kryeministri-ks.net/repository/docs/Constitution1Kosovo.pdf>

13) <http://mf.rks-gov.net/en-us/fillimi.aspx>

14) <http://www.riinvestinstitute.org/publikimet/pdf/15.pdf>

tive decisions should be taken in setting 21 priorities (accompanied by rigorous estimation, open debate, competition of needs/projects based on proper sectoral strategies). The public should be educated in order to ensure its active participation in discussions about the priorities. This kind of process would lead to a more realistic budget, also followed by a system of budget monitoring and estimation, so that a higher level of accountability would result in better budget management. The first steps necessary in establishing this kind of practice have not yet been initiated in Kosovo. Discussions on the budget and its managerial practices are not open enough to the public and sometimes, even to important institutions such as Parliament.

The level of public information with respect to the Kosovo Consolidated Budget and municipal budget is very low. The survey of 600 private businesses shows that only approximately 9% of respondents consider that they are properly informed about budget expenditure, while only approximately 5% are informed on where and how the budget revenue from taxes and customs are distributed. The budget system and its management should contribute toward the establishment of the concept of a “national budget of Kosovo”, which should justify public expectations and increase fiscal culture in general. Also public awareness, as regards their responsibility as a taxpayer, should be increased, notwithstanding transparent policies and the accountability of budget managers toward the taxpayers.

Kosovo fiscal transparency is not surveyed by OBI.

MACEDONIA

Constitutional and legal arrangement

Executive, legislative and judiciary power: Politics in the Republic of Macedonia occur within the framework of a parliamentary representative democratic republic, whereby the Prime Minister is the head of government, and of a multi-party system. Executive power is exercised by the government. Legislative power is vested in both the government and parliament. The Judiciary is independent of the executive and the legislature (Constitution of the Republic of Macedonia, Article 8¹⁵).

Budget documents

Documents	Yes/No	Comment ¹⁶
Pre-budget statements	No	
Executive budget proposal	Yes	
Supporting budget documents (mid-term budget framework, fiscal strategy, EU PEP-pre-accession program, etc)	Yes	Macedonia provides and publishes all these supporting budget documents
Citizens budget increased for a few points.	No	If Macedonia provides and publishes CB the OBI score will be
Enacted budgets	Yes	
End-year reports	Yes	Macedonia should increase the comprehensiveness of the Year-End Report by auditing outcomes
Audit reports	Yes	Macedonia should improve the quality of the Audit reports

15) <http://www.sobranie.mk/ustav-na-rm.nspix>

16) <http://internationalbudget.org/wp-content/uploads/OBI2012-MacedoniaCS-English.pdf>

Fiscal transparency of Macedonia¹⁷

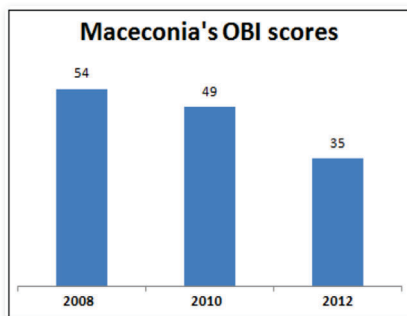
Macedonia's fiscal transparency is below the average transparency of 100 countries that are surveyed by OBI in 2012. Its score is 35, and it is lower than the scores of all neighbors in the region: Bosnia and Herzegovina, Croatia, Serbia and Albania.

Macedonia's score indicates that the government provides the public with minimal information on the national government's budget and financial activities during the course of the budget year.

In addition, is important to be mentioned that Macedonia declines its score every year from the beginning of the survey.

The International Budget Partnership has developed recommendations for undertaking steps to improve the budget transparency. Some of them are the following:

- to produce and publish a Pre-Budget Statement and a Mid-Year Review (only Serbia from the neighborhood publishes the Mid-Year Review);
- to produce and publish a Citizens Budget;
- to increase the comprehensiveness of the Executive's Budget Proposal; to increase the comprehensiveness of In year Reports by comparing actual year-to-date expenditures and revenues with either the original estimate for that period or the same period in the previous year and by providing information on the composition of government debt and actual borrowing;
- Macedonia should increase the comprehensiveness of the Yeas-End Report by auditing outcomes, increasing the level of detail of explanation of the differences between original expenditure estimates, original macroeconomic forecast, original nonfinancial and performance information, and enacted levels of funds intended to benefit the poor in the country and their actual outcomes, along with actual outcomes for extra budgetary funds;
- Macedonia should increase the comprehensiveness of the Audit Reports by making public report on what steps the executive has taken to address audit recommendations or findings that indicate a need for remedial action and by providing to the legislature annual accounts of the security sector and other secret programs.
- the executive should consult with members of the legislature as part of its process of determining budget priorities and be required to seek approval from the legislature prior to using contingency funds.



MONTENEGRO

Constitutional and legal arrangement

Executive, legislative and judiciary power: Politics of Montenegro takes place in a framework of a parliamentary representative democratic republic, whereby the Prime Minister of Montenegro is the head of government, and of a multi-party system. Executive power is exercised by the government. Legislative power is vested in both the government and the Parliament of Montenegro. The Judiciary is independent of the executive and the legislature (The Constitution of Montenegro¹⁸, Article 11-Division of Powers, Part 3-Organization of Powers).

17) <http://internationalbudget.org/wp-content/uploads/OBI2012-MacedoniaCS-English.pdf>

18) http://www.comparativeconstitutionsproject.org/files/Montenegro_2007.pdf

Budget documents

Documents	Yes/No	Comment
Pre-budget statements	No	
Executive budget proposal	Yes	
Supporting budget documents (mid-term budget framework, fiscal strategy, EU PEP-pre-accession program, etc)	Yes	
Citizens budget	No	
Enacted budgets	Yes	
End-year reports	Yes	
Audit reports	Yes	

Fiscal transparency of Montenegro¹⁹

Montenegro is not surveyed by the Open Budget Survey, and cannot be compared with the countries of its neighborhood by scores of its fiscal transparency. According to the Open Government Partnership, the Government of Montenegro will undertake some steps to increase the fiscal transparency:

The Government should amend the Organic budget law to define budgeting calendar dates more specifically, aiming to provide sufficient time to all participants in the planning process, including also the parliamentary procedure.

Furthermore, introduction of specific fiscal rules and medium-term budgeting are also necessary, which will increase significantly the transparency, accountability in planning and implementation, as well as precision in budget planning.

The Ministry of Finance should introduce, as a standing practice, a presentation of the annual budget in a visually comprehensible and simple manner, in order to ensure better understanding and increase public interest for budget operations.

The same practice should be established for the amended budget as well. Taking into account that the Program Budgeting significantly improves efficiency in spending of budget resources of some budget users, the Ministry of Finance should continue its implementation and work on identifying and developing performance indicators, as a mechanism for monitoring planned activities.

Moreover, with the objective to increase transparency of the use of public resources, the Ministry of Finance should make amendments to the Chart of Accounts, which will improve the expenditure control.

In addition, the Ministry of Finance should form internal structures that will monitor reports of the State Audit Institution, its findings, stated recommendations and its implementation by the audited institution.

The Government should work on improving communication and exchange of information and findings between the internal audit system and the State Audit Institution.

Montenegro fiscal transparency is not surveyed by OBI.

19) <http://www.opengovpartnership.org/country/commitment/budget-transparency>

SERBIA

Constitutional and legal arrangement

Executive, legislative and judiciary power: The legal system in Serbia is unique. Government system shall be based on the division of power into legislative, executive and judiciary. Relation between three branches of power shall be based on balance and mutual control. Judiciary power shall be independent (Constitution of the Republic of Serbia²⁰, Part 1- General provisions, Article 4.). The concrete provisions about the power division are defined in Part 5- Organization of Government.

Budget documents

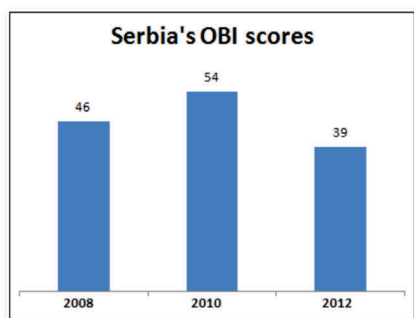
Documents	Yes/No	Comment ²¹
Pre-budget statements	No	
Executive budget proposal	Yes	Serbia should increase the comprehensiveness of the Executive's Budget Proposal
Supporting budget documents (mid-term budget framework, fiscal strategy, EU PEP-pre-accession program, etc)	Yes	Serbia should increase the comprehensiveness of the Mid-Year Review by improving the discussion of the updated macroeconomic forecast.
Citizens budget	No	If Serbia provides and publishes Citizens Budget the OBI score will be increased for a few points.
Enacted budgets	Yes	
End-year reports	Yes	Serbia should increase the comprehensiveness of the Year-End report
Audit reports	Yes	Serbia should improve the quality of the Audit report

Fiscal transparency of Serbia²²

Serbia in the past few years has significantly decreased its fiscal transparency. Only Serbia and Macedonia has decreased their OBI scores in 2012. Serbia's score is 39 out of 100 which is below the average score of 43 for all surveyed countries. Serbia's score indicates that the government provides the public with minimal information on the national government's budget and financial activities during the course of the budget year.

For that purpose, the International Budget Partnership has provided some recommendation for improving the transparency. Some of them are the following:

- Serbia should produce and publish a Pre-Budget Statement and Citizens Budget;
- Serbia should increase the comprehensiveness of the Executive's Budget Proposal;



20) http://www.srbija.gov.rs/cinjenice_o_srbiji/ustav.php?change_lang=en

21) <http://internationalbudget.org/wp-content/uploads/OBI2012-SerbiaCS-English.pdf>

22) <http://internationalbudget.org/wp-content/uploads/OBI2012-SerbiaCS-English.pdf>

- should increase the comprehensiveness of the Mid-Year Review by improving the discussion of the updated macroeconomic forecast, including more detailed updated expenditure and revenue estimates for the remaining six months of the fiscal year;
- should increase the comprehensiveness of the Year-End report by releasing the report six months or less after the end of the fiscal year, etc.
- Also, IBP recommends Serbia to improve the quality of the Audit report by realizing to the public audits of extra-budgetary funds and publishing reports listing actions taken by the executive to address audit recommendations.
- Also, for improving the budget oversight the legislature in Serbia should have a specialized budget research office to assist it with budget analysis, have a formal pre-budget policy debate prior to the tabling of the Executive's Budget Proposal, have the executive present the budget proposal at least three months before the start of the fiscal year, consult with members of the legislature as part of its process of determining budget priorities, and be required to seek approval from the legislature prior to spending contingency funds.

Open Budget Survey Tracker

Transparency and accountability, as two basic principles of good governance, are crucial in providing information and insight to the public on how public money, our money, is collected, allocated and spent. Additionally, transparency and accountability are necessary to show the determination and the intention of the public institutions, as well as to inform and to share this information with the public. But where a citizen as a fresh public finance starter can start to look at? What documents he or she should ask and/or look for? Anyone, taxpayer or citizen, should be able to follow how his own money are spent by the government. It may look simple to track availability and timelines of the 8 budget documents but this tracking can be an important instrument to promote that transparency and accountability to the general public.

In September 2014, IBP launched the Open Budget Survey Tracker (www.obstracker.org), an online monitoring tool allowing citizens, civil society, media, and others to monitor in real time whether central governments are releasing the requisite information on how the government is managing public finances.

The IBP main reasons for developing this tool were to: enable people to be the judge of whether or not their government officials are good stewards of public funds; provide the public with comprehensive and timely information on the government's budget and financial activities; provide opportunities to participate in decision making which can strengthen the oversight and improve policy choices; fighting with restricting access to information which can create opportunities for governments to hide unpopular, wasteful, and corrupt spending, ultimately reducing the resources available to fight poverts.²³

Why an **OBS Tracker**? A country's Open Budget Index score is the most comprehensive measure of budget transparency at the central government level but is updated only every two years. *Therefore OBS Tracker monitors on monthly basis one of the factors included in the Open Budget Index: whether governments at least release the eight key budget documents to the public (it does not assess the level of detailed information provided).* Though the Open Budget Index score is the gold standard measure, the Tracker allows for tracking a country's progress on meeting basic international standards for the publication of budget documents.

This tool is especially important for developing and emerging countries which do not have alternative ways to measure and monitor its level of transparency and accountability. Western Balkan countries are among countries where an independent and comprehensive way/tool for monitoring and improving transparency

23) That is why we at CEA have joined a global effort to implement a new tracking tool. On Sept. 12, 2104, the US-based International Budget Partnership (IBP) launched a new tracking tool, the Open Budget Survey Tracker to provide real-time information on the availability to the citizens of eight essential budget documents.

and accountability is more than needed. This is one of the reasons to present, in this part of the study the real results and outcomes of this new IBP activity. From all of the Western Balkan countries only Macedonia was initially included in the Open Budget Survey Tracker, so in addition we want to elaborate its situation in terms of transparency and accountability.

Table: Current situation in Macedonia

Document	Fiscal Year	Current Status	Comments	Date of Publication	Next Publishing Period
Pre-Budget Statement	2015	● Not produced		Unavailable	Sep 1, 2015 - Oct 15, 2015
Executive's Budget Proposal	2015	● Publicly available		Sep 14, 2014	Oct 1, 2015 - Dec 31, 2015
Enacted Budget	2015	● Publicly available		Jan 5, 2015	Before Mar 31, 2015
Citizens Budget	2014	● Not produced		Unavailable	Same as either the Executive Budget Proposal or Enacted Budget.
In-Year Report	2015	● Publicly available		Jan 31, 2015	Publishing period for each report is one to three months after a particular month/quarter ends.
Mid-Year Review	2014	● Not produced		Unavailable	Jul 1, 2015 - Sep 30, 2015
Year-End Report	2013	● Publicly available		Jul 16, 2014	Jun 30, 2015 - Dec 31, 2015
Audit Report	2012	● Publicly available		Oct 24, 2013	Before Jun 30, 2015

Source: Open Budget Partnership, OBI tracker, see: <http://www.obstracker.org/status/Macedonia>

From the table above we can see the current status of Macedonia regarding publicly available budget documents. The red marks show the documents which are not produced, and which should be put on a priority list by the Macedonian government: Pre-Budget Statement, Citizens Budget and Mid-Year Review. The table below presents the historical information about improvements of the level of transparency and accountability. It also enables us to see the undertaken periodical activities regarding the main budget documents.

Historical information about Macedonia

	Pre-Budget Statement	Executive's Budget Proposal	Enacted Budget	Citizens Budget	In-Year Report	Mid-Year Review	Year-End Report	Audit Report
Feb 2015	●	●	●	●	●	●	●	●
Jan 2015	●	●	●	●	●	●	●	●
Dec 2014	●	●	●	●	●	●	●	●
Nov 2014	●	●	●	●	●	●	●	●
Oct 2014	●	●	●	●	●	●	●	●
Sep 2014	●	●	●	●	●	●	●	●
Aug 2014	●	●	●	●	●	●	●	●
Jul 2014	●	●	●	●	●	●	●	●
OBS 2012	●	●	●	●	●	●	●	●

Source: Open Budget Partnership, OBI tracker, see: <http://www.obstracker.org/status/Macedonia>

Having in mind on one hand the advantages offered by this tool in terms of continuous monitoring of the level of budget transparency and accountability, and on the other hand the enormous need for monitoring of the level of transparency in the Western Balkans, we sincerely hope that each of the countries in this region will become a part of this global analysis /framework in the near future.

Conclusions and recommendation

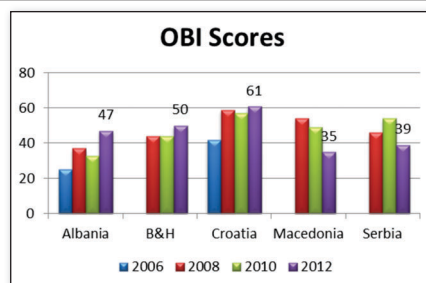
Fiscal transparency allows a better informed debate by both policymakers and the public about the design and results of fiscal policy, and provides legislatures, markets, and citizens with the information they need to hold governments accountable. Having in mind the close connections of fiscal transparency and accountability with: the trend of increasing budget deficits and public debt, i.e. lower fiscal discipline; the credit rating of the country and the possibility of borrowing on the international capital markets; and the level of corruption – measuring and improving fiscal transparency in the Western Balkan countries is of enormous importance. The methodology developed by OBI provides a unique opportunity for Western Balkan countries, first to measure the level of transparency and second to detect the weak points regarding the transparency.

On the Figure below we present the OBI scores (Kosovo and Montenegro are not surveyed by OBI) of the countries in the Western Balkans plus Croatia. We can draw several general conclusions: all of the countries except Macedonia and Serbia have an upward trend of OBI, they are improving the level of budget openness and transparency; Croatia notices/records the highest OBI of 61, almost 15 points higher than Macedonia; the strongest fall of OBI in 2012 is noticed/recorded in Macedonia and Serbia (this downward trends are noticed even in the global report prepared by OBP).

Figure

OBI scores of the countries in Western Balkans²⁴

Source: Open Budget Survey 2012.



According to our previous analysis in the paper, it is especially interesting to detect the weakest spots regarding budget openness in the Western Balkan countries. Thus we prepared one table below which detects the areas that require emergent attention by policy makers (government).

	Albania	Bosnia and Herzegovina	Kosovo	Macedonia	Montenegro	Serbia
Documents	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
Pre-budget statements	Yes	Yes	No	No	No	No
Executive budget proposal	Yes	Yes	Yes	Yes	Yes	Yes
Supporting budget documents (mid-term budget framework, fiscal strategy, EU PEP-pre-accession program, etc)	Partially	No	Partially	Yes	Yes	Yes
Citizens budget	No	No	No	No	No	No
Enacted budgets	Yes	Yes	Yes	Yes	Yes	Yes
End-year reports	Yes	Yes	Yes	Yes	Yes	Yes
Audit reports	Yes	Yes	/	Yes	Yes	Yes

24) Kosovo and Montenegro are not surveyed by OBI.

Taking into account the results of the table and our previous analysis we would like at the end to briefly summarize the general recommendations directed to Western Balkan countries:

- All countries should begin to publish / develop Citizens budget as the main tool for bringing the budget and its implementation closer to the public;
- Most of the countries (except Albania and Bosnia and Herzegovina) should develop and publish Pre - Budget Statement;
- A part of the countries need to increase the coverage of information (important information missing) regarding the supporting budget documents (mid-term budget framework, fiscal strategy, EU PEP-pre-accession program, etc.), as well as to provide additional detailed information on the proposed budget that will allow easier monitoring of the effects of the budget and determining the fiscal position of policy makers;
- All countries should create mechanisms and opportunities for public involvement in the discussions about the budget and the budget process (all Western Balkan countries are in the lowest group by OBI for this area);
- Increased attention needs to be paid to the auditor's report on the budget, especially regarding a successful implementation of the audit remarks and recommendation;
- The countries should start to think about the introduction of performance-based budgeting that would allow not only a significant improvement of the transparency of budget activities, but also an improvement of the accountability and efficiency in the implementation of the budget.

References

- [1] Budget Law of Montenegro
- [2] Budget Law of the Federation of Bosnia and Herzegovina
http://www1.worldbank.org/publicsector/pe/BudgetLaws/fbh_budg_law.pdf
- [3] Budget Law of the Republic of Albania
<http://www1.worldbank.org/publicsector/pe/BudgetLaws/AlbaniaOrganicBudget1998.pdf>
- [4] Budget Law of the Republic of Croatia
<http://www1.worldbank.org/publicsector/pe/BudgetLaws/CroatiaBudgetLaw200.pdf>
- [5] Budget Law of the Republic of Kosovo
<http://www1.worldbank.org/publicsector/pe/BudgetLaws/BudgetLawKosovo.pdf>
- [6] Budget Law of the Republic of Macedonia http://www.finance.gov.mk/files/u6/_____precis-ten_tekst_1.pdf
- [7] Budget Law of the Republic of Serbia
<http://www1.worldbank.org/publicsector/pe/BudgetLaws/SerbiaBudgetSystemLawJuly162009EnglishFINAL.pdf>
- [8] Budget Law of the Republic of Srpska
<http://www.narodnaskupstinars.net/lat/stranica/zakon-o-budzetskom-sistemu-republike-srpske-lat>
- [9] Constitution of Bosnia and Herzegovina
- [10] Constitution of the Federation of Bosnia and Herzegovina http://www.advokat-prnjavorac.com/legislation/constitution_fbih.pdf
- [11] Constitution of Republika Srpska <http://www.vijecenarodars.net/materijali/constitution.pdf>
- [12] Constitution of The Federation of Bosnia and Herzegovina
http://www.ccbh.ba/public/down/USTAV_BOSNE_I_HERCEGOVINE_engl.pdf
- [13] Constitution of the Republic of Albania <http://www.ipls.org/services/constitution/const98/contents.html>
- [14] Constitution of the Republic of Croatia <http://www.sabor.hr/Default.aspx?art=2411>
- [15] Constitution of the Republic of Kosovo <http://www.kryeministri-ks.net/repository/docs/Constitution1Kosovo.pdf>
- [16] Constitution of the Republic of Macedonia <http://www.sobranie.mk/ustav-na-rm.nspix>
- [17] Constitution of the Republic of Serbia http://www.srbija.gov.rs/cinjenice_o_srbiji/ustav.php?change_lang=en
- [18] International Budget Partnership
- [19] Law on the Audit of Institutions of Bosnia and Herzegovina
http://www.revizija.gov.ba/zakoni_i_akti/zakon_o_reviziji/Default.aspx
- [20] Law on the Audit of Institutions of the Federation of Bosnia and Herzegovina
<http://www.saifbih.ba/zakon/Default.aspx?id=7&langTag=bs-BA>
- [21] Law on the Budget System of Republika Srpska
http://www1.worldbank.org/publicsector/pe/BudgetLaws/rs_budg_sys_law.pdf
- [22] Law on the Establishment of the Office of the General Auditor of Kosovo and the Audit Office of Kosovo
http://oldoag.rks-gov.net/te%20tjera/2008_03-L075_SRPSKI.pdf
- [23] Law on the National Assembly of the Republic of Serbia
<http://www.parlament.gov.rs/upload/documents/412-10.pdf>
- [24] Law on the Parliament of the Republic of Macedonia
<http://www.sobranie.mk/zakon-za-sobranieto-na-rm.nspix>

- [25] Law on the Financing the Institutions of Bosnia and Herzegovina
http://www.mft.gov.ba/bos/images/stories/chj/zakon_o_finansiranju_bs.pdf
- [26] Law on the Republic Srpska Public Sector Auditing
http://www.gsr-s.org/static/uploads/zakon_o_reviziji/zakon_o_reviziji_precisceni_tekst_cyr.pdf
- [27] Law on the State Audit (MK)
http://www.dzr.gov.mk/Uploads/NOV_Zakon_dzavna_revizija.pdf
- [28] Law on the State Audit Institution (ME)
http://www.dri.co.me/1/index.php?option=com_wrapper&view=wrapper&Itemid=122&lang=sr
- [29] Law on the State Audit Institution (RS)
http://www.dri.rs/images/pdf/dokumenti/zakon/zakon_dri.pdf
- [30] Law on the State Supreme Audit Institution (AL)
<http://www.lexadin.nl/wlg/legis/nofr/eur/arch/alb/Auditlaw.pdf>
- [31] Ministry of Finance of the Republic of Kosovo
<https://mf.rks-gov.net/en-us/fillimi.aspx>
- [32] Nikolov M. and Bogoevska K. (2014): "Good governance through better fiscal transparency"; CEA publication
retrieved 29th May 2014 at:
http://www.cea.org.mk/documents/CEA_Fiscal%20transparency_budget_proces_FINAL.pdf.
- [33] Open Government Partnership <http://www.opengovpartnership.org/country/commitment/budget-transparency>
- [34] The Constitution of Montenegro http://www.comparativeconstitutionsproject.org/files/Montenegro_2007.pdf
- [35] The Rules of Procedure of the Assembly of the Republic of Albania
- [36] The Rules of Procedure of the House of Representatives of the Parliamentary Assembly of Bosnia and Herzegovina
<https://www.parlament.ba/sadrzaj/about/ustav/docs/default.aspx?id=45150&langTag=bs-BA&pril=b>
- [37] The Rules of Procedure of the House of People of the Parliamentary Assembly of Bosnia and Herzegovina
<https://www.parlament.ba/sadrzaj/about/ustav/docs/default.aspx?id=45153&langTag=bs-BA&pril=b>
- [38] The Rules of Procedure of the House of Representatives of the Parliament of the Federation of Bosnia and Herzegovina
<http://predstavnickidom-pfbih.gov.ba/bs/page.php?id=20>
- [39] The Rules of Procedure of the House of People of the Parliament of the Federation of Bosnia and Herzegovina
http://www.parlamentfbih.gov.ba/dom_naroda/bos/dom_naroda/poslovnik/index.html
- [40] The Rules of Procedure of the Assembly of the Republic of Kosovo
http://www.kuvendikosoves.org/common/docs/P_S_R_K_29__04_2010_serbisht.pdf
- [41] The Rules of Procedure of the Budget and Finance Committee (Assembly of the RK)
http://www.kuvendikosoves.org/common/docs/Poslovnik_%20o_%20radu_Odbora_za_bud_et_i_finansije.pdf
- [42] The Rules of Procedure of the National Assembly (RS)
<http://www.parlament.gov.rs/upload/documents/Poslovnik%20Narodne%20skupstine%20-%20precisceni%20tekst%20Sluzbeni%20g.pdf>
- [43] The Rules of Procedure of the National Assembly of the Republic of Srpska
<http://www.narodnaskupstinars.net/lat/stranica/poslovnik-lat>
- [44] The Rules of Procedure of the Parliament of Montenegro
http://www.skupstina.me/images/dokumenti/Poslovnik_Skupstine_Crne_Gore_2014.pdf

[45] The Rules of Procedure of the Parliament of the Republic of Macedonia

<http://www.sobranie.mk/delovnik-na-sobranieto-na-republika-makedonija-precisten-tekst.nspix>

[46] The Rules of Procedure of the State Audit Institution

<http://www.dri.co.me/1/doc/Poslovnik-Drzavne-revizorske-institucije.pdf>

[47] The Ministry of finance of the Republic of Albania

http://www.financa.gov.al/files/userfiles/Programimi_EkonomikoFiskal/Programi_Ekonomik_e_Fiskal/EFP_2014_english_FINAL.pdf

.....

UDC 339.562:339.727.22].025(560)

DOES INWARD FOREIGN DIRECT INVESTMENT INCREASE IMPORTS TO TURKEY? AN INSTRUMENTAL VARIABLES APPROACH

Bulent Esiyok

Baskent University, Ankara

Abstract

Whether foreign direct investment (FDI) complements or substitutes trade is a significant policy issue. This is particularly the case with respect to the relationship between FDI inflows and host country imports, especially imports of intermediate goods and the adverse effects of the latter on the current account. A surge in FDI inflows and imports over the last three decades makes Turkey an interesting case for investigating the link between FDI inflows and imports. Applying an instrumental variables approach to panel data for 19 OECD countries with FDI stocks in Turkey from 1982 to 2007, I find that an increase of FDI by ten percentage points leads to an increase of imports by around 3.6 to 8.9 percentage points, on average. These findings suggest that imports ensuing FDI inflows can lessen the positive effect of the latter on the current account balance.

Keywords: *International trade, foreign direct investment, Turkey.*

JEL Classification: *C33, C36, F14, F21, F23.*

1. Introduction

Turkish economy has experienced unprecedented growth of both FDI inflows and imports over the last three decades. On average, inward FDI stocks in Turkey grew by about 13.5% per annum from 1982 to 2007 and merchandise imports in Turkey increased by about 13.3% annually over the same period. To put into perspective, both Turkish inward FDI stocks and imports growth rates were higher than those of world, which were %13.2 and 8.2% respectively. This enormous growth in both inward FDI and imports led to studies investigating their determinants in the Turkish context. Surge in inward FDI is mainly associated with national income level, government stability and the initiation of membership negotiation with the EU in 2004

(Esiyok, 2011), while imports are found to be sensitive to national income level, real exchange rate and Customs Union with European Union (EU) countries (Bilin et al., 2007). So far, the effects of inward FDI on imports have been overlooked by existing studies on Turkey, despite the existence of a large body of theoretical and empirical literature on FDI-trade linkage. This study aims to fill in this gap in the literature by extending the investigation of determinants of imports to include inward FDI.

The paper is organised as follows. Section 2 reviews theoretical and empirical literature on FDI-trade relationship. Section 3 specifies the econometric model, discusses the methodology, and describes the dataset. Section 4 explains the estimation results and presents policy recommendations. Section 5 concludes and indicates some directions for future research.

2. Literature Review: Theory and Empirical Evidence

2.1 Theory

Factor proportion and proximity-concentration hypotheses underpin the debate on FDI-trade relationship. The factor proportion hypothesis views the phenomenon of FDI from the perspective of Multinational Enterprises' (MNEs) ability to fragment the value chain geographically, thereby taking advantage of differences in factor costs across countries (Markusen, 1984; Helpman, 1984; Helpman and Krugman 1985; Ethier and Horn, 1990). For instance, if firm specific inputs (intangible assets, such as, knowledge-capital) produced at headquarters could easily be transferred to the foreign affiliates at a low cost, a single plant multinational would arise to exploit possible factor cost differences. Headquarters would be located in the country with skilled abundant-labour and the production plant, where unskilled labour is plentiful. Given the large factor cost differences between developed and developing countries, vertical investment is more likely to arise between them as the factor proportion hypothesis predicts.

If factor proportions consideration dominates in a given industry, MNEs' investments are uni-directional, from home to a host country, and they export differentiated product to the home country. The effect of this inter-industry trade on overall trade of a given country depends on how MNEs would meet the needs of production in terms of inputs, whether through imports from the parent, third country or local suppliers. Moreover, external tariffs of regional blocs might affect the trade for inputs and induce MNEs to trade within the regional bloc.

Based on the assumption that countries are symmetric in terms of market size, factor endowments and technological development, the proximity-concentration hypothesis (Brainard, 1993a) suggests that firms prefer FDI over exporting if they are motivated by proximity to customers or specialized suppliers at the expense of reduced scale (concentration). Hence, MNEs' existence is positively correlated with high transport costs, trade barriers, low investment barriers and the ratio of scale economies at the plant level relative to the corporate level (Horstmann and Markusen, 1992; Brainard, 1993a). Given the symmetries in countries' market size, factor endowments and technologies, MNEs motivated by market access would invest in foreign markets to minimise transport costs associated with exporting. This setting allows for horizontal FDI, where two-way investment between countries similar in terms of both absolute and relative factor endowment occurs. The proximity-concentration hypothesis predicts large FDI flows among industrialised countries.

Trade substituting effects of FDI is likely to dominate if MNEs are concerned with proximity. If proximity considerations dominate in a given industry, multinational sales would replace two-way trade in final goods of unequal magnitudes and might generate inter-industry trade in intermediates (Brainard, 1993a). In this respect, even the presence of FDI itself might have further effects on trade between home and host country. For instance, FDI stimulate demand for imports through informational spill-overs and the creation of production channels (Swenson, 2004). Markusen (1998), Markusen and Venables (1996, and 1998) introduce asymmetries of market size, factor endowments and technological efficiency among countries in explaining the choice between trade and FDI. In these models, as the asymmetries start to disappear between countries in terms of market size, factor endowments, and technological efficiency, more firms would establish

subsidiaries in these developing countries; hence FDI and trade could exist simultaneously. As a result, MNEs become more important relative to trade as countries become more similar in size and in relative endowments as world income grows, and multinational production would substitute trade when countries are similar (Brainard, 1997).

2.2 Empirical Evidence

Existing empirical studies investigating FDI-trade relationship have used data at firm, industry, and country-level data with different estimation techniques and provided mixed results. For instance, Lipsey and Weiss (1984) analyse trade and subsidiary sales using cross-sectional firm data by utilising size of parent company and host country income. They confirm the complementary relationship between USA MNEs' production in foreign soil and their exports to foreign market. Similarly, Blomstrom et al. (1989) using trade equations on US and Swedish firm-level data arrive at the same conclusions as those of Lipsey and Weiss (1984).

Even though firm-level data used in the aforementioned studies allows the analysis at a more disaggregate level, the use of cross-section data makes it impractical to investigate the relationship between multinational activity and trade over time (Egger, 2001). Head and Ries (1997) and Blonigen (2001) employ firm-level panel data in their studies. Head and Ries (1997) find a positive relation between subsidiaries sales and exports, while Blonigen (2001) reveals linkages between trade and FDI in form of importing inputs from home country. His results indicate that there is substitution and complementary effects at product level. Taking disaggregation further, Swenson (2004) analyses the effect of FDI on trade at the product, industry, and the overall manufacturing levels in USA. Her findings confirm the complementary at the overall manufacturing level, while substitution effect becomes visible when USA imports are matched to disaggregated FDI at product level.

Studies applying export and import demand equations to country and industry level data have further enriched the FDI-trade debate. This strand of literature is based on the estimation of augmented export and import equations motivated by theoretical studies suggesting that the same exogenous factors determine trade and MNEs activities. Lin (1995) finds a positive long-run relationship between outward FDI and home country exports. Pfaffermayr (1996) analyses outward FDI and exports with a simultaneous equation system using time series and cross-sectional industry level data from the Austrian manufacturing sector. His findings indicate a significant complementary relationship between outward FDI and exports. Utilising an augmented export demand model in a panel data framework, Pain and Wakelin (1998) report a negative impact of outward FDI stocks on home country exports. Findings of Barrell and Pain (1997) confirm the negative relationship between outward FDI stocks and exports. Using affiliate sales instead of FDI stocks, Clausing (2000) reports that affiliate sales and export sales are positively associated at the aggregate, industry and country level.

Recent panel data studies lend further support to complementary relationship between FDI and trade. Sajid and Nguyen (2011) find that Vietnamese imports are positively associated with inward FDI. Similar results are reported by Soo et al. (2013) between Malaysian imports and inward FDI. Dividing outward Korean FDI and exports data into developed and developing countries, Kang (2012) finds a positive association between outward FDI and exports to developing countries, but fails to find a link between the two variables, outward FDI and exports from Korea, to developed countries.

The literature suggests that variations in methods used by studies in explaining the effect of FDI on trade are firmly related to data availability. Where multinationals sales are available at firm or product level, studies tend to use disaggregated data. In the absence of disaggregated data, studies generally use FDI stocks or flows to gauge multinational activity.

