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ALTERNATIVE VIEWS ON THE PARTICIPATION OF NON-EURO ZONE COUNTRIES AT THE BANK UNION

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Abstract. The reformation of the bank systems' regulation and supervision in The European Union was founded on a macroprudential approach to monitor systemic risks and the vulnerabilities in a more effective way. Considered as the backbone of the new macroprudential supervision architecture, the Bank Union raises intense debates among the catching up economies. The fact that there are few studies on the costs and benefits of joining the Bank Union for the Central and Eastern European countries, explains the different views of the decision makers concerning this issue. The study stresses the manner in which macroprudential policies were implemented in Romania, as a particular case among the CEE countries, and the extent of their contribution to mitigating vulnerabilities and maintaining financial stability. The paper summarises the main arguments in favour of joining the Bank Union by emphasising the Romanian monetary authorities' stance compared to those of the neighbouring CEE countries.

JEL classification: E58

Keywords: macroprudential policies, Bank Union, stability, reforms

1. Introduction

The recent financial crisis has brought into debate the issue of the effectiveness of bank regulations and supervision in the Euro zone and the European Union at large. The severity of imbalances and their consequences on the domestic financial systems have raised awareness that the strength of individual financial institutions is not able

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to support, alone, the financial stability (Brunnermeier et al., 2009) in the region. The reformation of the regulating and supervision framework based on a macroprudential approach was intended to extend the monitoring of systemic risks and vulnerabilities that have affected all the banking systems in the EU. The project of the Bank Union is a key element of this new philosophy, whereas the concentration of macroprudential regulations at the European Central Bank is required to reduce the crossborder risk of contagion and to protect the integrity of the European banking system.

Since the positive externalities induced by the financial stability recommends it as a global public good, the negative financial outcomes of the crisis led to a general consensus that *ensuring and maintaining financial stability require a monetary, fiscal, prudentiality and competition policy mix, revolving around the macro prudential policy as a key determinant*.

It is well known that unconventional monetary and macroprudential policies are the two most important latest evolutions in central banking, with a significant impact on the international financial system, due to their unprecedented power, influence and authority. The macroprudential approach of Central banks' supervising authority was promoted by the G-20, followed by the Committee for Financial Stability and the Basel Committee for Bank Supervision. Their proposals of macroprudential supervision standards (i.e. the countercyclical capital buffer, the tools required by the safeguarding of systemically important financial institutions, the additional capital and liquidity requirements, the resolution mechanisms, etc.) were implemented at regional and national level.

Presently, the European institutional framework for macroprudential policy includes: the European Systemic Risks Boards (responsible for the implementation of macroprudential policies, the ECB (responsible for the macroprudential measures within the Single Mechanism of Supervision), the national macroprudential designated authorities (responsible for the elaboration of macro prudential policies at national level).

Embarking on the process of adopting the tools of macroprudential policies depends on the types of externalities related to strategic complementarities, credit crunches, interconnectedness (Claessens, 2014) they intend to mitigate and which widely vary according to the particular circumstances of each economy. In a rather homogenous approach encountered in the Euro zone, macroprudential policies are convergent, but, since the economic and financial stance of the Central and Eastern European (CEE) countries widely differ within the region, it is expected that the approaches related to the macroprudential tools and joining the Bank Union would be divergent.

Considered as the backbone of the new macroprudential supervision architecture, the Bank Union raises intense debates among the catching up economies. The fact that there are no definitive conclusions on the costs and benefits of joining the Bank Union for the CEE countries explains the different views of the decision makers concerning this issue. The paper takes Romania as a benchmark considering the positive effects of the prudential monetary policy. The NBR has opted for a tight monetary policy in managing the financial crisis which proved to be effective, further preventing the deepening of vulnerabilities and a rather swift restauration of the equilibrium. In addition, the Romanian banking system is dominated by foreign banks's branches that may support the decision to join the Bank Union as a prerequisite to adopt the Euro.

The paper is one of the few contributions analysing the manner in which macroprudential policies were implemented in Romania, as a particular case among the CEE countries, and the extent they have contributed to mitigating vulnerabilities and maintaining financial stability. The paper summarises the main arguments in favour of joining the Bank Union by emphasising the Romanian monetary authorities' view compared to those of the neighbouring CEE countries. Given the complexity of the subject, a mechanistic approach was avoided, the authors rather stressing the advantages and disadvantages of joining the Bank Union, opening further debates that need to be embedded in the context of each economy. The paper proceeds as follows: 2. Alternative macroprudential policy tools, 3. The macroprudential framework of the Romanian banking system, 4. The consequences of The Bank Union on the Romanian banking system, 5. Benefits and costs associated with joining the Bank Union. The rest of the paper is dedicated to Conclusions and policy lessons.

2. Alternative macroprudential policy tools

Bank crisis are recurrent evolutions after excessive private lending. They may trigger deep, long financial depressions that affect the real economy through the credit channel. It is a large consensus in literature that changes in banks' capital and liquidity levels influence the credit supply (Holmstrom and Tirole, 1997), (Allen and Gale, 2007), (Diamond and Rajan, 2011). Under these circumstances, understanding the impact of macroprudential tools on the credit life-cycle and on the resilience of the banking system is essential. The Bank of International Settlements (Report of Committee on the Global Financial System, 2012) and the European Committee for Systemic Risks (ESRB, 2014a) set the foundation in choosing and implementing the main macroprudential tools:

a. ***Capital macro prudential tools*** (countercyclical capital buffer, systemic risk buffer, buffers for the global systemic institutions G-SIIs and the national O-SIIs).

a.1.The countercyclical capital buffer **(CCB)** - the main objectives of this instrument are: "protecting the bank system against losses associated with the cyclical systemic risk and supporting sustainable lending for the real economy" (ESRB, 2014b). The *countercyclical capital requirements* are decided by the designated macroprudential authority and is applicable for all the domestic exposures irrespective of the lenders' country of origin. The decision to activate this instrument is based on the information about the weight of credit / GDP and its long run trend included in the analysis together with the data concerning the accumulation of cyclical systemic risk originating in the credit and real estate prices expansion, external imbalances, bank balance sheets (i.e. the leverage effect indicator), private sector indebtedness, etc. The countercyclical buffer rate operates as a percentage of total risk exposure amount and ranges between 0 percent and 2.5 percent.

a.2.The capital buffer for systemic risk – approaches structural systemic risks and pursues the limitation of direct and indirect concentration of exposures and the prevention of indebtedness. The systemic risk buffer is structural in nature, the risk transmission channels including: *common exposures* (by market sector, counterparty, funding source, asset class, currency, geographical area, etc.); *direct interconnectivity* via the interbank market or indirect interconnectivity via information contagion; *financial*

system concentration. The buffer is designed as a flexible instrument available for national authorities, which may be applied to high-risk exposures, institutions, groups of institutions or the banking sector as a whole. The level of the buffer may vary depending on the contribution to the risk build-up and the characteristics of the national financial system.

a.3. Capital buffers for globally (G-SII) and nationally important institutions (O-SIIs) applicable for banks identified as "too big to fail". It pursues the limitation of moral hazard as intermediate macroprudential objective. This macroprudential instrument is effectively used to achieve the intermediate objective of limiting the systemic impact of misaligned incentives in order to lower moral hazard, by enhancing the loss-absorption capacity of systemically important institutions, which mitigates the likelihood of emerging tensions and their potential impact.

The main effects of these instruments are the following:

Effects on the bank system's resilience - depend on the level of capital reserves voluntarily held by banks. It has been proven that the increase of capital requirements directly improves the resilience on the bank system and can help the prevention of excessive increase of credits and of indebtedness accompanied by a greater capacity for loss absorption. The requirements of additional buffers reduce the probability of interruptions in lending and other financial services supplied for the real economy. The indirect effects are noticeable through the credit cycle or expectations' channel that may lead to an improvement of risk management standards.

Credit cycle effects - the implementation of capital requirements limits the credit supply and assets' prices through the capital constraints and expectations' channel. Increasing capital requirements by activating CCB pursues the excessive limitation of credit. Thus, the banks are forced either to increase their capital (as a share of the undistributed profit or by issuing new shares) or to diminish risk weighted assets. Diminishing the volume of credit means introducing credit restrictions that further impact on the credit demand and on the interest rate. Setting up reserves during the upward trend of lending allows their relaxation during the crisis to the lowest level of the required capital in order to prevent a potential lending crisis. Moreover, the necessity to maintain a higher level of capital could discourage banks to engage in quantitative and risky unsustainable lending. Using buffers for banks considered "*too big to fail"* may ensure a higher level of capital compared to their assets allowing these banks to finance the real economy even during the decline of the financial cycle and may reduce, ex-ante, the probability of a crisis or may cushion its effects.

Regulation arbitrage/leakages – the capital tools' effectiveness may be limited by regulation arbitrage and leakages towards less regulated cross border entities. Loans granted by banks submitted to capital reserve requirements may be substituted by funding obtained from shadow banks or by securisation (i.e. bonds issuance). In the particular case of the *countercyclical capital buffer*, to reduce the risk of leakages, the capital requirement is applicable on mandatory reciprocity basis (i.e. banks with high exposure in various countries are forced to use the CCB rate set by a designated authority of a country, for all the exposures of the clients that operate in a country that applies the countercyclical capital buffer).

b. Liquidity macro prudential tools (Liquidity Coverage Ratio – LCR and Net Stable Funding Ratio – NSFR). The main macroprudential liquidity tools are: *i*. volum based tools (i.e. minimum liquidity reserve requirements (Liquidity Coverage Ratio – LCR) and restriction on maturity (Net Stable Funding Ratio – NSFR), *ii*. general liquidity surcharge meant to discourage banks to access short run funding that triggers the excessive lending and the leverage effect by internelising the externalities by its contribution to the liquidity systemic risk.

b.1. The Liquidity Coverage Ratio – LCR – banks should maintain a sufficient stock of liquid assets in order to cover the possible imbalances between liquidity inflows and outflows for a 30 days time frame during severe crisis.

b.2. Net Stable Funding Ratio – NSFR is a structural long term indicator that shows the imbalances concerning various maturities, stimulating banks to stable resoureces in funding their activity.

Summarised, the effects of thes tools are:

Effects on the bank system's resilience - are predictible when stricter liquidity standards improve the bank system's resilience, reducing the need of the banks for frequent refunding and preventing asset selling that might induce unfavourable funding conditions for all the participating actors on the market. Therefore banks are inclined to hold liquid assets based on long run stable resources. The indirect impact is manifested through the credit cycle or the expectations channel that may lead to stricter risk management standards.

Credit cycle effects – the liquidity reserve requirement raises the costs for banks, but these costs may be limited because macroprudential measures may be implemented on the up swing of the credit cycle when the long term loans and more liquid assets are not so costly. During the down turn of the credit cycle, the monetary authorities may relax the liquidity requirements thus inducing the increase of the credit demand due to the reduction of interest rates. The implementation of the net stable requirement during the up swing phase of the credit cycle may help to prevent the fast increase of lending by increasing the cost of credit. In case of a financial crisis a complete implementation of the macro prudential policy can sustain the necessary funding of the real economy.

Regulation arbitrage/leakages – the liquidity tools effectiveness can be reduced by the regulation arbitrage and the transfer, during a credit boom, towards non regulated entities, including foreign ones. To avoid crossborder distortions, coordination and reciprocity agreements are necessary among countries in the implementation of macroprudential policies process. The results of the analysis concerning liquidity requirements for the Romanian banking system provisioned by NBR show that all the institutions fulfilled the minimum 60% requirement (including the minimum reserve requirements) for the 1st of January 2015. Unless the minimum reserve requirements were not included, than 26 banks (owning 77% of the entire bank assets) reached the 60% concerning LCR (NBR, FSR 2013)

c. **Borrower based macro prudential tools** (loan-to-value, loan-to-income, debt-to-income)

Borrower based macroprudential tools have as intermediate objective the reduction of excessive lending and of the leverage effect by smooting the credit cycle. The LTV, LTI, DSTI limits are applicable based only on the national legislation and indirectly contributes to the limitation of excessive lending by ceiling the amount that can be borrowed according to the collateral (LTV) or the debtor's income (LTI, DSTI). LTV ensures an increased capacity of the lenders to face adverse evolutions by diminishing the loss given default (LGD), while LTI and DSTI ensures an increased resilience of the debtors to unfavourable financial evolutions reducing the probability of default (PD).

The main effects of these tools are:

Effects on the bank system's resilience - are determined by diminishing the loss given default and the probability of default. The impact on the credit cycle and on the expectation channel are indirect effects that may induce a strengthening of risk management standards.

Credit cycle effects - these limitations contribute to the smoothing of the credit cycle since they become mandatory during the upslope of the credit cycle, when the credit and the real estate prices tend to grow faster than the revenues. The application of strict limitations reduces the real estate credit demand and the property prices.

These limitations may be relaxed during the recession of the real estate credit and may contribute to the prevention of credit induced crisis. There are empirical studies that show an increase of banks' resilience determined by an increased resilience of the clients that become less sensitive to shocks induced by the changes in income and property prices. Following their research conducted on 57 countries, Kuttner and Shim (2013) concluded that the limitation of LTV, LTI, DSTI had a significant impact on the growth of real estate loans and less significant impact on the property price increase.