3. Model, Methodology and Data

3.1 Model

In a world consisting of two countries, two goods and two production factors (capital and labour), trade depends on world GDP, similarity of country GDPs and difference in factor endowments (Elhanan Helpman 1987). Similarity of GDPs and difference in factor endowments capture intra-industry trade and inter-industry trade respectively, while world GDP measures trade capacity of countries. In the literature, this specification has been extended to include other factors thought to affect trade (Egger, 2001; Bergstrand and Egger, 2007). In the same manner, I augment the core model with trade costs (costs of imports from home countries to Turkey), real exchange rate, customs union dummy and inward FDI;

$$\ln IM_{iht} = \gamma + \alpha_1 \ln Sum_{iht} + \alpha_2 \ln Sim_{iht} + \alpha_3 \ln PERCD_{iht} + \alpha_4 TRC_{iht} + \alpha_5 REER_{iht} + \alpha_6 CUD_{iht} + \alpha_7 \ln FDIN_{iht} + \theta_{ih} + \lambda_t + \varepsilon_{iht} \quad (1)$$

where subscripts i , h and t stand for home country i , Turkey, and time respectively. $\ln IM_{iht}$ is the log of imports from home country i to Turkey at time t ; $\ln Sum_{iht}$ is the log of sum of the GDPs of home country i and Turkey at time t . $\ln Sim_{iht}$ is the log of similarity index of GDPs of home country i and Turkey at time t . Similarity index is defined as:

$$Simindex = \left(1 - \left(\frac{GDP_{it}}{GDP_{it} + GDP_{ht}} \right)^2 - \left(\frac{GDP_{ht}}{GDP_{it} + GDP_{ht}} \right)^2 \right) \quad (2)$$

$\ln PERCD_{iht}$ is the log of per capita GDP difference between home country i and h at time t , TRC_{iht} is the trade cost for imports from home country i to Turkey at time t . In line with Egger (2001), trade cost of imports is taken as the ratio of import inclusive of cost, insurance and freight (c.i.f.) reported by Turkey to free on board (f.o.b.) export reported by country i . $REER_{iht}$ is the real exchange rates index between home country i and Turkey at time t . $REER_{iht}$ is calculated as:

$$REER_{iht} = \frac{E_{iht} \cdot P_{ht}}{P_{it}} \quad (3)$$

where E_{iht} represents the nominal exchange rate of home country i against Turkish currency, and P_{it} and P_{ht} stand for the consumer price indices of home country i and Turkey, respectively. A rise in $REER_{iht}$ represents an appreciation of home country i currency against the currency of Turkey. CUD_{iht} is the Customs Union dummy to capture the effect of CU between home country i and Turkey at time t . If both home country and Turkey are members of a Customs Union, the CUD_{iht} takes value 1 and 0 otherwise. $\ln FDIN$ is the log of outward stocks of home country i in Turkey at time t . θ_{ih} captures the unobserved country pair specific effects between home country i and Turkey and λ_t control for time fixed effects and ε_{iht} is the error term. Table 1 presents expected signs of variables.

3.2 Methodology

The simultaneity between trade and FDI is reported in the literature by several studies (e.g. Brainard, 1993b; Swenson, 2004; Blonigen, 2005). The simultaneity arises from the common factors in equation (1) that determine both trade and FDI. For instance, an increase in host country GDP would tend to affect imports and inward FDI in the same direction. However, a positive correlation between higher imports and inward FDI does not necessarily mean trade creation. In addition, it is possible that current values of inward FDI are correlated with current (Rodríguez and Bustillo, 2011) and past values of imports (Vernon, 1966; Johanson and Vahlne, 1977)

Simultaneity has serious consequences for estimates. If there is simultaneity in equation (1), the variable $\ln FDI_{iht}$ is correlated with the error term and this correlation violates the consistency assumption of Ordinary Least Squares (OLS). Ignoring the endogeneity of FDI leads to a bias in standard OLS estimator. To account for the potential bias, two methods are used in the literature. The first is to use lagged value of FDI (Pain and Wakelin, 1998) and the second is to employ two-stage least squares (2SLS) method (De Sousa and Lochard, 2004). Frankel (1997) argues that employing lagged variable does not ensure causality; therefore I use 2SLS to account for potential bias caused by the endogeneity of inward FDI.

Although it is fairly easy to detect endogeneity with the aid of statistical tests, it is a daunting task to find suitable instruments that are highly correlated with endogenous variable ($\ln FDI$) but not correlated with the error term in equation (1). The choice of instrumental variables in the literature is quite arbitrary and there is no consensus on a set of instrumental variables. Ghatak and Halicioglu (2007), and Aminian et al. (2008) use country risk indexes as instruments for FDI, assuming that there is a high correlation between these indexes and FDI. Given the limitation in available instruments for FDI, I use indexes of corruption, law and order for Turkey and ratified bilateral investment treaties for investment liberalisation between home countries and Turkey. The literature on FDI suggests that FDI is responsive to corruption (Egger and Winner, 2006), law and order (Busse and Hefeker, 2007), and investment liberalisation (Carr et al., 2001). The assumption that policy variables are thought to affect FDI and not correlated with the error term in equation (1) is very crucial to get reliable estimates using 2SLS. In line with previous empirical studies, Sargan test is used to ensure that instruments meet this condition.

3.3 Data

The dataset comprises 19 home countries that report outward FDI stocks in Turkey: Austria, Canada, Denmark, France, Finland, Greece, Germany, Hungary, Italy, Japan, Republic of Korea, Netherlands, Norway, Poland, Spain, Sweden, Switzerland, UK and USA. The period under consideration is 1982-2007. Observation for FDI is not available for each year for each country; therefore the panel is unbalanced with 295 observations for FDI. The choice of FDI stocks as proxy for multinational activity rather than multinational sales is dictated by data availability.

Nominal values of aggregate merchandise exports (f.o.b.) of home countries (imports of Turkey) are obtained from *Direction of Trade Statistics of International Monetary Fund (IMF)*. Then, nominal export values of home countries are deflated by export price indexes taken from *World Economic Outlook (WEO)*. Some studies use export price deflators or export unit values from IMF. However, export price deflators are not available for the all countries in the sample and export unit values exhibit a great deal of discrepancy from actual price deflators. Disaggregated data for merchandise goods of exports (f.o.b.) according to Broad Economic Category is not available; therefore aggregate merchandise imports ($\ln IM$) are used as dependent variable. The data for GDP and population are taken from *World Bank*.

Data on inward FDI stocks are compiled from various resources, mainly from *OECD International Direct Investment Statistics Database*. FDI data from OECD is extended with the data taken from *Eurostat*, *Central Bank of Netherlands*, *Statistics of Canada*, and *Japan External Trade Organisation*. In line with the OECD database, I convert the values in national currencies into dollars. Exchange rates are taken from main indicators of *OECD database*. FDI stock data from OECD International Direct Investment Year Book are estimation based on market values. Therefore, negative values of FDI stocks are possible because of different accounting practices among countries. In line with Bénassy-Quéré, et al. (2007), I add a small constant to real FDI values deflated by the GDP deflator of each country taken from *United Nations (UN)* database to transform the negative values of FDI to positive use the logarithm of real FDI values ($\ln FDI_{IN}$).

Nominal exchange rates of US\$ for home countries taken from *International Financial Statistics of IMF*; then the real exchange rates of the currencies of home countries against Turkish Lira is calculated. IMF reports data for currencies of the Euro countries in European Currency Unit (ECU). Similar to the method followed

by Bénassy-Quéré et al. (2007) I take conversion rates from *European Central Bank (ECB)* to calculate the exchange rate between European Monetary Union (EMU) countries in the sample and Turkey prior to the year 1999 (when Euro was first introduced). I use the lagged value of Real Exchange Rate (*REER*) to avoid reverse causality. In deflating all the nominal variables in the sample, 2000 is selected as the base year.

The indexes of corruption and law and order are taken from the *International Country Risk Guidance (ICRG)*. Data on the number of bilateral investment treaties are taken from the *Undersecretariat of Treasury in Turkey*. Table A1 and Table A2 in the Appendix provide correlation matrix and descriptive statistics respectively.

4. Results

Table 2 presents regression results using OLS estimator. Given high correlation between *lnSUM* and *lnSIM*, these variables enter the regression separately to prevent multicollinearity. Due to the presence of heteroscedasticity and autocorrelation problems, robust and clustered standard errors are used. The R-squared indicate that the variables in the regression explain 97 per cent of variation in dependent variable, *lnIM*.

As shown in Table 2, only the coefficient estimates for *lnSUM*, and *lnPERCD*, and are significant. The standard OLS procedure does not account for simultaneity between *lnFDIN* and *lnIM*. Consequently, the OLS estimator could lead to some variables not being significant or having unpredicted signs. In order to overcome the potential endogeneity related to inward FDI, variable *lnFDIN* is instrumented with indexes of corruption, law and order for Turkey and ratified bilateral investment treaties and results are presented.

Table 3 presents the results for regressions (3) to (4), using 2SLS method with the instrumental variables. As Wu-Hausman F Test and Durbin-Wu-Hausman test in Table 3 indicate that the exogeneity of the variable *lnFDIN* is clearly rejected. Hence, the simultaneity leads to the inconsistency in the OLS estimator. As Sargan test statistics in Table 3 shows, the null hypothesis that the instruments are valid instruments is not rejected for both models. In other words, the instruments are not correlated with the error term and the choice of instruments is appropriate. The instruments for regressions (3) and (4) appear to be highly correlated with inward FDI as Cragg and Donald (1993) Wald F statistics of excluded instruments are 19.81 and 13.50 for the regressions (3) and (4), respectively. Staiger and Stock (1997) suggest that F tests for instruments below 10 point to weak instruments.

Furthermore, the null hypothesis that disturbance is homoscedastic is not rejected for regressions (3) and (4) using Pagan-Hall general statistics meaning that heteroscedasticity is not a problem in the estimations. Moreover, as the Chi-square tests for country pair in Table 4 show, there are significant country pair and time effects. In addition, all the coefficient estimates are statistically significant and carry expected signs except for the variable, *lnSIM*.

As shown in Table 3, the sum of national incomes is positively associated with exports as the coefficient estimate for *lnSUM*, is significantly positive at the 1% level. On average, if the sum of national incomes (*lnSUM*) increases by 1 percentage point, imports would increase by 1.9 percentage points, other things being constant. In contrast to the predictions, similarity of incomes (*lnSIM*) is negatively related to imports. On average, if similarity of income (*lnSIM*) increases by 1 percentage point, imports would decrease by 2.3 percentage points. Probably, year dummies capture the cyclical effects in similarity of income (*lnSIM*). Per capita difference captures the inter-industry trade, and *lnPERCD* is positively related to imports. The coefficient estimate for *lnPERCD*, is significant at the 5% level, suggesting that an increase of *lnPERCD* by 1 percentage point leads to an increase of imports by 0.7 to 1.05 percentage points.

Moreover, the trade cost (*TRC*) is negatively related to imports, as the coefficient estimate for *TRC*, is significant at the 1% level. On average, an increase of *TRC* by 1 percentage point leads to a decrease of imports by around 0.3 to 0.4 percentage points. Furthermore, Customs Union is positively associated with imports and the coefficient estimate for *CUD*, is significant at the 1% level. On average, signatory home

countries to CU with Turkey are predicted to export to Turkey about %37.9 to 39.1 % more than non-signatory home countries, other things being constant.

In addition, real exchange rate is negatively related to imports as the coefficient estimates for *REER*, is significant at the 5 % level. A one point drop in bilateral real exchange rate index (*REER*) leads to an increase in imports of 0.5 percentage points. Regression results with respect to real exchange rate index and Customs Union are in line with those of Bilin et al. (2007).

Lastly, the major interest of the variable *InFDIN* is positively related to imports as the coefficient estimate for *InFDIN*, is significantly positive at the 10% level. On average, an increase of FDI by 1 percentage point leads to an increase in *InIM* of 0.36 to 0.89 percentage points, other things being constant. The empirical results lend support to the complementary relationship between outward FDI and exports of home countries (imports of host countries), and confirm the findings of Lipsey and Weiss (1984), Blomstrom et al. (1989), Lin (1995), Head and Ries (1997), Pfaffermayr (1996) and Clausing (2000).

The empirical evidence presented here is consistent with the view that inward FDI acts as a catalyst for aggregate imports from home countries to host country. However, the empirical results cannot distinguish imports generated by vertical investment from those generated by horizontal investment, due to the lack of inward FDI and import data at disaggregated level. Overall, results suggest that outward FDI stimulate exports from home countries to Turkey and thereby indicate that fears of job losses in home countries are misplaced.

Assuming that estimated elasticity of imports with respect to inward FDI stays constant, imports ensuing FDI inflows can lessen the positive effect of the latter on the current account balance in future. On the other hand, given the high imported content of exported and domestic goods, any policy change to restrict imports would choke off economic growth. In the face of this dilemma, policy makers could use subsidies to help supplier industry compete with foreign produced inputs. An equally important policy could be to keep inflation in check in order to maintain international competitiveness of local suppliers.

5. Conclusions

Both trade enhancing and trade-displacing nature of FDI raise interest among scholars and policy makers. Existing empirical studies point to a trade-enhancing effect of FDI on trade. Nonetheless, the theoretical literature presents that direction of effect between FDI and trade largely depends on income level and factor cost differences between home and host countries. Consequently, FDI-trade relationship might vary with country pairs included in samples for empirical analysis.

This study analyses the impact of inward FDI from nineteen OECD countries on imports in Turkey during the period 1982-2007. In line with previous studies real exchange rate, customs union and trade costs of imports are added to the regression model. In addition, time dummies are included to smooth out temporal fluctuations caused by internal and external economic crises during the period under investigation. Simple OLS estimations show no evidence that inward FDI has an impact on imports. Since statistical tests present the endogeneity of FDI to imports, 2SLS method is used to correct for simultaneity. After controlling for real exchange rate, customs union effect, and trade costs I find that inward FDI is positively related to imports. Estimated elasticity of inward FDI for imports ranges between 0.36 and 0.89.

One should exercise caution in interpreting the estimation results presented here, based on data at country level. This study suggests a complementary relationship between inward FDI and imports in Turkey. However, a study with disaggregated data at industry or firm level may arrive at conclusions conflicting with this study. Such a detailed empirical analysis could represent a fruitful research avenue provided that inward FDI and trade data are available at firm and industry levels in future.

References

- Aminian, N. Fung K., Iizaka H., & Siu A. (2008). Foreign Direct Investment, Intraregional Trade and Production Sharing in East Asia. United Nations ESCAP Macao Regional Knowledge Hub Working Paper 11.
- Barrell, R., & Pain N. (1997). Foreign Direct Investment, Technological Change, and Economic Growth Within Europe. *The Economic Journal*, 107(445), 1770-1786. DOI: 10.1111/j.1468-0297.1997.tb00081.x.
- Bénassy-Quéré, A., Coupet M., & Mayer T. (2007). Institutional Determinants of Foreign Direct Investment. *World Economy*, 30(5), 764-782. DOI: 10.1111/j.1467-9701.2007.01022.x.
- Bergstrand, J. H., & Egger P. (2007). A knowledge-and-physical-capital model of international trade flows, foreign direct investment, and multinational enterprises. *Journal of International Economics*, 73(2), 278-308. DOI:10.1016/j.jinteco.2007.03.004.
- Bilin, N., Taskin F., & Ungor M. (2007). Has European Customs Union Agreement really affected Turkey's trade?. *Applied Economics*, 39(16), 2121-2132. DOI: 10.1080/00036840600735390
- Blomstrom, M. R., Lipsey E., & Kulchicky K. (1989). "U.S. and Swedish Direct Investment and Exports," In Trade Policy Issues and Empirical Analysis, ed. Robert E. Baldwin, 259-304. Chicago: University of Chicago Press.
- Blonigen, B. A. (2001). In Search of Substitution Between Foreign Production and Exports. *Journal of International Economics*, 53(1), 81-104. DOI:10.1016/S0022-1996(00)00066-0.
- Blonigen, B. A. (2005). A Review of the Empirical Literature on FDI Determinants. *Atlantic Economic Journal*, 33(4), 383-403. DOI: 10.1007/s11293-005-2868-9
- Brainard, L. S. (1993a). A Simple Theory of Multinational Corporations and Trade with a Trade-off Between Proximity and Concentration. National Bureau of Economic Research (NBER) Working Paper 4269.
- Brainard, L. S. (1993b). An Empirical Assessment of the Factor Proportions Explanation of Multinational Sales. National Bureau of Economic Research (NBER) Working Paper 4583.
- Brainard, L. S. (1997). An Empirical Assessment of the Proximity-concentration Trade-off between Multinational Sales and Trade. *The American Economic Review*, 87(4), 520-544.
- Busse, M. & Hefeker C. (2007). Political risk, institutions and foreign direct investment. *European Journal of Political Economy*, 23(2), 397-415. DOI:10.1016/j.ejpoleco.2006.02.003.
- Carr, D. L., Markusen J. R., & Maskus K. E. (2001). Estimating the Knowledge-Capital Model of the Multinational Enterprise. *The American Economic Review*, 91(3), 693-708. DOI: 10.1257/aer.91.3.693
- Clausing, K. A. (2000). Does Multinational Activity Displace Trade?. *Economic Inquiry*, 38(2), 190-205. DOI: 10.1111/j.1465-7295.2000.tb00013.x.
- Cragg, J. G., & Donald S. G. (1993). Testing Identifiability and Specification in Instrumental Variable Models. *Econometric Theory*, 9(2), 222-240.
- De Sousa, J., & Lochard J. (2004). The Currency Union Effect on Trade and the FDI Channel. Université Panthéon-Sorbonne Working Paper j0411.
- Egger, P. (2001). European Exports and Outward Foreign Direct Investment: A Dynamic Panel Data Approach. *Review of World Economics*, 137(3), 427-449. DOI:10.1007/BF02707625

- Egger, P., & Winner H.** (2006). How Corruption Influences Foreign Direct Investment: A Panel Data Study. *Economic Development and Cultural Change*, 54(2), 459–486.
- Esiyok, B.** (2011). Determinants of foreign direct investment in Turkey: a panel study approach. MPRA Working Paper 36568.
- Ethier, W. J., & Horn H.** (1990). Managerial Control of International Firms and Patterns of Direct Investment. *Journal of International Economics*, 28(1-2), 25-45.
- Frankel, J. A.** (1997). *Regional Trading Blocs in the World Trading System*, Washington: Institute for International Economics.
- Ghatak, A., & Halicioglu F.** (2007). Foreign Direct Investment and Economic Growth: Some Evidence from Across the World. *Global Business and Economics Review*, 9(4), 381-394. DOI: 10.1504/GBER.2007.015101
- Head, K., & Ries J.** (1997). International Mergers and Welfare under Decentralized Competition Policy. *Canadian Journal of Economics*, 30(4), 1104-1123.
- Helpman, E.** (1984). A Simple Theory of International Trade with Multinational Corporations. *Journal of Political Economy*, 92(3), 451-472.
- Helpman, E.** (1987). Imperfect Competition and International Trade: Evidence from Fourteen Industrial Countries. *Journal of the Japanese and International Economies*, 1(1), 62-81.
- Helpman, E., & Krugman P.** (1985). *Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition and the International Economy*, Cambridge, MA: MIT Press.
- Horstmann, I. J., & Markusen J. R.** (1992). Endogenous Market Structures in International Trade. *Journal of International Economics*, 32(1), 109-129. DOI:10.1016/0022-1996(92)90038-L.
- Johanson, J., & Vahlne J.-E.** (1977). Internationalization process of firm - model of knowledge development and increasing foreign market commitments. *Journal of International Business Studies*, 8(1), 23-32.
- Kang, K.** (2012). Is the relationship between foreign direct investment and trade different across developed and developing countries? Evidence from Korea. *Asian-Pacific Economic Literature*, 26(2), 144-154. DOI: 10.1111/j.1467-8411.2012.01343.x
- Lin, A.-I.** (1995). Trade Effects of Foreign Direct Investment: Evidence for Taiwan with Four ASEAN Countries. (Review of World Economics), 131(4), 737-747.
- Lipsey, R. E., & Weiss M. Y.** (1984). Foreign Production and Exports of Individual Firms. *The Review of Economics and Statistics*, 66(2), 304-308.
- Markusen, J. R.** (1984). Multinationals, Multi-plant Economies, and the Gains from Trade. *Journal of International Economics*, 20(3-4), 205-226.
- Markusen, J. R.** 1998. Multinational Firms, Location and Trade. *The World Economy*, 21(6), 733-756. DOI: 10.1111/1467-9701.00161
- Markusen, J. R., & Venables A. J.** (1996). "The Increased importance of Direct Investment in North Atlantic Economic Relationships: A Convergence Hypothesis," In *The New Transatlantic Economy*, ed. Matthew B. Canzoneri, Wilfred J. Ethier, and Vittorio Grilli, 169-189. Cambridge: Cambridge University Press.
- Markusen, J. R., & Venables A. J.** (1998). Multinational Firms and the New Trade Theory. *Journal of International Economics*, 46(2), 183-203. DOI:10.1016/S0022-1996(97)00052-4.
- Pain, N., & Wakelin K.** (1998). Export Performance and the Role of Foreign Direct Investment. *The Manchester School*, 66(Supplement), 62-88.

- Pfaffermayr, M.** (1996). Foreign Outward Direct Investment and Exports in Austrian Manufacturing: Substitutes or complements?. *Review of World Economics*, 132(3), 501-22.
- Rodríguez, C., & Bustillo R.** (2011). A Critical Revision of the Empirical Literature on Chinese Outward Investment: A New Proposal. *Panoeconomicus*, 5(Special Issue), 715-733. DOI: 10.2298/PAN1105715R.
- Sajid, A., & Nguyen L. P.** (2011). Foreign direct investment and trade: The case of Vietnam. *Research in International Business and Finance*, 25(1), 39-52. Retrieved from <http://www.researchgate.net/>
- Soo K. G., Wong K. N., & Tham S. Y.** (2013). Trade linkages of inward and outward FDI: Evidence from Malaysia. *Economic Modelling*, 35, 224-230.
- Staiger, D., & Stock J. H.** (1997). Instrumental Variables Regression with Weak Instruments. *Econometrica*, 65(3), 557-586. DOI:10.2307/2171753.
- Swenson, D. L.** (2004). Foreign Investment and the Mediation of Trade Flows. *Review of International Economics*, 12(4), 609-629. DOI: 10.1111/j.1467-9396.2004.00470.x.
- Vernon, R.** (1966). International Investment and International Trade in the Product Cycle. *The Quarterly Journal of Economics*, 80(2), 190-207. DOI: 10.2307/1880689.

Table 1: Expected Signs of Variables

<i>lnSum</i>	+
<i>lnSim</i>	+
<i>lnPERCD</i>	+
<i>TRC</i>	-
<i>REER</i>	-
<i>CUD</i>	+
<i>lnFDIN</i>	+/-

Table 2: the Impact of inward FDI on Imports: OLS Estimates

Variables	(1)		(2)	
	<i>(lnIM)</i>		<i>(lnIM)</i>	
<i>CONS</i>	-25.890 [†]	(0.029)	-6.577*	(0.000)
<i>lnSUM</i>	1.347 [‡]	(0.085)		
<i>lnSIM</i>			-0.989	(0.150)
<i>lnPERCD</i>	0.728*	(0.000)	0.852*	(0.000)
<i>TRC</i>	-0.242	(0.207)	-0.248	(0.161)
<i>REER</i>	0.001	(0.859)	0.000	(0.862)
<i>CUD</i>	0.292	(0.112)	0.258	(0.138)
<i>lnFDIN</i>	-0.021	(0.629)	-0.025	(0.614)
Country Dummies	YES		YES	
Year dummies	YES		YES	
R-squared	0.97		0.97	
No. of observations	295		295	

Source: Author's calculations.

p values are in parentheses. *, †, ‡ represent statistical significance at the 1%, 5% and 10% level, respectively.

Table 3: the impact of inward FDI on Imports: IV estimates

Variables	(3)		(4)	
	(lnIM)		(lnIM)	
CONS	-36.584*	(0.000)	-15.534*	(0.000)
lnSUM	1.976*	(0.000)		
lnSIM			-2.309*	(0.000)
lnPERCD	0.765*	(0.000)	1.050*	(0.000)
TRC	-0.317*	(0.000)	-0.441*	(0.001)
REER	-0.002	(0.236)	-0.005†	(0.029)
CUD	0.330*	(0.000)	0.321*	(0.001)
lnFDIN	0.368*	(0.000)	0.892*	(0.000)
Country dummies	YES		YES	
Year dummies	YES		YES	
Wu-Hausman F Test	16.689*	(0.000)	90.788*	(0.000)
Durbin-Wu-Hausman Chi-sq Test	18.702*	(0.000)	78.914*	(0.000)
Sargan Test	1.464	(0.226)	0.353	(0.838)
Pagan Hall heteroscedasticity test	36.694	(0.860)	21.342	(0.999)
Cragg Donald Wald F statistic	19.810*	(19.810)	13.500*	(0.000)

Source: Author's calculations.

p values are in parentheses. *, †, ‡ represent statistical significance at the 1%, 5% and 10% level, respectively.

Appendix

Table A1: Correlation Matrix

	lnIM	lnSum	lnSIM	lnPERCD	TRC	REER	CUD	lnFDIN
lnIM								
lnSum	0.6008							
lnSIM	-0.3884	-0.9235						
lnPERCD	0.2093	0.3388	-0.2551					
TRC	-0.1905	0.0153	-0.0116	0.1256				
REER	-0.2551	-0.3406	0.2049	-0.1313	-0.2135			
CUD	0.3000	-0.1933	0.3087	-0.0221	-0.1964	-0.1999		
lnFDIN	0.7445	0.6002	-0.3644	0.3453	0.0536	-0.3812	0.1967	

Source: Author's calculations.

Table A2: Descriptive Statistics

Variables	Mean	Standard Deviation	Minimum	Maximum
<i>lnIM</i>	6.8894	1.2043	4.0398	9.9402
<i>lnSUM</i>	18.4784	0.9757	17.1648	20.9007
<i>lnSIM</i>	-1.2783	0.7094	-3.0975	-0.6931
<i>lnPERCD</i>	9.6663	0.8706	4.5158	10.5064
<i>TRC</i>	1.0979	0.2626	0.3959	2.4568
<i>REER</i>	115.0714	22.8481	55.0019	169.9838
<i>CUD</i>	0.3796	0.4861	0	1
<i>lnFDIN</i>	6.1867	0.9083	4.8234	8.4296

Source: Author's calculations.

.....

UDC 339.972:336.748.12]:338.124.4(4-672EU)
"2002/2013"

THE IMPACT OF ECONOMIC CRISIS ON INFLATION CONVERGENCE IN THE EUROPEAN UNION. A PANEL DATA APPROACH²⁵

Mihaela Simionescu,
PhD Senior Researcher
Institute for Economic Forecasting of the Romanian Academy

Abstract

The aim of this research is to assess the convergence rate of the inflation in European Union 28 (EU-28) and to evaluate the impact of recent economic crisis on the convergence process in inflation. Therefore, a panel data approach was used, the unit root tests for stationary indicating enough evidence for convergence in the period from 2002 to 2013. However, a decline in the convergence process was observed during the economic crisis (2008-2013) compared to the previous period of the same length (2002-2007), the convergence rate decreasing with 3.98 percentage points.

Keywords: inflation convergence, unit root tests, economic crisis, panel data, inflation, convergence rate

Introduction

Inflation convergence in the European Union is a popular topic in literature, many researchers being interested in the degree of convergence regarding different macroeconomic indicators.

The inflation rate convergence was specified in the Maastricht treaty as an important requirement to accept a country as member of the European Monetary Union. This condition requires that a country has an inflation rate that is higher with no more than 1.5 percentage points compared to the average of the three lowest inflation rates in the European Monetary System.

The objectives of this research is to assess the convergence rate in EU-28 and to check if there was a decline in convergence process during the recent economic crisis compared to the period before this crisis.

25) This paper presents some results from the study "Convergence in the European Union. Theory and applications" coordinated by Academician Lucian-Liviu Albu, being part of the research program for 2014 of the Institute for Economic Forecasting of the Romanian Academy.

The panel data approach and the unit root tests for panels are applied in this study.

The paper is structured in several sections, after a brief literature review, an extended methodology being presented. The empirical study refers to the members of the EU-28, obtaining a decline in convergence rate during the crisis compared to the previous period.

Literature review

The unit root testing procedure proposed by (Quah, 1992) proposed the unit root testing procedure using panel data, while (Levin & Lin, 1993) came with a test that is specific for individual effects panel. (Im, Pesaran, & Shin, 1995) started from Dickey-Fuller's test, proposing another test for which the statistic average is based on N elements.

(Islam, 1995) adapted the usual equation for convergence to dynamic panel approach. The advantage of panel approach is related to the fact that it permits differences in the aggregate production function. (Kočenda & Papell, 1996) studied the inflation convergence in European Union and they tested if the Exchange Rate Mechanism accelerated the inflation. (Harris & Tzavalis, 1996) developed the panel data procedure for normalized bias of the Least Squares estimator.

(Gaulier, Hurlin & Jean-Pierre, 1999) presented the tests for convergence based on panel data approach. The authors proposed a procedure to characterize different types of convergence, the analyzed samples referring to OECD, World and Europe. (Lee, Longmire, Matyas & Harris, 1998) applied the panel data approach for Solow model to analyze the convergence process in OECD countries. The results showed that there is a likely convergence to the stable state of about 2%-4%.

(Holmes, 2002) checked the inflation convergence in most of the European Union countries utilizing unit root and co-integration tests. Using monthly data the author obtained a strong evidence of convergence, the macro-economic independence being explained by the ERM from 90s years.

(Weeks & Yudong Yao, 2003) analyzed the income convergence in China's regions using the Solow model for growth. The authors used panel data approach, solving the estimation problem with generalized method of moments. The conclusion was that during the reform period in China there was an obvious divergence process. (Badinger, Müller, & Tondl, 2004) assessed the income convergence for NUTS2 regions, proposing a procedure for dynamic panels. Using system generalized moments method for filtered variables the authors computed a convergence speed of 7%. (Kutan & Yigit, 2009) used a panel data analysis for 8 new members of the European Union and showed that human capital is the most important factor that determined productivity growth during 1995-2006. (Lee, 2009) used the dynamic panel approach to make a comparative analysis between trade and foreign direct investment in the convergence framework. The results of panel unit root approach consist in confirming the convergence regarding the long-term productivity in manufacturing for 25 analyzed countries. (Ucar & Guler, 2010) used a seasonal variant of Solow-Swan model to analyze the convergence in some OECD countries. It was introduced a new statistic for which critical values were generated. (Arnold, Bassanini, & Scarpetta, 2011) computed the convergence speed in 21 OECD countries being consistent with augmented Solow model and Uzawa-Lucas model. (Nath & Hegwood, 2012) utilized panel unit root tests with structural breaks to study the price convergence in USA, obtaining an obvious price index convergence between towns in USA.

Methodology

The inflation rate for each country at time t is determined using the harmonized index of consumer prices:

$$ir_t = \ln \frac{HICP_t}{HICP_{t-1}} \cdot 100 \quad (1)$$

An autoregressive model of order 1 is proposed for the inflation rate:

$$ir_{i,t} = \alpha + \beta \cdot ir_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

The average inflation corresponding to the group of countries in a certain time period t is computed as:

$$\overline{ir}_t = \alpha + \beta \cdot \overline{ir}_{t-1} + \varepsilon_t \quad \overline{ir}_t = \frac{1}{n} \sum_{i=1}^n ir_{i,t} \quad (3)$$

where the average inflation is calculated as:

n - number of countries

For convergence analysis we have to work with inflation differential, which is the difference between the inflation in each country and the average inflation in the entire group at time t . the average of inflation differentials is zero for all countries and time periods.

After subtracting the last equation from the previous one, we will obtain:

$$ir_{i,t} - \overline{ir}_t = \beta \cdot (ir_{i,t-1} - \overline{ir}_{t-1}) + \varepsilon_{i,t} \quad (4)$$

The last equation is essential in convergence methodology of Ben-David (1996). The convergence condition implies a decrease in time of the inflation differentials. Therefore, the estimate of the parameter β should be less than 1. A value higher than 1 for this estimate supposes divergence. Actually, β is in this case the convergence coefficient.

The estimate of β is used to compute the actual convergence rate within a certain group of countries. If the difference $ir_{i,t} - \overline{ir}_t$ is denoted by $d_{i,t}$, we assume that the inflation differentials diminish in time as:

$$d_{i,t} = d_{i,0} \cdot e^{-rt} \quad (5)$$

where r - convergence rate

The convergence rate can be determined taking into account the convergence coefficient:

$$r = -\ln(\beta) \quad (6)$$

The Dickey-Fuller (DF) test is used to calculate the convergence coefficient for a group of countries. The Augmented-Dickey-Fuller (ADF) test deletes the eventual auto-correlation in data. The difference of inflation differential is $\Delta d_{i,t} = d_{i,t} - d_{i,t-1}$ and the equation corresponding to ADF test is:

$$\Delta d_{i,t} = (\beta - 1) \cdot d_{i,t-1} - \sum_{j=1}^k \gamma_j \Delta d_{i,t-j} + \varepsilon_{i,t} \quad (7)$$

where $i=1,2,\dots, k$ is the index for countries in a certain group.

This equation checks the presence of unit root in the panel. If the convergence coefficient is different from 1, then the null hypothesis of unit root is rejected.

A parametric method is utilized to compute the number of lagged differences (k). A maximum value of k is a start value for the procedure. After the regression estimation, the significance of the parameter γ_j is tested. In case of non-significance, the value of k decreases with one unit and the regression (7) is estimated again till we get a k for which the parameter is significant. If we did not find a significant parameter, then k will take the value 0 and the standard Dickey-Fuller test is applied.

In panel data analysis the most used critical values are those proposed by (Levin & Lin, 1992), but these critical values do not take into account the errors' auto-correlation, not being suitable for small samples. Therefore, (Papell, 1996) proposed higher critical values using Monte Carlo simulations in order to take into account the errors' serial correlation.

The critical values were determined using Monte Carlo method. Autoregressive (AR) models were estimated and the best AR model was chosen using Schwarz criterion. These models actually represent the errors' data generating process for each panel. The pseudo-samples are built using the best AR models that are independent and identically distributed with the null average and variance equaled to σ^2 . Then, t test is applied in order to check the significance of $(1-\beta)$ with a lag length equaled to k.

A large number of replications is used and the vector of replications was sorted, representing the critical values of the sample repartitions. The selected significance levels were 1%, 5% and 10%. Later this test was improved by (Levin, Lin, & Chu (2002) that computed an adjusted t-statistic. (Harris & Tzavalis, 1999) used the unit root test for fixed time periods (T) and large number of groups (N). A homogeneous panel is considered:

$$y_{it} = \varphi \cdot y_{it-1} + v_{it} \quad (8)$$

The coefficient φ is zero under the null hypothesis. The, we consider a unit root process with non-homogeneous drift:

$$y_{it} = \alpha_i + \varphi \cdot y_{it-1} + v_{it} \quad (9)$$

The last model has linear trend and heterogeneous drift:

$$y_{it} = \alpha_i + \beta_i \cdot t + \varphi \cdot y_{it-1} + v_{it} \quad (10)$$

For the null hypothesis $\omega = 1$ and $\beta_i = 0$.

The OLS estimator is computed as:

$$\hat{\varphi} - 1 = [\sum_{i=1}^N y'_{i, -1} Q_T y_{i, -1}]^{-1} [\sum_{i=1}^N y'_{i, -1} Q_T v_i] \quad (11)$$

Q_T - projection matrix

$$y_{i, -1} = (y_{i1}, \dots, y_{iT-1})$$

$$v'_i = (v_{i1}, \dots, v_{iT})$$

Testing the inflation convergence before and during the economic crisis in EU-28

The annual average rate of change (%) based on harmonized index of consumer prices for period is provided by Eurostat for each of the 28 countries in the European Union. The data was partitioned in two time periods: before the recent economic crisis (2002-2007) and during the economic crisis (2008-2013) when the convergence hypothesis is analyzed separately during two distinct periods. The two time intervals have the same number of years (6).

Firstly, the Harris-Tzavalis unit-root test was applied for inflation rate during 2002-2013 (number of panels=28 and number of years=12). The assumptions for this test are:

H_0 (null hypothesis): Panels have unit roots

H_a (alternative hypothesis): Panels are stationary

The autoregressive parameter is common, the panels means are included, but not the time trend. If all the panels are stationary, then a convergence tendency in inflation is identified.

Table 1 The results of Harris-Tzavalis unit-root test for all the countries (2002-2013)

	Statistic	Z	p-value
Rho	0.3357	-9.7597	0.00

Source: own computations

The p-value is 0, the null hypothesis being rejected. So, the panels are stationary. The average annual convergence rate in inflation for EU-28 during 2002-2013 is 9.15%. This implies that on the entire period we have evidence of convergence in inflation in EU-28. Indeed, the new members of EU (Croatia, Romania, Bulgaria, Slovenia, Slovakia, Malta, Czech Republic) had made efforts to get and maintain low inflation before and after the entrance in EU. The disparities between countries regarding inflation evolution are quite low on the entire period. The Fisher type unit root test for inflation is also applied for the entire period in order to check the convergence in inflation.

Table 2 The results of Fisher-type unit root test for inflation based on augmented Dickey-fuller tests

Fisher-type unit-root test for inflation
Based on augmented Dickey-Fuller tests

Ho: All panels contain unit roots	Number of panels =	28
Ha: At least one panel is stationary	Number of periods =	12

AR parameter: Panel-specific	Asymptotics: T -> Infinity
Panel means: Included	
Time trend: Not included	
Drift term: Not included	ADF regressions: 1 lag

		Statistic	p-value
Inverse chi-squared(56)	P	167.6312	0.0000
Inverse normal	Z	-7.2255	0.0000
Inverse logit t(144)	L*	-7.9137	0.0000
Modified inv. chi-squared Pm		10.5482	0.0000

P statistic requires number of panels to be finite.
Other statistics are suitable for finite or infinite number of panels.

Source: own computations

The Fisher type unit root test indicated that at least one panel is stationary. The result of this test is in accordance with Harris-Tzavalis unit-root test. It confirms the convergence in inflation during 2002-2013.

Moreover, the Augmented Dickey-Fuller (ADF) test is applied to the average inflation rate of the entire EU-28. This time we do not take into consideration the individual evolution of inflation rate in each distinct country from European Union by using a panel data. We test the stationary of a time series for average inflation rate in EU-28. We suspect that the data aggregation made when the average is computed, might generate different results. Moreover, another perspective of convergence process is analyzed: the tendencies of the inflation values in EU as a whole to its average.

According to ADF test for the entire EU-28, we do not have enough evidence for convergence process at 5% level of significance. Indeed, the time series for average inflation in EU is not stationary and the convergence hypothesis is not confirmed. In this case the overall inflation in EU does not converge to a certain average.

Table 3 The results of Augmented Dickey Fuller for inflation of the entire EU-28

ADF Test Statistic	-4.565156	1% Critical Value*	-4.3260
(intercept included in test equation)			
		5% Critical Value	-3.2195
		10% Critical Value	-2.7557
ADF Test Statistic	-4.154058	1% Critical Value*	-5.2735
(trend and intercept included in test equation)			
		5% Critical Value	-3.9948
		10% Critical Value	-3.4455
ADF Test Statistic	-0.549254	1% Critical Value*	-2.8622
(no trend and no intercept included in test equation)			
		5% Critical Value	-1.9791
		10% Critical Value	-1.6337

Source: own computations

We run a fixed effects and a random effects model and a pooled OLS regression, the tests indicating than the pooled OLS regression model is the best. The application of Hausman test we got that model fitted on these data fails to meet the asymptotic assumptions of the Hausman test. Therefore, seemingly unrelated estimation is applied. For the OLS regression model, the errors' homoscedasticity and independence were checked. In the 28 countries of the European Union 44.14% of the variation in inflation is explained by the evolution in the previous period of the same indicator.

Table 4 The results of pooled OLS regression for inflation in EU-28

Source	SS	df	MS	Number of obs = 336		
Model	875.526384	1	875.526384	F(1, 334) =	263.92	
Residual	1108.0236	334	3.31743594	Prob > F =	0.0000	
				R-squared =	0.4414	
				Adj R-squared =	0.4397	
Total	1983.54999	335	5.92104474	Root MSE =	1.8214	

inflation	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
inflation1	.6155853	.0378926	16.25	0.000	.541047	.6901236
_cons	1.025133	.1538652	6.66	0.000	.7224664	1.3278

Source: own computations

The Harris-Tzavalis unit-root test was applied for the entire EU-28 before and during the crisis in order to observe if the convergence process declined during the crisis compared to the period before the actual economic crisis started in 2008. Previous studies made for GDP per capita convergence, like those of Albu(2012) and Simionescu(2014), showed that the economic crisis slowed the convergence in output. We suspect that this impact of economic crisis on convergence might be valid also for inflation.

Table 5 The results of Harris-Tzavalis unit-root test for EU-28 during the crisis period (2008-2013) compared to the previous period (2002-2007)

	Statistic	Z	p-value
Rho	-0.3535	-3.0997	0.0010

Source: own computations

The rate of convergence during the crisis (2008-2013) decreased with 3.98 percentage points compared to the ante-crisis period (2002-2007). During the crisis we have a slow convergence rate than on the entire period. This is due to the high convergence rate in the period before crisis start (2000-2007). Like in the case of GDP per capita, the economic crisis slowed the inflation convergence. Indeed, the convergence analysis is dependent on the considered time period. World food prices increased dramatically in 2007-2008, reaching a maximum in 2011. However, different policy measures have been implemented in the various countries of EU to face the price instability, but the impact was different. Therefore, the convergence rate was affected and it decreased during the crisis period compared to previous period or to the entire period.

Conclusions

The inflation rate convergence in EU is a process under observation of many economic actors. The stability of prices criterion should be achieved on the basis of inflation convergence. According to Maastricht treaty regarding the inflation convergence, the inflation rate of a candidate to Economic and Monetary Union should not surpass the threshold of 1.5% of the average of the first 3 countries with the lowest inflation from euro area. After the euro adoption as common currency, a clear process of divergence was observed in the euro zone. Most of the studies analysed the inflation convergence for euro zone, but this study brings as novelty the problem of inflation convergence in the entire European Union (EU-28).

For studying the inflation convergence, there is a various methodology presented in literature, employing complex statistical and econometric methods: models with variable coefficients in time, principal components analysis, co-integration approach, unit root test that consider the countries' correlations. However, the results of the convergence analysis in EU depend on time horizon and institutional changes. There are two tendencies that act in different senses: the Exchange Rate Mechanism has to ensure the inflation convergence while a common monetary policy and the unique currency bring the inflation divergence.

Moreover, the economic crisis generated an obvious decline in the convergence process of prices. The decrease in the convergence rate was assessed and the statistical results confirmed this hypothesis. The rate of convergence during the crisis in European Union decreased with 3.98 percentage points compared to the ante-crisis period. During the crisis we have a divergence process according to inflation evolution in EU-28. It would be interesting to check the convergence of other macroeconomic indicators before and during the crisis in a future research.

APPENDIX 1

Fixed effects and random effects models for the inflation rate

Fixed-effects (within) regression
 Group variable: country

Number of obs = 336
 Number of groups = 28

R-sq: within = 0.2187
 between = 0.9881
 overall = 0.4414

Obs per group: min = 12
 avg = 12.0
 max = 12

F(1,307) = 85.95
 Prob > F = 0.0000

corr(u_i, Xb) = 0.6228

inflation	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
inflationl	.4568419	.049276	9.27	0.000	.3598805	.5538033
_cons	1.517285	.1821803	8.33	0.000	1.158805	1.875765
sigma_u	.68064395					
sigma_e	1.819317					
rho	.12278102	(fraction of variance due to u_i)				

F test that all u_i=0: F(27, 307) = 1.03 Prob > F = 0.4297

Random-effects GLS regression
 Group variable: country

Number of obs = 336
 Number of groups = 28

R-sq: within = 0.2187
 between = 0.9881
 overall = 0.4414

Obs per group: min = 12
 avg = 12.0
 max = 12

Wald chi2(1) = 263.92
 Prob > chi2 = 0.0000

corr(u_i, X) = 0 (assumed)

inflation	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
inflationl	.6155853	.0378926	16.25	0.000	.5413171	.6898535
_cons	1.025133	.1538652	6.66	0.000	.7235631	1.326704
sigma_u	0					
sigma_e	1.819317					
rho	0	(fraction of variance due to u_i)				

References

- Albu, L. L. (2012). The Convergence Process in the EU Estimated by Gini Coefficients. *Romanian Journal of Economic Forecasting*, 4, 5-16.
- Arnold, J., Bassanini, A., & Scarpetta, S. (2011). Solow or Lucas? Testing speed of convergence on a panel of OECD countries. *Research in Economics*, 65(2), 110-123.
- Badinger, H., Müller, W., & Tondl, G. (2004). Regional convergence in the European Union, 1985-1999: A spatial dynamic panel analysis. *Regional Studies*, 38(3), 241-253.
- Ben-David, D. (1993). Equalizing exchange: Trade liberalization and income convergence. *The Quarterly Journal of Economics*, 108(3), 653-679.
- Gaulier, G., Hurlin, C., Jean-Pierre, P. (1999), Testing convergence: a panel data approach, *Annales d'Economie et de Statistique*, 411-427.
- Harris, R.D.F. and Tzavalis, E., (1996), Inference for Unit Root in Dynamic Panels, Working Paper, University of Exander, UK.
- Harris, R. D. F., and E. Tzavalis. (1999), Inference for unit roots in dynamic panels where the time dimension is fixed. *Journal of Econometrics* 91: 201–226.
- Holmes, M. J. (2002). Panel data evidence on inflation convergence in the European Union. *Applied Economics Letters*, 9(3), 155-158.
- Im, K.S., Pesaran, M.H., and Shin, Y., (1995), Testing for Unit Roots in Heterogenous Panels, DAE, Working Paper 9526, University of Cambridge.
- Islam, N. (1995). Growth empirics: a panel data approach. *The Quarterly Journal of Economics*, 110(4), 1127-1170.
- Kočenda, E., & Papell, D. H. (1996). *Inflation convergence within the European Union: A panel data analysis*. Center for Economic Research and Graduate Education-Charles University.
- Lee, J. (2009). Trade, FDI, and productivity convergence: A dynamic panel data approach in 25 countries. *Japan and the World Economy*, 21(3), 226-238.
- Lee, M., Longmire, R., Matyas, L., & Harris, M. (1998). Growth convergence: some panel data evidence. *Applied Economics*, 30(7), 907-912.
- Levin, A., and Lin, C-F., (1992), Unit Root Test in Panel Data: Asymptotic and Finite-Sample Properties, Discussion Paper 92-23, Department of Economics, University of California, San Diego.

Levin, A., C.-F. Lin, and C.-S. J. Chu. (2002), Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics* 108: 1–24.

Kutan, A.M., Yigit, T.M. (2009), European integration, productivity growth and real convergence: Evidence from the new member states
Economic Systems, Volume 33, Issue 2, June 2009, Pages 127-137

Nath, H. K., & Hegwood, N. (2012). Structural Breaks and Relative Price Convergence among US Cities. Available at SSRN 2130762.

Simionescu, M. (2014 a). Testing the Convergence Hypothesis in the European Union,” Global Economic Observer, “Nicolae Titulescu” University of Bucharest, Faculty of Economic Sciences; Institute for World Economy of the Romanian Academy, vol. 2(1), pages 222-229, May.

Ucar, N., & Guler, H. (2010). Testing stochastic income convergence in seasonal heterogeneous panels. *Economic Modelling*, 27(1), 422-431.

Quah, D., (1992), International Patterns of Growth: I, Persistency in Cross-Country Disparities, Unpublished manuscript, London School of Economics.

Weeks, M., & Yudong Yao, J. (2003). Provincial conditional income convergence in China, 1953–1997: a panel data approach. *Econometric Reviews*, 22(1), 59-77.

UDC 336.77-026.23:311.21(497.7)"2000/2014"
330.101.541:336.77-026.23]:303.22(497.7)

ESTIMATION OF THE “NORMAL” CREDIT GROWTH IN THE REPUBLIC OF MACEDONIA WITH REGARDS TO THE ECONOMIC FUNDAMENTALS

Elena Naumovska, Ph.D., Assistant Professor,

*Faculty of Economics – Skopje, University ss. Cyril and Methodius, Republic of Macedonia
elenan@eccf.ukim.edu.mk*

Mihail Petkovski, Ph.D., Full Professor,

*Faculty of Economics – Skopje, University ss. Cyril and Methodius, Republic of Macedonia
mpetkovski@eccf.ukim.edu.mk*

Iskra Stanceva - Gigov, Ph.D., Assistant Professor,

*The Institute of Economics – Skopje, University ss. Cyril and Methodius, Republic of Macedonia
iskra@ek-inst.ukim.edu.mk*

Abstract

The subject of this paper is the credit growth in the Republic of Macedonia and the way in which it contributes to the financial development process. Two types of approach are used in the paper in order to estimate credit growth in the Republic of Macedonia. The first is the statistical approach, based on deviations of the Credit/GDP ratio series in their long-term trend. The second is the econometric approach based on using an error correction model in order to explain the level of credit growth as a function of economic fundamentals.

The basic purpose of this paper is to explore the two-way relationship between the sustainability of credit growth and key developments in macroeconomic and financial fundamentals. According to the obtained results the paper provides suggestions for maintaining sustainability of the credit growth in the Republic of Macedonia which would result with a positive impact on the financial sector development. Our findings show that the Macedonian banking sector has not experienced credit booms, even though a rapid credit growth and a deviation of the Credit / GDP indicator from its long-run trend in the period before the last financial crisis have been detected.

Keywords: credit activity, financial stability, market capitalization, credit growth, credit booms, non-performing-loans, source of financingflow of funds account, crisis.

JEL Classification: E51, G21

Introduction

The analysis of the impact of the banks' credit growth on financial development, directs the focus of interest on two channels. The first channel refers to the effectiveness of the banking sector in canalizing the mobilized savings to the area of their most productive utilization with potential positive influence on economic growth. The second channel concerns the macroeconomic factors related to the credit growth with a crucial role of providing financial stability and financial integration between the various segments of the financial sector in Macedonia.

This paper consists of three sections. We have reviewed the literature that explores the credit view of economic growth in the first section. The second section is a discussion of the credit growth in Macedonia. Finally, the third section of the paper represents a statistical analysis of the long-term trend of the Credit / GDP indicator, as well as an econometric estimate of this indicator relative to the macroeconomic variables in the Republic of Macedonia.

The subject of this paper is the way in which credit growth in Macedonia contributes to the financial development process. Based on the obtained results the paper provides conclusions about opportunities and directions for maintaining sustainability of the credit growth in the Republic of Macedonia with a positive influence on the financial development process.

Literature Review

There is a growing body of empirical support for the credit view of economic growth. Originally clarified by Gurley and Shaw (1955) the credit hypothesis argues that availability and cost of bank credits play an important role in explaining the trends in macroeconomic activity. Bernanke's (1983) empirical study of the US Great Depression in the period between 1929 and 1933 demonstrated that a strong credit effect associated with widespread bank and business failures worsens output declines beyond that explained by monetary factors. Studies by Bernanke (1986) and King (1995) have found mixed evidence concerning a credit effect using post-war US data.

Further work investigates the issue of credit cycles and variable credit standards. Rajan (1994) has shown that bank managers with short-term concerns select the bank's credit policies. Weinberg (1995) shows that an increase in the expected payoff of all borrowers' projects can lead banks to grant loans to borrowers with a lower success probability. Manove, Padilla and Pagano (2001) show that the act of sorting borrowers through collateral requirements may reduce additional bank screening. Ruckes (2004) presents a model in which variations in the quality of borrowers over the cycle can affect the standards that banks apply in lending. Dell'ariccia and Marquez (2006) have examined how the informational structure of loan markets interacts with banks strategic behavior in determining lending standards, lending volume, and the aggregate allocation of credit.

Excessiveness of the credit growth in the years preceding the 2008-2009 financial crisis become an issue of importance. Two types of approach are used in economics literature to identify credit booms. The first is a purely statistical approach, based on deviations of credit series from their long-term trend, such as in Gourinchas *et al.* (2001), Tornell and Westermann (2002), IMF (2004), and Sa (2006). The second is econometric and seeks to explain the level of credit or credit growth as a function of economic fundamentals; in Cotarelli *et al.* (2005), Boissay *et al.* (2006), Egert *et al.* (2006), and Kiss *et al.* (2006).

Borio and Disyatat (2011) conjectured that the main contributing factor to the financial crisis was not "excess saving" but the "excess elasticity" of the international monetary and financial system: the monetary and financial regimes in place failed to restrain the build-up of unsustainable credit and asset price booms. Chor and Manova (2012) have managed to show that credit conditions were an important channel through which the crisis affected trade volumes, by exploiting the variation in the cost of capital across countries and over time, as well as the variation in financial vulnerability across sectors.

Celeska, Gligorova and Krstevska (2011) provide an overview of the macroprudential measures undertaken by the National Bank of the Republic of Macedonia to prevent further deterioration of the systemic risk and to promote resilience of the banking system. The measures were intended to protect the banking system against the increase of credit risk arising from the credit boom.

Petkovski and Kjosevski (2014) have examined the question whether in 16 transition economies from Central and South Eastern Europe the banking sector influences economic growth by using a generalized method of moments (GMM) dynamic panel method. The research results show that credit to the private sector and interest margin are negatively related to the economic growth, while ratio of quasi money is positively related to economic growth.

2. Discussion on the Credit Growth in Republic of Macedonia

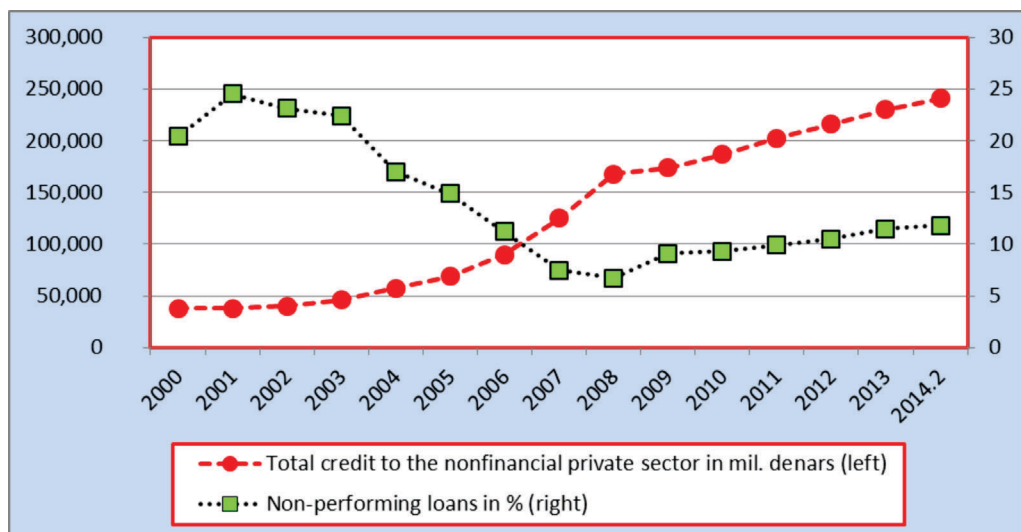
As in most countries in transition, in the post-transition period, the credit market in Macedonia was relatively inactive. Additionally, important factors contributing to such dynamics in the field of private sector lending may be indicated as follows: a low level of bank deposits, which means a small domestic credit potential; gradual restructuring of the real sector of the economy, thus following difficulties regarding finding quality borrowers and quality investment projects; prudent policy of the banks, in terms of an inherited and acquired "bad" loan portfolio; a low level of bank deposits, which implies low domestic credit potential; restructuring and consolidation of the banks, which needed time for setting new adequate credit policies and procedures and an adequate lending process; banks' high lending interest rates; an inadequately defined legal framework, mainly in terms of speed and efficiency in the implementation of the collateral; uncertainty as a characteristic of the post-transition period, as well as the uncertainty generated by several shocks of a non-economic character.

All these factors resulted in the maintenance of the share of the total private credit on an extremely low level until 1998, when certain positive developments were registered. But the 1999 Kosovo crisis and the crisis in 2001 had their impact on the aspect of lending. The decrease in both private sector consumption and investment resulted in reduced supply and demand for loans. The attempts to overcome the negative consequences of the crisis and the stabilization of the macroeconomic conditions contributed to the start of a growing trend of private sector lending by banks.

Graph 1 represents a trend of the credit activity and the non-performing loans in the Republic of Macedonia in the period between 2000 and the second quarter of 2014. It is obvious that the banking sector has experienced rapid credit growth in the period between 2003 (the year when Macedonian banks woke up from the group of "sleeping beauties") and 2008 as the Credit/GDP indicator increased by 2.5 times (from 16.45% in 2002 to 40.78% in 2008). During this period, the absolute amount of credit provided to the private sector increased by 4 times, and the average annual growth was approximately 30%. The strong credit growth in this period was due to the influence of the following factors:

- An increase in the banks' credit potential through expansion of the deposit base and increased opportunities for financing credit activity with attractive foreign credit lines;
- Increased attractiveness of credit arising from the diversified offer of credit products (diversification of the types of loans and the conditions for their use);
- A higher degree of competition in the banking system, arising from the entry of foreign capital into banks, which can be noticed through the narrowing of banks interest margins, as well as promoting corporate governance. For the duration of this period, the main objective of the banks was achieving increased volume of loan portfolio, profits, and providing greater market share.

Graph 1. The credit growth and the non-performing loans in the Republic of Macedonia (2000-2014Q2)



Source: Authors' own calculations based on data from NBRM

It can be said that in Macedonia the effects of the crisis were felt with some delay as when the global financial crisis started, lending activity in the banking sector was still growing at a fast rate. In the same period, the direction of the trend of non-performing loans had changed. After several years of decline, at first began a slow and then a rapid growth of non-performing loans. In 2009, credit activity in Macedonia slowed down due to the following factors: the effects of the global financial crisis and reduced activity of the national economy; slower growth of deposits; limited sources for financing the credit activity with foreign credit lines, course of tightened monetary policy; as well as increased banks precaution in loans approval process. In the upcoming period, banks have redirected to the following main goals: stability and liquidity, as well as maintaining a quality loan portfolio. In 2011, there was a slight increase in credit activity in terms of a more stable macroeconomic environment, improved expectations, growth of bank deposits and reduced rates on treasury bills. Furthermore, as a result of the debt crisis in the euro zone and uncertainty for the recovery of domestic economic activity, in 2012, lending slowed down and the quality of the loan portfolio deteriorated. Quality has become an important determinant of funding when making decisions for loans approval and banks took stronger actions to improve the credit risk management system. Despite the imminent revival of lending activity in the last quarter of 2013, influenced by the conservative strategies of some of the major banking groups present in the country, banks have continued applying prudent lending policies. For the duration of 2014 the lending activity in Macedonia has accelerated simultaneously with the reduced investments of banks in government securities, suggesting a gradual stabilization of the banks' perceptions of risks, influenced by the positive performances in the domestic economy.

3. The Long-run Trend of the Credit / GDP Indicator in Macedonia

This section represents a statistical analysis of the long-run trend of the Credit / GDP indicator, as well as an econometric estimate of this indicator relative to the macroeconomic variables in Macedonia.

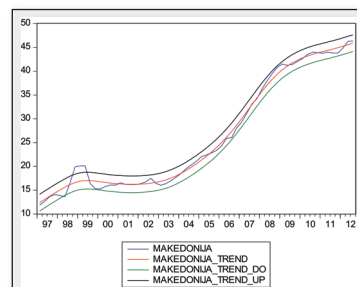
3.1 The deviations of the CRED/GDP indicator from the long-run trend by the HP filter

The Hodrick-Prescott filtering method is used for calculating the long-run trend of the Credit/GDP indicator. The time series are decomposed into their long-run and short-run components. If the credit indicator signif-

icantly exceeds its long-run trend at a certain period, this can be considered to signal a credit boom. Periods of credit boom are determined by deviations of the indicator from the long-run trend over a certain threshold. The thresholds are calculated for each country separately as a multiple of the standard deviation of credit fluctuation around the trend: $Sk, i = a\sigma k, i$, where $\sigma k, i$ denotes the standard deviation of the credit fluctuation around the trend for country i and a is an arbitrarily chosen coefficient.

Graph 2.

CRED/GDP indicator (%) - deviations from the long-term trend by the HP filter in Macedonia (1997-2012)



Graph 2 represents an interpretation of the results obtained from the HP filter for the deviation of the Credit / GDP indicator from its long-term trend. It is important to make a distinction between the expansion of credit activity (upward movement of the Credit / GDP indicator) and credit booms, or between credit contraction (downward movements of the Credit / GDP indicator) and credit busts. Only the expansion that is above and contraction which is below the specified threshold are interpreted as a credit boom or credit bust. Nevertheless, the Macedonian banking sector hasn't experienced credit booms besides the rapid growth of the credit activity.

3.2 Econometric estimates of the credit/GDP ratio relative to macroeconomic variables in the Republic of Macedonia

3.2.1 Modeling the "normal" credit growth in the Republic of Macedonia with regard to fundamentals

A simple statistical approach provides an opportunity to obtain certain information and warnings, and draw some conclusions. However, these findings need to be further tested and validated by applying more complex models and methods. The econometric approach seeks to explain the level of credit growth as a function of economic fundamentals.

The CRED indicator measures the activity of the banking sector and represents the relationship between bank credit and GDP. The credit/GDP ratio is calculated as a function of certain fundamental variables and the "normal value" of this ratio is assessed. For this purpose, we have used VECM (the Vector Error Correction Model) in the following form:

$$\log(\text{CRED}t) = \alpha_0 + \sum_{m=1}^M (\alpha_m X_{m,t}) + \varepsilon_t$$

Where CRED is Credit/GDP ratio for time t , α_0 denotes a constant, α_m for $m = 1, \dots, M$ denote M coefficients, $X_{m,t}$ represents economic fundamental variables and the ε_t residuals of the equation.

3.2.2 Specification of the fundamentals

GDP per capita (GDP) is a fundamental economic variable that indicates the level of development of a country. It is expected to move in the same direction with approved loans and acceleration at the rate of GDP growth to increase the credit activity of the banks, as well as slow or negative GDP growth rate to reduce the credit volume. From this point of view, on the one hand, it is logical to expect a positive relationship between GDP and credit activity. On the other hand, if we take into consideration that acceleration in the rate of GDP growth implies a higher living standard of the population, in addition to greater capacity of the corporations

for financing from their own sources, it is reasonable why there is a possibility for obtaining a negative sign between those two indicators. Moreover, in this research the Credit/GDP indicator is used as a measure of credit activity. Hence, it is expected that GDP growth will reduce the portion of credit amount in GDP.

National Bank key rate (RATE). The interest rate on treasury bills is the basic interest rate, which determines the direction of the monetary policy of the NBRM. If the key interest rates are high, banks prefer their assets to be held in highly liquid and safe securities rather than being lent. The credit supply is limited and the lending rates are high. Moreover, the interest rate on treasury bills is in inverse relation to the credit activity. However, a positive sign can be found if the monetary authorities react to the excessive credit growth by raising the key interest rates.

Market Capitalization (MC) This indicator is the ratio between the value of the shares traded in the market (calculated as the product between the share price of listed companies and their number on the specific day) and GDP. On the one hand, higher market capitalization indicates the increased value of the property of the companies and the higher value of the collateral as a basis for increased lending. Hence, a positive sign is expected. On the other hand, if the market financing is considered an alternative source of corporate financing and if market financing influences bank financing complementarily and substitutionally, then a negative sign is to be expected.

Unemployment rate (UNIMP). This indicator is the ratio between the unemployed and the total working population in a particular economy. Its value is in inverse relation to the credit activity because increased unemployment causes reduction of the creditworthy population or, vice versa, decreased unemployment which means a higher level of potential borrowers, logically has a positive influence on credit activity. Additionally, a greater amount of investment loans for corporations may reduce the rate of unemployment and consequently increase the creditworthy population.

Foreign direct investments (FDI). This indicator shows the amount of foreign direct investment as a percentage of GDP in an economy. FDI are often recognized as the basis for further completion of the investments that would be financed through domestic bank loans. If foreign direct investments represent investments in infrastructure, they could be the basis for starting new domestic investments that would be financed with domestic bank loans. In addition, foreign direct investments would reduce the rate of unemployment and increase the creditworthy population. That is why a positive relationship between this variable and the indicator Loans / GDP is expected.

Openness to trade (TRADE). The trade openness indicator represents the sum of exports and imports in the country as a percentage of GDP. The credit activity of the banks rises with the increase of export and import arrangements in the economy. Hence, the indicator TRADE is proportionally associated with bank loans.

Assuming there exists credit market equilibrium in the credit market, the econometric model to be estimated is expressed as follows:

$$\ln CRED_t = \beta_0 + \beta_1 \ln GDP_t + \beta_2 \ln MC_t + \beta_3 \ln DEPt + \beta_4 \ln FDI_t + \beta_5 \ln UNIMP_t + \beta_6 \ln RATE_t + \beta_7 \ln TRADE_t + \varepsilon_t$$

For the above eight variables quarterly data for the period between the first quarter of 1997 and the first quarter of 2014 were used. In this model, the NBRM's key rate is treated as an exogenous variable because the determination of this rate is subject to regulatory decision-making.

The following table is a presentation of the Augmented Dickey Fuller test for stationarity:

Table 1: Results of the unit root test (level of significance of 1%)

Variable	Augmented Dickey Fuller
ln(CRED)	I(1)
ln (GDP)	I(1)
ln (MC)	I(1)
ln (DEP)	I(1)
ln (FDI)	I(0)
ln (UNIMP)	I(1)
ln (TRADE)	I(1)*
ln (RATE)	I(1)

*According to the initial test for stationarity, the variable TRADE is not stationary and with the first-order differentiation cannot be stationary with a significance level of 1%. For these reasons, the variable TRADE is excluded from subsequent analyzes. Thus, the equation for the regression model obtains the following form:

$$\ln CRED_t = \beta_0 + \beta_1 \ln GDP_t + \beta_2 \ln MC_t + \beta_3 \ln DEP_t + \beta_4 \ln FDI_t + \beta_5 \ln UNIMP_t + \beta_6 \ln RATE_t + \varepsilon_t$$

3.2.3 Presentation of the results

Table 2 represents the long-run relations and their significance between the credit indicator and the fundamentals.

Table 2. Estimation of the model cointegration equation

Variable	Coefficient	t-statistic
ln (GDP)	-2.668228	-14.7595*
ln (MC)	-0.049624	-1.49451
ln (DEP)	0.915235	6.70437*
ln (FDI)	0.069081	3.14477*
ln (UNIMP)	-0.494973	-2.16463**
ln (RATE)	-0.018382	-1.98369***
Note:		
*means level of significance of 1%,		
** means level of significance of 5%,		
*** means level of significance of 10%,		

According to the presented results in Table 2, the **GDP** variable is highly and significantly correlated with the Credit/GDP indicator with a negative sign, which shows that if the GDP grew by 1 percent, the value of CRED/GDP would be reduced on average by 2,668228 percent, assuming all other factors remain unchanged. It is an indisputable fact that the credit activity in Macedonia is largely conditioned by the GDP

growth rate. The negative relationship between these two variables may be a result of several reasons: firstly, the sample has a significant share of the periods of negative GDP growth, and secondly, the credit growth rate in the analyzed period exceeds the rate of economic growth. Nevertheless, the research implies that the unstable macroeconomic environment and unfavorable economic developments, do not create a solid basis for sustainable and growth enhancing acceleration of the credit activity.

The long-run parameter of the deposits (**DEP**) is positive and highly significant, showing that if deposits increase by 1 percent, then the loans will increase on average by 0.915235 percent, assuming all other factors remain unchanged. The research points to the importance of a deposit base for the credit growth in Macedonia. In an environment of limited opportunities to finance lending activity in the international financial markets, the Central Bank's monetary policy and the policy of commercial banks should address particular attention to maintaining confidence in the banking sector and maintaining and increasing the deposit base as the primary source of funding for domestic credit growth.