Regulation arbitrage/leakages – the effectiveness of these instruments may be reduced by regulation arbitrage and by leakages towards less regulated entities, including crossborder ones, respectively. It is recommended to use the limitations on LTV, LTI, DSTI simultaneously since they complement each other.

Table1 shows the main macroprudential tools provisioned by CRDIV/CRR[1] and optionally by the national legislations and their gradual implementation during 2014-2019.

[1] Directive 2013/36/ (EU) of The European Parliament and of The Council on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC.

Regulation (EU) No 575/2013 of The European Parliament and of The Council on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012.

Table 1. Macro prudential tools provisioned by CRD IV/CRR

Macro prudential tools	2014	2015	2016	2017	2018	2019
Minimum capital requirement + Capital conservation buffer	8%	8%	8,625%	9,125%	9,875%	10,5%
Capital macroprudential tools						
Countercyclical capital buffer CCB			≤0,625%	≤1,25%	≤1,875%	≤2,5%
Capital buffer for systemic risk (optional)	1 % - 3% (5 % or more)					
Capital buffers for globally important institutions (G-SIIs)				Between 1 % - 3,5 % depending on the importance of systemic globally institution		
Capital buffers for nationally important institutions(O-SIIs) - optional				Max 2 %		
Liquidity macroprudential tools						
Liquidity Coverage Ratio – LCR		60%	70%	80%	90% 100%	10%
Net Stable Funding Ratio – NSFR	The proposal of European Comision until 31.12.2016					
Loan/deposit ratio and Leverage ratio (optional)	Based on national legislation					
Borrower based macroprudential tools						
LTV, LTI, DSTI (optional)	Based on national legislation					

3. The macroprudential framework of the Romanian banking system

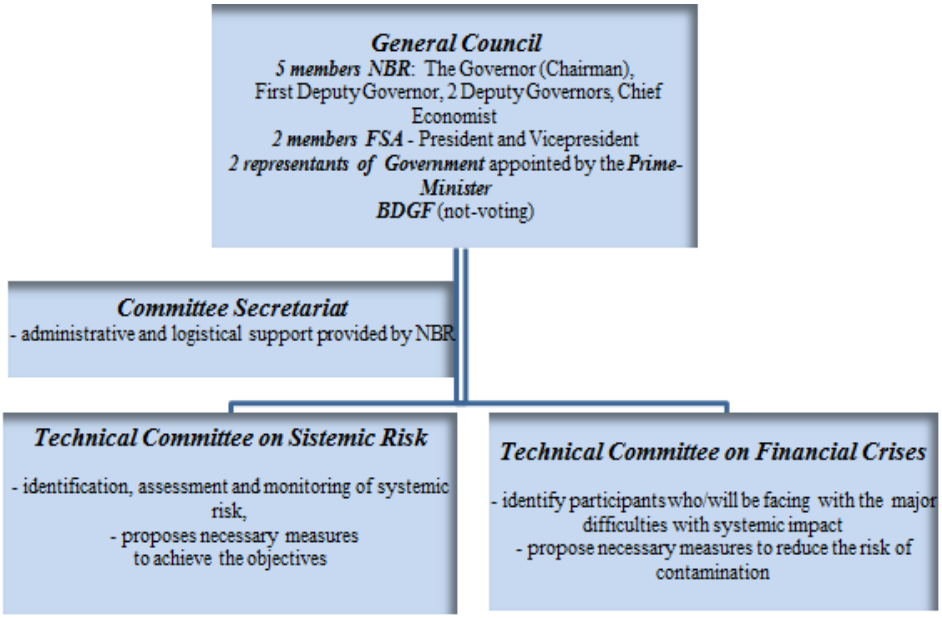
3.1. The recommendations of the European Systemic Risk Board for the banking sector

The recommendations of The European Systemic Risk Board for the banking sector were meant to support the coherent implementation of the macroprudential policy in the EU member states and to narrow the vulnerabilities identified in the European financial system. Consequently, two recommendations were issued: ESRB/2011/3 referring to the designation of national macroprudential authorities and ESRB/2013/1 concerning the intermediate policy objectives and macroprudential policies.

In the particular case of Romania, the designated macroprudential authority is *"The National Committee for Macroprudential Oversight*" (NCMO), that includes the authorities playing a decisive role in ensuring financial stability, the NBR, that has the key macroprudential role, the Financial Supervisory Authority, the Government and the Bank Deposits Guarantee Fund (as observer). The NCMO shall act as an interinstitutional cooperation structure without legal personality, which shall aim to

ensure coordination in the field of macroprudential oversight of the national financial system by setting the macroprudential policy and the appropriate instruments for its implementation. Figure 1 shows the structure of the macroprudential committee according to the provisions of the macro prudential supervision law.

Fig. 1. The structure of the "National Committee for Macroprudential Oversight" in Romania



Source: The Law concerning the macroprudential supervision of the financial system

The intermediary objectives and macroprudential tools implemented by the NBR in line with the Recommendation ESRB/2013/1, concern the prevention and reduction of: excessive credit growth and leverage; excessive maturity mismatch and market illiquidity; the limitation of direct and indirect exposures; the limitation of the systemic impact of misaligned incentives in order to lower moral hazard and the strengthen the resilience of the financial infrastructure. For achieving the ultimate objective of safeguarding the financial system stability, the NBR estabilished, in addition to the intermediate objectives of macroprudential policy recommended at EU level, two nationally specific objectives: the sustainable increase of financial intermediation and the improvement of financial inclusion. For each intermediate objectives, the NBR established macroprudential tools such as: capital based tools (i.e countercyclical capital buffer, systemic risk buffer, O-SII buffer), liquidity related tools (i.e liquidity coverage ratio, net stable funding ratio), borrowers related tools (i.e loan-to-value ratio, debt-to-income).

After selecting the main intermediate objectives and macroprudential policy tools, the next stage in the completion of the macroprudential policy framework was to define the macroprudential strategy, which had an operationalising role, thus establishing the connection between objectives, indicators and tools. To this end, the overall framework defining the macroprudential policy strategy of the NBR was prepared, according to the relevant responsibilities of the Central bank in its capacity as supervising authority.

This project is designed to be part of the national strategy for macroprudential policy. The NBR will identify the situations requiring the use of macroprudential policy tools, select the appropriate tools, estabilishing their level and deadline for implementation, the institutions to which for which the tools are applicable and will periodically assess their appropriateness and effectiveness in achieving macroprudential policy objectives.

The NBR has a long experience in the implementation of macroprudential tools. Since 2004 it has constantly monitored the excessive credit growth and unsustainable indebtedness by targeting the following ratios: loan-to-value (LTV), debt- to-income (DTI) and limited excessive foreign currency exposure of credit institutions. Prior to the 2008 crisis, the high potential of the Romanian banking system (both in intense banking activity and competitiveness) had attracted important capital inflows that, consequentlty, had contributed to the accumulation of excessive financial risks. The most important vulnerability was the increase of the foreign currency denominated loans granted to risky borrowers and a massive indebtedness of the population.

There is limited literature concerning the effectiveness of macroprudential tools in emerging economies, arguing that these countries have used them more frequently, while developed countries only seldom employed them. Empirical studies for Romania (Lim et al., 2011; Neagu et al., 2014) have shown that the LTV and DTI had certain effectiveness in limiting the excessive credit growth, improving the risk management of debtors and creditors.

In evaluating the impact of these tools on crediting and on the quality of bank assets (Neagu et al., 2014) show that:

- the impact on credit growth in the first semester after implementation is between 3 and 11% with the greatest influence on consumption credits. The effect diminishes to zero after five month.
- the relaxation time frames are associated with a higher non performance rate (specific for consumption and real estate credits) and with a higher sensitivity to macroeconomic evolutions (e.g. unemployment).

The experience of the NBR shows that macroprudential regulations were most effective when not „self regulated", that macroprudential measures should be adjusted over the financial cycle to impede regulating arbitrage and migration to other types of credits, that in the decisions concerning LTV and DTI macroprudential monitoring, watching lending on other markets than the domestic ones is more useful (IFN and foreign lending), that LTV and DTI should be implemented together and supported by microprudential and monetary policies.

Moreover, in the previous year, following the National Committee for Financial Stability's recommendations, the NBR has introduced three macroprudential tools as *capital buffer*[2] for credit institutions, which are described in Table 2.

Table 2. Macroprudential capital buffers implemented by the NBR

Buffer	Objective	Level established in Romania	Deadline for implementation
Countercyclical capital buffer	Limit excessive credit growth	**0 percent**	1 January 2016
O-SII buffer	Mitigate the systemic risk generated by the size of the institutions	**1 percent** of total risk exposure amount of the institution, solely for systemically important banks	1 January 2016
Systemic risk buffer	Prevent or mitigate long-term non-cyclical systemic or macroprudential risks	**1 percent** of total exposure amount to which it applies, solely for selected banks, it does not add to the O-SII buffer	31 march 2016

3.2 The macroprudential indicators used by NBR

To identify the financial institutions that are already exposed or susceptible to be exposed to systemic risk, the NBR periodically evaluates the potential risks that endanger financial stability by using various techniques and indicators: stress tests (that show the resilience of the banking sector to vulnerabilities), identifies systemically important banks, macroprudential data basis, early warning systems (i.e. Financial stability indicators recommended by the IMF and ECB), specific analysis (that study the impact of european regulations (CRD IV/CRR) on the Romanian banking system), conducts polls to identify the banks' opinions concerning the credit supply and demand.

The stress tests conducted to assess banking sector's solvency and liquidity confirm its resilience, *i.e* its capacity to prevent, without major difficulties, the shocks induced by unfavourable developments in liquidity. Recent stress tests show that the Romanian banking capital is above the minimum safety thresholds. The vulnerabilities identified at individual level have a moderate impact. However, the systemic risk posed by the uncertain and unpredictable legislative framework in the banking and financial field may produce effects on bank solvency. Also, recent macroprudential stress tests show a comfortable level of liquidity, the banking sector not facing major

[2] The National Committee for Financial Stability (NCFS) issued Recommendation No. 1/26.11.2015 the implementation of capital buffers in Romania and NCFS Recommendation No. 3/18.12.2015 on the implementation of systemic risk buffer in Romania.

difficulties in the event of a liquidity crunch, mainly due to: rather restrictive monetary policy measures, low dependence on foreign funding, savings in the NBR accounts. Following the financial crises, building and defining relevant signal indicators' thresholds for systemic risk, were a priority for the NBR. According to the methodology recommended by the IMF, the financial soundness indicators of the Romanian banking system regard: the capital adequacy, the asset quality, the profitability, the efficiency and liquidity of the banking system. (Table 3)

Table 3. Financial stability indicators for the Romanian banking system

FSIs (core)	*dec. 2010*	*dec. 2011*	*dec. 2012*	*dec. 2013*	*dec. 2014*	*dec. 2015*	*sept. 2016*
I Assessment of capital adequacy							
Regulatory capital (capital adequacy ratio)	15	14,9	14,9	15,5	17,6	19,2	18,8
Regulatory Capital Tier 1	14,2	12	13,8	14,1	14,6	16,7	16,6
II Assessment of quality asset							
Nonperforming loans	11,9	14,3	18,2	21,9	13,9	13,5	10
IFRS provisioning coverage ratio	96,9	97,8	61	67,8	54,7	57,7	54,5
III Assessment of banking sector profitability and efficiency							
Return on assets (ROA)	-0,2	0,2	-0,6	0,01	-1,3	1,2	1,3
Return on equity (ROE)	-1,7	-2,6	-5,9	0,1	-12,5	11,7	12,3
Net interest income/operating income	60,6	61,9	62,3	58,8	58,6	58,5	55,1
Non-interest expenses/ gross income	64,9	67,8	58,7	56,6	55,5	58,4	51,1
IV Assessment of banking sector liquidity							
Liquid assets to short term liabilities	142,2	139	147,7	156,3	158,9	163,4	157
Liquid assets ratio	60	58,7	57,6	56,2	57,4	54,1	53,6
Net open position in foreign exchange to capital	-1,4	-4,7	-1,7	2,5	2	0,7	1,4

Source: NBR, FSR december 2016, IMF- Financial Soudness Indicators (FSIs), 2017

Over the past few years, the Romanian banking system has had an appropriate level of capitalisation, the capital adecuacy indicators having witnessed an almost continuous increase. The main determinants which contributed to these evolutions where: the improved macroeconomic environment, the increase of shareholders' capital contributions, limited distribution of dividends as a results of micro and macroprudential requirements, which are expected to contribute to strengthening banks' resilience. The "capital adequacy ratio" (total capital ratio) was 18,8 percent in september 2016, while the "Regulatory Capital Tier 1" (Common Equity Tier 1) stood at 16,6 precent.

According to the NBR data, these values are above the EU average, thus positioning the capital adequacy indicators in the lowest risk bucket. The quality of bank assets shows that the relevant indicators generally strengthened their positive trend noticeable during the past three years. Non-performing loan ratios followed a downward trend, but are still at high levels, above the EBA's red threshold (8 percent). Non-performing loans originate in the unsustainable economic growth and considerable capital inflows during 2007-2008. During the last years, the banking sector's profitability improved, primarily on account of the resumed rise in operating profits and the reduction in net expenses with provisions, amid a stable domestic macroeconomic environment. The main profitability indicators of the Romanian banking sector "return on assets" (ROA) and "return on equity" (ROE), stood at a comfortable 1.3 percent and 12.3 percent respectively in September 2016. The major challenges for the banking profitability are as follows: operating in a low interest rate environment with the prospect of narrowing spreads; the large share of low-yielding, but less risky assets on banks' balance sheets; an important stock of restructured loans that may entail additional loan loss expenses, and implementation of borrower - oriented legislative initiatives that would pose moral hazard. Nevertheless, the liquidity indicators show a favorable situation.

4. The consequences of The Bank Union on the Romanian banking system

4.1. The Romanian perspective

The two pillars of the Bank Union, i.e. The Single Supervising Mechanism and The Single Resolution Mechanism brought a significant change in the supervision and resolution architecture with different effects on the two groups of states: the Euro zone member states, that are the main beneficiaries of the new project and the non - Euro zone member states, that can join the Bank Union upon request in close cooperation with the ECB.

Presently, membership in the Bank Union, before adopting the Euro, is not considered attractive by the CEE countries (Hungary, The Czech Republic, Poland, Croatia, Romania and Bulgaria), these countries claiming unequal treatment compared to the Euro zone countries concerning the following issues*: insignificant role in the Single Supervising Mechanism* (i.e. non-member states of the Euro zone would not be members of th Council of Governors that approves the decisions of the Supervising Council); *lack of access to the liquidities offered by the ECB* (non- member states would not have immediate access to the funding facilities offered by the ECB*); lack of access to the common safety net* (i.e. these countries would not be eligible for direct recapitalisation from the European Stability Mechanism).

Nevertheless, Romania expressed its willingness to participate at the Bank Union, considering that joining the Bank Union is a compromise between a swift, rather risky action, but potentially efficient and a long preparation process that may overlook the opportunity of an efficient action (Isrescu, 2014). Membership in The Bank Union can be evaluated considering the following aspects: the structure, importance and integration of the Romanian bank system with the European bank system; the supervision and resolution standards that reflect the rigour and the quality of supervision at national level; the challenges concerning macroprudential policy. All these are important issues and form the basic framewok, relevant for determining the potential benefits and costs that can be achieved, on the long run, by joining the Banking Union.

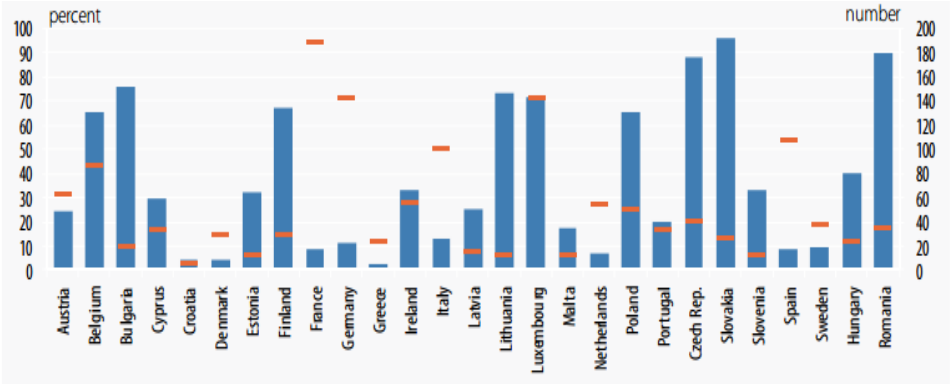
4.2. The implications of the Bank Union on the Romanian supervising activity

Joining the Single Supervising Mechanism implies a new approach of the supervision model applied by the NBR that mainly affects the three major commercial banks, because the supervision competences are delegated to the ECB. The other smaller, less significant banks will be directly supervised by the NBR under the obligation to follow the regulations, instructions and trends set by the ECB.

The potential benefits of participation at the Single Supervising Mechanism refer to:

- improving the supervision of crossborder bank groups, thus ensuring coordination and supervision for the branches of Euro zone banks opened in CEE countries that are not members of the Euro zone;
- the risk of reducing the activity of crossborder banks is diminished (any delay in joining The Bank Union increases the risk that Euro zone banks might reduce the activity of their branches opened in non-Euro zone countries that are not part of the supervising mechanism);
- the competitive disadvantage for domestic banks or branches that do not have the parent bank in one of the Euro zone member states, considering that the supervision of The ECB is a solid guarantee for low cost funding;
- participation at debates concerning the regulations for the practical functioning of the Single supervising mechanism;
- full access to supervision information, given the large presence of the Euro zone bank capital on the Romanian market (Figure 2).

Fig. 2. Market share and number of credit institutions with foreign capital (international comparison)



assets of credit institutions with foreign capital as a share in total assets
number of credit institutions with foreign capital, including foreign bank branches (rhs)

Note: 2014 data were available for EU Member States and June 2015 data were available for Romania.

Source: NBR, FSR 2015

5. Benefits and costs associated with joining the Bank Union

The direct and indirect benefits associated to joining the Bank Union depend on the manner their financial systems and supervision develop. As a host country for foreign banks, similar to other CEE member states, Romania can benefit of a higher financial stability and more straightforward cross border bank groups supervising interactions under the authority of a single supervising institution, i.e. ECB.

The 2014 study conducted by the IMF (Bluedorn et al., 2014) reflects the attitude of CEE Central Banks and Ministries of Finance that have not adopted yet the Euro (The Czech, Poland, Hungary, Bulgaria, Croatia and Romania) concerning the participation at the Bank Union before adopting the Euro. Table 3 shows the main findings of the study, the benefits and the potential disadvantages of joining the Bank Union before adopting the Euro as a currency.

Table 3. Possible advantages and disadvantages of joining the Bank Union for the non-Euro countries

Potential benefits	Potential disadvantages
• access to the mutual funding scheme in case of resolution needed by a bank • larger access to the parent bank supervising information • enhancing the quality of supervision by improving the market perception and the application of coherent prudential norms • crossborder supervisory coordination • the reduction of bank conformity costs • the increase of supervising decisions related to the parent banks • the reduction of cost related bank funding • arm's length supervision of local interest • improved supervision by applying stricter prudential norms.	• loss of control over cross border intra group liquidity flows • inadequate role in the Single Supervising Mechanism (SSM) governance and in the Single Resolution Mechanism (SRM) decision making process • loss of control over bank resolution • lack of access to the liquidity facilities offered by the ECB • bank supervision may be insufficient in the SSM • excessively complicated resolution procedure in SRM • monetary and prudential policies' coordination challenges • incomplete mutualisation of the Single resolution fund • contributions to the Single resolution funds are too high compared to the expected benefits

Other benefits that can be envisaged are:

- the risk to diminish the activity of cross border bank groups' branches in a non-Euro country is avoided – meaning that any delay in joining the Bank Union may increase this risk because the parent bank can decide to diminish and/or close branches operating in countries that are not part of this mechanism;
- the cost related competitive disadvantage of domestic banks or their branches that do not have the parent bank in the Euro zone is diminhed;
- the supervision of these entities by the ECB is considered a solid guarantee for obtaining less costly funding;
- the participation at the Bank Union secures a place at the „disscusion table" concerning the rules and procedures of a project Romania will be part of when adopting the Euro;
- by implementing the new resolution system in the EU it is predictible that a future banking crisis can be managed swiftly and safely, reduces the necessity to bail-out of banks in distress, thus breaking the connection between the banks and sovereigne risks. (Isărescu, 2014; Schoenmaker and Siegmann, 2013; Darvas and Wolff, 2013)

Romania considers that its participation at the Bank Union is a compromise with swift action, that bears a certain degree of risk, but possibly more effective on the long run. In the case of the rest of the non-Euro member states, the decision to join the Bank Union depends, *largo sensu*, on the cost-benefit analysis and the time horison to adopt the Euro as a currency. The Hungarian, Polish and Czech strategy of „wait and see" may be regarded as a prudential approach but with potential negative consequences of being left out of the monetary integration mechanisms.

6. Conclusions

The Bank Union, considered as the main pillar of macroprudential architecture has been created with the precise aim to consolidate the Euro-zone banking systems and the monitoring of systemic risks and of externalities on the EU bank markets. The decision to set up a single supervisor for the European banking system was founded on the desire to create an independent, powerful institution to supervise major European banks and prevent risk contagion. It can be stated that the arguments in favour of a single supervisory entity are the same that supported Central Banks' independence: the non-involvement of the political institutions in the national supervising decisions and the enforcement of strict rules for all the participants on the European bank market that would grant coherence for the supervision procedures and restore trust in the banking system. Moreover, the single resolution mechanism secures the prevention and early intervention in case of financial distress.

The Bank Union project is very important and has profound implications for the European bank supervising architecture, including the Romanian banking system that is dominated by Euro zone banks' subsidiaries. Consequently, the structure of the Romanian banking system is a dominant determinant in joining the Bank Union. Even in the absence of significant bank groups, but with an important presence of

Eurozone bank branches, the participation at the bank Union is preferable for significantly reducing the costs of supervision and for mitigating the risk of contagion from the parent banks.

Given that the disatvantages to participate at the Bank Union project are sometimes considered to outweight the advantages, the majority of CEE countries have adopted a precautionary attitude. The envisaged risk of „being too small to count" reflects the need to accept mandatory general conditions that are not properly calibrated or, the lack of attention tailored on the CEE countries' needs.

From a macroprudential perspective, one can consider that a close cooperation with the ECB allows a better orientation of macroprudential measures towards risks with cross border effects, due to the decision making process that envisages a coordination mechanism between the national macroprudential authorities and the ECB. On the other hand, such an approach implies the loss of sovereignity over the macroprudential policy, but, on the other hand, the prevalence of pursuing and protecting the European interest, also means protecting the national interest.

Nevertheless several policy lessons can be drawn: CEE countries should carefully consider the effectiveness of resouce allocation when deciding on the macroprudential tools used to counterbalance procyclicity; improve their institutional architecture to mitigate further vulnerabilities and crisis, designate the most appropriate supervisory agency (that might not necessarily be the Central bank) to reduce externalities that might deepen financial vulnerabilities and prevent the implementation of discretionary policies. An optimal design of a policy mix (including the monetary policy, fiscal policy, microprudential policy) that does not come into contradiction with the macroprudential tools would attach to it a higher transparency, accountability and credibility.

Obviously, the Bank Union is a long, dynamic project, some of its mechanisms being under blueprint (i.e. the single scheme for the bank deposit guarantee) while others will be modified according to the evolutions of the financial markets. Lately, concerns were expressed regarding the rebalancing of the financial structure in Europe that is strongly bank oriented and the granting of support for the development of financial markets as a funding alternative. The rational behind the equilibration of the financial market structure is based on the theoretical fundamentals that shows that the dominance of the market system can increase the systemic risk mainly in significant asset price fluctuations and a low economic performance.

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A GENDER AND MARITAL STATUS ANALYSIS OF HOUSEHOLD INCOME IN A LOW-INCOME TOWNSHIP

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Abstract. The analysis of income at household level is highly important for understanding the poverty and for supporting the efforts to deal with poverty. Poverty measures can be calculated from a multitude of approaches. A common approach is to use household income and draw a minimum level of income required for a household to be considered above or below poverty. This paper looked at income at household level from a gender perspective and a marital status perspective in order to draw conclusions of the nature of household's characteristics that are associated with higher or lower income as a proxy for poverty. Based on data collected in a low income township in South Africa, the regression analysis was applied to investigate the differences between different marital statuses and gender and how they are associated with different levels of income. The regression results reveal that female headed households have, on average, lower incomes compared to male headed households, and also, that married heads of households have higher incomes compared to the single, divorced, and widowed. The widowed had the lowest average income.

JEL classification: I32

Keywords: poverty, measurements, gender, marital status, income

1 Introduction

Poverty has become an operative word for most researchers and development practitioners and sometimes requires no definition. To assume that there is a consensus in the understanding of what poverty means is however erroneous. The fact that a poor person in one country may not be considered poor in another country, or the fact that there are households without income that are not poor, points to the differences in the

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understanding and hence the definition of poverty. In the preface of Sen, (1981) Essay on Poverty and Famines he points out that 'not everything about poverty is quite so simple. Even the identification of the poor and the diagnosis of poverty may be far from obvious when we move away from extreme and raw poverty' The analysis of household income at household level is thus an important aspect in the understanding of poverty and efforts to deal with human deprivation and poverty. Dollar and Kraay (2000) argued in their study that at national level income growth proxied by GDP growth can reduce poverty. At micro level poverty measures can be calculated from a multitude of approaches (Ravallion, 1996:5 2001; Rio Group, 2006:35). A common approach is to use household income and draw a minimum level of income required for a household to be considered poor or non-poor (Ravallion 1996). There is however a weakness in using income especially in households that are involved in subsistence farming. This however remains a better and easier method. Expenditure method is also linked to the income method, where households are asked on how much they spend, this suffers from similar weaknesses as those of the income method (Meyer & Sullivan, 2012). However, assets can also be used to calculate household poverty or wellbeing (Barrett & Carter, 2006; Brandolini, *et al.* 2010) The use of income however become easy to compare situations and an absolute poverty line is a more agreed upon postulation among the many measures that exist the weaknesses notwithstanding. This paper uses income due to the limitation of the data collected in the survey, however it sets the starting point for subsequent studies in the same area that will build on the results to use more robust measures of poverty. The theories of poverty attempt to explain the origins and the causes of poverty and hence make room for better ways to circumvent the controversies surrounding the measures, but for purposes of this paper, that debate is not pursued. In this paper an analysis of the theories of poverty and the perceptions of poverty will be done in the literature review section only in a nutshell to make cognizance of the existence of the debate and how it informs the measures of poverty used in an analysis. The epistemology and the method of the data analysis will be explained in section three of the paper. The rest of the paper is organized as follows, section two is the literature review, and section three is the methodology and description of the data collection process.