In regards to market capitalization (**MC**), a negative and insignificant long-run relation has been obtained, assuming all other factors remain unchanged. Taking into consideration that the credit growth of the banking sector in Macedonia is a primary source of corporate financing, as well as the fact that market financing is substituted by bank financing, it is logical to expect an inverse relation between MC and CRED variables. The obtained result for an insignificant long-term relation between credit activity and market capitalization indicates the insufficient degree of integration and the unequal position of the various segments of the Macedonian financial sector.

The **FDI** parameter is positive and significant, showing that if the FDI increase by 1 percent, then CRED on average will increase by 0.069081 percent, assuming all other factors remain unchanged. This suggests that the increase in foreign direct investments causes a positive reaction to credit growth, which is in accordance with the previous expectations, since foreign direct investments are often recognized as the basis for further completion of the projects to be financed through domestic bank loans. Additionally, foreign direct investments would reduce the rate of unemployment and increase the creditworthy population with a positive influence on domestic credit growth.

The unemployment (**UNIMP**) parameter is negative and there is the significant long-run parameter with the level of significance of 5%, which shows that if the unemployment rate is reduced by 1 percent, loans will be increased on average by 0.494973 percent, assuming all other factors remain unchanged. An inverse relation between unemployment and the credit growth may be treated in a reasonable and logical manner through the facts further discussed. Increased unemployment causes reduction of the creditworthy population or, vice versa, decreased unemployment which means a higher level of potential borrowers, logically has a positive influence on credit activity. Additionally, a greater amount of investment loans for corporations may reduce the rate of unemployment and consequently increase the creditworthy population.

NBRM's key interest rate (**RATE**) is negative and there is a weak significance of the long-term parameter (with the level of significance of 10%), which shows that if the rate of treasury bills decreases by 1 percent, then the loans will increase on average by 0.018382 percent. This confirms the inverse relationship between the banks lending interest rates and the benchmark interest rate. Moreover, this inverse relation is in accordance with our initial expectations and has credible theoretical background by its own definition. However, the low level of significance shown for the relationship between benchmark interest rate and the credit growth is more uncertain and it indicates partial responsiveness of the monetary policy in transforming the monetary impulses and the occurrence of a liquidity trap. Considering that after the recent global financial crisis in Macedonia there was a period of lower credit growth simultaneously with a very low rate of treasury bills, our obtained result is basically confirmed.

Conclusions

This paper represents a statistical analysis of the long-term trend of the Credit / GDP indicator as well as the econometric estimates of this indicator relative to the macroeconomic variables in Macedonia.

According to the statistical analysis of the long-run trend of the Credit/GDP indicator, implemented by using the Hodrick-Prescott filtering method, the Macedonian banking sector has not experienced credit booms even though a rapid credit growth and a deviation of the Credit / GDP indicator from its long-run trend in the period before the last financial crisis have been detected.

In econometric estimation, the Credit/GDP ratio is calculated as a function of certain fundamental variables (GDP, market capitalization, foreign direct investments, NBRM key interest rate, unemployment, deposits etc.) by using the VECM (Vector Error Correction Model) and quarterly data for the above seven variables in the period between the first quarter of 1997 and the first quarter of 2014 in the Republic of Macedonia. By analyzing the obtained results from the specified model, we have concluded that the variables representing the economic activity and deposits have the highest level of influence on credit growth in Macedonia. What is more important though, the negative and insignificant long-run relation obtained for market capitalization is more uncertain.

The research implies that the unstable macroeconomic environment, uncertainty in terms of the financial crisis, as well as unfavorable economic developments, do not create a solid basis for sustainable and growth enhancing acceleration of the credit activity. Additionally, the research points to the importance of the deposit base for the credit growth in Macedonia. In an environment of limited opportunities to finance the lending activity in international financial markets, the Central Bank monetary policy and the policy of commercial banks should pay particular attention to maintaining confidence in the banking sector as a way for increasing the deposit base which is the primary source of funding for domestic credit growth.

According to the obtained results, the credit growth in the Republic of Macedonia is complementary to foreign direct investment, and represents a substitute for market financing. Hence, the revival of the capital market, among other things, depends on the legal and institutional amendments that will allow gradual reorientation of companies from bank to market financing. It is necessary the financial legislation to be directed to stimulate the interest for market based financing and to provide an equal position of the various segments of the financial sector.

References

- Allen, F., & Gale, D. (2000). Bubbles and Crises. *The Economic Journal*, 110 (460), 236-255.
- Boissay, F., Calvo-Gonzales, O., & Kozluk, T. (2006). Is Lending in Central and Eastern Europe Developing Too Fast? *Financial Development, Integration and Stability: Evidence from Central, Eastern and South-Eastern Europe*.
- Celeska, F., Gligorova, V., & Krstevska, A. (2011). Macroprudential Regulation of Credit Booms and Busts – The Experience of the National Bank of the Republic of Macedonia. *Policy Research Working Paper 5770*.
- Cihak, M., Demirguc-Kunt, A., Feyen, E., & Levin, R. (2012). Benchmarking Financial Systems around the World. *Policy Research Working Paper 6175*.
- Cottarelli, C., Dell'Arricia, G., & Vladkova Hollar, I. (2005). Early Birds, Late Risers, and Sleeping Beauties: Bank Credit Growth to the Private Sector in Central and Eastern Europe and in the Balkans. *Journal of Banking and Finance*, 29 (1), 83-104.
- Coudert V., & Pouvelle, C. (2010). Assessing the Sustainability of Credit Growth: The Case of Central and Eastern European Countries *The European Journal of Comparative Economics*, 7 (1), 87-120.
- Egert, B., Backe, P., & Zumer T. (2006). Credit Growth in Central and Eastern Europe: New (Over) Shooting stars? *ECB Working Paper 687*.
- Favara, G. (2003). An Empirical Reassessment of the Relationship between Finance and Growth. *IMF Working Paper 03/123*.
- Kiss, G., Nagy, M., & Vonnak, B. (2006). Credit Growth in Central and Eastern Europe: Convergence or Boom? *Magyar Nemzeti Bank Working Papers 2006/10*.
- Petkovski M. & Kjosevski J. (2014). Does banking sector development promote economic growth? An empirical analysis for selected countries in Central and South Eastern Europe. *Economic Research – Ekonomska Istrazivanja*, 27:1, 55-66. Published by Taylor & Francis.
- Rajan, R. G., & Zingales, L. (1998). Financial Dependence and Growth. *The American Economic Review*, 88 (3), 559-586.
- Sa, S. (2006). Capital Flows and Credit Booms in Emerging Market Economies. *Financial Stability Review*, 9, 49-66.
- Sendeniz, I., Levent, A., & Aydogan, K. (2008). Interdependence of the Banking Sector and the Real Sector: Evidence from OECD Countries. *Applied Economics*, 40, 749-764. Faculty of Business Administration, Bilkent University, Ankara, Turkey.
- Tenant, D., Kirton, C., & Abdulkadri, A. (2010). Modelling the Effects of Financial Sector Functions on Economic Growth in a Developing Country: A Cointegration and Error Correction Approach. *Journal of Developing Areas*, 44 (1), 183-204.
- Tomoya, S. (2004). Credit Channel of Monetary Policy in Japan: Resolving the Supply Versus Demand Puzzle. *Applied Economics*, 36, 2385-2396.
- Tornell, A., Westermann F. (2002). Boom-Bust Cycles in Middle Income Countries: Facts and Explanation. *IMF Staff Papers* 49.

UDC 659.13:004.738.5]:366.1:519.233.5(497.7)

MEASURING ATTITUDES AND BEHAVIOR TOWARDS DIFFERENT FORMATS OF ONLINE BANNER ON MACEDONIAN MARKET

Ezeni Brzovska, Ph.D., Faculty of Economics - Skopje

Marija Trpkova-Nestorovska, Ph.D., Faculty of Economics - Skopje

Snezana Ristevska Jovanovska Ph.D., Faculty of Economics - Skopje

Abstract

Digital media started to dominate on the global media landscape. Companies are intensively employing new advertising formats in order to gain and maintain competitive edge in defined target market. The increasing time that people spend on the new media points out the necessity of implementing new media format as a part of the comprehensive media communication plan.

Choosing the appropriate format of the online banner will be crucial for implementing the integrated and effective approach in marketing communication activities. To date, there has been limited research for the effects of different formats of online banners. The objective of this paper was to evaluate consumers attitudes and self reported behavior toward different format of online banner. Factor analysis was conducted followed by single and multiple regression analysis for testing of the hypothesis for all types of banners.

The study examines the effect of the format of the banner on consumers' likability.

The results of the study provide useful managerial and theoretical implication.

Keywords: *format of the banner, rich media, attitudes, behaviour*

Introduction

The traditional channels are rapidly losing relevance. Today, the majority of consumers are spending most of their time on the Internet. With the meteoric rise of internet penetration, it's no surprise that internet is a way of life. Europe has impressively high levels of internet usage, with several countries registering penetration of more than 90% (InternetWorldStats, 2014).

The Internet proliferate the media channels and support a number of additional ad formats in the media landscape, among which is display advertising. Media fragmentation is occurring at lightspeed in today's multi

platform environment and this new paradigm offers consumers a seamless digital experience that can easily traverse platforms, locations so that content can be experienced anytime and anyplace (ComScore, 2013). Over the past several years, digital media has continued to develop as a branding medium, growing beyond its roots as a channel of interest solely to direct response and companies are increasing the usage of digital channels and new ad formats in order to achieve the business objectives of conversion and revenue. As consumers' media consumption continues to migrate toward digital channels, brand marketers (and their advertising currencies) will need to follow them there. A great percentage of marketers stated that they will increase their online brand advertising budgets. A recent Econsultancy survey found that marketers are spending 35% of their total marketing budget on digital channels (Econsultancy, 2013). Total Internet advertising is expected to get higher each year, and it is forecast to rise to 24.6% in 2015. Display advertising is the fastest-growing sub-category, with 20% annual growth (ZenithOptimedia, 2013). Display-related advertising includes display/banner ads (19% of revenues), rich media (3%) (IAB Report, 2013).

Banner ads offer great possibility for interactivity. In a cluttered and interactive digital environment it is and will be a great challenge for all the marketers to capture consumers' attention in a sidebar display ad, when they have only have 250 x 300 pixels (in most cases) worth of space on disposal. So using a proper format of online banner will be one of the determinants whether consumer will choose to click or be part of the banner they are seeing or interacting with. A recent comScore study shows that when it comes to launching an online campaign, creative execution drove more than half of the contribution to sales volume changes (Comscore brand sales).

Advertising formats of online banner evolve to provide richer experiences, trying to grab consumers attention for a moment. Faced with a wide array of options, the consumer is able to choose whether will perceive the online banner, making it more difficult for marketers to control their brand message. People go to websites for information, entertainment and engagement with other people, not to click on online banners.

Companies are trying to figure out how to maximize the visibility of the online banner and how to employ new formats of online banner that will have impact on consumer attitudes and behavior. The impact of the new formats on the consumers likeability to see and click must be analyze on order to chose the proper format of online banners. The main goal of this paper is to determine the effect different types of banner have on the perception, attitude and behavior of the customers.

Literature review

Display advertising is not only effective for advertising products, but is also crucial for creating positive attitude and making a positive impact on consumer behavior. There is current void in theory for analyzing the different formats of online banner and their effects on influencing consumer attitude and behavior.

Beside the fact that each day we are inundate with different types of online banner there is a lack of empirical data in examing the liability of different formats of banners. In order to cut through the noise, marketers must use appropriate formats of online banner. Several studies found that distinctive advertising elements, unique features and greater interactivity on online banner create a positive effect on consumer attention and generate immediate recall (Phillips and Lee 2005; Liu and Shrum's, 2002; Li and Bukovac 1999; Cho, Lee, and Tharp, 2001; Heo and Sundar 2000; Hong, Thong, and Tam 2004). These effects may lead to more positive attitudes toward ads and stronger purchase intentions (Choi, Miracle, and Biocca 2001).

The significant benefit of display advertising is using and developing different formats of online banners. By employing different formats of online banners companies can create a display ad campaign that consumers will notice and will make a lasting impact.

The Interactive Advertising Bureau divide online banner in two main groups: standart banner (display of a static or linked banner or logo) and rich media formats. Rich media formats integrate some component of streaming interactivity. Rich media ads often include flash or java script, but not content, and can allow users

to view and interact with products or services (e.g., scrolling or clicking within the ad opens a multimedia product description, expansion, animation, video or a “virtual test-drive” within the ad) (IAB internet advertising revenue report, 2014). Interactive rich media formats increase user involvement and emphasizes user engagement in the form of clicks and mouse rollovers. Rich media describes online content comprise of different multimedia elements, such as sound, video, audio, animation or content that moves when a user click on the page that features the content (Shaw, 2004; Chabrow, 2006). A static advertising that neither moves nor changes its content with every loading page includes only one gif or jpeg image file. Still standart banner is the most used format of online banner in the Republic of Macedonia (Ispos Strategic Puls, 2013).

An opposite of static banner, banner with interactive features attracts more attention and has a strong persuasive impact (Brown, 2002).

Interactivity in advertising is an important factor for creating favorable attitude and has a positive influence on consumers' perceptions of brands (Macias, 2003). Cho and Leckenby (1999) define interactivity as a “degree to which a person actively engages in advertising processing by interacting with advertising messages”. Interactivity is the extent to which user can participate in modifying the format and content of a mediated environment in real time (Steuer, 1992).

A number of researches confirmed that interactivity has a direct and positive effect on persuasive outcomes and lead to more positive attitudes (Briggs and Holis, 1997; Maddox et al., 1997).

New media and new ad formats revolutionize the whole process of communication between companies and customers, changing the way companies communicate with their customers and providing an interactive multimedia communication, greater flexibility for the companies and greater control for the consumer (Hoffman and Novak, 1996). In consideration of the fact that consumers are not simply reacting to Internet ads, they are using these ads to accomplish their goals, if the advertising is not adopted according consumers need there is no adequate base for dealing with complex behavior such as responding to persuasive communication (Rodgers and Thorson, 2000).

Macias (2003) found that interactivity is the main factor in consumer persuasive outcomes among which is attitude toward the ad. Cho and Leckenby (1999) also found that a higher degree of interactivity yields favorable attitude toward the ad and higher purchase intention.

Rodgers and Thorson in their Interactive advertising model explain how individuals process advertisements in an interactive environment by analyzing the aspects of the Internet that are consumer-controlled and those that are advertiser-controlled. Beside the fact that advertisers have controlled which ads consumers see, when and how, consumers always have the alternative of not paying attention to, becoming involved with or ignoring the ad. Knowing what motivates individuals to use the internet also provides insights into the types of ads and ad appeals that will attract attention and prompt click-throughs (2009). Interactive formats of ads initiate difference in terms of how people perceive and process it (e.g., Cho, 1998; Li & Bukovac, 1999). It was found that different advertising formats result in different consumers behavior (Rodgers and Thorson, 2000).

All the findings show that the format of the online banner has an impact on consumers attitude and behavior. Therefore, it is expected that:

Hypothesis 1: The format of online banner influence the attitude of the respondents

Hypothesis 2: The format of online banner influence the behavior of the respondents

Methodology

In order to gather data about attitude and self reported behavior toward different formats of online banners in Macedonia, a questionnaire based on a previous research (Burns and Lutz, 2006) was developed. This study represents the first attempt to compare different formats of online banners in the Republic of

Macedonia.

A convenience sample of 350 citizens participated in the experiment. Data were collected in the second half of 2012. From the initial sample 93 were rejected due to uncompleted data. They were removed from the data set, leaving a total of 257 participants. Fifty seven percentage were female (n=178) and forty three (n=135) were male. Respondents were recruited from each region (eight) in the Republic of Macedonia.

Respondents were asked to respond individually to the online questionnaire in order to measure the level of likeability, attitude and self reported behavior toward five different formats of online banners. Each online questionnaire contained links to an example of each banner format (takeover, floater, synchronized units, stretching and standard banner). Consumer perception for different formats of online banners were measured with fourteen items: innovative, different, entertaining, creative, irritating, attractive, annoying, boring, eye-catching, sophisticated, attractive, interactive, intrusive and usual. A five item semantic differential scale was used to measure consumers' attitude. The semantic differential scale from Burns and Lutz was modified and final version was comprised of three items: liked by me/disliked by me, one of the best formats/ one of the worst formats and an excellent ad format/ a poor ad format (2006). The self reported behavior was measured with 8 items ranging on five point Likert statement ranging from "strongly agree" to "strongly disagree".

Analyses and results

A principal component analysis with orthogonal rotation (varimax) and reliability analysis was conducted for all five different types of banner formats on:

- A 14 items in order to develop factor(s) that would describe the format characteristics (FORMAT);
- B 3 items in order to develop factor(s) that would describe the attitudes of questionnaire responders (ATTITUDE);
- C 8 items in order to develop factor(s) that would describe the behavior of questionnaire responders (BEHAVIOUR).

A) Format

Principal component analysis suggested possible two – factor solution for four types of banners, and only one factor solution for one type of banner. Two – factor solution recognized two factors, where the first one can be described as pleasant, while the second factor as unpleasant. The last type of banner, standard banner, had only one factor, pleasant, since the factor items irritating, disruptive, boring, intrusive and usual were eliminated since they didn't correlate fairly well with other items (Field, 2009). Factor loadings were not generated for the last format, standard banner, since only one component was extracted and the solution could not be rotated. For all types of banners, except for the standard banners, factor loadings after rotation are presented in table 1.

Table 1. Factor loadings for the rotated factor solution (for format constructs)

FACTOR 1 PLEASANT	TYPE OF BANNER				
	TAKEOVER	FLOATER	SYNCHRONIZED	STRETCHING	
			UNITS	BANER	
	Innovative	0,764	0,782	0,777	0,772
	Different	0,757	0,797	0,825	0,786
	Entertaining	0,715	0,851	0,793	0,829
	Creative	0,671	0,832	0,833	0,774
	Attractive	0,722	0,806	0,752	0,782
	Likeable	0,680	0,806	0,727	0,758
	Interesting	0,808	0,829	0,803	0,802
FACTOR 2 UNPLEASANT	Exciting	0,783	0,804	0,747	0,759
	Interactive	0,687	0,774	0,736	0,653
	Irritating	0,776	0,767	0,776	0,810
	Disruptive	0,799	0,769	0,720	0,789
	Boring	0,809	0,710	0,661	0,799
	Intrusive	0,759	0,751	0,775	0,742
Usual	0,651	0,534	0,625	0,721	

Statistics for principal component analysis are presented in the Table 2. The Kaiser – Meyer – Olkin measures (KMO) verified the sampling adequacy for the analysis (according to Field, 2009, 'superb' for standard banner and synchronized units, and 'great' for the other types of banners). All KMO values for individual items are well above the acceptable limit of 0,5 (Field, 2009). Bartlett's test of sphericity with $p < 0,001$ for all types of banners indicates that correlations between items were sufficiently large for principal component analysis.

The first factor accounted from 35,613% to 43,031% of the total variance, while the second factor accounted from 19,559% to 22,491%. For the last standard banner, only the first factor accounted 70,024%.

Table 2. Statistics for principal component analysis with varimax rotation (for format constructs)

	TYPE OF BANNER				
	TAKEOVER	FLOATER	SYNCHRONIZE	STRETCHING	STANDARD
			D UNITS	BANER	BANNER
KMO	0,895	0,891	0,907	0,895	0,931
KMO individual	> 0,5	> 0,5	> 0,5	> 0,5	> 0,5
BTS χ^2	1691,588	2212,641	2101,801	1981,026	1988,528
BTS (df)	91	91	91	91	36
p value	0,000	0,000	0,000	0,000	0,000
1 component	35,613%	43,031%	40,850%	38,977%	70,024%
2 component	22,332%	19,559%	20,644%	22,491%	-
Total	57,945%	62,590%	61,495%	61,469%	70,024%

A summary of means, variances and reliability coefficients for each type of banner are presented in table 3. The factors for all banner types have provided acceptable internal consistency according to Nunnally's (1978) suggested minimum of 0,70.

Table 3. Mean scores, variances and reliability coefficients for factors and banner types (for format constructs)

	TYPE OF BANNER				
	TAKEOVER	FLOATER	SYNCHRONIZE	STRETCHING	STANDARD
	(n = 257)	(n = 257)	D UNITS (n = 257)	BANNER (n = 257)	BANNER (n = 257)
Factor 1 Pleasant					
Mean	3,786	2,933	3,743	3,955	2,830
Variance	0,044	0,037	0,032	0,049	0,022
Cronbach's α	0,899	0,940	0,930	0,917	0,946
Factor 2 Unpleasant					
Mean	3,374	2,622	3,407	3,511	-
Variance	0,044	0,032	0,020	0,030	-
Cronbach's α	0,831	0,768	0,792	0,840	-

B) Attitude

For the second construct attitude, all three items converged to one factor – solution for all types of banners in the principal component analysis. The factor can be described as attitude. Factor loadings were not generated since only one component was extracted and the solution could not be rotated.

Statistics for principal component analysis are presented in the Table 4. The Kaiser – Meyer – Olkin measures (KMO) verified the sampling adequacy for the analysis (according to Field, 2009, 'good' for all types of banners). All KMO values for individual items are well above the acceptable limit of 0,5 (Field, 2009). Bartlett's test of sphericity with $p < 0,001$ for all types of banners indicates that correlations between items were sufficiently large for principal component analysis. The construct attitude accounted from 78,357% of the total variance for takeover banner to 84,563% of the total variance for standard banner.

Table 4. Statistics for principal component analysis with varimax rotation (for attitude construct)

	TYPE OF BANNER				
	TAKEOVER	FLOATER	SYNCHRONIZE	STRETCHING	STANDARD
			D UNITS	BANNER	BANNER
KMO	0,736	0,745	0,739	0,722	0,755
KMO individual	> 0,5	> 0,5	> 0,5	> 0,5	> 0,5
BTS χ^2	355,281	426,353	435,041	369,077	509,298
BTS (df)	3	3	3	3	3
p value	0,000	0,000	0,000	0,000	0,000
1 component	78,357%	81,486%	81,599%	78,404%	84,563%
Total	78,357%	81,486%	81,599%	78,404%	84,563%

A summary of means, variances and reliability coefficients for 'attitude' construct for each type of banner are presented in table 5. The factors for all banner types have provided acceptable internal consistency according to Nunnally's (1978) suggested minimum of 0,70.

Table 5. Mean scores, variances and reliability coefficients for factors and banner types (for attitude construct)

	TYPE OF BANNER				
	TAKEOVER	FLOATER	SYNCHRONIZE	STRETCHING	STANDARD
			D UNITS	BANNER	BANNER
	(n = 257)	(n = 257)	(n = 257)	(n = 257)	(n = 257)
Factor 1 Attitude					
Mean	3,636	2,838	3,709	3,825	2,868
Variance	0,022	0,011	0,012	0,016	0,002
Cronbach's α	0,858	0,883	0,885	0,860	0,908

C) Behaviour

Principal component analysis with varimax rotation converged to one factor solution for all types of banners. The new construct (factor) is named behavior. Correlation matrix for 8 items suggested some of the items should be removed since they did not correlate well with other items. For all banner types the items: 'I would notice this banner format' and 'I would ignore this banner format' were deleted. For banner format floater only the first item 'I would notice this banner format' was deleted. Factor loadings were not generated since only one component was extracted and the solution could not be rotated.

Statistics for principal component analysis that generate the construct behavior are presented in the Table 6. The Kaiser – Meyer – Olkin measures (KMO) verified the sampling adequacy for the analysis (according to Field, 2009, 'superb' for floater and standard banner, and 'great' for the other types of banners). All KMO values for individual items are well above the acceptable limit of 0,5 (Field, 2009). Bartlett's test of sphericity with $p < 0,001$ for all types of banners indicates that correlations between items were sufficiently large for principal component analysis. The construct behavior accounted from 60,261% of the total variance for stretching banner to 71,728% of the total variance for standard banner.

Table 6. Statistics for principal component analysis with varimax rotation (for behavior construct)

	TYPE OF BANNER				
	TAKEOVER	FLOATER	SYNCHRONIZE	STRETCHING	STANDARD
			D UNITS	BANNER	BANNER
KMO	0,842	0,917	0,887	0,847	0,906
KMO individual	> 0,5	> 0,5	> 0,5	> 0,5	> 0,5
BTS χ^2	732,109	1165,887	846,486	696,523	1040,730
BTS (df)	15	21	15	15	15
p value	0,000	0,000	0,000	0,000	0,000
1 component	60,766%	66,474%	65,813%	60,261%	71,728%
Total	60,766%	66,474%	65,813%	60,261%	71,728%

A summary of means, variances and reliability coefficients for each type of banner are presented in table 3. The factors for all banner types have provided acceptable internal consistency according to Nunnally's (1978) suggested minimum of 0,70.

Table 7. Mean scores, variances and reliability coefficients for factors and banner types (for behavior construct)

	TYPE OF BANNER				
	TAKEOVER	FLOATER	SYNCHRONIZE	STRETCHING	STANDARD
	D UNITS	BANNER	BANNER		
	(n = 257)	(n = 257)	(n = 257)	(n = 257)	(n = 257)
Factor 1 Behavior					
Mean	3,018	2,492	3,200	3,182	2,673
Variance	0,141	0,027	0,152	0,119	0,031
Cronbach's α	0,869	0,912	0,895	0,866	0,921

Multiple regression analysis was used for testing of the hypothesis for all types of banners. For each type of banner, two regressions were conducted. Constructs or factors 'pleasant' and 'unpleasant' were used as explanatory variables, construct 'attitude' was used as respondent variable for the first hypothesis, while the construct 'behavior' was used as respondent variable for the second hypothesis. Simple regression analysis was used for the last banner format, standard banner, since the factor analysis converged to only one factor 'pleasant'.

The results from the regression analyses for the first hypothesis are presented in table 8.

General conclusion valid for all types of banners is that the attitude of the respondents is influenced by the banner formats, both 'pleasant' and 'unpleasant'. Unstandardized coefficients B are statistically significant in all regressions for both factors. Since for the last banner type – standard banner, only one factor 'pleasant' was available, the influence on the attitude of 'unpleasant' banner types cannot be examined.

The adjusted explains the percentage of variation in 'attitude' explained by the variation in 'pleasant' and 'unpleasant'. It varies from 48,8% to 63,9%.

To draw conclusions about a population based on a regression analysis done on a sample, several assumptions must be true (Field, 2009).

Variable types: All predictor variables are continuous and unbounded, since they were derived from factor analysis as factor scores.

Table 8. Regression results for Hypothesis 1 (Response variable: Attitude)

	TYPE OF BANNER				
	TAKEOVER	FLOATER	SYNCHRONIZE	STRETCHING	STANDARD
	D UNITS	BANNER	BANNER		
Explanatory variables Unstandardized coefficients B					
'Pleasant'	0,677**	0,759**	0,739**	0,706**	0,795**
'Unpleasant'	0,183**	0,172**	0,308**	0,322**	-
Adjusted R^2	0,488	0,602	0,639	0,598	0,630
Durbin-Watson	1,593	1,644	1,721	1,689	1,717

Multicollinearity: For all models the variance inflation factor values are all well below 10 and the tolerance statistics all well above 0,2, so we can safely conclude that there is no collinearity within our data.

Homoscedasticity and linearity: For all regression models, standardized predicted values and standardized residuals were plotted. The points were randomly and relatively evenly dispersed throughout the plot, which is indicative of a situation in which the assumptions of linearity and homoscedasticity are met.

Independent errors: Durbin–Watson test varies from 1,593 to 1,721 meaning that the residuals are uncorrelated.

Normally distributed errors: Histograms of the residuals and normal probability plots are used to test this assumption. After examining the charts for all regression models, the conclusion is that most of the residuals are relatively normally distributed.

It is important to conclude that rather good or bad, the banner definitely influences the attitude of the respondents.

Table 9. Regression results for Hypothesis 2 (Response variable: Behavior)

TYPE OF BANNER					
	TAKEOVER	FLOATER	SYNCHRONIZE	STRETCHING	STANDARD
			D UNITS	BANNER	BANNER
Explanatory variablesUnstandardized coefficients B					
'Pleasant'	0,568**	0,702**	0,583**	0,495**	0,699**
'Unpleasant'	-0,018	0,189**	0,066	0,044	-
Adjusted R²	0,317	0,524	0,339	0,241	0,487
Durbin-Watson	1,486	1,805	1,845	1,804	1,663

The results from the regression analyses for the second hypothesis are presented in table 9.

For all format types, a conclusion can be made that the 'pleasant' banners influence the behavior of the respondents. All unstandardized coefficients B are statistically significant. On the other hand, the 'unpleasant' banners seem not to influence the behavior except for the floater banner. For the last banner type – standard banner, only one explanatory variable 'pleasant' was available, so only this influence on the behavior was measured.

The adjusted R^2 explains the percentage of variation in 'behavior' explained by the variation in 'pleasant' and 'unpleasant'. It varies from 24,1% to 52,4%.

Regarding the assumptions, the conclusions are:

Variable types: All predictor variables are continuous and unbounded, since they were derived from factor analysis as factor scores.

Multicollinearity: For all regression models the variance inflation factor values are all well below 10 and the tolerance statistics all well above 0,2, so the conclusion is that there is no collinearity within the data.

Homoscedasticity and linearity: For all regression models, standardized predicted values and standardized residuals were plotted. The points were randomly and relatively evenly dispersed throughout the plot, which is indicative of a situation in which the assumptions of linearity and homoscedasticity are met.

Independent errors: Durbin–Watson test varies from 1,486 to 1,845 meaning that the residuals are uncorrelated.

Normally distributed errors: After examining the histograms of the residuals and normal probability plots for all regression models, the conclusion is that most of the residuals are relatively normally distributed.

Final conclusion is that the good or pleasant banner influences the behavior of the respondents, while the negative or unpleasant banners don't seem to have any effect on the behavior of the respondents (except for the floater banner).

The results indicate that different format of banners impact on/how different formats of online banners affects brand attitude in the interactive environment.

Conclusion

As the internet has increasingly become an integrated tool for marketing, the effectiveness of the format of online banners remains a crucial issue. The ad format could generate a huge impact in the campaign results.

Two hypothesis which were set in the primary research were fully confirmed. The conducted research confirmed the correlation among the format and attitude and self reported behavior in a positive direction. The findings make explicit connection between the favorable consumer attitudes and behavior toward more interactive online banners. Attitude toward the format was found to be significant predictor which is a well established influence on brand attitude. According Burns and Lutz, "understanding the underlying determinants of format attitudes can help advertisers realize when they need to overcome unfavorable attitude toward the format – through a compelling creative approach" (2006).

The findings emphasize the importance of comparing the different format of the online banner so that marketers could implement the most effective. Marketers can then reduce risk of running unsuccessful formats of online ads and take more innovative approach to online advertising. Online advertisers should select their formats carefully as format attitudes influence ad likability which in turn influences brand attitude and behavior (Haley, 1990)

If company do not realize the impact of the formats of online banner, they will avoid the great opportunity to perform communication activity with enormous possibilities. The research was a pioner attempt to highlight the impact and effects of the formats of the online banner on the attitude and behavior. Overall, this paper provides significant theoretical contribution to the growing literature for online advertising and also offers valuable conclusions for the effects of different formats of online banners.

The results of this study could be used by marketers as a basis for developing interactive formats of online banners. Marketing agencies should be focus on creating a web banner that incorporate interactive elements. This paper will be beneficial both for the scientifically research in defining the most appropriate format of online banner in their marketing communications campaigns.

The sample was comprised only from Macedonian citizens limits the generalizability of the results. To increase the generalizability of the results, it is important to use a larger, more diverse sample. Another issue which is important to consider in the future researches is examining consumer behavior in a more natural setting. The fields experiment also meets the ongoing need for additional research outside laboratory settings (Carison et al,2005). The field experiment will contribute for extended understanding of different formats of banners and more accurate facts for banner effectiveness.

Taking in to consideration the fact that results for the standart banner did not correlate well and were deleted resulting with only one factor as explanatory variable 'pleasant', a further issue which should be considered is designing the random ordering of the formats or design where respondent assesses only one format.

Literature:

- Briggs, R., & Hollis, N., (1997), Advertising on the web: is there response before click-through?, *Journal of Advertising research*, 37, 33-46.
- Brown, M., (2002), The use of banner advertisements with pull-down menus: A copy testing approach, *Journal of Interactive Advertising*, 2(2), 57-65.
- Burns, K. S., & Lutz, R. J. (2006). The function of format: Consumer responses to six on-line advertising formats. *Journal of Advertising*, 35(1), 53-63.
- Carlson, L., Grove, S. J., & Stafford, M. R., (2005), Perspectives on advertising research: Views from Winners of the American Academy of Advertising Outstanding Contribution to Research Award, *Journal of Advertising*, 34(2), 117-149.
- Chabrow, E. (2006), US grants patent for broad range of internet rich applications, *Information Week*.
- Cho, C. H. (1999)., How advertising works on the www: Modified elaboration likelihood model, *Journal of Current Issues & Research in Advertising*, 21(1), 34-50.
- Cho, C. H., & Leckenby, J. D. (2000), Banner clicking and attitude changes on the www, In *proceedings of the conference-american academy of advertising*, pp. 230-230, Pullman, WA; American Academy of Advertising
- Cho, C. H., & Leckenby, J. D., (1999), Interactivity as a measure of advertising effectiveness, In *Proceedings of the American Academy of Advertising*, pp. 162-179, Gainesville: University of Florida.
- Cho, C., Jung-Gyo, L., and Marye, T., (2001), The Effects of Different Forced Exposure Levels to Banner Advertisements on the WWW, *Journal of Advertising Research*, Vol. 41 Issue 4, pp. 45-56
- Choi, Y. K., Miracle, G. E., & Biocca, F. (2001), The effects of anthropomorphic agents on advertising effectiveness and the mediating role of presence, *Journal of Interactive Advertising*, 2(1), 19-32.
- ComScore (2013), Brave new digital world - A Manifesto for the Future of Digital Media Measurement & Analytics
- Econsultancy, (2013), Digital marketing experience - Marketing Budgets Report
- Field, A. P., (2009), Discovering statistics using SPSS. London, England: SAGE.
- Haley, R. I., & Baldinger, A. L., (1991), The ARF Copy Research Validity Project, *Journal of advertising research*.
- Heo, N., & Sundar, S. S. (2000), Emotional responses to Web advertising: The effects of animation, position, and product involvement on physiological arousal, In *Annual Conference of the Association for Education in Journalism and Mass Communication*, Phoenix, AZ.
- Hoffman, D. L., & Novak, T. P. (1996), Marketing in hypermedia computer-mediated environments: conceptual foundations, *The Journal of Marketing*, 60 (3), pp. 50-68.
- Hong, W., Thong, J. Y., & Tam, K. Y. (2004), Does animation attract online users' attention? The effects of flash on information search performance and perceptions, *Information Systems Research*, 15(1), 60-86.
- <http://www.comscore.com/Insights/Press-Releases/2010/10/comScore-ARS-Research-Highlights-Importance-of-Advertising-Creative-in-Building-Brand-Sales>
- http://www.ipsos.com/Country_Profile_Macedonia
- <http://www.zenithoptimedia.com/zenithoptimedia-forecasts-stable-ad-growth-in-2013-will-pave-way-for-recovery-in-2014-and-2015/>
- Internet worldstat, (2014), <http://www.internetworldstats.com/list2.htm>
- Li, H., & Bukovac, J. L. (1999), Cognitive impact of banner ad characteristics: An experimental study. *Journalism and Mass Communication Quarterly*, 76 (2), pp. 341-353
- Li, H., & Bukovac, J. L., (1999), Cognitive impact of banner ad characteristics: An experimental study, *Journalism & Mass Communication Quarterly*, 76(2), 341-353.
- Liu, Y. and Shrum, L.J. (2002), What Is Interactivity and Is It Always Such a Good Thing? Implications of Definition, Person, and Situation for the Influence of Interactivity on Advertising Effectiveness, *Journal of Advertising*, (31) 4,

pp. 53-66.