The results and discussion are presented in section four and the last section presents the conclusion.

2 Literature Review

The measures of poverty have evolved over time from the basic income and expenditure approaches to now include approaches that are not easily monetized or quantified. The changes have been due to the developments that have taken place in the definitions of poverty and what needs to be included in understanding the Phenomenon. A good example to the evolution in the understanding of poverty may include the advent of the multidimensional poverty measurement (Alkire & Foster, 2013; Alkire, 2009) Understanding poverty and its antecedents is therefore an ever changing process as more and more approaches are discovered and incorporated into the main stream literature of poverty (Ravallion 1991; Meyer & Sullivan, 2012:112; Atkinson *et al* 1995, Alkire *et al.* 2015). Poverty has been considered to have a gender dimension to it as women are considered to be more likely fall into poverty

than their male counterparts (Zick & Smith, 1991). Other vulnerable groups which are in a sense more vulnerable than women include children and the disabled. There are a number of studies that have also linked marital status to poverty or even life longevity (Gove, 1973; Kobrin & Hendershot, 1977; Trovato & Lauris, 1998; Zick & Smith, 1991). The reasoning behind the gender based income differentials is ubiquitous in the data emanating from the centuries old discrimination against women in all spheres of mankind, be-it in education, or in labour participation and even in the preference of boys to girls in the upbringing process. The gender disparity has changed substantially in most countries especially in the first world. The studies that looked at marital status differential however have pointed at different factors other than those of discrimination to be some of the factors that explain the differences. A study by Zick and Smith (1991) looked at the effect of marital transition, poverty and gender on mortality. The mortality aspect is not of interest in this paper although the logic behind the results found in Zick and Smith may also make a lot of sense in understanding income differentials in gender and marital status.

In looking at the importance of marital status categorization as a determinant of poverty, it is worth noting that marriage in the 21st century is not as popular as it was in the previous century, and divorce has become more acceptable than before (Mergenhagen, *et al.*, 1985). Reasons to the acceptance of divorces as a new normal may be found in other disciplines and not necessarily in economics. Data from national surveys show that there are currently more divorces than previous decades and fewer marriages than previous years (Society at a glance 2016; STATSSA 2014). A report by OECD shows that marriage rate defined as Crude marriage Rates are at their lowest in most of the OECD countries. CMR is defined as number of marriages per 1000 people, it is at an average of 4.6 for the OECD countries. However divorces also defined as number per 1000 people has reached an all-time high increasing by over 50% for the average OECD countries between 1970 and 2012 (Society at a glance 2016) Although economic explanations maybe present in the understanding. A bold guess would be that women used to rely on men for economic survival, they still do in developing countries, and hence marriage was a way out of poverty. In the modern days women are at the same level as men in most cases and hence people marry for other reason other than money, or do they? The claim that women are on the same level as men may be overstating the fact. There has been a lot of progress made especially in the developed world, but the same is not the case in developing countries, especially in the sub-Saharan Africa.

2.1 Gender and poverty

There is a vast body of literature on the link between gender and poverty (Jackson, 1998; Chant, 2006; 2008). The understanding of gendered poverty is not as straight forward as the proclamation that women are poorer than men, or that women are more venerable to poverty than men, it is beyond the materialistic thinking. Cecile Jackson in (1998) argued as to whether the discussion should be women and poverty or gender and wellbeing? Her argument was that the issue is beyond materials. She stated that "*I have noted the tendency in development discourses to represent gender issues in development as variants of poverty problems and to reduce gender disadvantage to a claim that women are over-represented among the*

poor" This to her is a misrepresentation of the issue. Although it can be agreed that the over representation is true, her argument is that, that's not all, there is more to the gendered poverty discourse as is well document by works of Chant (Chant, 2006; Chant, 2008). Women face poverty in more ways than men and women's responsibilities in dealing with poverty may come from angles that are akin to men.

2.2 Marital status and poverty

The marital status connection to poverty maybe derived from a number of factors that are associated with marriage. Zick and Smith (1991) in their research on the relationship between marital status and death argued that married people live longer than the other categories. The higher advantages of the married people relative to the other categories are based on two main explanations. The first is that healthier and in the same reasoning, successful people are more likely to be selected for long term relationships. The other explanation is that marriage encourages people to live a good and acceptable life style. This is enforced by a network of relatives that come about due to marriage (Helsing, et al. 1981:808; Zick, Smith, 1991). It can be extended in the same line of thinking that people that enter into marriage are more likely to be those with a stable flow of income possibly with a job and a good level of education. This is based on what I would term the natural selection process. If a person, especially a man is not able to prove ability to provide enough for survival or sustainability, the chance that they will be accepted or selected into marriage or long term relationship is very small. It is not non-existent, but it is very small. This may explain the expectation therefore that those in marriage are more likely to be outside the poverty bracket much more than those that are not married. In that line of argument therefore it is not the marital status itself that is responsible of the income level. Although with the second line of think, the enforced good behavior hypothesis, marriage may be responsible for higher levels of income.

Marital status however can be categories into more than married and single categories. In the not married categories, there are more categories, both post and pre marriage categories.

3 Methodology

Data used in this study were collected in Boipatong Township in 2013. A household survey was administered to 300 households. The sample size was arrived at based on previous studies that used a similar sample size and came up with valid results (Dubihlela, et al 2014*;* Sekhampu, 2013) Households were randomly selected from a map of the area, and where a house that was pre-selected was not found on the site, the next house used in its place. Heads of households were interviewed on a number of issues including their income level gender and marital status. This study decided to isolate the marital status of the heads of household and gender of the heads of household and regress them with income. This is important as most models have used a combination of many demographic characteristics and hence become difficult to isolate the importance of gender and marital status. The importance of isolating gender and marital status is the fact that there have been studies that have shown

that men earn more than women. An IMF by Kinoshita and Guo, (2015) pointed out that more men work than women in most countries, and they get paid more for similar work. In many countries, girls and women have less access to education, health and finance than boys and men.

3.1Model Specification

The aim of the study was to investigate the differences in household income based on the gender and marital status of the head of household. An ANOVA (Analysis of Variance) model is estimated as this regression model has qualitative explanatory variables only (Gujarati & Porter, 2009:283). A separate ANOVA model was run for marital status before combining marital status and gender. The model was specified as follows

$$Y = \alpha_0 + \alpha_1 D_1 + \cdots \alpha_n D_n + \beta_j D_j + e_i$$

Where Y is household income, α_0 is the intercept term $\alpha_1 \ldots \alpha_n$ are the coefficients for the different marital status categories that are represented by $D_1 \; to \; D_n$. Marital status responses had seven categories namely, never married, married, divorced, separated, widowed, cohabiting and child. In the sample there were no children so the child category was removed. Married and separated were further grouped together as one group, the basic justification of grouping married and separated as one category was that separated people are by definition still married and most circumstances financial obligations remain unchanged between the partners. The final marital status variable had 4 categories namely never married, Married, Divorced and widowed. $\beta_j D_j$ are the coefficient and the dummy for gender respectively.

The dummy variables are there defined as follows; D_1 dummy variable for never married defined as 1 for never married and 0 all other values. D_2 dummy for Marred defined as 1 for married and 0 all other values. D_3 dummy variable for divorced defined as 1 for divorced and 0 all other values. D_4 dummy variable for widowed defined as 1 for widowed and 0 otherwise. In an Anova model or any categorical variable, n-1 dummy variables are need for a categorical variable with n categories. In this case 3 dummy variables are used for marital status with 4 categories. The dummy for gender is defined as 1 for female and 0 for male.

The model to be estimated will therefore take the following form

$$Y = \alpha_0 + \alpha_1 never\ Married + \alpha_2 Divorced + \alpha_3 Widowed + \beta_1 Gender + e_i$$

The forth category which is Married is therefore the reference category meaning that all the coefficients will be compared to married who will take the value of the coefficient.

4 Results and discussion

Table 1 are the frequencies of the marital status distribution in the sample, this helps paint a picture of the percentage distribution of the different categories. The biggest group is those that were never married. This indicates that a large number

of heads of households are either young or that marriage is not common which is in agreement with what was discussed in the literature as to the popularity of marriage in the 21st century (STATSSA 2014). Those that are married however are also a sizeable percentage.

Table1: Frequencies for Marital Status

		Frequency	Percentage
Valid	Never married	107	36.4%
	Married and living together	88	29.9%
	Divorced	16	5.4%
	Widowed	83	28.2%
	Total	294	100%
Total		294	100.0

Source: Survey Data

Table 2 presents the gender distribution in the sample. Although one can argue that there is almost an equal representations, the figures show that there were more females taking up 54.3 percent compared to the male participants who took up the remaining 45.7 percent of the sample.

Table 2: Gender distribution

		Frequency	Percentage
Valid	Males	137	45.7%
	Female	163	54.3%
	Total	300	100.0%

Source: Survey Data

The number distribution of the sample between males and females is balanced enough so that the numbers in the marital status categories should not be skewed due to under representation of one category. Table 3 is a cross-tabulation of gender and marital status to see which category between males and females is more represented in the married category. The results in table 3 indicate that there is a difference in the representation of males and females in the group. Table 4 also confirms that there is a significant difference between the marital status of males and females in the sample. A big representation amounting to 85.2% within the married or living together are males, and females only take up 14.8% of the living together or married. This only means that in the households where there is both partners, it was the males that were reported as the head of household. In the 14.8% of the married or living together, the head of household was the female, these could be households where the female is a bread winner or where both partners are female.

Table 3: Gender Head and marital status association

		Marital status				Total
		Never Married	Married or Living together	Divorced	Widowed	
Males	Count	23	75	5	32	135
	% within Gender Head	17.0%	55.6%	3.7%	23.7%	100.0%
	% within New Marital status	21.5%	85.2%	31.3%	38.6%	45.9%
	% of Total	7.8%	25.5%	1.7%	10.9%	45.9%
Female	Count	84	13	11	51	159
	% within Gender Head	52.8%	8.2%	6.9%	32.1%	100.0%
	% within New Marital status	78.5%	14.8%	68.8%	61.4%	54.1%
	% of Total	28.6%	4.4%	3.7%	17.3%	54.1%
Total	Count	107	88	16	83	294
	% within Gender Head	36.4%	29.9%	5.4%	28.2%	100.0%
	% within New Marital status	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	36.4%	29.9%	5.4%	28.2%	100.0%

Source: Calculations from survey data

The household heads that reported to be in the 'never married' category were predominantly females, taking up 78.5% compared to only 21.5% for males. This revelation needs a deeper digging to understand as to why there are more female single headed households compared to male single headed households. Would it mean that men do not head household as single parents? If that is the case why? Is it the case that when they are not married males live under some head until they marry? This number should not be confused with separated or divorced who are in their own category. There are more questions to this results than there are answers. This could be the whole explanation behind the vulnerability of women falling into poverty than men. Since married people are more likely to have a higher income and escape poverty, and more men are likely to live in a married situation than female, then it follows that women are indeed more likely to fall into poverty. The reasons could be the same as those used to explain higher incomes in households where the head of household is married.

Table 4: Chi-Square Test

	Value	Degrees of freedom	Asymptotic Significance (2-sided)
Pearson Chi-Square	83.655[a]	3	.000
Likelihood Ratio	89.985	3	.000
Linear-by-Linear Association	1.231	1	.267
N of Valid Cases	294		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.35.			

Source: Calculations from survey data

The Pearson Chi-Square Test reported in table 4 confirms the differences in marital status between males and females in the data. A p-value of 0.000 means that we reject the null hypothesis of no significant difference between the gender categories in terms of marital status, and conclude that there is a significant difference in marital status between males and females.

Table 5: Regression results of the ANOVA model

Coefficients					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1622.250	316.305		5.129	.000
Divorced	270.503	634.221	.024	.427	.670
Married or living together	1707.525	381.598	.310	4.475	.000
Never Married	49.339	339.081	.009	.146	.884
Gender (Female head)	-623.096	318.872	-.124	-1.954	.052
a. Dependent Variable: Household total income					

Source: Calculations from survey data

The results of the Anova regression model are reported in table 5. The regression is known as an Anova or analysis of variance regression because all the explanatory variables are categorical variables, meaning that the regression basically looks at how the dependent variable varies across the categories of the explanatory variable(s). It can also be calculated to see how much each category would have as an average in terms of the dependent variable, hence in the case average household income based on the marital status and gender of the head of the household.

The category 'Widowed" is not entered in the regression based on the rule of how to deal with categorical variables in a regression. Given a variable with N categories, then N-1 dummy variables are entered in the regression. If all N categories were to be entered it would create a problem of perfect multicollinearity. So for marital status, widowed is not entered and hence it takes the value of the constant, but also on gender, males are not entered based on the same N-1 principle, and hence widowed male head of households take the value of the constant. In this case the results show that widowed male head of households have an average income of R1622.25. On the other hand widowed female heads of household on average have a monthly income of R999.15 (R1622.25-R623.096). A summary of the average incomes are therefore as follows;

Table 6: Average monthly incomes for the marital status categories by gender

Widowed female head of household	R999.15
Never Married Females	R1048.51
Divorced Females	R1269.66
Widowed Male head of household	R1622.25
Never Married Males	R1671.60
Divorced males	R1892.75
Married or living together Females	R2706.69
Married or living together Males	R3329.78

Source: Calculations from the regression in table 5

Table 6 presents the monthly average incomes for the households with heads belonging to the different marital status and gender categories. The lowest earners are the widowed female heads of households, and the highest earners are the male married or living together heads of households. The summary of results confirms the hypothesis that marriage is associated with higher levels of household income whether the head is male or female. This could be explained by the same explanation as that given in Helsing, *et al.* (1981:808) and Zick and Smith, (1991) that its people with good income that are selected into marriages and not necessarily marriage helping people to have higher income. The higher income among the married could also be explained by the fact that it is combined income from the two partners in the marriage.

5 Conclusion

The study has revealed a number of interesting results; first that there are more single female headed households than are of male in Boipatong Township this is difficult to conclude based on this study. This idea should be narrowed to be a picture in the current sample. The fact that there are more male headed households in the married category is not surprising as men are considered a de-facto head of

households in married couples. Although a reasonable percentage of married households reported females as the head and this may mean a movement from the traditional 'man is head' to a new definition of head, which may include the one earning the income or a higher income between the two. This also agrees with a number of studies on poverty with marital status of the head of household (Grobler, Dunga, 2014; Makhalima, Sekatane, Dunga, 2014; Meyer, Dunga, 2014).

The paper has also confirmed the perception in the literature that married people are at an advantage in terms of having on average a higher income than the other categories. The widowed females have the lowest income of all the categories. This lower income among the widows could be an indication of women that relied on their husbands to provide, as it is shown by the fact that widowed males income is higher than that of widowed women, divorced and never married women. This point to the age old understanding that women are more vulnerable than men, and that the fight for gender equality needs to continue, especially in-terms of income. The fact that married heads of households have a higher income may also be based on the fact that they have combined income from the two partners. There is need for more studies to understand the importance of marriage especially in the contemporary age where there are more divorces than there are marriages. The study raises more questions, interesting questions that make further investigations into the characteristics of these households pertinent. The study recommends more in-depth analysis of the dynamics between male and female headed households, and the relationship between marital status and incomes, taking into account the structure of the households and making comparisons in other similar townships in South Africa

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PERFORMANCE THROUGH EFFICIENCY IN THE PUBLIC HEALTHCARE SYSTEM - A DEA APPROACH IN AN EMERGENT COUNTRY

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Abstract. Aiming to analyze the efficiency of the public sector, this paper enriches the literature by providing insights of the healthcare system for an emergent country – Romania. The empirical findings reached by applying the input orientated-variable return to scale (VRS) model of Data Envelopment Analysis (DEA) and Tobit regression method are determined on two key levels of the study. The Data Envelopment Analysis technique quantifies the efficiency within 20 representative hospitals located in the four administrative macro-regions, highlighting the ways of increasing efficiency, while the Tobit regression identifies the factors that influence the efficiency level. The results of the investigation allow for comparisons with other emerging countries, as efficiency has become an increasingly significant factor for public sector evolution.

JEL classification: H41, I18, M40

Keywords: performance, efficiency, public healthcare system, DEA, emergent country

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1. Introduction

Performance management in the public sector is a growing phenomenon worldwide (Goh, 2012) designed to improve public sector accountability (Harrison et al., 2012). It is still facing many problems and challenges in implementing effective measurements, despite multiple frameworks developed over the last decades. Performance measurement is widely seen as the cornerstone of public management reforms (Kong, 2005), being researched in-depth for a long time and comprehensively reviewed (van Helden et al., 2008) for highlighting the relevance of performance measurement and reporting.

Access to performance information enhances users' decision-making and promotes public sector accountability (IPSASB, 2011), which is not simply a one-to-one (principal-agent) relationship (Mulgan, 2000). It usually implies different stakeholders whose economic and political interests overlap (Pilcher et al., 2013).

In this context, performance measurement and reporting are a necessary response to public pressure for accountability. Thus, they encourage public entities to disclose publicly and to be responsible for their actions (OECD, 2004), even if there is still no consensus on the real usefulness of performance information (Rossi and Aversano, 2015). Moreover, evidence reveals substantial differences in the adoption of performance measurement and reporting system worldwide, mainly due to the particularities of the institutional, cultural and historical contexts of each country (Benito et al., 2007).

To address this gap, alongside the academic literature, International Public Sector Accounting Standards Board (IPSASB) ensures a strong incentive for promoting the concept of service performance information within public sector entities. Thus, IPSASB published the Recommended Practice Guideline on Reporting Service Performance Information (RPG 4) aiming to develop a framework dedicated to service performance information of public sector entities, meant to enhance accountability for both services provided and resources consumed. Moreover, an essential part of the Conceptual Framework for General Purpose Financial Reporting (GPFR) includes information on performance measurement, thus focusing on service recipients' and the resource providers' needs for high-quality information, for both accountability and decision-making purposes.

Basing on this approach, the primary objective of this study is to provide evidence of the performance assessment in the public sector, by analyzing the efficiency of rendering services, using mathematical techniques and debating potential factors that might affect the outputs, thus leading to inefficiency. Moreover, considering the continuous medical advances, that not only have increased the demand for quality healthcare services but also triggered the challenge of managing rising costs and maintaining efficient operations, the study focuses on the hospital efficiency, one marked in the last decades by serious inefficiencies (Afonso and Aubyn, 2005; Evans et al., 2001; Spinks and Hollingsworth, 2009). Consequently, this study contributes to the prior literature in this field by estimating the technical efficiencies of the hospitals, evaluating the benchmarks and setting the targets for the inefficient hospitals in an emergent country.

For achieving our goal, first of all, we apply a non-parametric technique based on linear programming for assessing the technical efficiency of hospitals,

namely Data Envelopment Analysis (DEA). Secondly, we resort to the econometric analysis using different statistical tools, like descriptive analysis and regressions to identify those factors with an overwhelming influence on inefficient hospitals.

The sample of our paper consists of 20 public county hospitals in Romania collected from the Centre for Research and Evaluation of Health Services website and the Ministry of Heath's website for the year 2014. Considering the variables used in the previous studies and the availability of data, we have taken the number of beds, the number of doctors and the non-salary operating expenditure as input variables, while the total operating revenues, the number of cases and hospitalization days are considered as output variables.

The results of our DEA model reveal that among all public hospitals in our sample, five are inefficient and for each of these hospitals a benchmark is being provided for improving their operations. The results of a Tobit regression indicate that the number of cases has a positive influence on the efficiency level. Also, variables such as the total operating revenues also present a positive impact on the efficiency score, while non-salary operating expenditures and the number of doctors influence the efficiency level in a negative manner.

The study addresses a broad range of users: theoreticians interested in analyzing emerging countries, as parts of the European Union, and practitioners who manage to find justifications and solutions to similar issues faced in their national systems. Moreover, as the first study that investigates the effectiveness of the health system in this manner, focusing on the main causes of inefficiency in Romania, we appreciate it as a valuable reference base for international literature in the field, too.

The limitations of the study are generated by the sample's dimension and by the period considered for analysis. Thus, the study estimates the efficiencies for half of the county public hospitals in Romania and one calendar year only, which can be extended for time series analysis. Anyway, we appreciate all these as challenges that give us outlooks for future research.

The paper unfolds as follows: at first, the topic of performance and efficiency in the public sector is theoretically approached by analyzing the related literature, from general to specific on public health system (literature review). The next section (methodology framework) develops the concept of efficiency by empirically approaching it from a dual perspective. The efficiency measurement using the multi-criteria non-parametric analysis model known as Data Envelopment Analysis (DEA) is followed by an econometric analysis using various statistical tools to identify those factors with an overwhelming influence on inefficient hospitals. Our analysis ultimately leads to validation or invalidation of research hypotheses (result section), thus reaching conclusions and expressing opinions that respond to papers' primary goal and its objectives (conclusions section).

2. Literature review and hypothesis development

According to prior research, there are significant differences in the efficiency of delivering public services across countries, public organizations either being incredibly wasteful and ineffective in performing even core activities or achieving their objectives systematically and comprehensively (Afonso et al., 2005). These differences

are due to various factors such as fiscal decentralization (Adam et al., 2014), political determinants (Adam et al., 2011), the quality of governance (Hwang and Akdede, 2011), education (Afonso and Fernandes, 2008; Bose et al., 2007), investment and the openness of the economy (Angelopoulos et al., 2008).

Therefore, in the latest decades, the cross-country research studies conducted reveal serious inefficiencies in managing public expenditures (Afonso and Aubyn, 2005; Evans et al., 2001; Spinks and Hollingsworth, 2009), especially in the health sector. In this field, it is expected that public spending on health and social care to increase faster than the economic growth over the next 50 years, in line with recent trends across the OECD (Rumbold et al., 2015). Thus, healthcare systems must find ways of delivering health services at acceptable levels of quality, even with budgets that are growing more slowly than in the past decades. They also have to improve the quality of budgeting and financial management, the key determinants of an effective public spending (Fonchamnyo and Sama, 2015).

Also, the rising healthcare expenditure and large public budgets have recently led decision-makers to search for ways to increase the performance of healthcare organizations. Hospitals, in particular, are increasingly held accountable for their efficiency and financial performance (Tiemann and Schreyögg, 2012), thus supporting the motivation of our study.

This situation manifests itself mainly because healthcare is the part of the public sector where various stakeholders might have different needs and performance embraces a diversity of facets (Harrison et al., 2012). Thus, policy makers have a fiduciary duty to make sure that healthcare expenditure is on a sustainable path. Hospital managers are interested either in improving the quality of the output while using the same amount of resources or in reducing the operation expenses without sacrificing the quality of care provided by the hospital. Instead, doctors and nurses have the responsibility to preserve the safety of their patients and the quality of their work, while patients, as customers of the hospitals, need to be provided with the greatest quality of care (Du et al., 2014).

According to prior research, maximizing efficiency has become an increasingly significant factor for hospital executives, as the possibility for cost savings is better if healthcare institutions are managed appropriately (Harrison et al., 2004; Rodriguez-Alvarez et al., 2004). Therefore, this study has been taken up to identify the factors that cause inefficiency in the case of the Romanian healthcare sector and to find suitable ways to improve their efficiency.

In this context, the first hypothesis intends to validate the academic literature, which supports the need to maximize the efficiency of using public funds by increasing the quality of services provided (e.g. Harrison et al., 2004; Harrison et al., 2012; Rodriguez-Alvarez et al., 2004):

H1. The Romanian healthcare system is efficient.

Recently, rising of expenditure on health system reflects only partially the changes in health services demands. These are sometimes represented by new technological innovations in diagnosis and treatment, and therefore in high-quality services, but such progress also comes at a cost. Unfortunately, the evidence reveals that although the technical efficiency has benefited from the embodiment of the new medical technology, the scale efficiency remains unaffected (Tsekourasa et al., 2010).

Moreover, few innovations in technologies had a substantial impact on reducing costs and improving efficiency (Blank and Van Hulst, 2009).

In this context, there was significant interest in conducting studies in the area of health economics to propose solutions to curb the rapid increase in healthcare spending and to improve the efficiency of the healthcare system. Thus, an insight of the relationship between technology and cost provided relevant results that could influence the long-term cost growth by controlling the availability and diffusion of new technologies (Blank and Van Hulst, 2009). Moreover, most studies analyzing the hospital efficiency focus on technical efficiency (the maximum output given, the input or the minimum input usage given the output), the scale efficiency (the maximum "average product"—i.e., no increasing or decreasing returns), and/or cost efficiency (the minimum cost given, the input prices and the output quantities) and their determinants (Ferrier, et al., 2013).

In this context, our study aims to measure the technical efficiency of public sector hospitals in Romania, to identify the inefficient hospitals and the input reduction required to make them efficient. Consequently, the second hypothesis seeks to validate the positive association between the input and output variables and the efficiency level of the hospitals included in our sample:

> *H2. There is a positive association between the input and output variables and the efficiency lev*el

In the next sections we develop the hypothesis in order to fulfill the objectives of the study.

3. Methodology framework

3.1 Method

The performance of the healthcare system is an important issue and has been analyzed in many studies from the efficiency perspective by using a non-parametric analysis model known as Data Envelopment Analysis (DEA). DEA is a non-parametric frontier technique used to search for optimal combinations of outputs and inputs based on the real performance of comparable units (Ozcan, 2008) or decision-making units (DMUs). This approach measures the efficiency by determining the capability of accommodating multiple inputs to produce multiple outputs and also establishes an efficient frontier (a graphics segment generated by the efficient units) as a benchmark for underlying the efficient hospitals and the inefficient ones. Moreover, this method highlights the means of increasing efficiency by indicating what inputs must be reduced or what outputs must be increased so that a hospital reaches the efficiency frontier. In DEA, the maximum output that an enterprise can produce from a set of inputs is estimated from the best performers tracing out the border. This efficiency border can be viewed as a benchmark for assessing the efficiency of an organization (Bryce et al., 2005).