Macias, W., (2003), A preliminary structural equation model of comprehension and persuasion of interactive advertising brand web sites, *Journal of interactive advertising*, 3(2), 36-48.

Maddox, L. M., Mehta, D., & Daubek, H. G., (1997), The role and effect of web addresses in advertising, *Journal of Advertising Research*, 37, 47-60.

Nunnally, J. C., (1978), *Psychometric theory*. New York: McGraw-Hill.

Phillips, B. and Wei-Nei.L., (2005), Interactive Animation: Exploring Spokes-Characters on the Internet, *Journal of Current Issues and Research in Advertising*, Vol. 27, Issue 1, pp.1-17

PWC, (2014), IAB internet advertising revenue report - 2013 full year results

Rodgers, S., & Thorson, E., (2000), The interactive advertising model: How users perceive and process online ads, *Journal of interactive advertising*, 1(1), 41-60.

Shaw, R. (2004), Evolution of rich media, *Imedia Connection*.

Steuer, J., (1992), Defining virtual reality: dimensions determining telepresence, *Journal of communication*, 42 (4), pp. 73-93

UDC 334.72:005.94]-057.875

KNOWLEDGE SPECIALIZATION AS A BARRIER FOR SOCIAL BUSINESS/IT ALIGNMENT

Nikola Levkov

Ss. Cyril and Methodius University in Skopje, Faculty of Economics - Skopje
blvd. Goce Delcev 9V, 1000 Skopje, R. Macedonia,
nikolal@eccf.ukim.edu.mk

Blagoja Gjorgijovski

Ss. Cyril and Methodius University in Skopje, Faculty of Economics - Skopje
blvd. Goce Delcev 9V, 1000 Skopje, R. Macedonia,
blagoja@eccf.ukim.edu.mk

Abstract

The article use exploratory approach to identify the potential areas of disagreement between business and IT students, by measuring commonality in their interpretation when they are confronted with the same problem. The main idea behind this article is that lack of holism in education or education in isolation between disciplines is responsible for potential conflicts in management practice. Knowledge specialization in certain fields has strong influence on the individual cognitive structure and his interpretation and perception of the world. Through pre-experimental design authors tested the perception of business and IT students who were treated as surrogates of business and IT professionals in the real world. The results confirmed different interpretation between the two groups of students on six dimensions. At the end of the paper the results are presented and discussed and propositions for future improvements are suggested.

Keywords: *knowledge specialization, common interpretation, social alignment, cognitive dimension, mutual understanding.*

1. Introduction

Business/IT alignment remains one of the key IT management challenges and concerns. Almost three decades, IT alignment has been constantly appointed as key IT management concern from IT executives and academic researchers. Since 1980, the Society for Information Management (SIM) has conducted an annual survey of the key issues facing IT executives in United States and globally. A close look of the results published in reports of Society for Information Management in period 2003-2012 shows that business/IT alignment was ranked six times as number one concern, three times as number two concern and once as number three concern (Luftman and Derksen, 2012). Another article from the same institute published very

recently in December 2014 conducted survey on 717 organizations in USA and confirmed again alignment as number one IT management concern (Kappelman et al., 2014). Similar study based on a survey conducted in Europe and compares the results to the global results, again confirmed that business/IT alignment is one of the perennial concerns. The survey was conducted in summer 2013 and for that year business/IT alignment was ranked as number one concern from IT executives in most of the countries in Europe and worldwide (Derksen and Luftman, 2012).

Business IT alignment was hot topic in the past in academics. Many questions still remain unanswered and authors often argue that alignment literature fails to capture important phenomena. The research field of IT alignment faces with challenges in both areas: literature and practice. Some of the arguments of many scholars are that alignment is mechanistic, not desirable and that it should often challenge business and instead of following (Chan and Reich, 2007). Ciborra (1998, 1997) pointed out that models developed in alignment literature are mainly conceptual and does not correspond to the real world and difficult to implement in business practice.

Several different dimensions of business/IT alignment were studied in the literature including strategic, structural, operational, intellectual, social, cultural and cognitive dimension. Most of the papers in the past were considering alignment on strategic level and only some at the functional level (Aversano et al., 2012). Authors in recent study propose clear distinction between organizational level and content of business/IT alignment. For the later they categorize the dimensions of alignment in three distinctive groups 1) human dimension, 2) social dimension and 3) intellectual dimension. By human dimension they refer to distinct attributes of individual persons, meaning skills, knowledge, leadership and behavior (Schlosser et al., 2012). Intellectual alignment as term was introduced by Reich and Benbasat (1996) referring to the consistency and external validity of business and information technology plans. Vast number of studies (Floyd and Wooldridge, 1990; Reich and Benbasat, 1996) done in the past were focused on intellectual alignment.

Only recently social capital theory and its three dimensions structural, cognitive and relational were used in exploring social dimension of business/IT alignment at strategic and operational level (Karahana and Preston, 2013; Wagner et al., 2014). The social dimension as discussed in the literature is about relationships and cognitive linkages. It encompasses relationships, mutual understanding, cultural issues and informal structure (Schlosser et al., 2012). Reich and Benbasat (Reich and Benbasat, 2000) define social alignment as state in which business and IT executives understand and are committed to the business and IT mission, objectives and plans. This is generally accepted definition of social alignment. Researchers have acknowledged that shared understanding between business and IT is a crucial factor to achieve higher level of alignment and business value of IT (Jentsch and Beimbom, 2014; Zhao et al., 2009).

Many arguments can be found in the literature about antagonism and lack of understanding between business and IT professionals. Scholars argue that there is profound difference in how business and IT professionals understand the social environment. Often in academic articles various terms were used as symbols of the antagonism between business and IT professionals. Some of the words referring to this lack of mutual understanding mentioned in papers and conferences are: 1) disconnect of mindsets (Brennan, 2008) 2) tango with a robot (Dedene, 2010) 3) strangers on the train (Day, 2007) 4) troubled marriage (Ward and Peppard, 2007) 5) mind the gap (Peppard and Ward, 1999) 6) sound off (Jahnke, 2004) and others. This has inspired many scholars to explore and to go deeply into the very nature of mutual understanding between these two groups of professionals.

Several important studies have been done in past related to potential conflicts between these two groups of professionals. Rao and Ramachandran build on research of Guzman (2008, 2009) and others and conducted a research about occupational culture of information systems and managerial personal. One of the goals of their study was to identify the potential points of conflict between these two groups of professionals on two groups of dimensions (Rao and Ramachandran, 2011). The theoretical framework of grid and group dimensions used in their study was previously suggested by Trice (1993). The group dimension serves to assess the cohesiveness of the overall group while the grid dimension focuses on group member beliefs about the

hierarchy and division of labor. In the results of the study they found source of potential conflict in five out of seven group dimensions and in all three grid dimensions. Data were collected by interview of ten IS professionals and eleven managers in North American organizations. The goal of this paper is similar to the goals of previously mentioned studies. This study is trying to identify the potential areas of different interpretation between business and IT students as a result of knowledge specialization created through the process of education. The identified areas could be a source for future cognitive conditioning and impede mutual understanding and agreement between these two groups. If we succeed to identify the potential areas of different interpretation we might get closer to the source of the problem in social business/ICT alignment.

2. Knowledge Specialization and Mutual Understanding

Knowledge specialization is mainly result of division of labor and the intention to increase work efficiency and productivity. We could also accept the notion that another reason for knowledge specialization is the limited potential of humans to absorb large amount of knowledge, explicit and tacit in a limited time frame. Demestz (1988) argue that specialists exist because some items of knowledge are cheaper to learn together than others. This cost of learning is related to the prior related knowledge which can increase our ability to absorb new knowledge. This means that it is easier for people to expend their knowledge base in certain domain if their prior knowledge base is somehow related with the new incoming knowledge. Postrel (2002) indicates that the fundamental tension in the division of knowledge is between superior learning efficiency of specialization and its inferior integration properties.

Jacobson (2008) developed knowledge sharing model based on work of Shannon and Weaver (1948), and their classical model of communication. According to the knowledge sharing model the absorptive capacity of knowledge receiver is related to his prior knowledge. This supports the assumption that two persons, sender and receiver, can better exchange knowledge if both are similar in terms of education and background. Also if that is the case it is more likely that receiver would change his attitude or behavior as result of absorbing new knowledge. In most cases in the real business world business and IT professionals have different background and previous knowledge which limits their absorptive capacity and impedes knowledge sharing. This is very important in achieving mutual understanding between business and IT professionals because scholars have indicated that communication is important but not sufficient enough for achieving alignment. Cognitive dimension which captures shared codes, language, and perspectives, and refers to the extent to which IT and business staff knows each other's interpretations of reality is also very important (Wagner et al., 2014). According to knowledge sharing model of Jacobson prior knowledge plays important role in absorptive capacity of new knowledge in the process of knowledge sharing. The knowledge base of both professionals group is created in large portion through the process of education. This paper is an attempt to identify potential areas of division in the knowledge base mainly created through professional education.

Postrel indicates that studies of product development show that greater knowledge commonality is associated with better firm performance. Although situation where it makes sense to maintain positive amounts of understanding across specialties are relatively rare in the economy as a whole they are relatively common in the areas where management is necessary (Postrel, 2002). Business IT alignment is a proper area of management which requires mutual understanding across specialties. Number of authors confirmed that higher level business/IT alignment is positively related with better business performance. Preston and Karahana empirically supported that shared language, shared domain knowledge and structural and social systems of knowing have the role of antecedents in achieving better shared understanding between CIO and top management team. Thus success of achieving higher levels of business/IT alignment depends critically on developing superior trans-specialist understanding (Preston and Karahanna, 2009).

This was another driver for authors of this article to conduct research about commonality of attitudes and perceptions between business and IT students on a real business/IT case example. The core idea behind the theoretical elaboration above is that business and IT students would have different opinions and percep-

tions as a result of highly specialized knowledge which they obtain through the process of their education. The extra effort required to obtain knowledge from another discipline reduce student's motivation for such endeavor. Building interdisciplinary study programs, conducting cross-disciplinary research and obtaining cross domain knowledge is recent activity even in highly developed countries. Most of the educational programs especially in developing countries remain strongly isolated and highly specialized in one area and only offering few optional courses to students from other disciplines. The processes of employee orientation in the business world are not very much focused on crossing barriers in knowledge specialization. The null hypothesis tested in this article is: Business and IT students have common interpretation and similar perception of all aspects of the IT replatforming case story.

Several authors (Armstrong and Sambamurthy, 1999; Nahapiet and Ghoshal, 1998; Preston and Karahanna, 2009; Tan and Gallupe, 2006) confirmed that shared knowledge is antecedent of shared or mutual understanding. Preston and Karahanna (2009) advocate sharp discrimination between shared knowledge and shared understanding. In their model of antecedents of shared understanding they make clear distinction between these two constructs. Shared knowledge is consisted of CIO business knowledge and TMT – top management team IS knowledge. The term shared understanding in the same model according to authors refers to the shared understanding between CIO and the TMT about the role of IS in the organization (Preston and Karahanna, 2009). Other authors (Nelson and Coopride, 1996; Ray et al., 2005; Ajan, 2009) use the term knowledge and understanding interchangeably. Jenetch and Beinborn (2014) based on a previous work on other scholars accept the approach that shared understanding in terms of agreement and shared knowledge as justified true belief within a social group are the same. Both approaches to understanding mentioned above whether as antecedent to shared understanding or as exactly as the same concepts supports the key assumption of this paper that strong knowledge specialization can restrain mutual understanding. Knowledge similarity of the two groups of specialists is a key factor to mutual understanding.

Based on the work of Cannon-Bowers and Salas (2001) through the experimental design in this paper we are measuring whether business and IT students share common interpretation based on their level of knowledge similarity. In their paper they have identified four categories of shared knowledge: overlapping knowledge, similar/identical knowledge, complementary or compatible knowledge and distributed knowledge. In this paper first two categories have been used as theoretical assumptions for conducting this experimental research. The first category overlapping knowledge refers to the need that team members need to have some common knowledge. It does not mean that team members need fully redundant knowledge but some portions of knowledge need to be shared (Cannon-Bowers and Salas, 2001). This argument is exactly the opposite what is usually done through the process of professional education and creating strong knowledge specialization.

Second category is related with the need of holding similar or identical knowledge by team members in order to achieve shared cognition. According to the same authors this category applies most directly to shared attitudes and beliefs. Team members must hold similar attitudes and beliefs in order to draw common interpretations. When such attitudes are not shared, resulting confusion and failed expectations can have an obvious negative impact on performance (Cannon-Bowers and Salas, 2001).

In this paper first two categories named as overlapping and similar knowledge have been used as explanation of the term “shared”. The key assumption is that if students have more similar and overlapping knowledge they are more likely to create common interpretation to a same situation. The Case of Co-operative Bank's Core Banking System Migration was the situation with which students from both groups were confronted through survey questions. Creation of division in knowledge through process of specialization result in cognitive conditioning that impedes mutual understanding.

3. Research methodology

In order to test commonality in interpretation between the two groups of business and IT students a case study was developed. The case study was based on the Report of the independent review into the events leading to the Co-operative Bank's capital shortfall²⁶. The report was published on 30th of April 2014. Mainly the section of IT replatforming was used for developing the case but also other sections have been used when additional information were needed to better represent the events. An excerpt from the IT replatforming case is presented in the appendices A1 and A2 of this article with the list of subheadings. The whole version of the case story cannot be presented taking into the account the limited space for the article and it can be delivered upon request from the author. The case study was adjusted to the needs of the research purpose of this study. Also a survey with 25 questions on seven point Likert scale was developed based on a theory about business/ICT alignment and the context of the IT replatforming case. All survey items are presented in the appendices B1.

The whole version of the case study and the survey questions were pretested with five business, three IT students and one person from academic staff. Useful comments and suggestions from pretesting helped to improve the text of the case, make it clearer and closer to the students' knowledge. The questions from the survey have also been modified in accordance with the feedback provided by students participating in the pretesting. Two groups of business and IT students have been randomly selected from Ss. Cyril and Methodius University on voluntary basis to read the case and answer the questions from the survey. The business students were studying management and marketing at the Faculty of Economics - Skopje while IT students were studying informatics and computer engineering and network technologies at the Faculty of Computer Science and Engineering. Both faculties are part of Ss. Cyril and Methodius University. Both groups were students from fourth year and similar age which means that age was not contributory factor to potential difference in perception.

Data collection has been done in two days spent on two faculties. Business and IT students from both faculties have been asked to read the case and fill the survey after the class. Four main instructions have been given to the students: First carefully to read the case and understand what the story is about and what has happened; second based on their personal opinion to answer the questions from the survey; third to try to answer to all of the questions and if they do not understand some question to leave it blank; and fourth participating in the experiment is on voluntary basis and there is no punishment or reward for participating in the experiment. No other instructions were given to the students in order to avoid any influence on their point of view. One and half hour was given to students to read the case and fill the survey.

The total number of students responded on survey was 110 but two respondents were removed from the sample because there were too many missing values and the data were not useful for analysis. The number of business students who answered the survey was 73 while the number of IT students who answered the survey was 35. The difference in the total number of received responses from both groups does not affect final results because independent sample Mann-Whitney U test was used to analyze collected data.

4. Data analysis and discussion of results

Data analysis was performed on a sample of 108 usable questioners. The data were analyzed regarding missing values, normality and equality of variances. All 108 questioners did not have missing values and the quality of the data was analyzed in terms of normality. Normality of the data was tested by performing Kolmogorov-Smirnov and Shapiro-Wilk test. The results showed that data were not normally distributed which was expected from the researcher to a certain extent. Next Levin test that assess the equality of variances for two or more groups was performed on all data and the results were significant which was indica-

26) The report was downloaded from internet link

<http://www.cooperative.coop/PageFiles/989442031/kelly-review.pdf>

tor for switching to non-parametric tests free from homoscedasticity assumptions. A Mann–Whitney U test for comparing medians was used to analyze the data because the dependent variables are continuous variables and the data have not been normally distributed. In the survey a seven point Lickert scale was used as interval scale and it was expected differences between the two groups in the answers to fall on one side of the continuum. Thus a single-tail versus two-tail statistics was used to identify potential differences between the answers of the two groups.

The statistics did not show any significant difference in the median results in 19 survey questions for both groups IT and business students. According to the results we could not reject the null hypothesis for all 19 questions which lead to the conclusion that in most aspects and dilemmas posed to the students through question items resulted in very similar interpretations and perceptions of the IT replatforming story. This means that we fail to reject the null hypothesis for 19 out of 25 survey items.

A significant difference in the median score was identified in 6 out of 25 survey indicators numerated as questions 3,5,7,10,12 and 13 in the questionnaire used in the survey. For these six items we can reject the null hypothesis that there is no difference between business and IT students in their perception and interpretation of the banking case for replatforming. Below in table 1 are presented only results for the six items from the survey where statistical significance has confirmed the difference in the median between IT and business students.

Table 1. Dimensions of significantly different interpretation

	Q 3	Q 5	Q 7	Q 10	Q 12	Q 13
Mann-Whitney U	950.000	1006.500	891.000	898.500	1001.000	962.000
Z	-2.193	-1.812	-2.572	-2.661	-1.844	-2.204
p - value	.028	.070	.010	.008	.065	.028
Grouping variable: educational profile						

Q3 as indicator was measuring the justifiability of frequent and inconsistent change in the IT strategy of the bank. Since $p\text{-value} = .28/2 = 0.014 < 0.05 = \alpha$ there is enough evidence to conclude that there is a difference in the median perceptions between the two groups. Q5 was measuring the role of rigidity of information technology as barrier for strategic business/ICT alignment. The $p\text{-value} = .07/2 = 0.035 < 0.05 = \alpha$ again confirms the conclusion that there is significant difference in the perceptions of both groups. Q7 was used as measure of banking decision to go for replatforming in situation when there is no too many previous positive experiences. The question should impose dilemma in front of the two groups of students to test their attitude related to risk taking. The social business/ICT alignment is very often reflected in IT project management regarding the potential risk and priority of the project for the company. The $p\text{-value} = .01/2 = 0.005 < 0.05 = \alpha$ confirms the conclusion that there is significant difference in the perceptions of both groups regarding the risk taking for replatforming. Q10 is an indicator measuring responsibility of the IT manager in relation to the board of directors. The reason for this question was to identify potential differences in interpretations of two groups of students regarding IT manager responsibility in the project of migration. The table 1 shows that $p\text{-value} = .08/2 = 0.004 < 0.05 = \alpha$ confirm the conclusion that there is significant difference in the perceptions of both groups regarding IT manager responsibility.

Very interesting significant difference appeared in the Q12 which was measuring the level of technical knowledge that CEO and the board of directors should have. Two groups business and IT students significantly differently rated the level of technical knowledge that top management of the bank must had. This difference in perception whether business people should know more about IT or IT people should know more about business is often discussed in the literature and mentioned in business practice from both groups of professionals as problem. Again the $p\text{-value}$ was significant with $p = .065/2 = 0.0325 < 0.05 = \alpha$ confirm the significance

in the different perception of the two groups. Q13 was measuring again responsibility of IT manager but this time in the project management activities for IT replatforming. On test was the decision to leave the project and the two groups should judge the appropriateness of the decision that was taken. The results in table 1 show that p-value was significant also for this indicator with a value of $p=0.028/2=0.014 < 0.05 = \alpha$. The analysis of the results showed that in most of dimensions related to the case of IT project failure students of both groups did not show significant difference in their perceptions.

The goal of this paper was to identify some potential areas of different views through pre-experimental design. The potential areas of different interpretation and perceptions between the two groups of students with specialized knowledge identified through this study were: 1) approval of frequent change in IT strategy, 2) rigidity of information technology as argument for time lag in IT/business strategy tuning, 3) level of risk orientation, 4) IT manager responsibility regarding IT project and risk management, 5) required level of technical knowledge of board of directors, 6) IT manager responsibility regarding IT project and risk management. The analysis of the results from testing the perceptions of two groups of students on a single case is a useful way to identify potential areas of future research. The significance shown on six dimensions can be potential areas where in future the author could delve more deeply into the potential factors that contribute to different perceptions on those dimensions. Also future research can propose methods and best practices that can help to bridge those differences and overcome the areas of mismatch between the two groups of professionals.

5. Research limitations and future improvements

The attempt of this research study to identify potential difference in interpretation and perception of the reality between two professional groups has some limitations. Although this paper has contributions, it has inherent limitations that warrant caution in interpretation of the results. A first, important limitation is the sample size. Increasing the sample size would probably yield more valid and reliable results. Second important limitation was the level of engagement of the students in deep understanding of the case example and trustworthiness in filling the survey. Third, this is more pre-experimental design which means that there were no more scenarios given to the students; also there was no pretesting and post-testing, control and treatment group. Fourth, subjective interpretation of the results can also be strong limitation of the study. Fifth, the students as objects of research who were participating in the experiment were from one country and single educational system. Making the same experiment in other countries would increase the validity and reliability of the study. Sixth, using students as surrogates to relate the results with business and IT practitioners in real world has some disadvantages.

The study also has some limitations regarding the methodology. The pre-experimental design can be improved and transformed into true experiment by including control and treatment group. Some more advanced techniques like multidimensional scaling can be used to measure the similarity between the interpretations of the groups. Interesting approach for improving the study would be if third group of students who are studying information systems management or information management program is involved in the study to compare the results between all three groups: business students, IT students and information systems students. The research can be expended in the real business world involving real business and IT professionals apart from students and compare the results. It would be interesting to compare the results from both datasets the one with students and the one with real business and IT professionals. If the comparison of the results not give any significant difference it would mean that the potential areas of disagreement or different perception have not been changed as a result of working experience. The number of dimensions in which differences would be identified could also be interesting for comparison. If the number of dimensions where null hypothesis is rejected is higher in the experiment involving business and IT practitioners, than we could argue that through process of working experience and stronger involvement in real business and IT problems the antagonism between these two groups has increased compared to students. The potential improvements mentioned above are the future research activities that the author of this paper is intending to

do in order to improve the validity and reliability of the results of this paper. This pre-experiment was very useful in order to test the potential and space for future research regarding the null hypothesis tested in this paper.

6. Conclusion

This study has contribution to existing theory in several ways. First this pre-experiment was response to the call of many authors for more research in social dimension of business/ICT alignment with more focus on cognitive dimension. Although there is growing number of studies that use cognitive perspective in IS research, not many can be found in the field of business/ICT alignment. The research done in this paper is an attempt to identify potential dimensions that constitutes different cognitive structures in two groups of students, business and IT students. The key assumption in the study is that differences in cognitive structures are greatly resulting from knowledge specialization in education. Therefore, in certain way this study explores both the commonalities (similarities) and individualities (differences) in the cognition of two groups of professionals when they are confronted with same problem.

Business and IT students have shown more sensitivity to only two dimensions related to strategic alignment. The responsibility of IT manager was measured through five indicators where significant difference was found on only two. The rest of the two dimensions where null hypothesis was rejected are related to the dimension of knowledge overlapping and risk orientation. Knowledge overlapping was measured through three dimensions whereas risk orientation was measured through four questions. In both situations significant difference was found on only one dimension. Although on most dimensions for different interpretation and perception of reality between business and IT students was not found, the six dimensions where such difference was confirmed opens the window of opportunity for research in those subareas as additional testing for greater validity. There are several useful conclusions that can be derived from the results in this research study. Most of the survey indicators which have been used for measuring some dimensions of students' perception did not show significant difference. Considering research limitations of the study we may conclude that there is greater commonality in cognitive structure between these two groups of students than differences. Only on several dimensions the research results confirmed significant difference between the groups. The identified dimensions can be valuable source for focusing educational effort in bridging the gap between the two groups of specialists. The research in future can be more focused to test the validity of the dimensions identified as areas of division in interpretation and perception.

References

1. Aijan, H., 2009. Improving Project Management Through a Shared Understanding of Project Risk and Return. Proceedings of the Americas Conference on Information Systems, San Francisco
2. Armstrong, C.P., Sambamurthy, V., 1999. Information Technology Assimilation in Firms: The Influence of Senior Leadership and IT Infrastructures. *Inf. Syst. Res.* 10, 304–327.
3. Aversano, L., Grasso, C., Tortorella, M., 2012. A Literature Review of Business/IT Alignment Strategies. *Procedia Technol.* 5, 462–474. doi:10.1016/j.protcy.2012.09.051
4. Brennan, O., 2008. Client and IT Engagement in Software Development: A Disconnect of Mindsets. *ACIS 2008 Proc.*
5. Cannon-Bowers, J.A., Salas, E., 2001. Reflections on Shared Cognition. *J. Organ. Behav.* 22, 195–202.
6. Chan, Y.E., Reich, B.H., 2007. IT alignment: what have we learned? *J. Inf. Technol.* 22, 297–315.
7. Ciborra, C.U., 1998. Crisis and foundations: an inquiry into the nature and limits of models and methods in the information systems discipline. *J. Strateg. Inf. Syst.* 7, 5–16.
8. Ciborra, C.U., 1997. De profundis? Deconstructing the concept of strategic alignment. *Scand. J. Inf. Syst.* 9, 67–82.
9. Day, J., 2007. Strangers on the train: The relationship of the IT department with the rest of the business. *Inf. Technol. People* 20, 6–31.
10. Demsetz, H., 1988. The theory of the firm revisited. / *Law, Econom. Organ.* 4 141-161
11. Dedene, G., 2010. Lecture notes course ICT service management, Master in information management, KULeuven, Leuven
12. Derksen, B., Luftman, J., 2014. European key IT and Management Issues & Trends for 2014, Results of an International Study. CIONET (2014) Floyd, http://blog.cionet.com/wpcontent/uploads/2014/02/ITTrends_2014print.pdf
13. S. W. Floyd and B. Wooldridge., 1990. Path analysis of the relationship between competitive strategy, information technology, and financial performance. *J. Manag. Inf. Syst.* 47–64.
14. Guzman, I.R., K.M. Stam, J.M. Stanton., 2008. The Occupational Culture of IS/IT Personnel Within Organizations, *The DATA BASE for Advances in Information Systems* (39)1, pp. 33–50.
15. Guzman, I.R. and J.M. Stanton., 2009. IT Occupational Culture: The Cultural Fit and Commitment of New Information Technologists, *Information Technology & People* (22) 2, pp.157–187.
16. Jacobson, C.M., 2008. Knowledge sharing between individuals. Published in: *Knowledge management concepts methodologies tools and applications IGI Global* 1633-1642.
17. Jahnke, A., 2004. Sound Off - Why Is Business-IT Alignment So Difficult?
18. <http://www.cio.com/article/2439612/business-alignment/sound-off---why-is-business-it-alignment-so-difficult-.html> (Accessed November 2014)
19. Jentsch, C., Beimborn, D., 2014. Shared understanding among business and IT-A literature review and research agenda. *ECIS 2014 Proc.*
20. Kappelman, L., McLean, E., Johnson, V., Gerhart, N., 2014. The 2014 SIM IT Key Issues and Trends Study. *MIS Q. Exec.* 237–263.
21. Karahanna, E., Preston, D.S. 2013. The Effect of Social Capital of the Relationship Between the CIO and Top Management Team on Firm Performance. *J. Manag. Inf. Syst.* 30, 15–56.
22. Kearns, G.S., Lederer, A.L., 2000. The effect of strategic alignment on the use of IS-based resources for competitive advantage. *J. Strateg. Inf. Syst.* 9, 265–293.
23. Luftman, J., Derksen, B., 2012. Key Issues for IT Executives 2012: Doing More with Less. *MIS Q. Exec.* 11, 207–218.
24. Nahapiet, J., Ghoshal, S., 1998. Social capital, intellectual capital, and the organizational advantage. *Acad. Manage. Rev.* 23, 242–266.

25. Nelson, K.M., Coopridge, J.G., 1996. The Contribution of Shared Knowledge to IS Group Performance. *MIS Q.* 20, 409–432. doi:10.2307/249562
26. Peppard, J., Ward, J., 1999. "Mind the gap": diagnosing the relationship between the IT organisation and the rest of the business. *J. Strateg. Inf. Syst.* 8, 29–60.
27. Postrel, S., 2002. Islands of shared knowledge: Specialization and mutual understanding in problem-solving teams. *Organ. Sci.* 13, 303–320.
28. Preston, D.S., Karahanna, E., 2009. Antecedents of IS strategic alignment: a nomological network. *Inf. Syst. Res.* 20, 159–179.
29. Rao, V.S., Ramachandran, S., 2011. Occupational Cultures of Information Systems Personnel and Managerial Personnel: Potential Conflicts. *Commun. Assoc. Inf. Syst.* 29, 582–604.
30. Ray, G., Muhanna, W.A., Barney, J.B., 2005. Information technology and the performance of the customer service process: a resource-based analysis. *MIS Q.* 625–652.
31. Reich, B.H., Benbasat, I., 2000. Factors That Influence the Social Dimension of Alignment between Business and Information Technology Objectives. *MIS Q.* 24, 81–113. doi:10.2307/3250980
32. Reich, B.H., Benbasat, I., 1996. Measuring the Linkage between Business and Information Technology Objectives. *MIS Q.* 20, 55–81. doi:10.2307/249542
33. Shannon, C. E., & Weaver, W., 1948. The mathematical theory of communication *The Bell System Technical Journal*, Vol. 27, pp. 379–423, 623–656.
34. Schlosser, F., Wagner, H.-T., Coltman, T., 2012. Reconsidering the Dimensions of Business-IT Alignment, in: 2012 45th Hawaii International Conference on System Science (HICSS). Presented at the 2012 45th Hawaii International Conference on System Science (HICSS), pp. 5053–5061. doi:10.1109/HICSS.2012.497
35. Tan, F.B., Gallupe, R.B., 2006. Aligning business and information systems thinking: a cognitive approach. *Eng. Manag. IEEE Trans. On* 53, 223–237.
36. Trice, H.M. (1993) *Occupational Subcultures in the Workplace*, Ithaca, NY: ILR Press.
37. Wagner, H.-T., Beimborn, D., Weitzel, T., 2014. How Social Capital Among Information Technology and Business Units Drives Operational Alignment and IT Business Value. *J. Manag. Inf. Syst.* 31, 241–272. doi:10.2753/MIS0742-1222310110
38. Ward, J., Peppard, J., 2007. *Strategic Planning for Information Systems*. John Wiley & Sons.
39. Zhao, Z., Yunfeng, W., Xiaochun, C., 2009. The Development of Shared Understanding among IS Leadership Team: A Multiple Case Study in China, in: 2009 International Conference on Information Management, Innovation Management and Industrial Engineering. Presented at the 2009 International Conference on Information Management, Innovation Management and Industrial Engineering, pp. 356–359. doi:10.1109/ICIMI.2009.545

Appendix A. Excerpt from IT replatforming case and all subheadings

A1. Excerpt from the IT replatforming

Cooperative Bank is a full-service retail bank, also serving small and medium-sized enterprises. In 2007 needed a technological platform disproportionately complex for its size. It had originally built its core banking system in the 1970s, as had many other UK banks. An array of new components had been added over the subsequent decades as products evolved and new services were developed. The age and complexity of the system, and the many interfaces between its components, meant that the Bank's technology platform was unstable, expensive to maintain, complex to adapt and ill-equipped to support its business requirements. There were particularly severe problems with the functionality of the online business banking platform. These weaknesses resulted in high running costs. Upgrading to comply with new regulatory requirements ate up considerable resource. Having decided that it had to take action, the Bank evaluated the different options. It had two broad choices if it was to continue to run its IT systems in-house. It could attempt to improve its existing systems (remediation). Or, much more ambitiously, it could replace its core banking system completely, and simultaneously upgrade a large number of other applications – business process management tools, data management systems, internet banking applications and so on. The Bank decided to pursue the ambitious option. Core banking system replacement is therefore often discussed. But it has rarely been pursued. It is recognised to be both complex and very risky, sometimes compared to “changing engines on an airliner at 30,000 feet.”