Some studies (Burgess and Wilson, 1996) apply DEA to U.S. hospitals to determine whether the ownership structures – not-for-profit (NFP), for-profit (FP), federal, state, and local government hospitals – influence their technical ability to convert inputs into outputs. Their investigation reveals that FP hospitals are more efficient

than NFP hospitals and that NFP hospitals are more interested in providing high-quality services rather than obtaining profit. There are authors (Ersoy et al., 1997) who used the constant return to scale model (CRS) to 573 Turkish general hospitals, highlighting that inefficient hospitals use a large number of specialists and primary care physicians, with over two times the number of beds than the efficient ones. However, even with their excess inputs, inefficient hospitals produce fewer outputs than their counterparts. In Germany, public hospitals are more efficient than private ones because they use fewer resources (Helmig and Lapsley, 2001), compared with the significant investments in improving the quality of medical services in private hospitals.

Following prior studies (Bates et al., 2006; Lee et al., 2008; Wang et al., 2010), this research applies the input orientated model to assess the efficiency of using public resources in case of the Romanian county hospitals. Based on available data this study provides evidence on the technical efficiency of 20 public county hospitals in Romania for the year 2014. Given the size, diversity, and complexity of the healthcare services provided by these hospitals, they are among the largest consumers of financial resources in the Romanian Healthcare System.

The last part of our empirical studies uses the Tobit analysis, which is suitable for continuous data that are censored or bounded at a limiting value (Osgood, et al., 2002) and allows for the estimation of the impact of independent variables on the uncensored variables (Wang, et al., 2010).

Tobit regression represents an alternative to the OLS regression and is regularly used in modeling DEA scores (Hoff, 2007). A large number of studies use the Tobit regression procedure in the second stage of the DEA analysis (McDonald, 2009; Simar & Wilson, 2011). Given that the efficiency scores determined in the first stage of DEA model are between 0 and 1, the use of techniques such as Tobit regression or an exponential function model is preferable, because they are easy to interpret and can accommodate both categorical and continuous variables without changing the number of efficient DMUs (Yang & Pollitt, 2009).

3.2 Variables and data

First of all, aiming to perform a cost-oriented analysis the Romanian public hospitals, we consider the most popular variables for applying DEA in the healthcare system (ÓNeill et al., 2008), thus using similar inputs and outputs for our model (see Table 1).

Table 1. Variables considered for DEA analysis

Variables	Literature references
Inputs:	
(a) number of beds	Tiemann and Schreyögg (2009); Kirigia, et al. (2008); Staat (2006); Hu and Huang (2004); Puig-Junoy (2000); Ersoy, et al. (1993); Valdmanis (1992)
(b) number of doctors	Ng (2011); Kirigia et al. (2008); Puig-Junoy (2000); Ersoy et al. (1993); Valdmanis (1992)
(c) non-salary operating expenditure	newly introduced by our study

Variables	Literature references
Outputs:	
(d) total operating revenues	Lobo, et al. (2014); Du, et al. (2014); Kirigia, et al. (2008)
(e) the number of cases	Du et al. (2014); Staat (2006); Thanassoulis (1993); Valdmanis (1992)
(f) hospitalization days	Lobo et al. (2014)

Source: authors' projection

Following the selection, we provide arguments to support the choice of each variable considered for our model:

(a) Number of beds – is used as a proxy for the hospital size, aiming to determine if managers are using hospital facilities in an efficient and effective way. Prior evidence suggests a positive association between the number of beds and efficiency (Hu and Huang, 2004; Tiemann and Schreyögg, 2009), thus revealing that an increased number of beds improves hospital efficiency.

(b) Number of doctors – is used as a substitute for the labor force. Capital and labor are both imperial in delivering healthcare services in hospitals (Ng, 2011). Some studies measured the labor through other related variables, such as the number of physicians, including residents (Puig-Junoy, 2000) or by considering only the inhabitants (Valdmanis, 1992), as well as the number of doctors plus nurses (Kirigia et al., 2008).

(c) Non-Salary operating expenditure (NSOE) – is a new variable introduced in our DEA model as a consequence of prior literature limitations (Kirigia et al., 2008), which did not consider the administrative costs as inputs. We appreciate that physicians are responsible for significant amounts of resource consumption in hospitals and, consequently, they should be accountable for the financial implications of their decisions and actions.

Consequently, regarding the input variable of our study, we use the number of beds and the hospital's expenditure as two separate variables. From the entire hospital's expenditures, we have excluded payroll expenses to avoid the double counting problem (the doctors' incomes), considering that we have already selected the number of doctors as inputs.

(d) Total operating revenues – is used as a financial proxy, measured in other studies by patient admissions (Kirigia et al., 2008) or high complexity procedures (Lobo et al., 2014).

(e) The number of cases. This variable was often used in prior analyses being encountered in various forms, such as the number of patients by age - adult, pediatric, or elderly (Valdmanis (1992), normal/severe patients (Thanassoulis, 1993), including their survival rate (Du, et al., 2014).

(f) Hospitalization days, proven to be positively associated with the number of beds (Lobo et al., 2014).

For the second part of our empirical analysis aimed to identify those factors influencing the efficiency in Romanian public hospitals by using the regression analysis, we consider the efficiency score generated by DEA as the dependent variable and the above-described inputs and outputs as the independent variables.

Among the results revealed by the prior evidence, we glean that there are significant differences between the efficient and inefficient hospitals regarding the number of beds (Lobo et al., 2014). Moreover, the size of the hospital and the average length of stay have a positive impact, while the ratio of doctors and nurses per patient has an adverse impact (Karagiannis, 2013; Chu and Chiang, 2013).

The sample of our study consists of a reduced sample (20 hospitals) because the minimum number of DMUs that can be used in a DEA model is the number of inputs multiplied by the number of outputs (Boussofiane et al., 1991; Ozcan and McCue, 1996). Also, prior researchers recommend that the number of DMUs should be at least twice (Golany and Roll, 1989) or three times the number of inputs and outputs selected (Bowlin, 1998). In addition to that, Dyson et al. (2001) propose that the total number of units must be two times the product of the number of inputs and outputs.

The selection of hospitals in this study is based on administrative and development considerations. One of the main characteristics of healthcare policy in the public systems is the frequency with which restructurings take place, redefining institutional roles, centralizing or decentralizing, splitting or consolidating different delivery organizations. These reorganizations have a significant impact on the careers of healthcare workers and the quality of the care experienced by the patients (Datta et al., 2013).

The country taken into account for our study is divided into regions, on three levels: NUTS-I, NUTS-II, and NUTS-III. The level NUTS-I consists of four macro-regions, the NUTS-II level is composed of eight regions, and the NUTS-III level consists of 41 counties plus the capital of the country (Boldea et al., 2013). The selection of the hospitals is made so that every macro-region is fairly represented in the study. Thus, the sample includes five hospitals from the macro-region 1, six hospitals from the macro-region 2, four hospitals from macro-region 3 and five hospitals from macro-region 4. It is important to mention that each one of the macro-regions consists of a different number of counties.

Following literature recommendation and considering the inputs and outputs variable selected for our study, the minimum number of DMUs should be 9 or 18, so this constraint has been satisfied by our analysis.

The hospitals and variables included in our study are described in Appendix 1.

3.3 Results and discussions

In this study, we apply an input-oriented variable returns to scale (VRS) model to measure county hospitals technical efficiency. Our choice of model is based on the assumption that public hospitals have more control over their inputs than over the outputs. According to this model, the inputs are minimalized, and the outputs are kept at their current level (Banker et al., 1984):

$$\theta^* = min\ \theta$$

subject to:

$$\sum_{j=1}^{n} \lambda_j x_{ij} \leq \theta x_{i0} \quad , (i=1,2,\ldots,m)$$

$$\sum_{j=1}^{n} \lambda_j y_{rj} \geq y_{ro} \quad , (r=1,2,\ldots,s)$$
$$\sum_{j=1}^{n} \lambda_j = 1 \quad ,$$
$$\lambda_j \geq 0 \quad , j=1,2,..,n$$

Let y_{rj} be a vector of outputs (r=1,…., s) and x_{ij} a vector of inputs (i=1,…, m) for each hospital j (j=1,….., n). Since θ ≈ 1 is a feasible solution to the optimal value, θ* ≤ 1. If θ*= 1, then the current input levels cannot be reduced (proportionally), indicating that *DMUo* is on the frontier. Otherwise, if θ* < 1, then *DMUo* is dominated by the frontier. θ* represents the (input-oriented) efficiency score of *DMUo*.

For a given level of outputs y_r and a given level of inputs x_i for hospital O, we will determine the input and output slack values by solving the following model (Charnes, at al., 1982):

$$\max \sum_{i=1}^{m} s_i^- + \sum_{r=1}^{s} s_r^+$$

subject to:

$$\sum_{j=1}^{n} \lambda_j x_{ij} + s_i^- = \theta^* x_{io} \quad , (i=1,2,\ldots,m)$$
$$\sum_{j=1}^{n} \lambda_j y_{rj} - s_r^+ = y_{ro} \quad , (r=1,2,\ldots,s)$$
$$\sum_{j=1}^{n} \lambda_j = 1 \quad ,$$
$$\lambda_j \geq 0 \quad , (j=1,\ldots,n)$$

Where s_r^- and s_i^+ represent input and output slacks for DMU_o under evaluation and λ_j is the weight for hospital *j*. This model enables us to analyze inefficiency in each input and each output to have a view on which variable(s) makes a specific DMU be inefficient compared to others. For the current application, we use the VRS (variable returns to scale) DEA model, rather than the CRS (constant returns to scale) one. As a justification for our choice of the model we exemplify the set of slacks we obtained for DMU_9 by using the CRS version of DEA:

$S_{19}^- = 0$; $S_{29}^- = 22.55$; $S_{39}^- = 0.45$;

$S_{19}^+ = 0$ $S_{29}^+ = 0$ $S_{39}^+ = 9233.84$

These results indicate that for DMU_9 to reach 100% efficiency compared with all the other DMUs in the observation set, its hospitalization days should increase with 9233.84 days/ year. In general, a high number of hospitalization days per patient

is not desirable for a hospital. The purpose of implementing the reimbursement system according to DRGs (diagnosis-related groups) is to reduce the average length of staying, which in the end conducts to an efficient use of a hospital's resources. The DRG scheme classifies patients into a restricted number of medically justified groups, with a statistically stable distribution of resource consumption in each cluster (Thompson et al., 1979).

The descriptive statistics for the study variables is illustrated in Table 2. Note that the variations in most input and output variables are significant. For instance, in the case of bed size, the minimum is 350 beds while the maximum is 1560 beds, with a standard deviation of 360.91.

Table 2. Descriptive statistics of the inputs and outputs used in the analysis

Variables	Inputs			Outputs		
	Beds	Doctors	NSOE[1] millions)	TOR[2] millions)	Cases	HD[3]
Mean	961.45	160.52	11.57	25.04	34603.65	226671.50
Maximum	1560.00	345.00	29.09	53.33	60392.00	386226.00
Minimum	350.00	60.00	4.00	10.51	14644.00	81931.00
Std. Dev.	360.91	80.78	7.99	14.18	13966.77	93597.84

1 EUR=4.41 RON (Romanian currency)
Where [1] – Non-salary operating expenditures
[2] – Total operating revenues
[3] – Hospital days

Regarding the inefficient hospitals, their technical efficiency scores are presented in the second column of Table 3, along with their corresponding slack values.

The non-zero slack values represent resource excesses or wastes regarding inputs and insufficiencies or shortfalls in term outputs. Thus, for increasing the performance, hospitals such as DMU5 and DMU7 should decrease the number of beds, while DMU6, DMU7, and DMU14 should have fewer doctors.

On the other hand, the results show that all five inefficient hospitals have too few cases.

Table 3. Results for DEA model-inefficient DMUs

Hospital	Technical efficiency	Slacks					
		Beds	Doctors	NSOE	TOR	Cases	HD
DMU3	0.85	0.00	0.00	0.41	0.55	4625.83	0.00
DMU5	0.90	6.06	0.00	0.00	1.16	2326.75	0.00
DMU6	0.9	0.00	17.64	0.00	0.00	110.58	0.00
DMU7	0.97	3.85	25.32	0.00	0.00	1036.27	0.00
DMU14	0.84	0.00	4.33	0.00	0.00	4236.15	0.00

The lowest technical efficiency score was registered by DMU14 (0.84). In this context, Table 4 presents a comparative analysis between DMU 14 and DMU 1, which is considered the benchmark for DMU 14.

Table 4. DMU1 vs. DMU14

Hospital	Inputs			Outputs		
	Beds	Doctors	NSOE	TOR	Cases	HD
DMU1	758	116	8.58	20.76	33619	205111
DMU14	818	141	8.89	18.82	23357	168845
DMU1-DMU14	-60	-25	-0.31	1.94	10262	36266

Analyzing the table above, we can draw some preliminary conclusions, regarding the discrepancies between DMU1 and DMU14, latter being the most inefficient hospital within our sample.

It can be noticed that, with almost the same budget and less personnel, DMU1 can treat more cases than DMU14 and to support more hospitalization days/year with a lower number of beds. Also, in the case of DMU1, the number of cases/doctor is higher, as average turnover/doctor, the latter being significantly higher. Also, the cost per case and the cost of hospitalization day/case are lower in the case of DMU1, given that the average length of stay is lower for DMU1.

However, taking into consideration that the cases had been validated and the costs for treating these patients had been reimbursed by The National Health Insurance House, as reflected in the total operating revenues (TOR), and also by the average revenue per case, it is plausible to assume that DMU14 is treating more complicated cases than DMU1. Nonetheless, the non-zero slack value for the number of cases provided by the DEA analysis in the case of DMU14 might be explained by the investments performed by this hospital in 2014. Public hospitals receive financial resources that can be used for the specific purpose of purchasing medical equipment, investments, modernization and extension of existing buildings or repairs. These amounts are comprised in the total non-salary operating expenditure, but cannot be used for treating patients. The budget reveals that in 2014, DMU14 invested 8.3 times more in renovations and medical equipment than DMU1. The same link was found in the case of the other three hospitals determined as inefficient by the DEA model (DMU3, DMU5, and DMU6). All these three hospitals invested more in their infrastructure and equipment for improving the quality of medical services.

Prior work also supports these results. In this context, Gok and Sezen (2011) state that one crucial way to increase the efficiency of the Turkish hospitals is by decreasing investments in the health field and/or increasing the production factors, such as the existing beds or physicians (Rezapoor et al., 2011). Moreover, Araújo and his colleagues (2014) argue that high investments in equipment and resources required to treat the patients can generate hospitals' inefficiency. Also, significant investments have the goal to improve the quality and the position of the hospitals against the health insurance companies regarding the budget negotiations (Agai, 2015;

Helmig and Lapsley, 2001; Hsu, 2010). However, hypothesis H1 can be confirmed, given that 75% of hospitals included in the sample are efficient, according to the DEA analysis.

The second part of our investigation focuses on determining the factors that might influence the efficiency level. We use the Tobit regression because our dependent variable does not present a continuous structure, mainly taken the values of 0 or 1. The econometric model must take into consideration the possibility that the dependent variable could be censored/truncated in the extremes of 0 and 1 and the Tobit regression is a classical model that addresses this possibility.

Table 5. The results of Tobit regression

Variables	Coefficient		Std. Error	
LOG (BEGS)	-0.194	0.223	S.D. dependent var	0.048
LOG (CASES)	0.618***	0.171	Akaike info criterion	-0.069
LOG (DOCTORS	-0.369***	0.127	Schwarz criterion	0.328
LOG (HOSPDAYS)	-0.369	0.263	Left censored obs	0
NSOE	-0.044***	0.014	Uncensored obs	5
TOR	0.037***	0.011	Right censored obs	15
			Total obs	20

* p-value is <10%, ** p-value is <5%, *** p-value is <1%

The results provided by the Tobit regression reveal that the number of cases has a positive influence on the efficiency level. In Romania, according to the Health Reform Law no. 95/2006, public hospitals are being funded according to the number of cases validated by the Health Insurance House. In this context, the number of patients positively influences the revenue, while the latter influences the efficiency.

The inadequate infrastructure and outdated medical equipment could raise difficulties in establishing a precise diagnosis, generating waste of resources and leading to inefficiency. This argument is also supported by the results provided by the Tobit regression in the case of NSOE.

As we can notice from the Table 5, the non-salary operating expenditures influence the efficiency level, but the sign reveals a negative correlation, meaning that the lower the level of the expenditures the higher the efficiency score. This result is supported by the insights provided by the DEA model, which highlights that all inefficient hospitals in our sample performed substantial investments in 2014, compared to their benchmarks. Investments in technology, renovations or modernizations are necessary and, even if they could lead to inefficiency, they only have an intermediate effect on the efficiency and do not influence efficiency in the same year (Frohlof, 2007).

Regarding the number of doctors, it appears that this factor influences the efficiency level but in a negative manner. This result is supported by the non-zero slack values provided by DEA for the number of doctors. As we already pointed, a high

number of doctors within the hospital involves a decrease of the average turnover/doctor and the average number of cases/doctors, and an increase of the salary expenditures, leading to inefficiency. This result is consistent with other prior studies arguing that the ratio of doctors and nurses per patient has an adverse impact (Karagiannis, 2013).

Concerning to the last two factors, prior studies have found a positive association between both the number of beds (Karagiannis, 2013; Lobo et al., 2014) and the hospitalization days (Karagiannis, 2013) and the efficiency score but in our case, no such connection was found. Therefore, hypothesis H2 can be only partially confirmed.

4. Conclusions

The new trends in public sector organizations have recently changed the approach of resources allocation and use, the importance of the public services quality being to the detriment of their quantity. This issue undoubtedly involves assessing the efficiency and performance of the public services. Moreover, public entities gradually became accountable for the services provided and for the resources employed in their activity as a consequence of the worldwide adoption of performance measurement and reporting systems. In this context, a broad range of stakeholders might benefit from this reporting, while allowing all users to assess the entity's service efficiency and effectiveness.

Assessing the performance of the health care system has increasingly become one of the most intensely explored areas of research at international level, due to the severe inefficiencies that marked this sector in the last decades. In this context, our study has an absolute novelty degree for Romania and enriches the literature specific to emergent countries by analyzing the efficiency of public health system, using a sample of 20 selected hospitals from the four Romanian macro-regions.

Moreover, we added value to this paper by the methodology employed that successfully combines two research methods. Thus, firstly, we used data envelopment analysis (DEA), by applying the input orientated variable returns to scale (VRS) model, which determines the minimal use of inputs while keeping the outputs constant, based on the assumption that public hospitals have more control over their inputs than over the outputs. Moreover, this model enabled us to analyze inefficiency in each input and each output to have a view on which variable(s) makes a particular decision-making unit (DMU) to be inefficient compared to others. Afterward, a regression analysis was performed, offering a relevant image on how the considered variables influence the efficiency scores within the hospitals included in the sample.

For testing our first hypothesis (H1) we use the number of beds (size), the number of doctors, and non-salary operating expenditure as the input variables and total operating revenues, the number of cases and hospitalization days as output variables. The attained results allow us to conclude that 15 of the considered hospitals are efficient while 5 of them are inefficient. Although the official statistics indicate a lower degree of efficiency in the Romanian health system, our results show that 75% of the sampled hospitals are efficient. In this case, the first hypothesis (H1) is validated by the findings based on DEA.

Identifying the factors that generate inefficiency demonstrates that efficiency requires not only reducing the allocated resources, but also increasing of the generated results, and consequently it should be a top priority for hospitals operating with limited resources.

Regarding the second hypothesis (H2), the results provided by the Tobit regression indicate that the number of hospital cases and the total operating revenues have a positive influence on the efficiency score. On the other hand, the non-salary operating expenditures influence the efficiency level, but the sign reveals a negative correlation. In other words, it means that the lower the level of expenses the higher the efficiency scores. Regarding the number of doctors, this variable influences the efficiency level, but in a negative way. Thus, a large number of doctors in a hospital determine a decrease of the average turnover/doctor and the average number of cases/doctors and, on the other hand, an increase of the salary expenditures leading to inefficiency. Consequently, the second hypothesis (H2) is partially confirmed.

In conclusion, the results of the study reveal that the efficiency of the public sector does mean not only the ability to reduce the operating costs but also the capacity to ensure a rational use of resources to obtain the necessary results.
The most significant limitations of the study concern the small size of the sample and the fact that the research regards only one country. Also, the aim of the further research is to investigate the efficiency for a greater number of hospitals from a series of countries, using more input and output variables for the DEA approach.

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Appendix 1. Database used in methodological framework

			Efficient Input Target			Efficient Output Target		
DMU No.	Macro-region	DMU Name	BEDS	DOCTORS	NSOE	TOR	CASES	HD
1	2	Vrancea	758,00000	116,00000	8,58495	20,7558233619,00000205111,00000		
2	4	Valcea	1353,00000	188,00000	9,50317	24,1546550336,00000348936,00000		
3	4	Caras Severin	716,31682	103,80160	7,60433	18,5212530929,83489188047,00000		
4	4	Gorj	1009,00000	164,50000	4,79383	16,3668234996,00000216608,00000		
5	1	Bistrita	884,46650	114,04461	7,70951	18,7403133234,75458222298,00000		
6	1	Satu Mare	1041,08228	146,73290	9,47163	24,1376437612,58666262496,00000		
7	1	Sf. Gheorghe	577,39858	61,61965	4,10940	10,7909321649,27969128554,00000		
8	2	Constanta	1560,00000	261,50000	25,96371	47,9444255704,00000345380,00000		
9	3	Ilfov	350,00000	85,00000	5,37311	10,5178314644,00000	81931,00000	
10	3	Slobozia	510,00000	69,00000	4,00944	11,3453818848,00000101119,00000		
11	3	Giurgiu	514,00000	71,00000	4,67945	10,9613516714,00000121708,00000		
12	3	Calarasi	571,00000	60,00000	4,09705	10,5723421611,00000127762,00000		
13	3	Alexandria	725,00000	99,00000	4,39478	15,8600922501,00000146723,00000		
14	4	Hunedoara	693,53751	115,21423	7,53949	18,8197427593,15740168845,00000		
15	1	Baia Mare	920,00000	205,00000	14,96380	32,3648037305,00000220297,00000		
16	4	Timisoara	1174,00000	318,00000	29,09891	53,3350644759,00000304770,00000		
17	2	Braila	1215,00000	172,00000	17,55910	38,0777543539,00000311973,00000		
18	1	Cluj	1542,00000	345,00000	26,18240	53,0284860392,00000386226,00000		
19	2	Bacau	1444,00000	235,00000	18,63741	36,6387853414,00000321631,00000		
20	3	Prahova	1199,00000	171,00000	12,77506	29,6509045007,00000323015,00000		

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DETERMINANTS OF ACCESS TO FORMAL CREDIT BY THE POOR HOUSEHOLDS

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Abstract. This paper investigates the determinants of access to formal credit by poor households in South Africa. Despite some progress in poverty reduction in the recent years, it remains astonishingly high by historical and international standards. Access to credit is believed by some scholars to be a primary means to address poverty and improve the standards of living of poor households. Thus, it is necessary to identify the determinants of the propensity to borrow and of the amount that is borrowed. Using 2008-2012 data from the National Income Dynamics Study (NIDS), a Heckman Selection model was estimated. The results from this study suggest that age of the household head, race, educational level, gender, employment, geographic location of households affect the propensity to borrow by poor households in South Africa.

JEL classification: D12, O12

Keywords: formal credit, poor households, Heckman selection and NIDS

1. Introduction

Despite the well-established and effectively regulated South African banking system, many low-income or poor households do not have access to credit services. There are several reasons for this: (i) poor households are regarded as risky and unprofitable (ii) the low levels of saving and asset accumulation in the low-income population render them to have a high risk profile, thus making them unattractive to commercial banks (iii) commercial banks are likely to incur high information costs to assess the creditworthiness poor households (Dallimore and Mgimeti, 2003; Mashigo 2007 and Okurut 2006).

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Access to credit can play an important role in the lives of the low-income or poor households as it allows them to cope better with various types of shocks (such as illness, malnutrition, famine, crime, unemployment, financial crisis and natural disasters), thus ameliorating socio-economic problems (Mashigo 2007; Zeller 1994; Islam and Maitra 2012; Vicarelli 2010; Morduch 1995; Gertler, Levine and Moretti 2009). A forceful proponent of this view is Seefeldt (2015:263) who found evidence to suggest that access to credit can "increase consumption beyond what one's income can support, it can smooth consumption during periods when income falls, and it can represent an investment in the future".

Much work has been done on the determinants of credit market access in developed and developing countries (see for example Anang, Sipiläinen; Bäckman and Kola (2015); Quoc (2012); Kedir (2003); Zeller, Schrieder, von Braun and Heidhues (1997); Zeller (1994); Omonona, Lawal, and Oyinlana (2010), Hussein and Ohlmer (2008); Oyedele, Akintola, Raji and Omonona (2009). However, few studies have been conducted in the South African context (Baiyegunhi, Fraser and Darroch 2008; Mashigo 2007 and Okurut 2006). Moreover, studies employing suitable techniques of assessing the determinants of access to formal credit by poor households are limited. Thus the contribution of this paper is twofold: we propose and implement an econometric framework which seeks to overcome the shortcomings of the research methodology employed in previous studies. Specifically, we correct for possible selection bias and unobserved heterogeneity in the panel data setting by estimating a model (or panel Heckman selection) proposed by Wooldridge (1995). Secondly, this paper attempts to address some of the deficiencies associated with cross-sectinal data by using the National Income Dynamics (NIDS) dataset, a nationally representative survey of households in South Africa.

The remainder of this paper is organized as follows. Section 2 examines existing literature applicable to this topic. Section 3 explains the data and explanatory variables used in the empirical analysis. Section 4 sets out the methodology used. Section 5 presents the results obtained using the Heckman selection model. Finally, section 6 provides a summary and conclusion.

2. Literature Review

There is extensive literature on the determinants of access to credit in many countries (see Anang, Sipiläinen; Bäckman and Kola 2015; Quoc 2012; Kedir 2003; Zeller, Schrieder, von Braun and Heidhues 1997; Zeller 1994; Omonona, Lawal, and Oyinlana 2010, Hussein and Ohlmer 2008; Oyedele, Akintola, Raji and Omonona 2009). For example, Quoc (2012) estimated a double hurdle model and the Heckman selection model using data from a survey of 325 rural households in Vietnam. The results of the double hurdle model and the Heckman analysis show that household's capital endowments are important determinants of the demand for formal credit as well as the loan amount. The results also show that the probability to borrow is influenced by marital status and distance to the market centre.