A2. Case subheadings

1. Credit Bank description and working environment
2. Bank business and IT strategy
3. The development of core IT banking system before decision for migration
4. Causes for It system changes in 2007/2008
5. Decision and realization of IT migration
6. Description of new banking solution
7. IBM collaboration with the bank
8. IT manager leaves the project
9. IBM excluded from the migration project
10. Britania merger
11. Project management of IT migration
12. Rise of complexity after migration
13. Project migration costs
14. Dropping the migration project
15. Consequences for the bank from project migration failure

Appendix B. Measuring business and IT students common interpretation

B1. Survey items

Likert scale (ranging from 1 = strongly disagree to 7 = strongly agree)

1. I would not change business strategy very often like Cooperative Bank.
2. It was necessary for the bank to change business strategy dramatically as a result of increased requirements from the regulator and dynamic nature of the business.
3. I think that the bank was changing very often IT strategy without good reason.
4. I think that IT strategy has failed to follow the changes in the business strategy.
5. Information technology is very rigid in its nature and therefore it cannot follow frequent changes in business strategy.
6. I think that IT strategy should have stronger influence on business strategy and not the opposite.
7. The bank did not suppose to go for full migration of its core banking system without any other positive business practices.
8. The bank did not supposed to increase the migration requirements from core banking to full platform migration.
9. It was necessary for the bank to increase the migration requirements in order to support new business strategy.
10. It was IT manager's responsibility to present the potential risks and threats of the new product in front of the CEO and board of directors.
11. I think that IT manager had to compensate the lack of technical knowledge of the CEO and board of directors.
12. I think that general manager and board of directors had to have more technical knowledge.
13. If I was IT manager I would never leave the migration project during its implementation.
14. The bank should not left the collaboration with IBM because it was left with no expertise.
15. I think that bank made the right choice breaking the collaboration with IBM because the outsourcing contract was too expensive.
16. Starting the merger with Britania was wrong decision when IT migration was not still over.
17. Management should never decide to go for migration of two core IT systems from two organizations in process of merger on totally new, third IT platform.
18. I think that it was responsibility of whole IT department to create effective management of IT migration project.
19. I think that it was responsibility of IT manager to create effective management of IT migration.
20. I think that IT manager was responsible to coordinate different projects and teams in the IT migration project.
21. The increased change requests created by business people were not justifiable.
22. The new IT platform had to be adjusted to new business requirements.
23. The most responsible person for IT migration budget overrun was IT manager.
24. CEO and the board of directors are the most responsible for cost and time overrun.
25. I think that most responsible for project failure is IT manager and IT department.

UDC 330.322.54.025(4-11)"1993/2011"

TOBIN'S Q AND R&D INVESTMENT IN CESEE COUNTRIES

Dushko Josheski, University GoceDelcev - Stip, R.Macedonia

Cane Koteski, University GoceDelcev - Stip, R.Macedonia

Marija Magdinceva, Sopova University GoceDelcev - Stip, R.Macedonia

Abstract

In this paper Tobin's and R&D investment issue has been subject of investigation. Tobin's q quotient is derived by the ratio of market value (market capitalization of listed companies excluding investment companies and mutual funds) and replacement value of capital used in production (Adjusted savings: consumption of fixed capital). Further, the influence of democracy indices Freedom House political rights and Freedom house civil liberties as proxies for democracy has been investigated along with the some government related variables as well as other macroeconomic variables. The basic idea of this paper is being derived from Arrow paper. ZviGriliches first introduced production function that relates market value of the firms, tangible and intangible assets. This model also can be applied in a small and simple Keynesian framework, where change in capital stock (investment) is a function of the difference between actual q and normal q i.e. normal $\bar{q} = 1$, and some natural growth rate (actually fitted values of the output growth), when $q = \bar{q} = 1$ investment equals savings, i.e. there exists macroeconomic equilibrium. In the empirical section theories had been tested on a pooled data from sample of 12 CESEE countries.

Keywords: Tobin's q, R&D, Market value, Replacement value, CESEE countries

Introduction

In this paper we examine the issue of R&D investment and the Tobin's q. R&D investment is different than other ordinary investment, according to Hall and Lerner (2009)²⁷, fifty percent or more of R&D spending is on salaries of highly educated scientist and engineers. The idea comes from Arrow (1962)²⁸, but the Arrow introduced growth model in which the per capita growth rate depends on the capital per worker and the average of the stock of capital of other workers²⁹. In the empirical literature form this area one significant contri-

27) Hall, B., H. & Lerner, J. (2010). "The Financing of R&D and Innovation," UNU-MERIT Working Paper Series 012, United Nations University, Maastricht Economic and social Research and training centre on Innovation and Technology.

28) Arrow, K.J. (1962). "The Economic Implications of Learning by Doing," American Economic Review, May 96(2): pp. 308-312.

29) $y = Ak^{1-\alpha}(\bar{k})^\alpha$ $0 < \alpha < 1$ in equilibrium $k = \bar{k}$

bution is the paper by Connolly and Hirschey (2005), when comparing the R&D effect on Tobin's q they find positive and statistically significant relationship across sample of manufacturing and non-manufacturing firms, and the found evidence which statistically significant and positive influence of R&D on Tobin's q³⁰. Earlier Connolly and Hirschey (1984)³¹, considered relation between market structure, R&D and profits. And the find positive effect of R&D on profit, but also negative R&D concentration interaction effect³². As we said earlier with the Arrow paper (1962), and later Romer (1990), research and development expenditures have been valued in economic growth perspective (Warusawitharana, 2008)³³. Also the same production that ZviGriliches (1979)³⁴, used is vastly used in this literature, the functional form is as follows: $Y = F(K, L, T, u)$, here K and L are labor and capital inputs, and T is a measure of the current state of technical knowledge, and u are all unmeasured determinants of output and productivity. James Tobin (1978), also explains that q is a measure of profitable investment opportunities. Later ZviGriliches and Cockburn (1988), relate the value of the firm with Tobin's q, as follows:

$V = q$ (tangible capital, intangible capital), so in this paper³⁵, q is related also to intangible capital. Megna and Klock (1993)³⁶, also examined the contribution of R&D stocks of the firms in semi-conductor industry, and find positive externalities of own R&D stock of the firms as well as the rivals stock of R&D on Tobin's q, but rivals patents negatively influenced Tobin's Q, this reveals that patents and R&D are distinctive measure of intangible assets, because patents are marketable and R&D are just initiative. Hall (1998)³⁷, introduced Cobb-Douglass production form with Tobin's q:

$$bV_t(TA, IA) = q_t TA^{\sigma - \alpha} IA^{\alpha} \quad (1)$$

Here TA are tangible assets, and IA are intangible assets. Intertemporal elasticity of substitution is given by, symbol. While in logarithms this function is presented by the following functional form:

$$\log bV_t = \log q_t + \sigma \log TA + \alpha (\log IA / TA) \quad (2)$$

Later Hall, Thoma, and Torrisi (2007)³⁸, explain that the functional form of intertemporal maximization with several capital goods it's hard to derive, and most of the literature relies on the assumption that market valuation equation takes log-linear, or log-log presentation. Hall, Thoma, and Torrisi (2007), make a distinction between knowledge capital and physical assets. Adaptive multiplicative separable function can be written as follows (Damianova, 2005)³⁹:

30) Connolly, R., Hirschey, M., (2005), Firm size and the effect of R&D on Tobin's q, R&D Management 35. 2, 2005. © Blackwell Publishing Ltd, 2005. Published by Blackwell Publishing Ltd,

31) Connolly, R., Hirschey, M., (1984), R & D, Market Structure and Profits: A Value-Based Approach, The Review of Economics and Statistics, Vol. 66, No. 4. (Nov., 1984), pp. 682-686.

32) The firms in the more concentrated industries are less efficient researchers, or are willing to take riskier projects.

33) Warusawitharana, M., (2008), Research and Development, Profits and Firm Value: A Structural Estimation, Division of Research and Statistics, Board of Governors of the Federal Reserve System

34) Griliches, Zvi (1979), R&D and Productivity: The Econometric Evidence, Chapter: Issues in Assessing the Contribution of Research and Development to Productivity Growth

35) Cockburn, Iain & Griliches, Zvi, (1988). "Industry Effects and Appropriability Measures in the Stock Market's Valuation of R&D and Patents," American Economic Review, American Economic Association, vol. 78(2), pages 419-23, May

36) Megna, P. and Klock, M. 1993. The Impact of Intangible Capital on Tobin's q in the Semiconductor Industry, The American Economic Review 83(2): 265 – 269.

37) Hall, B., (1998), Innovation and market value, University California Berkeley

38) Bronwyn H. Hall & Grig Thoma & Salvatore Torrisi, 2007. "The market value of patents and R&D: Evidence from European firms," NBER Working Papers 13426, National Bureau of Economic Research, Inc

39) Damianova, K., (2005), The Conditional Value of R&D Investments, National Centre of Competence in Research Financial Valuation and Risk Management

$$bV_t = (TA_t)^{\beta_1} \sum_{\theta=1}^T (IA_{t-\theta})^{\beta_2, \theta} \quad (3)$$

Here t is the time lag, denoting that production of knowledge capital is different than production of physical capital since it involves projects with durations of several years.

R&D and Tobin's q

R&D investment create "intangible" capital, and this affects the valuation of the company by the investors. Market value of the firm we treat as indicator for the success of the company, but only partial (Griliches, 1981)⁴⁰. We use here the "definitional" model by Zvi Griliches:

$$MV = q(TA + IA) \quad (4)$$

Here MV represents the market value of the firm (equity plus debt), which is equal to q (which represents the current market valuation coefficient of the company's assets), multiplied by TA which represents tangible assets, plus IA intangible assets. From the expression above we have following $q = \frac{MV}{(TA + IA)}$ that is the expression for Tobin's Q (quotient). Here we state that, IA - intangible assets are the "stock of knowledge" of the companies. The reason why in the q -theory, $Q > 1$, Q can be above 1, is because of the Intangible assets of the company. For the early Keynesians it was important, what is the position of the current cash flow and liquid assets, as a major determinants of investment (Akerlof, 2007)⁴¹. But later Modigliani - Miller, same as the other existing contemporary literature, assumed that the firm's financial position, is not important in investment decision, i.e. investment is independent of current cash flow and liquidity position. In the original paper by Tobin (1969), firms should invest up to the point where marginal costs of a new unit of capital is the valuation of such a unit capital in the market (Akerlof, 2007). Tobin like in neoclassical growth theory assumes some natural rate of growth y_n , and the equation $y_n * K = sY$, where s , is the savings ratio (marginal propensity to save), Y is the real income, marginal efficiency of the capital stock is \bar{R} , and, $\bar{R} = rK$, where r is the interest rate or return of the capital stock. In such a case $q=1$, and investment equals saving. While Tobin defines $\bar{R} = rq$, in Tobin's paper q is the market price of existing capital goods, so $rq=rK$, i.e. $q=K$, so the firm should invest up to the point where the marginal unit of capital is equal to valuation of such a unit of capital in the stock market. So investment is independent of finance situation of the firm.

In his interpretation of Keynesian LM curve Tobin introduced $\frac{\bar{R}}{q}$ as the speed of investment that should be equal in equilibrium with $\frac{r}{K}$, or $\frac{\bar{R}}{q} = \frac{r}{K}$. Later on in 1977 paper, Tobin defines marginal efficiency of capital as follows:

$$V = \int_0^{\infty} E(t) e^{-\bar{R}t} dt \quad (5)$$

Here V are the cost of capital (replacement value) and $E(t)$ are the expected future earnings,

For a definite integral solution is $-\frac{1}{r+1}$ for $Rq(r) < -1$. Now Tobin (1977) presents market value of capital goods of the firm and the expression is presented in the following expression: $MV = \int_0^{\infty} E(t) e^{-rt} dt$, $E(t)$ $E(t)$ is constant, then $V = E/\bar{R}$, and $MV = E/r$, consequently $\frac{MV}{V} = \frac{R}{r}$, this is the expression for out quotient Q . Tobin extends model to macroeconomics (IS-LM) model defining the investment function, which is a change in capital as follows, $\frac{\Delta K}{K} = f(q - \bar{q}) + y_n$, \bar{q} is some normal value of q , i.e. $q=1$, while y_n is the natural growth rate. And if, then, which represents net investment⁴². Now since we explained market valuation models for the firm, will add up R&D to see the causality between the two. Abel (1984), did set up a model

40) Griliches, Z. (1981), 'Market value, R&D and patents', Economics Letters, 7 (2), 183-187

41) Akerlof, George, (2007), Missing motivation in macroeconomics, American Economic Review, 2007, vol. 97, issue 1, pages 5-36

42) Tobin J, and Brainard W.C. (1977), Asset Markets and the Cost of Capital, Cowles Foundation Paper 440

of market value of the firm and R&D. Abel (1984)⁴³ uses Bellman value function⁴⁴, for the market value of the firm.

$$V(T_t, p_t) = \max_{L_t, R_t} E_t [p_t L_t^\alpha T_t^{1-\alpha} - wL_t - a\bar{R}_t^2 + \beta V(T_{t+1}, p_{t+1})] \quad (6)$$

Here E_t is conditional dynamic expectation, here $T_t^{1-\alpha}$ is the technology, which is accumulated to produce output, \bar{R}_t again is the marginal efficiency of capital, but yet it is some R&D activity, here $a\bar{R}_t^2$ are R&D expenditures. Here, wL_t are the wages of the workers that influence the cash flow of the company, p_t is the price of the output, and $p_t L_t^\alpha T_t^{1-\alpha} = \pi$ is the profit of the firm. Abel used the Bellman equation to derive the expression for Tobin's q.

$$q_t = \frac{V(T_t, p_t) - E_{t-1} V(T_t, p_t)}{V(T_{t-1}, p_{t-1})} \quad (7)$$

Here E_{t-1} are the expectations from the past period, but E_{t-1} is multiplied by the present value of the firm, meaning that excess return are uncorrelated with any past information (Efficient market hypothesis). Here we set hypothesis that Tobin's q is more positively affected by the tangible capital i.e. physical capital, and that R&D. Actually, Tobin's q quotient was introduced as a measure

Democracy, other economic variables and stock market performance

Throughout literature there is no clear indication as how political regime impacts economic growth. Though democracy has very attractive features, this model of political organization may lead to inefficient policies and high levels of income redistribution, Acemoglu (2008)⁴⁵. As Barro (1999)⁴⁶ noted more democracy encourages rich to poor redistributions and may enhance the power of interest groups. Or as Barro (1997)⁴⁷ once again concludes the net effect of democracy on economic growth is inconclusive. When financial development in matters some papers find positive association between financial development and the quality of political institutions, but this result is conditioned by the quality of the institutional framework,

Ghardallou, Boudriga (2006)⁴⁸. On the other hand Yang (2011)⁴⁹, found out that democracy is not positively related to stock market development. Here is set hypothesis that the effect of democracy on Tobin's q is positive, since democracy affects positively on the financial institutions. As the measures for democracy here are used Freedom house political rights and Freedom house civil liberties. The effect of government size appears to be negatively associated with the financial efficiency but positively associated with the financial sector size in low income economies, in some recent studies, like the one of Cooray, (2011)⁵⁰. The hypothesis here is that the government consumption effect is positively associated with the Tobin's q.

Methodology

In this paper one can see that time series models and panel model had been used jointly. In the first section in order to see the long run coefficient and the causality between R&D and Tobin's q paper starts with the

43) Abel, B. Andrew (1984), "R & D and the Market Value of the Firm: A Note". In R & D, Patents and Productivity, edited by Zvi Griliches, (1984), 261 - 269.

44) Bellman equation has been used in economics amongst others also by Edmund Phelps, Robert Lucas, Sargent and others.

45) Acemoglu, D. (2008), Oligarchic versus democratic societies, Journal of the European Economic Association.

46) Barro, R. (1999), Determinants of Democracy, Journal of Political Economy 107(S6): 158-183.

47) Barro, R. (1996), Determinants of economic growth: a cross-country empirical study, NBER Workingpaper.

48) Ghardallou, Boudriga (2006), Financial Development and Democracy: Does the Institutional Quality Matter?,

49) Yang, B., (2011), "Does democracy foster financial development? An empirical analysis", Economic Letters, 112, pp.262-265.

50) Cooray, A. (2011). The role of the government in financial sector development. Economic Modeling, 28 (3), 928-938.

usual cointegration testing. From the cointegration test paper uses Johansen test for cointegration. This test it is well known that allows for more than one cointegration relationship. This approach is similar to augmented Dickey-Fuller test but it requires for VAR approach.

$$x_t = A_1 x_{t-1} + \varepsilon_t; \quad (8)$$

$$\Delta x_t = (A_1 - IdMATRIX) x_{t-1} + \varepsilon_t \quad (9)$$

$$\Delta x_t = v x_{t-1} + \varepsilon_t \quad (10)$$

$$v = (A_1 - IdMATRIX) \quad (11)$$

So in Johansen cointegrating relationship IDmatrix is identity matrix, A_1 is a $g \times g$ matrix, x_t and y_t are cointegrating vectors. The rank of v is the number of cointegrating relationships. After one determines the number of cointegrating relationships, one can use VECM model to capture the long run relationship between variables in the model. Vector Error Correction Models (VECM) are the basic VAR, with an error correction term incorporated into the model and as with bivariate cointegration, multivariate cointegration implies an appropriate VECM can be formed. We are estimating the error correction mechanism by using the lagged residuals u_{t-1} .

$$\Delta Y_t = \beta_0 + \beta_1 \Delta X_t - \beta_2 (Y_{t-1} - C - \beta X_{t-1}) \quad (12)$$

Now the error correction mechanism is:

$$EC = Y_{t-1} - C - \beta X_{t-1} \quad (13)$$

In the cointegrating regression

$$\begin{aligned} Y_t &= C + X_t + u_t \\ u_t &= Y_t - C - X_t \Rightarrow u_{t-1} = Y_{t-1} - C - \beta X_{t-1} \end{aligned} \quad (14)$$

u_{t-1} in the last expression represents error correction mechanism. And further in the second section there exist joint tests of IS-LM and IS-MP-IA framework with the Tobin's q paper uses GMM estimation i.e. well known Arellano-Bond estimation technique. In order to capture the long run as well short run effect, paper uses level independent as well as lagged independent variable. In order to test for the validity of restrictions one can use Sargan test. Next for the panel data section, this paper uses panel unit root test first. This test is of Fischer type and it is based on the augmented Dickey-Fuller test. Null hypothesis is that all panels contain unit root, alternative is that at least one panel is stationary. Next, to the unit root test panel cointegration tests have been performed in order to test for the long run relationship of the variables in the model. These tests were based on Westerlund (2007)⁵¹ procedure. Data used in this paper cover period from 1993 to 2011 for 12 countries⁵².

Johansen test for cointegration

This test⁵³ as noted before allows for more than one cointegrating relationship unlike Engle Granger, but it is a subject to asymptotic properties i.e. requires large sample⁵⁴. In this series of test for each country in the sample the null hypothesis is either $r(\Pi) = 0$ or $r(\Pi) = 1$ this depends on the power of the test. If there is evidence of cointegration, one can estimate the ECM using the lagged residuals u_{t-1}

$$\Delta Y_t = \beta_0 + \beta_1 \Delta X_t - \beta_2 (Y_{t-1} - C - \beta X_{t-1}) \quad (15)$$

51) Westerlund, J. (2007). *Testing for error correction in panel data*. Oxford Bulletin of Economics and Statistics 69: 709–748.

52) See Appendix 1 Definitions on some of the variables used in the models

53) Johansen, S., (1988), Statistical analysis of cointegration vectors, Journal of economic dynamics and Control

54) Though Johansen test for cointegration works and with not so small samples.

In the previous expression EC Mechanism^o ($Y_{t-1} - C - \beta X_{t-1}$). And in the cointegration regression one can get:

$$Y_t = C + \beta X_t + u_t, u_t = Y_t - C - \beta X_t \Rightarrow u_{t-1} = Y_{t-1} - C - \beta X_{t-1} \Rightarrow u_{t-1} \equiv \text{EC mechanism} \quad (16).$$

The results prove that for every country in the sample there exist one cointegrating relationship between Tobin's q and knowledge absorption as proxy for R&D. The results are presented in the following table.

Table 1 Johansen test for cointegration

Country	Null hypothesis	Variables	Deterministic term	Johansen Trace test			Decision
				Lag order	Trace statistics	5% critical value	
Bulgaria	$rc(\Pi) = 0$	$q_t \text{ knowledgeabsorption}_t$	Constant	1	16.6237*1	15.41	Reject the null hypothesis that cointegration rank is zero, and accept alternative that cointegration rank is 1
Croatia	$rc(\Pi) = 1$	$q_t \text{ knowledgeabsorption}_t$	Constant	1	3.7365*	3.76	Insufficient evidence to reject the null hypothesis that cointegration rank is 1.
Czech Republic	$rc(\Pi) = 0$	$q_t \text{ knowledgeabsorption}_t$	Constant	1	0.5846*	3.76	Insufficient evidence to reject the null hypothesis that cointegration rank is 1.
Estonia	$rc(\Pi) = 1$	$q_t \text{ knowledgeabsorption}_t$	Constant	2	3.0070*	3.76	Insufficient evidence to reject the null hypothesis that cointegration rank is 1.
Hungary	$rc(\Pi) = 1$	$q_t \text{ knowledgeabsorption}_t$	Constant	2	0.0367	3.76	Insufficient evidence to reject the null hypothesis that cointegration rank is 1.
Macedonia	$rc(\Pi) = 1$	$q_t \text{ knowledgeabsorption}_t$	Constant	1	3.5754*	3.76	Insufficient evidence to reject the null hypothesis that cointegration rank is 1.
Moldova	$rc(\Pi) = 1$	$q_t \text{ knowledgeabsorption}_t$	Constant	2	14.5442*	15.41	Insufficient evidence to reject the null hypothesis that cointegration rank is 1.
Romania	$rc(\Pi) = 1$	$q_t \text{ knowledgeabsorption}_t$	Constant	2	13.3169*	15.41	Insufficient evidence to reject the null hypothesis that cointegration rank is 1.
Russian Federation	$rc(\Pi) = 0$	$q_t \text{ knowledgeabsorption}_t$	Constant	2	18.1933	15.41	Reject the null hypothesis that cointegration rank is zero, and accept alternative that cointegration rank is 1
Slovak Republic	$rc(\Pi) = 1$	$q_t \text{ knowledgeabsorption}_t$	Constant	2	0.97	3.76	Insufficient evidence to reject the null hypothesis that cointegration rank is 1.
Slovenia	$rc(\Pi) = 1$	$q_t \text{ knowledgeabsorption}_t$	Constant	1	1.16*	3.76	Insufficient evidence to reject the null hypothesis that cointegration rank is 1.
Ukraine	$rc(\Pi) = 1$	$q_t \text{ knowledgeabsorption}_t$	Constant	2	1.8507	3.76	Insufficient evidence to reject the null hypothesis that cointegration rank is 1.

After one had determined the number of cointegrating relationship, the analysis can continue to the Vector Error correction model, i.e. determining long run coefficient between Tobin's q and R&D.

Table 2 VECM models

Country	Cointegration vectors	Interpretation of cointegrating vector
Bulgaria	$q_t = \frac{0.62}{(-3.14)} \log \text{knowledgeabsorbtione}_t + ec_t^{FCLS}$	1 percentage point increase in payments for royalties and licence fees would lead to an increase of the Tobin's q by 0.0062%
Croatia	$q_t = \frac{0.077}{(0.96)} \log \text{knowledgeabsorbtione}_t + ec_t^{FCLS}$	t-stat lower than 1.61 proves that between knowledge absorption variable and Tobin's q do not exist cointegration relationship.
Czech Republic	$q_t = \frac{3.42}{(2.89)} \log \text{knowledgeabsorbtione}_t + ec_t^{FCLS}$	1 percentage point increase in payments for royalties and licence fees would lead to an decrease of the Tobin's q by 0.0342%
Estonia	$q_t = \frac{2.23}{(9.10)} \log \text{knowledgeabsorbtione}_t + ec_t^{FCLS}$	1 percentage point increase in payments for royalties and licence fees would lead to an decrease of the Tobin's q by 0.0023%
Hungary	$q_t = \frac{14.7}{(-2.94)} \log \text{knowledgeabsorbtione}_t + ec_t^{FCLS}$	1 percentage point increase in payments for royalties and licence fees would lead to an increase of the Tobin's q by 0.1470%
Macedonia	$q_t = \frac{1.21}{(-4.47)} \log \text{knowledgeabsorbtione}_t + ec_t^{FCLS}$	1 percentage point increase in payments for royalties and licence fees would lead to an increase of the Tobin's q by 0.0121%
Moldova	$q_t = \frac{7.49}{(3.21)} \log \text{knowledgeabsorbtione}_t + ec_t^{FCLS}$	1 percentage point increase in payments for royalties and licence fees would lead to an decrease of the Tobin's q by 0.0749%
Romania	$q_t = \frac{1.60}{(3.11)} \log \text{knowledgeabsorbtione}_t + ec_t^{FCLS}$	1 percentage point increase in payments for royalties and licence fees would lead to an decrease of the Tobin's q by 0.016%
Russian Federation	$q_t = \frac{0.66}{(5.12)} \log \text{knowledgeabsorbtione}_t + ec_t^{FCLS}$	1 percentage point increase in payments for royalties and licence fees would lead to an increase of the Tobin's q by 0.0066%
Slovak Republic	$q_t = \frac{0.32}{(3.42)} \log \text{knowledgeabsorbtione}_t + ec_t^{FCLS}$	1 percentage point increase in payments for royalties and licence fees would lead to an decrease of the Tobin's q by 0.0032%
Slovenia	$q_t = \frac{0.079}{(3.34)} \log \text{knowledgeabsorbtione}_t + ec_t^{FCLS}$	1 percentage point increase in payments for royalties and licence fees would lead to an increase of the Tobin's q by 0.00079%
Ukraine	$q_t = \frac{0.06}{(3.24)} \log \text{knowledgeabsorbtione}_t + ec_t^{FCLS}$	1 percentage point increase in payments for royalties and licence fees would lead to an increase of the Tobin's q by 0.00006%

Note: *** statistical significance at all levels of significance; ** statistical significance at 5%; * statistical significance at 10%

Positive sign on the independent variable means absence of long term positive association, and instead one should look for a short term relationship between variables. According to the results from the table, there exists positive association between Tobin's q and R&D in Bulgaria, the coefficient is positive **0.62** and significant at levels of statistical significance. In Croatia the coefficient is positive though is statistically insignificant. This proves that between R&D and Tobin's q there does not exist long run association. In Czech Republic marginal contribution of R&D to Tobin's q is negative. The coefficient is large -3.42, it means that on long run 1 percentage point increase in Royalty and license fees payments would decrease Tobin's q by **0.0342%**. In Estonia the coefficient is also negative. For Estonia, one can conclude that 1 percentage point increase in Royalty and license fees payments would decrease Tobin's q by **2.23 %**. In Hungary marginal contribution of knowledge absorption to Tobin's q is huge and the coefficient proves that 1 percentage point increase in R&D would lead to **0.1470%** increase in the ratio between market value and replacement value

of enlisted companies. In Macedonia, as the VECM model proves 1 percentage point increase in R&D investment would lead to **0.0121%** increase in the Tobin's q of enlisted companies. In Moldova marginal contribution of R&D investment to Tobin's q is negative 1 percentage point increase in R&D investment lowers the q quotient by **0.049 %**. In Romania 1 percentage point increase in R&D investment lowers the q quotient by **0.0160 %**. In Russian federation 1 percentage point increase in R&D investment increase the q quotient by **0.0066 %**.

In Slovak Republic 1 percentage point increase in R&D investment lowers the Tobin's q by **0.0032 %**. In Slovenia 1 percentage point increase in the R&D investment leads to an increase of the Tobin's q by **0.00079%**. In Ukraine 1 percentage point increase in payments for royalties and licence fees would lead to an increase of the Tobin's q by **0.0006%**. So from the results the association between R&D investment and Tobin's q only in Croatia is not significant. So from the countries in sample in six countries the result is positive and in five countries the association is negative. In the countries where the sign on the coefficient is negative policy implication would be that the R&D policy should develop more, and that the current state of that policy is underdeveloped.

Or that this policy does not exist at all. In Czech Republic the funding system was also obsolete. So in general the result is inconclusive whether the investment in R&D affects positively on Tobin's q. This finding is consistent with the notion that there exist U-shaped association between R&D intensity and firm value i.e. there exist diminishing marginal return to each unit of money spent on R&D, Huang, Liu (2006)⁵⁵. In the next table are published the results for the average Tobin's q for selected countries in the sample. Tobin's q is derived in a following way:

$$\text{Tobin's } q = \frac{\text{Market value of the installed capital}}{\text{Replacement cost of the capital}} = \frac{\text{Market capitalization of listed companies}}{\text{Adjusted savings: consumption of fixed capital}} \quad (17)$$

Table 3 Tobin's q for the selected countries in the sample⁵⁶

Year/Country	Bulgaria	Croatia	Czech Republic	Estonia	Hungary	Macedonia
1993	n.a.	n.a.	n.a.	n.a.	0.90	n.a.
1994	0.87	n.a.	0.976675	n.a.	0.93	n.a.
1995	0.76	0.91	1.01	n.a.	0.94	n.a.
1996	0.71	0.98	1.02	n.a.	0.98	0.90
1997	1.02	1.00	1.00	1.03	1.02	0.79
1998	0.96	0.99	1.00	0.99	1.02	0.79
1999	0.95	0.98	1.00	1.05	1.03	0.79
2000	0.95	0.99	1.00	1.05	1.02	0.79
2001	0.96	0.98	0.99	1.03	1.01	0.88
2002	0.99	0.99	1.00	1.05	1.01	0.94
2003	1.00	1.00	1.00	1.06	1.01	0.96
2004	1.02	1.01	1.01	1.07	1.03	0.96
2005	1.04	1.03	1.02	1.03	1.03	0.98
2006	1.07	1.06	1.02	1.05	1.04	1.00
2007	1.02	1.09	1.03	1.04	1.04	1.03
2008	1.01	1.04	1.01	0.98	0.99	0.97
2009	1.00	1.05	1.01	0.99	1.01	0.97
2010	1.01	1.05	1.01	0.99	1.01	0.96
2011	1.02	1.05	1.00	0.96	1.00	0.95

55) Huang, C. J., & Chun J. L. (2006). Exploration for the Relationship Between Innovation, IT and Performance, Journal of Intellectual Capital 6(2): 237-252

Table 3 continued Tobin's q for the selected countries in the sample

Year/Country	Moldova	Romania	Russian Feder.	Slovak Rep.	Slovenia	Ukraine
1993	n.a.	n.a.	0.68	n.a.	n.a.	n.a.
1994	n.a.	0.81	0.77	0.95	0.93	n.a.
1995	n.a.	0.84	0.93	0.94	0.89	n.a.
1996	0.93	0.81	0.97	0.96	0.92	n.a.
1997	0.95	0.92	1.03	0.95	0.96	0.96
1998	0.94	0.93	0.97	0.92	0.98	0.88
1999	0.94	0.93	1.05	0.92	0.98	0.93
2000	n.a.	0.91	1.03	0.93	0.99	0.95
2001	n.a.	0.94	1.05	0.94	0.99	0.93
2002	n.a.	0.96	1.06	0.94	1.01	0.97
2003	n.a.	0.96	1.08	0.95	1.02	0.98
2004	n.a.	0.99	1.08	0.96	1.03	1.01
2005	n.a.	1.00	1.10	0.96	1.02	1.04
2006	n.a.	1.02	1.12	0.96	1.04	1.06
2007	n.a.	1.02	1.12	0.97	1.06	1.09
2008	n.a.	0.98	1.06	0.95	1.02	1.02
2009	n.a.	1.00	1.10	0.95	1.02	1.01
2010	n.a.	1.01	1.10	0.94	1.01	1.04
2011	n.a.	0.98	1.09	0.94	0.99	1.01

From the tables one can see that the average Tobin's q quotient for the selected countries move s around 1, i.e. the market value is almost equal to replacement value of capital. Next, in a table descriptive statistics of some of the variables it has been published.

Table 4 Descriptive statistics of the variables in the model

Variable	Mean	Standard deviation	Minimum	Maximum	Observations
Tobin's q overall	0.823819	0.372374	0.0	1.286.911	N = 228
between		0.230658	0.2	1.042.841	n = 12
within		0.299463	-0.2	1.591.731	T = 19
R&D overall	562.848	0.290129	5.0	6.013.715	N = 228
between		0.097486	544349.0	5.747.852	n = 12
within		0.274636	4884992.0	6.068.262	T = 19
Government consumption overall	9.085.602	2.535.866	4.8	19.28	N = 216
between		211.436	5351111.0	1.389.778	n = 12
within		1.521.047	5725602.0	155.806	T = 18
Inflation overall	4.840.662	1.823.138	6.7	91.2	N = 216
between		1.370.293	2878222.0	7.357.944	n = 12
within		1.262.774	1501717.0	8.119.662	T = 18
Log Real GDP overall	9.111.734	0.660963	7290968.0	1.020.836	N = 216
between		0.649226	7568224.0	9.897.315	n = 12
within		0.220691	8587443.0	9.579.037	T = 18
Investment overall	0.085839	0.272361	-1.0	0.811422	N = 216
between		0.036422	0.0	0.135191	n = 12
within		0.270109	-1.0	0.785633	T = 18
Interest rate overall	3.197.315	1.039.439	492849.0	1443.61	N = 221
between		2.371.037	8687191.0	8.870.354	n = 12
within		101.359	-4739956.0	1386.88	T-bar = 18.4167
Log of M2 overall	3.695.929	0.475326	2424803.0	4.422.449	N = 225
between		0.310588	3355081.0	4.150.556	n = 12
within		0.371439	2765651.0	4.643.561	T = 18.75

From the above table one can see that the average value of Tobin's q overall is 0.82. The other variables statistics is presented in the table. In the descriptive statistics table also information are available for interest rate, monetary aggregate M2, investment and logarithm of real GDP, as well as inflation. Next in a table are presented results from panel unit root test.

Table 5 Panel Unit root test Fisher test Based on Augmented Dickey Fuller

Ho: All panels contain unit roots	Ha: At least one panel is stationary	Statistic	p-value	Decision	transformation required
Tobin's q	Inverse P chi-squared(24)	387,2395	0.000	Accept alternative hypothesis: At least one panel is stationary	none
R&D	Inverse P chi-squared(24)	694.394	0.000	Accept alternative hypothesis: At least one panel is stationary	none
Inflation	Inverse P chi-squared(24)	391.261	0.0265	Accept alternative hypothesis: At least one panel is stationary	Cross-sectional means removed
Log of Real GDP	Inverse P chi-squared(24)	523.633	0.0007	Accept alternative hypothesis: At least one panel is stationary	Cross-sectional means removed
Government consumption	Inverse P chi-squared(24)	512.302	0.001	Accept alternative hypothesis: At least one panel is stationary	none
Logarithm of M2	Inverse P chi-squared(24)	473.332	0.003	Accept alternative hypothesis: At least one panel is stationary	Cross-sectional means removed
Lending interest rate	Inverse P chi-squared(24)	235.156	0.000	Accept alternative hypothesis: At least one panel is stationary	none
World interest rate	Inverse P chi-squared(24)	81.178	0.000	Accept alternative hypothesis: At least one panel is stationary	none
Investment	Inverse P chi-squared(24)	130.767	0.000	Accept alternative hypothesis: At least one panel is stationary	none

From the above table one can see that in all cases with every variable one can reject the null hypothesis of unit root and accept alternative that at least one panel is stationary. Some variables ask for removal of cross sectional means otherwise no transformations are necessary.

In the next table are reported results for the panel cointegration test. Westerlund (2007)⁵⁷ test uses the following specification:

$$\Delta y_{it} = c_i + a_{i1} * \Delta y_{it-1} + a_{i2} * \Delta y_{it-2} + \dots + a_{ip} * \Delta y_{it-p} + b_{i0} * \Delta x_{it} + b_{i0} * \Delta x_{it-1} + \dots + \Delta x_{it-p} + a_i (y_{it-1} - b_i * x_{it-1}) + u_{it} \quad (18)$$

The speed of convergence in the ECM mechanism is :

$$y_{it} = - \left(\frac{b_i}{a_i} \right) * x_{it} \quad (19)$$

G_a and G_t statistics test: $H_0: a_i = 0 \forall i$ and $H_1: a_i < 0$ for at least one i . The Pa and Pt test statistics pool information over all the cross-sectional units to test $H_0: a_i = 0$ and $H_1: a_i < 0$ for all i

Table 6 Panel cointegration test Westerlund (2007) specification

variables	model set up	constant	trend	Gt	Ga	Pt	Pa	decision	Average AIC selected lag and lead lag length
tobin's q-R&D	lags(1 3) leads(0 3) lrwindow(3) westerlund	✓	✓	0.0000	0.0001	0.0000	0.0000	reject null hypothesis of no cointegration	2.08 and 2.83
tobin's q-Log of M2	lags(1 3) leads(0 3) lrwindow(3) westerlund	✓	✓	0.0000	0.0510	0.0680	0.1780	reject null hypothesis of no cointegration	2.5 and 2.08
tobin's q-Freedom house political rights	lags(1 3) leads(0 3) lrwindow(3) westerlund	✓	✓	0.0000	0.0000	0.0000	0.0000	reject null hypothesis of no cointegration	2.17 and 2.58
tobin's q-Freedom house civil liberties	lags(1 3) leads(0 3) lrwindow(3) westerlund	✓	✓	0.0000	0.896	0.0000	0.0000	reject null hypothesis of no cointegration	2.5 and 2.08
tobin's q-investment	lags(1 3) leads(0 3) lrwindow(3) westerlund	✓	✓	0.0000	0.065	0.0000	0.0130	reject null hypothesis of no cointegration	2.5 and 1.67
tobin's q-log natural output (centered moving average with 3 interval)	lags(1 3) leads(0 3) lrwindow(3) westerlund	✓	✓	0.0000	0.0000	0.0000	0.0000	reject null hypothesis of no cointegration	2.25 and 2.5

From the above table on can see that tobin's q is cointegrated with all of the variables. Of special importance is the notion that there is clear evidence of cointegration between tobins'q and R&D. Thus, there exist evidence of the long run relationship between innovations and Tobin's q.

Next, in a table is presented augmented model with democracy related variables and economic variables. Model specification is as follows:

$$q_{it} = C + \beta_0 \log R\&D_{it} + \beta_1 \log R\&D_{it(-1)} + \beta_2 FHPR_{it} + \beta_3 FHPR_{it(-1)} + \beta_4 FHCL_{it} + \beta_5 FHCL_{it(-1)} + \beta_6 \pi_{it} + \beta_7 \pi_{it(-1)} + \beta_8 \log GY_{it} + \beta_9 \log GY_{it(-1)} + \varepsilon_{it} \quad (20)$$

Table 7 Democracy and economic variables related with Tobin's q

Dependent variable	Tobin's q	Model 1 Coefficient (statistical significance)	Model 2 Coefficient (statistical significance)
Dependent variables Lag(1)	0.554***	0.561***	
Logknowledge absorption	Logarithm of knowledge absorption (proxy for R&D)	0.152***	0.16***
Lag(1)		-0.036	-0.03
FH_PR	Freedom House political rights index	0.018***	-
Lag(1)		-0.010	-
FH_CL	Freedom house civil liberties index	-	0.005
Lag(1)		-	0.019*
π_{it}	Inflation (percentage change in prices)	-0.0009	-0.001
Lag(1)	0.0034	0.002	
logGY _{it}	Government consumption	0.028*	0.018
Lag(1)		-0.001	-0.001
C	Constant	-0.640	-0.575
Arellano-Bond test for AR(1) in first differences ;p-value		0.0331	0.0308
Arellano-Bond test for AR(2) in first differences ;p-value		0.2112	0.6947

Note: *** statistical significance at all levels of significance,** statistical significance at 5%,*statistical significance at 10%.

From the above table one can see that there exist positive association between q and Freedom house political rights on long run, thus on short run coefficient is insignificant. Freedom house civil liberties coefficient is positive and significant on short run. Inflation is insignificant in relation with Tobin's q. While coefficient on government consumption is positive and significant on long run. R&D i.e. logarithm of knowledge absorption variable, is positive and significantly associated with the Tobin's q in long run. Next, Tobin's q is presented in traditional Keynesian IS-LM form. Specification for this models is as follows:

$$\left(\frac{q_{it} - q_{it-1}}{q_{it-1}} \right) = C + \beta_0 (q_{it} - q_{it-1}) + \beta_1 \log R\&D_{it-1} + \beta_2 m2_{it} + \beta_3 m2_{it-1} + \beta_4 i^r_{it} + \beta_5 i^r_{it-1} + \varepsilon_{it} \quad (21)$$

Table 8 IS LM model framework for Tobin's q

Dependent variable	Investment (Percentage change in physical capital)	Model 1 (Coefficient significance)	Model 2(Coefficient significance)	Model 3(Coefficient significance)
Dependent variables		0.072	0.020	0.0118
Lag(1)				
qminusqhat	Residual tobins'q	0.318***	0.380***	0.388***
Lag(1)		-0.392	0.229***	0.070
lrgdphat	Natural output (fitted values)	0.806**	-	-
Lag(1)		-1.153***	-	-
lognatural outputma3	Natural output(centered moving average with 3 periods)	-	0.0006	-
Lag(1)		-	0.0010***	-
Lognatural outputma5	Natural output(centered moving average with 5 periods)	-	-	-0.00049
Lag(1)		-	-	0.00041**
M2	Money andquasimoney (M2) as % of GDP	-0.009***	-0.401***	-0.220***
Lag(1)		0.006**	0.162***	0.287***
i^r	Lending interest rate	-0.003***	-0.0019***	-0.003***
Lag(1)		0.001	0.0008	0.001
C	Constant	0.564***	0.820***	-0.059
Sargan test H_0 : overidentifying restrictions are valid ;p-value		0.1224	0.0708	0.3517

Note: *** statistical significance at all levels of significance,** statistical significance at 5%,*statistical significance at 10%.

Dependent variable is percentage change in capital i.e. investment, as for natural output here it has been used centered moving average of logarithm of real GDP with 3 and 5 periods. Residual q is positively associated with investment, on long run and in short run when one controls for natural output with centered moving average with three periods. Money and quasi money are negatively associated with the investment on long run, though they are insignificant on short run. Money supply is positively and statistically significantly associated with investment when lagged once. Lending interest rate is negatively associated with the investment on long run and this result is statistically significant. Natural output is positively and statistically significantly associated with investment. Next Tobin's in IS-MP-IA framework has been tested. Specification Form is as follows:

$$\begin{aligned} \log \text{RGDP}_{it} = & C + \beta_0 q_{it} + \beta_1 q_{it(-1)} + \beta_2 \log \text{GY}_{it} + \beta_3 \log \text{GY}_{it(-1)} + \beta_4 \log \text{CY}_{it} + \beta_5 \log \text{CY}_{it(-1)} + \\ & \beta_6 \pi_{it} + \beta_7 \pi_{it(-1)} + \beta_8 \log \text{ER}_{it} + \beta_9 \log \text{ER}_{it(-1)} + \beta_{10} \log \text{R}^{\text{W}}_{it} + \beta_{11} \log \text{R}^{\text{W}}_{it(-1)} + \beta_{12} \log \text{Y}^{\text{W}}_{it} + \\ & \beta_{13} \log \text{Y}^{\text{W}}_{it(-1)} + \varepsilon_{it} \end{aligned} \quad (22)$$

Table 9 IS MP IA model and testing whether Ricardian equivalence holds

Dependent variable	log of Real GDP per capita (logRGDP _{it})	Model 1(Coefficient significance)	Model 2(Coefficient significance)
Dependent variables Lag(1)		0.8013***	0.644***
q	Market value/replacement value	0.0223*	0.005
Lag(1)		0.0114	0.005
logGY _{it}	Log of government consumption	-0.1048***	-0.092***
Lag(1)		-0.0078	0.047***
logCY _{it}	Log of private consumption	-	0.515***
Lag(1)		-	-0.297***
Logπ ^e _{it}	Log of expected inflation	-0.0341	-0.034*
Lag(1)		-0.0354	0.001
logER ^e _{it}	Expected exchange rate, log	-0.0156	-0.010
Lag(1)		0.0520*	0.075***
R ^w	World interest rate = US federal funds rate minus PPI	-0.0020***	-0.001
Lag(1)		-0.0014***	-0.001***
Y ^w	World output, log	0.8536***	0.247*
Lag(1)		-0.6041***	-0.096
Constant		-0.5363	-3.634
Sargan test H ₀ : overidentifying restrictions are valid ;p-value		0.0000	0.0315

Note: *** statistical significance at all levels of significance; ** statistical significance at 5%; * statistical significance at 10%.

Romer (2000)⁵⁸, proposed an alternative to the IS-LM model and AS-AD model. This model makes assumption that Central banks in the world follow interest rate rule rather than targeting money supply. This model is known as AD-IA, or aggregate demand inflation adjustments model. So this model uses expected inflation, that is inflation lagged once, when one makes inflation adjustment. In the Romer's approach aggregate demand relates to output and inflation. According to Romer (2000), target rate equals to last period inflation. This assumption also means that inflation rises when output is above its own natural rate, and inflation falls when output is below its natural rate. Dependent variable in the IS-MP-IA model is logarithm of Real GDP. Tobin's q is positively and statistically significantly associated with the logarithm of real GDP when private

58) Romer, D.,(2000),*Keynesian macroeconomics without the LM curve*, Journal of Economic Perspectives—Volume 14, Number 2—Spring 2000—Pages 149

consumption is not in the model. Government consumption is negatively associated with the logarithm of real GDP, which means that for these countries fiscal prudence is needed. Expected exchange rate is positively associated with logarithm of real GDP lagged once (on short run). World interest rate is negatively associated with the logarithm of real GDP. Lagged once coefficient is even more significant for this variable. World output is positively associated with the logarithm of real GDP on long run, and lagged once is negatively associated, though in the second models is insignificant. Expected inflation is negatively and statistically significantly associated with the logarithm of real GDP in the second model on long run. Government consumption is not insignificant in the presence of private consumption, so one can conclude that for these countries Ricardian equivalence does not hold. For a graphical depiction of these models see Appendix 2⁵⁹.

Conclusion

From this paper we concluded that there exist positive and statistically significant relationship between Tobin's q and investment in R&D, or as we name it, knowledge absorption, according to the Global Innovation Index 2012⁶⁰. The small size of the coefficient is being interpreted as evidence in support of the hypothesis that Tobin's q is being influenced by the increase of physical capital more than by investment in intangible capital or R&D which consists mainly of expenditures on the wages of scientists. This is one of important conclusion from this paper. Second, conclusion is that on average higher level of democracy does induce more positive stock market outcomes. This means that higher level of democracy thus induce higher ratio of Tobin's q. Government consumption is positively associated with the average Tobin's q. Cointegration tests by country prove the positive association between R&D investment and Tobin's q for 6 countries. Also, panel cointegration tests prove that Tobin's q does have long run relationships with the following variables: R&D, logarithm of M2, Freedom house political rights and civil liberties, investment, and logarithm of natural output. Tobin's q was tested in the IS-LM framework and in the more recent IS-MP-IA model and the results were as expected. From the results in the IS-MP-IA model also, relatively low world real interest rates and the expected world economic recovery would help increase real GDP whereas expected real depreciation of the national currencies of the countries in the panel would have negative effect on the real GDP. The estimation results suggest that the change of the effective exchange rate affects output positively (lagged once), while the change of the world interest rate affects output negatively or it does not affect the output at all, i.e. that variable is insignificant.

Appendix 1 Definitions on some of the variables used in the models

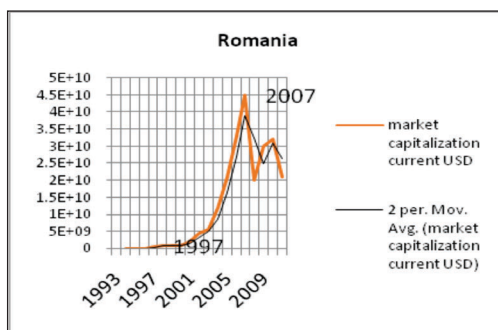
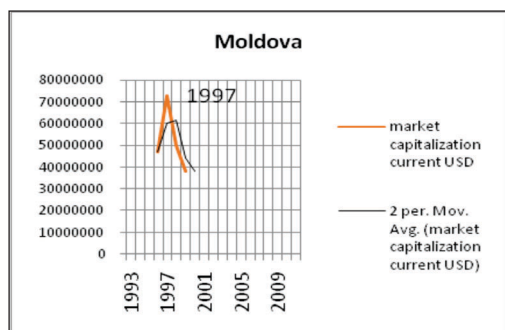
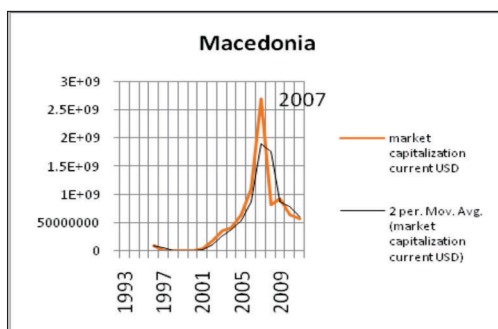
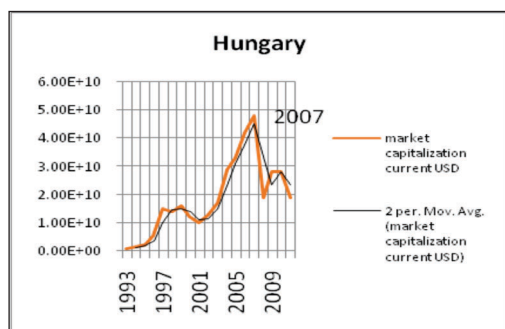
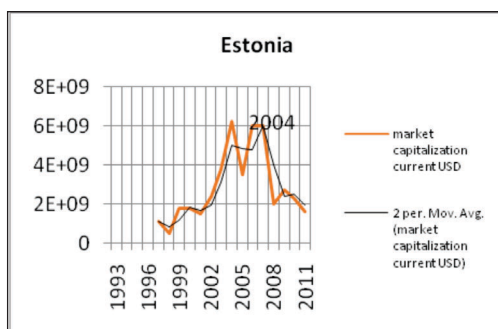
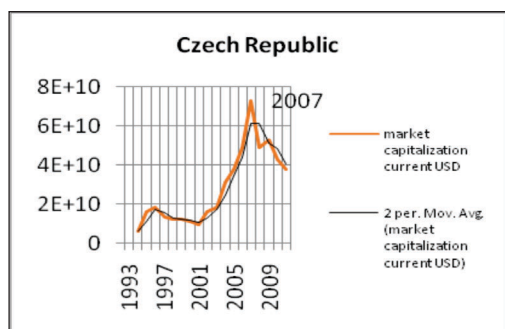
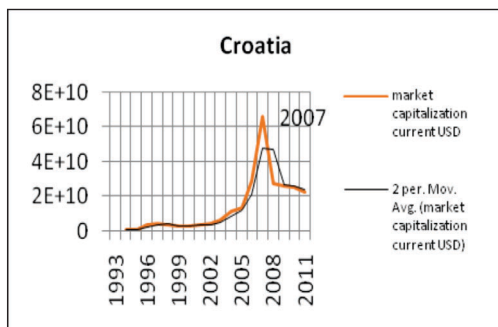
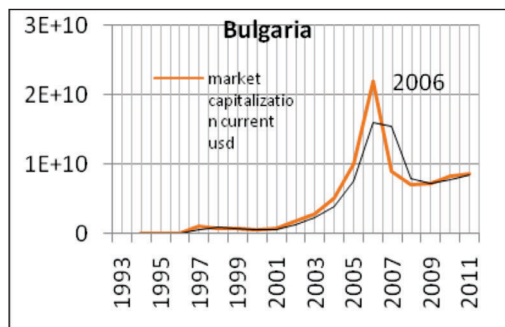
Name of the variable	Variable label
Market capitalization of listed companies (current US\$) (also known as market value)	Market capitalization (also known as market value) is the share price times the number of shares outstanding. Listed domestic companies are the domestically incorporated companies listed on the country's stock exchanges at the end of the year. Listed companies does not include investment companies, mutual funds, or other collective investment vehicles. Data are in current U.S. dollars.
Adjusted savings: consumption of fixed capital (current US\$) (Replacement value)	Consumption of fixed capital represents the replacement value of capital used up in the process of production.

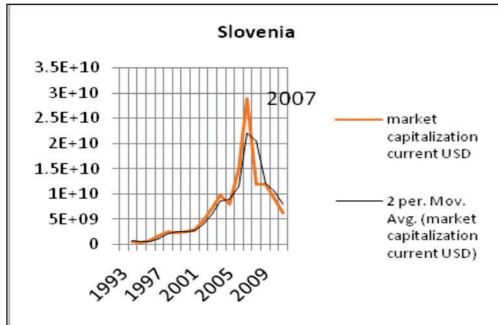
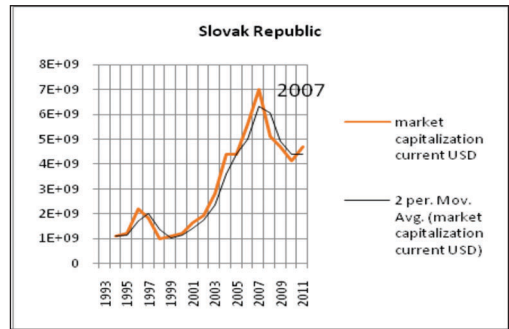
59) Appendix 3 R&D and Tobin's q, democracy and Tobin's q and IS-LM model

60) <http://www.globalinnovationindex.org/gii/>

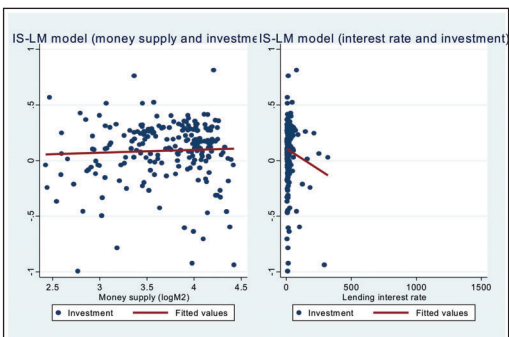
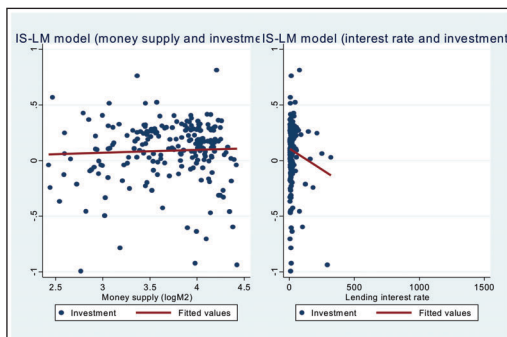
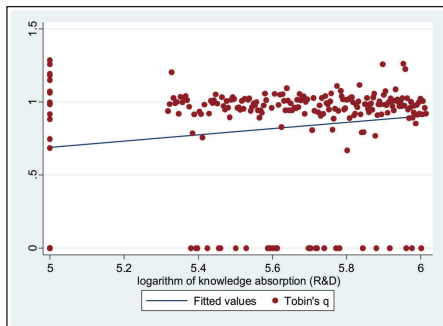
Royalty and license fees, payments (BoP, current US\$) (knowledge absorption)-(R&D)	Royalty and license fees are payments and receipts between residents and nonresidents for the authorized use of intangible, nonproduced, nonfinancial assets and proprietary rights (such as patents, copyrights, trademarks, industrial processes, and franchises) and for the use, through licensing agreements, of produced originals of prototypes (such as films and manuscripts). Data are in current U.S. dollars.
Freedom house political rights (FH_PR)	Since 1972 (1978 in book form), Freedom House publishes an annual report, Freedom in the World, on the degree of democratic freedoms in nations and significant disputed territories around the world, by which it seeks to assess the current state of civil and political rights on a scale from 1 (most free) to 7 (least free).
Freedom house political rights (FH_PR)	Since 1972 (1978 in book form), Freedom House publishes an annual report, Freedom in the World, on the degree of democratic freedoms in nations and significant disputed territories around the world, by which it seeks to assess the current state of civil and political rights on a scale from 1 (most free) to 7 (least free).
Government consumption (gov.cons) (% of GDP)	General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation.
Inflation (annual %)	Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency.
World interest rate	World interest rate is derived when US Federal funds rate is subtracted by the Producer Price Index in US manufacturing, which proxies for US inflation. This variable proxies for monetary policy conditions, same as exchange rate does. Data on US federal funds rate and US Producer Price Index for all commodities (which served for world interest rate derivation) are obtained by the FRED (Federal Reserve Bank of St.Louis) data base
World output	World output production of world GDP

Appendix 2 Market capitalization of firms in stock markets in CESEE countries





Appendix 3 R&D and Tobins'q, democracy and Tobins' q and IS-LM model



References

- Abel, B. Andrew (1984), "R & D and the Market Value of the Firm: A Note". In R & D, Patents and Productivity, edited by Zvi Griliches, (1984), 261 - 269.
- Acemoglu, D. (2008), **Oligarchic versus democratic societies**, Journal of the European Economic Association.
- Akerlof, George, (2007), Missing motivation in macroeconomics, American Economic Review, 2007, vol. 97, issue 1, pages 5-36
- Arrow, K.J. (1962). "The Economic Implications of Learning by Doing," American Economic Review, May 96(2): pp. 308-312.
- Barro, R. (1996), **Determinants of economic growth: a cross-country empirical study**, NBER Working paper.
- Barro, R. (1999), **Determinants of Democracy**, Journal of Political Economy 107(S6): 158-183.
- Bronwyn H. Hall & Grig Thoma & Salvatore Torrisi, 2007. "The market value of patents and R&D: Evidence from European firms," NBER Working Papers 13426, National Bureau of Economic Research, Inc
- Cockburn, Iain & Griliches, Zvi, (1988). "Industry Effects and Appropriability Measures in the Stock Market's Valuation of R&D and Patents," American Economic Review, American Economic Association, vol. 78(2), pages 419-23, May
- Connolly, R., Hirschey, M., (2005), Firm size and the effect of R&D on Tobin's q, R&D Management 35. 2, 2005. © Blackwell Publishing Ltd, 2005. Published by Blackwell Publishing Ltd,
- Connolly, R., Hirschey, M., (1984), R & D, Market Structure and Profits: A Value-Based Approach, The Review of Economics and Statistics, Vol. 66, No. 4. (Nov., 1984), pp. 682-686.
- Contribution of Research and Development to Productivity Growth
- Cooray, A. (2011). **The role of the government in financial sector development**. Economic Modeling, 28 (3), 928-938.
- Damianova, K., (2005), The Conditional Value of R&D Investments, National Centre of Competence in Research Financial Valuation and Risk Management
- Ghardallou, Boudriga (2006), **Financial Development and Democracy: Does the Institutional Quality Matter?**,
- Griliches, Z. (1981), 'Market value, R&D and patents', Economics Letters, 7 (2), 183-187
- Griliches, Zvi (1979), R&D and Productivity: The Econometric Evidence, Chapter: Issues in Assessing the
- Hall, B., H. & Lerner, J. (2010). "The Financing of R&D and Innovation," UNU-MERIT Working Paper Series 012, United Nations University, Maastricht Economic and social Research and training centre on Innovation and Technology.
- Hall, B., (1998), Innovation and market value, University California Berkeley
- Huang, C. J., & Chun J. L. (2006). Exploration for the Relationship Between Innovation, IT and Performance, Journal of Intellectual Capital 6(2): 237-252
- Johansen, S., (1988), **Statistical analysis of cointegration vectors**, Journal of economic dynamics and Control
- Megna, P. and Klock, M. 1993. The Impact of Intangible capital on Tobin's q in the Semiconductor Industry, The American Economic Review 83(2): 265 – 269.
- Reprinted from Private Values and Public Policy, Essays in Honor of William Fellner, North-Holland, 1977
- Romer, D., (2000), **Keynesian macroeconomics without the LM curve**, Journal of Economic Perspectives—Volume 14, Number 2—Spring 2000—Pages 149
- Tobin J, and Brainard W.C. (1977), Asset Markets and the Cost of Capital, Cowles Foundation Paper 440
- Tobin, J (1969). "A general equilibrium approach to monetary theory". *Journal of Money Credit and Banking* 1 (1): 15–29
- Warusawitharana, M., (2008), Research and Development, Profits and Firm Value: A Structural Estimation, Division of Research and Statistics, Board of Governors of the Federal Reserve System
- Westerlund, J. (2007). **Testing for error correction in panel data**. Oxford Bulletin of Economics and Statistics 69: 709–748.
- Yang, B., (2011), **Does democracy foster financial development? An empirical analysis**, Economic Letters, 112, pp. 262-265.

UDC 338.124.4(100)

THE GLOBAL ECONOMIC CRISIS - WHAT SHOULD NOT BE FORGOTTEN

Borce Trenovski, PhD

Ss. Cyril and Methodius University in Skopje, Faculty of Economics - Skopje

e-mail: borce@eccf.ukim.edu.mk

Biljana Tashevska, PhD

Ss. Cyril and Methodius University in Skopje, Faculty of Economics - Skopje

e-mail: biljana@eccf.ukim.edu.mk

Suzana Makreshanska, PhD

Ss. Cyril and Methodius University in Skopje, Faculty of Economics - Skopje

e-mail: suzana@eccf.ukim.edu.mk

Abstract

The global economic crisis opened a new chapter in economic policy and awakened economic science. Its severity, the various negative financial and economic shocks and the impotence of the economic policy response revealed new questions about the background and the causes of the economic crisis – what led to the emergence of the global economic crisis, are the causes new or already known, are there similarities with previous crises? The great number of analyses regarding these questions reveals different aspects that complete the whole picture of the causes, factors and lessons about the crisis that need to be remembered. This paper tries to offer an analysis of the causes and factors that contributed to the global economic distress by analyzing the global economic events that accumulated in the pre-crisis period. The main purpose is to synthesize and define the key direct and indirect economic events and developments that need to be considered by economic science and policy and that must not be forgotten in further analyses of the global economic development in the future.

Keywords: *global economic crisis, financial system, global economic imbalances, real estate bubble*

Introduction

For almost three decades, the macroeconomic theory and policy had developed in an environment characterized by: maintaining macroeconomic and price stability; rational expectations of economic agents; limited incentives for real economic activity provided by active economic policy (especially fiscal policy); creation of macroeconomic models that incorporate policy creators' credibility, time inconsistency, rational expectations, monetary rules etc; development of the theory of public choice (political macroeconomics) and criticism of

the government involvement in the conduct of economic policy. This was all strengthened by the shorter and milder cyclical fluctuations after the II World war, and by the transition of many countries from centralist to market oriented economic systems. As a consequence, the economists began to believe in the omnipotence of the market mechanism and in the "invisible hand" and glorified capitalism, liberal ideas and market based economic system more and more. The global economic crisis emerged in an economic and social environment where economic theory and policy was dominated by neoliberal macroeconomic theories. In the autumn of 2007 the crisis announced changes in these relations.

Economic history has recorded a large number of economic crises. However, after the Great Depression of the early 1930s and the Second World War, the economists seemed to have forgotten about the consequences of economic crises and considered that Keynesian economic policy measures had defeated the crises. However, the fact is that every economic crisis has its own specifics, and hence, economic science once again stood confused before the global economic crisis. It took some time to implement the measures that point to history, to the Great depression and to Keynes. The debate about the role of the state in the society and economy and about a balancing approach between market and government was revived. On the other side, some authors point to reaching other extremes and to the consequences from the implemented measures (over borrowing, inefficient allocation of resources, tightened protectionism and regulation etc.) (see Schneider and Kirchgässner, 2009).

The global crisis began in 2007 opened a new chapter in economic policy and awakened the economic science. The various negative financial and economic shocks and the impotence of the economic policy response revealed new questions about the background and the causes of the economic crisis and about the market mechanism that supports and propagates them: what led to the emergence of the global economic crisis; are the causes new or already known, are there similarities with previous crises, have the economists forgotten the lessons that needed to be learned in the past?

The remainder of the paper is structured in the following way: the second part provides a short analysis and comparison of the recent global economic crisis with previous crises, followed by a detailed analysis and systematization of the specific reasons and factors behind the Global economic crisis of 2007. In the end the picture is completed with an elaboration of the evolution of the Global economic crisis, its transmission channels and mechanism.

2. Similarities with previous economic crises

The economic crisis that distressed the world economy was caused by a mixed set of factors, some of which are similar to past financial/economic crises, while others distinct the recent global crisis. Four characteristics link the recent crisis to previous crises: rise in asset prices up to unsustainable levels; credit booms that lead to excessive borrowing; appearance of systemic risk and the failure of regulation and supervision to keep pace with the crisis and to react in the moments of "eruption" (see Claessens et al., 2010).

Real estate and asset price bubbles – There was a sharp rise of prices on the real estate market in the USA and other markets before the crisis. This pattern of price bubbles is similar with the episodes of large financial crises in history. The real estate market boom in the USA during the five pre-crisis years, reaching the peak six quarters before the start of the crisis, is incredibly similar to past large banking crises in developed economies: Spain in 1977; Sweden in 1991; Norway in 1987; Finland in 1991 and Japan in 1992 (see Reinhart and Rogoff, 2008).

Credit booms – The lasting credit expansion in the USA before the crisis is similar to other crisis episodes, with the difference of the expansion now being concentrated in one segment – the mortgage market. The lasting episodes of fast credit growth mainly coincide large fluctuations in economic activity – real output, demand and investments grow above their long run trend during the credit boom and fall below the trend after the boom. In the credit growth phase, the current account deteriorates, often accompanied by a wave of private capital inflows, growth in real estate and real exchange rate (see Mendoza and Terrones,

2008). In such circumstances, the indebtedness (the debt compared to disposable income) of households in the USA increased sharply after 2000, mainly headed by mortgage growth, accompanied by historically low interest rates and support from financial innovations. Credit expansions are linked to crises through a rising leverage of borrowers (and investors) and falling credit standards – which was the case in several countries affected by the crisis (Spain, Iceland, Great Britain, some East European countries etc.).

Marginal loan⁶¹ and systemic risk – The household credit expansion was supported by the favorable macroeconomic conditions before the crisis. In the USA, a large portion of the mortgage expansion consisted of loans approved to users with limited credit history. That made credit institutions and credit users extremely vulnerable to adverse developments of credit and monetary circumstances and to changes in asset prices. In other countries, the large exposure to foreign currencies of the corporate and financial sector is a feature that is common with the Asian crisis. For example, some East European countries denominated a large portion of their domestic loans (including household loans) in foreign currencies (euro, dollar, Swiss franc, yen etc.), which made them especially vulnerable to the stability of their exchange rate and to macroeconomic shocks. We need to mention here also the enormous growth of financial derivatives markets (mortgage based securities etc.), the prices and payment of which depended on the assets they were backed by and on their price movements.

Regulation and supervision – The crises throughout the history have often been accompanied by expansions caused by financial liberalization without appropriate regulation and supervision. Like in the past, in developed economies in the recent crisis financial companies, investment banks and off budget securities were not subject to banking regulations. Shadow banking provided extremely large financial intermediation and grew without an adequate surveillance which led to higher systemic risk. As has happened before, during the recent crisis, the focus of the authorities was mainly on the liquidity and solvency of individual institutions, while the financial system as a whole (the global financial system as well) was neglected and the possibility and costs of systemic risk were underestimated.

3. Causes of the Global economic crisis – what should not be forgotten

The biggest financial and economic crisis in the last 80 years caused a wide debate. A significant number of studies, books and conferences analyze the causes for its emergence and search for a response of economic policy that would efficiently address the crisis. What can be concluded from the vast literature is that the causes that influenced the emergence of the Global economic crisis are similar, although there are disagreements about the relative importance and the order of their appearance and dependence.

According to Taylor (2009), the global crisis was caused by the expansive monetary policy in the USA and in Europe (where there is a correlation between the movements of interest rates of central banks), the relationship between monetary policy, stimulating government policies and the mortgage market problem, as well as the complicated financial architecture – securitization, rating agencies, financial innovations etc. Other authors find and empirically prove that imbalances in the world economy are the main cause of the crisis, accompanied by the inadequate regulation and supervision, while monetary policy according to them did not cause the decrease of interest rates and the emergence of the crisis (see Merrouche and Nier, 2010). A third group of authors seek the reasons in the changes on the financial markets since 1998, which were supposed to have beneficial effects for reducing the risk and for an efficient allocation of resources, but instead caused the opposite – a deep international integration of capital markets, the process of securitization, growth of hedge-funds and other private capital funds, financial derivatives and innovations – which reduced the transparency, increased the leverage and the systemic risk (see Swagel, 2009). Similarly, a fourth group of authors include three elements: the battle between financial innovations and regulation, the

61) Marginal loans are loans taken to finance an acquisition of securities (or in this case real estate or other assets). They are usually provided by companies (broker firms and other forms that work with securities and real estate) that are hired by the users to trade with the assets.

consumption boom from 2002 to 2007 and the financial internationalization accompanied by deregulation and global imbalances (see Schneider and Kirchgässner, 2009). A fifth group of authors include an expanded set of determinants – imbalances in the world economy, unsustainable credit boom, financial innovations and architecture, monetary policy, deregulation, speculations (see Carmassi, Gros and Micossi, 2009). Another group of authors discuss macroeconomic factors (global imbalances and monetary policy) and microeconomic factors (financial innovations, inadequate regulation, credit boom and low credit standards, inadequate corporative governance and motivation system in the financial sector) (see Mohanty, 2010). Some authors seek for wider reasons for the crisis (crisis makers) – economic experts that see the world through economic rationalism and neoliberalism, policy creators that implement that vision and popular interpreters that persuade us to believe in that vision (see Snooks, 2000). The most detailed structure of the causes of the global economic crisis is provided by Jickling (2010) and the members of the Congress Committee in the report for Congress titled *Causes of the Financial Crisis*, where they name 26 different causes. The causes detected by Jickling (2010) are placed in four main groups: global imbalances in the world economy; deregulation and regulation of financial markets and institutions; new financial architecture and the real estate market bubble. (see table 1).

Table 1 – Structure of the causes of the Global economic crisis

Key causes	Structure
Global imbalances in the world economy	Global financial flows in the recent years have been characterized by movements that are unsustainable in the long run: some countries (like, China, Japan, Germany) have current account surpluses, while other countries (USA, UK) have not only current account deficits, but also domestic deficits in the household and government sector.
Deregulation and regulation of financial markets and institutions	<ul style="list-style-type: none"> - Legislation on deregulation; - Relaxed leverage regulation (allowing investment banks to work with companies with high leverage); - Fragmented regulation of financial institutions; - Absence of a regulator of systemic risk (shadow banking, hedge funds, non-bank dealers of financial derivatives etc.).
New financial architecture	<ul style="list-style-type: none"> - Securitization; - Rating agencies; - Shadow banking; - Off balance financing; - Financial innovations and their complexity; - Failure of risk management systems:
Real estate market bubble	<ul style="list-style-type: none"> - Excessive leverage. - Incautious approval of mortgages; - Price growth (creation of bubbles) on the real estate markets to unsustainable levels; - Lack of transparency and accountability in the mortgage finance; - Directing the banks to become involved in imprudent mortgage finance by the government, aimed at helping low income groups.
Other causes	<ul style="list-style-type: none"> - Human weaknesses (limited rationality) - Inadequate computer models - „Black Swan“ theory

Based on the literature review on the different groups of causes that initiated the Global economic crisis, we can synthesize five groups of causes for which there is a consensus in the majority of the literature: macro-economic causes (imbalances in the world economy and relaxed monetary policy) and microeconomic causes (deregulation and inadequate regulation and supervision of the financial system, real estate market bubble and the modern financial architecture).

3.1 Imbalances of the global economy

The expansion of global imbalances is accompanied by a larger dispersion of positions of the current account and larger net foreign capital flows. The high capital inflows can reduce the financing costs of banks on international markets; they can decrease the long term interest rates, causing financial institutions to increase their exposure, and investors to "pursuit higher yields" and increase the aggregate credit supply in the domestic economy, causing higher asset (real estate) prices in the domestic economy. Even before the beginning of the crisis, some authors claimed that global imbalances, i.e. the global excess of savings over the excess of intended investments (so called „savings glut“), decrease the long term interest rate on a global level, including the USA (see Bernanke, 2005).

The excess liquidity on the global capital markets supports the large the current account imbalances among the dominant economies and regions in the world. In this case, current account deficits in the developed economies (the USA has the largest gap between savings and investments) are covered by large current account surpluses in the emerging economies (see chart no. 1, chart no. 2 and chart no. 3). The dominant share of the assets on the global capital markets come from the falling investments in the Asian economies, and from the growth of oil prices, which caused asset/finance inflows to the Middle East, Russia and other countries, that should have been spent rationally (see more in Obstfeld and Rogoff, 2009; Servén and Nguyen 2010).

Chart no. 1

Source: International Monetary Fund, World Economic Outlook Database, April 2012.

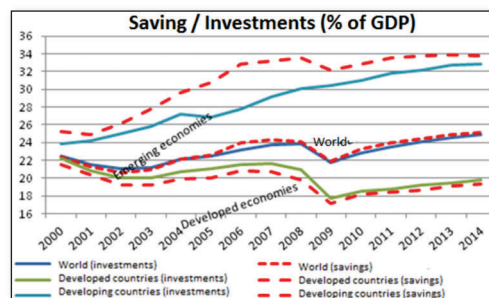


Chart no. 2

Source: International Monetary Fund, World Economic Outlook Database, April 2012.

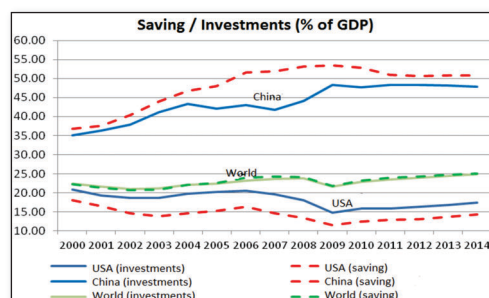
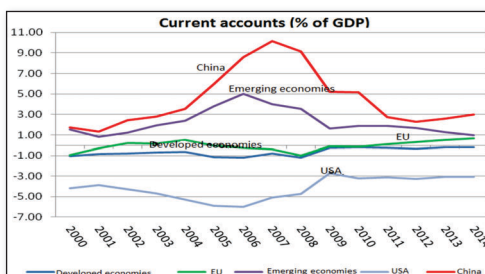


Chart no. 3

Source: International Monetary Fund, World Economic Outlook Database, April 2012.



Numerous analyses confirm the relationship between global imbalances and low global interest rates and their connection to financial imbalances in the economies (see Merrouche and Nier, 2010). Contrary to this opinion, other analyses claim the opposite, i.e. that the “key problem of the explanation is that there is actually no real evidence about the existence of savings glut” (see Taylor, 2009).

3.2 Relaxed monetary policy

The literature acknowledges numerous channels through which monetary policy can influence the enlargement of financial imbalances and risks, i.e. can contribute for banks and other financial intermediaries to undertake larger risk (credit and liquidity risk) and to increase the supply and demand for loans (mortgages), causing a growth in asset prices.

In many developed countries, central bank interest rates remained below the level considered neutral. The monetary policies of the USA and Japan were too expansive for too long. After the “dot-com” crisis in the USA and the September 11 attacks, the policy interest rate in the USA was reduced to a very low level (1% in June 2003), and then was gradually increased to a maximum level of 5,25% in June 2006. This level was maintained until the beginning of the crisis, when the policy interest rates started to decline drastically. In Japan, the policy rate reached 0,1%, which was maintained until 2006 and was followed by a mild increase. The situation was similar in the EU, China, Canada, Great Britain and other countries, where after a longer period of low policy rates, they substantially increased in the period 2005-2007, followed by a drastic drop of interest rates (see chart no. 4 and chart no. 5).

Chart No. 4

Source: IFS, Principal Global Indicators, IMF Stat.

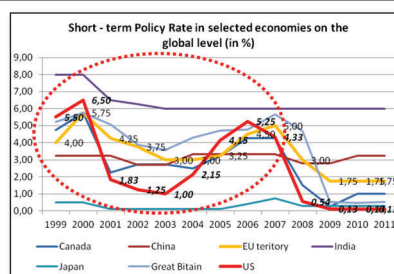
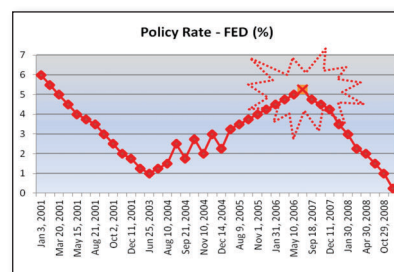


Chart No. 5

Source: Board of Governors of the FED,
<http://www.federalreserve.gov/monetarypolicy/openmarket.html>.



Taylor's (2009) analyses show that the policy interest rate in the USA was below the level implied by experience throughout history (the experience during the Great Moderation beginning from the 1980s). The unusual substantial deviation of the federal rate from the Taylor rule (followed by the policy since the turbulent 1970s), since 2001 (see chart 5) is a proof of the expansive monetary policy, leading to credit expansions and growth of real estate prices (see Taylor, 2009). The same analysis estimates the depth of the cycle if the Taylor rule is followed and confirms that the fall in economic activity would be smaller in that case. The analysis was extended to Europe where the same is confirmed – the policy interest rate of ECB was below the level suggested by the rule and the largest deviation is found in Spain (which has the biggest rise in real estate prices), while the smallest in Austria (which has the smallest growth in real estate prices).

Cooper's (2008) analysis of the monetary policy of the USA is also important. It points that the monetary policy of the USA continuously intervenes and fights negative bubbles, while remaining passive when facing an accelerated rise of crediting and asset prices. This relaxed monetary policy pursued for almost a whole decade substantially influences the convergence of expectations that asset prices would keep rising. This asymmetric monetary policy also creates a huge problem of moral hazard, where all subjects expect to be rescued from their mistakes and they stop caring about the concentration of risk, thus significantly deteriorating the systemic risk (see Carmassi, Gros and Micossi, 2009).

Contrary to the research on relaxed monetary policy as a cause of the crisis, there are also studies that empirically confirm the absence of a significant relationship between the interest rate of central banks and the financial imbalances in the countries. There is strong evidence that the high interest rates in some countries during a longer period did not impact strongly the decrease of financial imbalances in the system (see Merrouche and Nier, 2010).

3.3 Deregulation and inadequate regulation and supervision of the financial system

The Great depression of 1929-1933 triggered the need for financial regulation in order to stabilize the economies (the American above all) and to restore savers' confidence in banks and the financial system. The significant social and technological changes during the time served as a catalyst that pushed deregulation. The large banks and financial institutions also put efforts to eliminate and modify the regulation that restrained them, while the individuals strived to get larger control over their savings and investments on the financial markets. This led to high confidence in the market discipline and in self-regulation and hence many regulations were eliminated/отстранены/suspended. More prominent examples of deregulation are: the Law on deregulation of deposit institutions and monetary control (DIDMCA), which enabled banks and other saving institutions to set the interest rates themselves, thus encouraging competition; the Law on alternative mortgage transactions (AMTPA); the BASEL II standards that allowed banks to keep their capital in several forms, according to the riskiness of certain groups of assets; the relaxation of the regulation in the USA on the leverage of financial intermediaries in 2004 and the abolishment of the net capital principle in 1975; the abolishment of the articles in the Law on banks in the USA (Glass-Steagall Act) from 1933, that separated commercial from investment banking and the adoption of the Law on modernization of financial services (Gramm-Leach-Bliley), which allowed commercial banks to connect with investment banks, insurance companies and other financial institutions etc. Another element, that added "fuel to the fire" and was directly related to the estate bubble, was the initiative of the USA government for "affordable-housing mission" and Community Reinvestment Act at the beginning of the 1990s, which put pressure and influenced banks and government sponsored companies to relax their standards for approach to mortgage loans. On the other hand, the regulation and supervision was dispersed among several institutions responsible for separate financial institutions, while there was a lack of regulatory bodies and institutions responsible for the problems that emerged from the systemic risk (see in more detail Silvers and Slavkin, 2009; Tymoigne, 2009; Calabria, 2009).

The global trend of deregulation of financial systems and the relaxed regulation of financial institutions created a favorable ground for "profit seeking" and for creation of the new financial architecture (shadow bank-

ing, securitization, rating agencies, financial derivatives etc.) and relationships (belief in the power for self-regulation of markets, taking higher risks, moral hazard, speculation, fall of transparency etc.), that evolved with the growth of the real estate bubble.

The analyses of the impact of regulation and supervision as key causes for the financial imbalances show that the expansion of the balances of financial institutions, the effects of capital inflows and moral hazard, the spread between short term and long term interest rates are less pronounced in the economies where the supervision and regulation have been strong, where the central bank was responsible for the supervision and regulation and where the entrance barriers were higher (see Taylor, 2009).

The modern financial architecture and relations

As the crisis spread globally, it became clearer that the modern financial architecture, which was supposed to manage risk and make capital cheaper and more reachable, ultimately led to the creation of the Global crisis. The modern financial architecture and relations include the fast development of off balance activities, financial innovations that manifested through complex derivative instruments created in the securitization process, shadow banking that remained out of the reach of regulation, and confidence of regulators and investors in the rating agencies.

One of the key innovations was the process of securitization, which led to an expansion of complex securitized credit arrangements that promise high returns with low risk, thanks to the complex techniques for arranging and distributing the created financial instruments and the complicated mathematical models for their evaluation (see in more detail Tymoigne, 2009). Parallel to the securitization, there was a prevalence of off balance activities in the banking sector based on the model „*originate to distribute*“, where the loans were quickly sold to other investors, while the monitoring of the initial credit quality was substantially neglected due to the collective fallacy that the risk is hedged, i.e. transferred to somebody else. This caused, on one hand, banks to create more loans in the expansion period, and on the other hand, to keep less capital to potential losses and to provide limited transparency of their financial positions to the investors (see Carmassi, Gros and Micossi, 2009).

In addition to securitization, we should mention the fast growth of the number and size of hedge-funds (that owned assets in amount of approximately 1,3 trillion \$ before the crisis). They were among the first participants in the financial globalization, however with the growth of their size, of the number of clients, of the new services they offered and of the various schemes for risk diversification based on new technologies, they also joined the “hunger for returns” and the new financial architecture (more extensively in Stromqvist, 2009).

When we talk about securitization, we must mention the financial innovations that presented a “blood flow” of the global crisis. The new financial instruments were developed so fast that the market infrastructure and systems were not prepared when they found themselves under pressure. The new financial instruments should have been left to “mature” before letting them grow enormously, that is regulators, rating agencies, investors should have been given time to better analyze their role and behavior (see more details Stulz, 2009).

Credit agencies awarded highest ratings AAA to numerous financial instruments (mortgage securities) most of which proved to be with lowest ratings (junk status) at the beginning of the crisis. The reasons for the failure are usually searched for in the conflict of interests, the effective regulation and inadequate economic models. Another factor that put a larger pressure on rating agencies is the excessive relying of market operations on ratings, imposed by various laws and regulations as a condition for realization of investments in those instruments or as a factor in complying with the legislated level of capital (see more extensively White, 2010).

An addition to the modern financial architecture are the relations that emerged between the institutions and subjects in the market – lack of transparency and accountability in the financial system (mortgage market),

where banks used to sell “toxic” mortgages, intermediary financial institutions sold the “toxic” assets to investors without fear and accountability in case those agreements failed, and the chain continued with brokers, rating agencies and other market participants that transferred the problems further until the collapse of the system. This was complemented with the expansion of shadow banking – migration of different financial activities from banks and regulated financial spheres to unregulated institutions (see Jickling, 2010).

The combination of low interest rates, system liquidity, market confidence, new technologies and models, continued growth of asset prices, triggered the speculative financial powers that had an important influence on the behavior of all market participants and on the creation of the crisis. The optimism, the excessive risk taking and the increase in leverage replaced the cautiousness and rationality. Speculation is a human feature that accelerates the development of a herd mentality. The analysis of this type of behavior in finance shows that investors do not always make optimal choices: they think and reach rational decisions in a restricted environment (they suffer from “limited rationality” and “limited self-control”) and follow and coordinate their behavior and decisions, i.e. they behave like ants (Kirman, 2011).

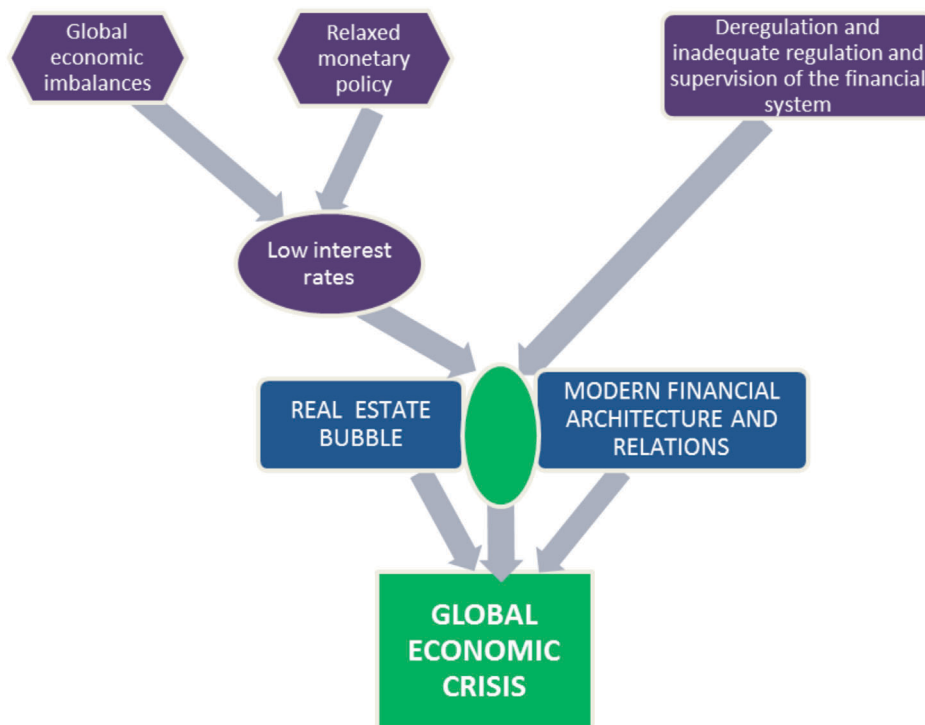
3.5 The real estate bubble

It can be said that one of the main problems that was an initial capsule for the global economic crisis was the real estate bubble in the USA and in many other countries, like Spain, Ireland and UK. The reasons behind the bubble can be analyzed in a narrow and wide context. In a wider context, the reasons behind the bubble are identical to the main causes of the crisis, while a more concrete observation locates the reasons in (see more extensively Kiff and Mills, 2007; . Taylor, 2007; Taylor, 2008; Carmassi, Gros and Micossi, 2009):

- the low interest rate trend, caused by global imbalances and expansive monetary policy. The mechanism that connects credit expansions to crises includes an increase in the leverage of borrowers (and creditors) and falling credit standards – which was the case in several countries affected by the crisis (Spain, Iceland, UK, some East European countries etc.);
- the USA government policy aimed at providing a home for everyone, thus putting pressure on banks and government sponsored companies (Fannie Mae and Freddie Mac) to relax the standards for approachability to mortgage loans and to issue various types of mortgage loans, the tax exemptions for the amount of the interest paid on mortgages etc.;
- the key characteristic of the speculative bubble – the anomaly of convergence of expectations that emerges in the given environment, when a rising share of investors believed that real estate prices can only keep growing, while the risk of their drop had somehow disappeared.

The analysis of the causes of the Global economic crisis presents a specific challenge, considering the complexity of the issue and the disagreement in the literature on the relative importance and the order of their emergence and dependence. Hence, Figure no.1 gives a schematic presentation of the causes of the global economic crisis and the relations among them.

Figure no.1 - Causes of the global economic crisis



Source: authors' systematization.

4. Evolution of the Global economic crisis – *transmission channels and mechanisms*

The global economic crisis evolved in several phases and expanded through many transmission channels. A catalyst of the crisis was the “overheated” real estate market in the USA (supported by the relaxed monetary policy, the global imbalances and the deregulation trend). A trigger was the big and fast fall in real estate prices in the USA, partly caused by the monetary policy tightening cycle. The mortgage market (the new financial architecture) was a key initiator for the consequent crises that expanded through all sectors of the economy. The crisis first hit the mortgage market in the USA, soon spread to other real estate markets and other financial markets in the USA (especially infecting asset-backed securities markets etc.). What was surprising was the level and speed with which the crisis spread globally, which evolved through several phases and various transmission mechanisms⁶² (see Claessens et al., 2010; BIS, 2009).

The first phase was through direct exposure. This phase was limited to banks (and other financial institutions) that were directly exposed to the USA financial markets. The direct exposure of financial markets and instruments created on those markets allowed the problems of European banks to soon appear (for example, in the German IKB in July 2007 and the French BNP Paribas in August 2007). These events caused inter-bank and liquidity problems on many markets, having in mind the problems that appeared in several real estate markets in Western Europe as a result of the stress on the mortgage market in the USA. The higher than expected deterioration of the situation on the mortgage market in the USA was followed by a

62) For a detailed elaboration of the evolution of the crisis and its global see BIS 79th Annual Report, Chapter II “The global financial crisis”, June 2009. Available from: <http://www.bis.org/publ/arpdf/ar2009e.htm>

quick drop in the ratings by rating agencies, who had been criticized for not being able to exactly determine/estimate the rating of complex mortgage securities and their close relations to the issuers of those securities. These falls further shook the markets and investors' confidence (counterparty risks), which caused a sharp increase in interest rates (expansion of the interest gap) of mortgage securities, a deterioration of inter-bank markets and markets of commercial securities and a sharp contraction of the mortgage markets.

The second phase of the international expansion of the crisis was through asset markets. This effectuated through the lack of liquidity, freezing of credit markets, a sharp decrease in securities prices on the world exchange markets, and through exchange rates fluctuations (the euro, the Swiss franc, the pound). The initial response of economic policy was strong and quick (without precedent in the history) – the main central banks provided liquidity to commercial banks. Even though the policies differed from country to country (liquidity injections, the range of collateral taken into account and other measures), they exhibited only short run effects and showed that it is difficult to handle the evolving situation – stabilization of the financial sector and reducing the effects on the real sector. The rushed, inconsistently implemented interventions of economic policy and their weak results created even more disturbances, loss of confidence of creditors and investors and downfall of the market mechanism that was based on it (which prolonged the crisis – see in more detail Taylor, 2008).

The third phase was characterized by big liquidity problems that followed the collapse of the “Lehman Brothers”. In October 2008, the solvency problems started to manifest in the systematically important global financial institutions, which led to massive sales and increase of the risks of financial collapse. In this phase, the risks and worries about liquidity began to be replaced by worries about solvency, having in mind the large exposure (leverage) of the financial systems. The high leverage level, especially of investment banks in the USA and of commercial banks in Europe, made the financial system vulnerable to the efforts for forceful deleveraging and increased the pressures for solvency. The financial institutions started to experience big losses and to write off illiquid securities, there was a sharp increase in asset sales (real estate and securities based on them), which caused a further decline of asset prices, increase in the needs for recapitalization and a further erosion of market confidence. In the solution of this situation a role had the late establishing of the solvency problems, and the measures for their overcoming which proved inefficient and unpredictable in practice. The weaknesses of the measure packages of developed economies, including the limited scope (e.g. investment banks and insurance companies were not covered), the limited coordination (e.g. between deposit insurance and lending of last resort) and the untimely and slow reaction (due to undefined frameworks for the functioning of banks in certain situations) led to a further intensification of the problems. In this phase, the numerous channels of global transmission of the crisis effectuated through banks and non bank institutions that tried to quickly deleverage. Despite the coordinated cut of interest rates of the main central banks, the expansion of guarantees in certain market segments in some countries and the implementation of a large number of unprecedented measures and policies, the market confidence continued to worsen, leading to a spiral of adverse effects in: the financial sector (the work of bank and nonbank financial institutions), the real sector (economic activity, consumption, unemployment, the standard of living, the global prices of goods and services etc.), the foreign sector (foreign trade, balance of payments and current accounts, foreign direct investments, foreign exchange positions etc.) and the fiscal sector in many countries (the debt crisis in Europe), which are still present.

The presented evolution and transmission channels of the crisis are differently structured in different analyses, depending of the depth of analysis, however those structures do not differ significantly. We would like to mention here the evolution according to the Bank for International Settlements (BIS), which structures the evolution of the crisis in five phases (see BIS, 2009): the first phase (from June 2007 to middle march 2008u) when the primary focus was on liquidity problems, bank losses and asset value deterioration. This resulted, in the second phase (from middle march to middle September 2008), in larger solvency problems and risks from failure/bankruptcy of banking institutions. On such collapse – the bankruptcy of

Lehman Brothers on September 15th drag the global economy into the third, most intensive phase, characterized by a global loss of market confidence, supported by numerous interventions by policy creators. In the fourth phase (from the end of October 2008 to middle March 2009) the markets slowly adapted to the negative trends in the global economic development, while the fifth phase (beginning in middle March 2009) brought the first signs of optimism in the global markets, but in terms of still present adverse macroeconomic and financial news on a global level.

An especially important part of the analysis of the evolution and transmission mechanisms of the global crisis is the transfer of the crisis to Europe and the emergence of the debt crisis. Research usually relates the transmission of the crisis to Europe to: the connection and direct exposure to the contaminated securities in the USA, the influence of the fall in confidence and wealth on consumption, global trade and the specifics of the European economies (indebtedness, credit expansions and booms on real estate markets) etc. (see more in European Commission, 2009; Dadush et al., 2010; SESRIC, 2011).

5. Conclusion

The analyses on the causes of the global economic crisis are always interesting, but it is especially intriguing that the history shows differing opinions among economists. This is one of the main reasons that each crisis is analyzed and observed as a relatively new event, without reaching for the “bag” of experiences about factors, causes and lessons for the past. However, even though the new economic disturbances have their own specifics, we find that a large part of these disturbances are related to determinants and causes that are already known, neglected or for which there had not been a consensus among economists. In our paper we try to point to some factors and causes that strongly influenced the emergence and transmission of the economic crisis of 2007 to the global scene. These factors can be changed, supplemented, expanded, but they must not be forgotten!

Based on the literature and on our analysis and view-point, we can name five groups of causes for which there is a relatively strong consensus about their importance and role in the emergence of the global economic crisis. The economic analysts should keep them in mind in light of future global economic disturbances:

Macroeconomic causes: imbalances in the global economy; relax monetary policy;

Microeconomic causes: deregulation and inadequate regulation and supervision of the financial system; real estate market bubble; modern financial architecture.

The global expansion of the crisis is another lesson to be remembered about the way in which national economic disturbances in favorable economic conditions can turn into global economic “tornados”. Generally, this unraveled during several phases and with different transmission mechanisms:

The first phase was through direct exposure. This phase was limited to banks (and other financial institutions) that were directly exposed to the financial markets in the USA;

The second phase of international transfer of the crisis was through asset markets. This effectuated through a lack of liquidity, freezing of credit markets, a sharp decline in securities prices in the world exchange, markets, and fluctuations of exchange rates (euro, Swiss franc, pound);

The third phase was characterized by big solvency problems, after the collapse of the Lehman Brothers. In October 2008, solvency problems began to manifest in the systemically important global financial institutions, which led to massive sales and higher risks from financial collapse.

References

- Azar, G., Kamran, and Mansori. (2011), "2008 Economic crisis analysis", MPRA Paper No. 33160, posted 04. September 2011 / 23:46.
- Barro, J.R., Ursúa, F. J. (2008), "Macroeconomic Crises since 1870", NBER Working Paper 13940, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138.
- Bernanke S. B. (2005), "The Global Savings Glut and the U.S. Current Account Deficit", Remarks at the Virginia Association of Economics, Richmond, Virginia.
- BIS (2009), "The global financial crisis", Chapter II in *79th Annual Report*, June 2009. Available from: <http://www.bis.org/publ/arpdf/ar2009e.htm>.
- Calabria, A.M. (2009), "Did Deregulation Cause the Financial Crisis", Cato Policy Report.
- Carletti, E., and Allen, F. (2009), "An Overview of the Crisis: Causes, Consequences and Solutions", *International Review of Finance*, 10(1), 1-26.
- Carmassi, J., Gros, D. and Micossi, S. (2009), "The Global Financial Crisis: Causes and Cures", *JCMS*, Volume 47. Number 5. pp. 977–996.
- Carmen, M. R., and Kenneth S. R. (2009), *This Time is Different: Eight Centuries of Financial Folly*, Princeton University Press, 41 William street, Princeton, New Jersey
- Claessens, S., Dell Ariccia, G., Igan, D. and Laeven, L. (2010), "Lessons and Policy Implications from the Global Financial Crisis", *IMF Working Paper* WP/10/44.
- Cooper, G. (2008), *The Origin of Financial Crisis: Central Banks, Credit Bubbles, and The Efficient Market Fallacy*, Harriman House Ltd., Hampshire, United Kingdom.
- Crotty, J. (2008), "Structural Causes of the Global Financial Crisis: A Critical Assessment of the 'New Financial Architecture'", University of Massachusetts – Amherst Economics Department Working Paper 2008-14.
- Cukierman, A. (2009), "The Great Depression, the Current Crisis and Old versus New Keynesian Thinking What have we Learned and What Remains to be Learned?" Paper Prepared for Symposium on Perspectives on Keynesian Economics, Ben-Gurion University, July 14, 15 2009.
- Dadush, U. et al. (2010), "Paradigm lost: Euro in crisis" 2010 Carnegie Endowment for International Peace, available at: www.CarnegieEndowment.org/EuroCrisis
- European Commission, (2009) "Economic Crisis in Europe: Causes, Consequences and Responses" *European Economy* 7|2009.
- Even, S., and Feldman, N. (2009), "Implications of the Global Economic Crisis", Institute for National Security Studies (INSS).
- Furceri, D., and Mourougane, A. (2009), "Financial Crises: Past Lessons and Policy Implications" preliminary version, OECD, *World Commodity Trends and Prospects*. Note by the Secretary-General, United Nations, A/63/267, p.11.
- Jickling, M. (2010), "Causes of the Financial Crisis", CRS Report for Congress, Congressional Research Service, Service, R40173.
- Kiff, J., and Mills, P. (2007), "Money for Nothing and Checks for Free: Recent Developments in U.S. Subprime Mortgage Markets" *IMF Working Paper* WP/07/188.
- Maurice, O., and Rogoff, K. (2009), "Global Imbalances and the Financial Crisis: Products of Common Causes," Paper prepared for the Federal Reserve Bank of San Francisco Asia Economic Policy Conference, Santa Barbara, CA.
- Mendoza, E., and Terrones, E.M. (2008), "An Anatomy of Credit Booms: Evidence from Macro Aggregates and Micro Data," NBER Working Paper No. 14049, Cambridge, MA: National Bureau of Economic Research.
- Merrouche, O., and Nier, E. (2010), "What Caused the Global Financial Crisis?—Evidence on the Drivers of Financial Imbalances 1999–2007", *IMF Working Paper* WP/10/265.

- Mohanty, D. (2010), "The global financial crisis – genesis, impact and lessons ", Speech by Mr. Deepak Mohanty, Executive Director of the Reserve Bank of India, at the international conference on "Frontiers of interface between statistics and science", *BIS Review* 15/2010.
- Reinhart, C., and Rogoff, K. (2008), "Is the 2007 U.S. Subprime Crises So Different? An International Historical Comparison," *American Economic Review* Vol. 98 No. 2, pp. 339-44.
- Romer, D.C. (2009), "The Economic Crisis: Causes, Policies, and Outlook", Testimony before the Joint Economic Committee.
- Servén, L., and Nguyen, H. (2010), "Global Imbalances Before and After the Global Crisis ", *The World Bank Policy Research Working Paper* 5354.
- SESRIC, (2011a), "European Debt Crisis and Impacts on Developing Countries?" SESRIC reports on global financial crisis, SR/GFC/11□9, July – December 2011
- SESRIC, (2011b), "The Eurozone debt crisis: a second wave of the global crisis?" SESRIC reports on global financial crisis, SR/GFC/11□8, 2011 – 1 issue.
- Silvers, D., and Slavkin, H. (2009), "The Legacy of Deregulation and the Financial Crisis-Linkages Between Deregulation in Labor Markets, Housing Finance Markets, and the Broader Financial Markets ", *Journal of Business & Technology Law*, Vol. 4 No. 2, pp. 301-47.
- Stiglitz E, J. (1993), 'The role of the state in financial markets', *Proceedings of the World Bank Annual Conference on Development Economics*, World Bank: Washington D.C.
- Stromqvist, M. (2009), "Hedge funds and financial crises", *Economic Review* 1/2009 available at: http://www.riksbank.se/upload/Dokument_riksbank/Kat_publicerat/PoV_sve/eng/stromqvist2009_1_eng.pdf
- Stulz, M. R. (2009), "Financial derivatives: Lessons from the Subprime Crisis" *The Milken Institute Review*. Available at: <http://www.cob.ohio-state.edu/fin/faculty/stulz/publishedpapers/financial%20derivatives-Lessons%20from%20the%20subprime%20crisis.pdf>
- Sturzenegger and Zettelmeyer (2006) *Debt Defaults and Lessons from a Decade of Crisis*, MIT Press.
- Swagel, P.(2009), "The Financial Crisis: An Inside View", *Brookings Papers on Economic Activity*, Conference Draft.
- Taylor B, J. (2009), "The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong", *NBER Working Paper* No. 14631.
- Taylor, B.J. (2007), "Housing and Monetary Policy", *NBER Working Paper* 13682.
- Temin, P. (January 2010), "The Great Recession and the Great Depression" *NBER Working Paper* 15645 <http://www.nber.org/papers/w15645>
- Tennant, D. (2010), "Global Financial Crisis to Real Sector Contraction: Exploring Transmission Mechanisms in a Small Open Economy – Business Coping Strategies in Jamaica". *Global Development Studies*. 6(1-2): 235-290.
- Tymoigne, E. (2009) "Securitization, Deregulation, Economic Stability and Financial Crisis, Part I – the Evolution of Securitization", *Levy Economics Institute Working Paper* No. 573.1.
- White, J.L. (2010), "Credit-Rating Agencies and the Financial Crisis: Less Regulation of CRAs is a Better Response", *Journal of International Banking Law and Regulation*, Vol. 25, Issue 4, 170.
- White, N.E. (2006), "Bubbles and busts: the 1990s in the mirror of the 1920s", *NBER Working Paper* 12138.



Publisher	Center for Economic Analyses - CEA
For the publisher	Marjan Nikolov
Title	CEA JOURNAL OF ECONOMICS
Editorial board	<p>Marjan Nikolov, Ph.D., President of CEA (Editor-in-Chief)</p> <p>Bryan Roberts, Ph.D. Senior economist at Econometrica Inc USA</p> <p>King Banaian, Ph.D. Professor in the Department of Economics at St. Cloud State University USA</p> <p>Giorgio Brosio, Ph.D. Professor of Public Economics, University of Turin, Italy.</p> <p>Nevenka Hrovatin Ph.D. Professor of Public Economics, University of Ljubljana, Slovenia</p> <p>Dubravka Jurlina Alibegovic, Ph.D. Director of the Institute of Economics, Zagreb, Croatia</p> <p>Borko Handziski, Senior Economist at the World Bank, USA</p> <p>Borce Trenovski, Ph.D. Faculty of Economics, Skopje Macedonia</p>
Cover & pre-press	GLOBAL Communications, Skopje
	Skopje, June 2015

Major Sponsors:

**This publication is supported by the Open Society Institute
Think Tank Fund Budapest**