Using both Tobit and probit, Kedir (2003) estimated the determinants of access to credit and loan amount in Ethiopia. His estimates suggest that the main

determinants are current resources, collateral, outstanding debt and marital status of the head. Baffoe and Matsuda (2015) also implemented a binary method (probit) to the determinants of access to credit. They found that the most important variables are livelihood diversification, household productivity, savings accounts and household size – factors that significantly influence the households' ability to access credit.

Education levels were consistently found to have a significant and positive effect on household's access to credit (Okurut 2006; Vaessen 2001; and Kedir 2003). Evidence from Vietnam suggests that levels of household expenditure/income and asset are important determinants of the propensity to borrow by rural households and the amount of the loan received (Ha, 1999; Ha, 2001). Evidence from South Africa show that access to semi-formal credit in South Africa is positively and significantly affected by household size, per capita expenditure, provincial location and being coloured, while the negative and significant factors include rural location, being poor and White Okurut (2006).

However, the evidence on most determinants is mixed. In particular, the influence of gender is inconclusive. Some studies find that male is more likely to be credit constrained (Okurut 2006 Barslund & Tarp, 2008; Chaudhuri & Cherical, 2011; Freeman, Ehui, and Jabbar 1998; Zeller, 1994) while Lawal and Muyiwa, 2009 Foltz et al., 2000 show the inverse result.

Some studies also provide mixed results on the influence of age. For example, Barslund and Tarp (2008) Freeman, Ehui, and Jabbar (1998) and Jia et al. (2010) find an inverse correlation between age and probability of being credit constrained, while Baiyegunhi et al. (2010) and Chaudhuri et al. (2011) find different results.

3. Data Source

Our econometric analysis is based on the National Income Dynamics Study (balanced panel data) of South African households observed over the period 2008–2012. The longitudinal survey was conducted by the Southern African Labour and Development Research Unit (SALDRU), based at the University of Cape Town's School of Economics. The NIDS commenced in 2008 with over 28 000 individuals in 7 300 households across the country. The later waves of the NIDS were implemented in 2010 and 2012, and re-surveyed original NIDS wave1 households. NIDS data comprise comprehensive set of variables (e.g. credit, employment, income, wealth, race dummies, and province dummies) which are important for our study.

In addition to the dependent variables (access to formal credit and the amount of credit), we use several control variables in our econometric analysis. Table 1 provides a list of all the variables used. Our choice of control variables (see Table 1) is informed by the ones used in the existing empirical literature. Specifically, we control for socioeconomic and demographic characteristics (age, gender, household income, asset ownership and levels of education), household composition characteristics (household size) and geographical variables (province dummies and indicator variables for location of the household—rural or urban).

Table 1: Explanatory variables used in the empirical analysis

Variables	Type	Description
Dependent variable		
Access to formal credit	Dummy	1= Access to formal credit, 0 = Otherwise
Loan (log)	Continuous	Amount of formal credit (log)
Explanatory variables		
Age of HH head	Continuous	Age of HH head (in years)
Age SQ	Continuous	Age squared
Asset ownership	dummy	own assets (1/0)
Income	Continuous	Amount of income earned(in rand)
Size of HH	Continuous	Total number of members in HH
Coloured	Dummy	1=Coloured HH ead,0=Otherwise
Indian	Dummy	1 = Indian HH head, 0 = Otherwise
White	Dummy	1 = White HH head, 0 = Otherwise
Primary education	Dummy	1 = HHH with primary education, 0 = Otherwise
Secondary education	Dummy	1 = HHH with secondary education, 0 = Otherwise
Tertiary education	Dummy	1 = HHH with tertiary education, 0=Otherwise
Matric	Dummy	1= HHH with matric, 0= Otherwise
Gender of HH head	Dummy	1 = Female, 0 = Otherwise
Employment status of HHH	Dummy	1= Employed 0= Otherwise
Urban	Dummy	HH in urban areas
Farm	Dummy	HH in farm areas
Eastern Cape	Dummy	HH in Eastern Cape
Northern Cape	Dummy	HH in Northern Cape
Free State	Dummy	HH in Free State
KwaZulu-Natal	Dummy	HH in KwaZulu-Natal
North West	Dummy	HH in North West
Gauteng	Dummy	HH in Gauteng
Mpumalanga	Dummy	HH in Mpumalanga
Limpopo	Dummy	HH in Limpopo

Income was deflated using the national Consumer Price Index of South Africa at constant 2008

Table 2 presents the descriptive statistics of the dependent and independent variables (sample of poor households). The data shows that over the three waves, the mean loan amount accessed by households increased from 0.7% in 2008 to 1%

in 2012. The mean monthly income received by households rose considerably from R278 in 2008 to R365 in 2012. Household size was stable across the three periods with an average of 7 members, whereas, the average number of household heads that obtained a primary education fell from 45.2% in 2008 to 37.8% in 2012. On average, the number of household heads that were employed fell from 11.8% in 2008 to 10.1% in 2012. The proportion of households headed by females increased from 57% in 2008 to 71.5% in 2012.

Table 2: Summary statistics of variables used in the regressions, 2008-2012

Variable	2008		2010		2012	
	Mean	Std dev.	Mean	Std dev.	Mean	Std dev.
Access to a loan	0.007	0.082	0.012	0.108	0.010	0.100
HHH_age	46	15	46	15	44	15
HH_income	278	127	333	151	365.015	142.
HH_size	7	3.639	7	3.677	7	3.479
HHH_empl	0.118	0.323	0.093	0.290	0.101	0.301
HHH_gender	0.570	0.495	0.658	0.475	0.715	0.452
Coloured	0.053	0.224	0.051	0.220	0.049	0.216
Indian	0.004	0.062	0.004	0.066	0.002	0.039
White	0.003	0.054	0.004	0.067	0.003	0.053
Primary education	0.452	0.498	0.380	0.485	0.378	0.485
Secondary education	0.272	0.445	0.293	0.455	0.306	0.461
Matric education	0.080	0.272	0.087	0.281	0.085	0.279
Tertiary education	0.014	0.116	0.021	0.144	0.013	0.113
Rural/traditional areas	0.535	0.499	0.523	0.499	0.536	0.499
Urban	0.394	0.488	0.407	0.491	0.401	0.490

Source: author's calculations using NIDS data

4. Methodology

Our empirical investigation is based on the estimation of the well-known Heckman selection model, which takes into consideration sample selection bias (due to non-random decision of household to participate in credit market and other related issues). In the presence of sample selection bias, OLS is likely to yield spurious results (i.e. biased and inconsistent). While the Heckman sample selection model is more frequently used in studies based on cross-section data, it is not appropriate in panel data settings. Thus to correct for the potential sample selection bias we employ the Wooldridge (1995) selection method that extends traditional Heckman selection model to a panel data. The Wooldridge (1995) selection method is similar to the

traditional Heckman selection model in that it is estimated in two stages. First it estimate a probit equation (the probability of receiving a loan in our case) and a Pooled OLS (for the amount of the loan in our case), including the Mills ratio.

Thus, the Wooldridge (1995) selection model can be expressed as follows:

Participation equation:

$$C_{it}^{*} = x_{1it}\beta_1 + \forall_i + \varepsilon_{1it} \quad (1)$$

Participation equation describes the probability of a household receiving a loan (C_{it}^{*}) as influenced by a set of independent variablesX_{it} (such as age, gender, household income, asset ownership, levels of education, household size, province dummies and indicator variables for location of the household—rural or urban). While $\forall_i$ denotes individual-specific time-invariant unobservables. The participation equation is estimated by a probit model. C_{it}^{*} is a dichotomous variable that takes a value of 1 if the household receives a loan, and 0 otherwise.

More formally, we have

$$\begin{aligned} C_i &= 1 \; if C_i^{*} > 0 \\ &0 \; if \; C_i^{*} \leq 0 \end{aligned} \quad (2)$$

Outcome equation:

$$Y_{it}^{*} = x_{2it}\beta 2 + \forall_i + \varphi_{it} + \varepsilon_{2it} \quad (3)$$

The outcome equation describes the determinants of the amount of household's loans. Y_{it}^{*} shows the amount of household loans, x_{2it}indicate the factors affecting the amount of household loans, and φ_{it} are the inverse Mills ratios estimated in the first selection stage using the probit model for each year. ε_{1it} and ε_{2it} follow a normal distribution – N (0,1) and N (0,σε), respectively.

5. Empirical Results

Table 3 reports the estimation results from the Heckman selection model. The coefficient of the Mills ratio is found to be statistically significant, implying the presence of the selection bias and, thus justifying the application of Heckman selection model. What stands out from the table is that a number of explanatory variables in the participation equation are statistically significant at 10 percent or lower level, with their expected signs. In accordance with a priori expectations the participation equation results suggest that education of the household head is an important determinant of the probability of receiving a loan (three of the four possible education levels are statistically significant in the participation equation) consistent with the findings of Okurut (2006), Vaessen (2001) and Kedir (2003).

Regarding employment status, the households where the head of the household is employed is more likely to be approved for loans than their counterpart, in line with previous findings in the literature (Fidrmuc et al. 2013). Likewise, the probability of receiving a loan is positively correlated with household income and assets, although the coefficients are statistically insignificant, a similar result was found by Sorokina (2013). Gender (female) of the household head enters with its predicted negative sign at the highly statistically significant level – female are less likely to be approved for loans than man. This result is in line with other existing studies such as Oyedele, Akintola, Raji and Omonona (2009). There are exceptions in the literature, however, as shown by D'Espallier, Guérin and Mersland (2009).

With regards to geographic variables, it was found that both household geo-type and provincial location influence the probability of obtaining access to formal credit in South Africa. Specifically, households living in the poorest provinces (Eastern Cape, Kwazulu Natal, Limpopo etc,) are less likely to be approved for the loan than those residing in the Western Cape. Surprisingly, the Northern Cape was the only province that was found to improve the propensity to borrow, however it was not found to be significant. Along the same lines, households living in traditional rural areas and farm areas are less likely to be approved for the loan than households in urban neighbourhoods. This result is anticipated because urban households are predicted to have higher levels of income and wealth and are therefore viewed as more creditworthy

Column three of Table 3 shows the determinants of the amount of the loan received. It can be seen that there are remarkable differences in the parameter estimates of the variables in participation equation and outcome equation. For example, some of the variables appearing in these equations have conflicting effects in terms of both signs and level of significance. Most of the parameters (such as household income and wealth, whether the head of the household is employed, whether the head of the household is male or female, household size and race dummies) that were statistically significant in the participation equation are no longer significant in the outcome equation of the Heckman selection model. The sign for certain variables such as education levels, and Northern Cape Province changed in the outcome equation. The differences in parameter estimates of the variables in participation equation and outcome equation confirm the fact that the decision to borrow and the decision on the amount are not made simultaneously – they are not explained by the same factors.

Table 3: Panel Heckman selection model estimates of the determinants of access to formal credit by poor households in South Africa

	Participation equation		**Outcome equation**	
Variables	**Coef.**	**Rob. Std. Err.**	**Coef.**	**Rob. Std. Err.**
Age of HHH	0.1265826***	0.0393013		
Age SQ	-0.0012274***	0.0004204		
Asset ownership	0.0666691	0.0576382	0,0035572	0,8143747

Variables	Participation equation		Outcome equation	
	Coef.	Rob. Std. Err.	Coef.	Rob. Std. Err.
Income	0.1467037	0.1004438	0,2099511	0,2343073
Size of HH	0.0142573	0.0260586	0,0698138	0,0531952
Coloured	-0.6647291***	0.2475982	-0,8782707	0,6264319
Primary	0.4901221**	0.2308865	-0,3169149	0,4641351
Secondary	0.6604904***	0.2505928	-0,1899239	0,4510873
Tertiary	0.9692691***	0.286741	-0,1501453	0,5796951
Matric	0.2774267	0.4515922	-0,2765149	0,8618749
Gender	-0.4159641***	0.1249802	-0,0081419	0,3204073
Employment	0.187946*	0.1037089	0,0411134	0,3159033
Urban	0.5257752***	0.1573747	0,2227421	0,4038616
Farm	-0.0078894	0.2543639	1,334874***	0,3754075
Eastern Cape	-0.9341571***	0.2827325	-0,4362408	0,8030133
Northern Cape	0.0036328	0.2415262	-2,916314***	0,7424952
Free State	-0.7073709***	0.2634206	-0,8035216	0,8765267
KwaZulu-Natal	-0.4834772**	0.2430332	-0,7080882	0,7352048
North West	-0.3892125	0.2680546	-1,446433	0,8861254
Gauteng	-0.5239795**	0.2399221	-0,4606594	0,8924259
Mpumalanga	-0.4513028	0.2798945	-0,6745748	0,9112239
Limpopo	-0.8121656**	0.3381386	-0,2215831	0,8973172
Constant	-6.695918	1.275649	3,539753	3,17208
Wave 2	0.1740624**	0.0858532	-0,2138409	0,3085567
Wave 3	-0.0688128	0.1195086	0,974978***	0,4961136
Mills ratio			0,3862088**	0,1522697
Adjusted R-squared	0.6373			
Heteroscedasticity Test†	(0.0000)		(0.0000)	

Note: * Significant at 10%, ** Significant at 5%,*** Significant at 1%
Source: author's calculations using NIDS data

4. Conclusions

In this paper, we investigated the determinants of access to formal credit by poor households in South Africa. We corrected for possible selection bias and unobserved heterogeneity in the panel data by estimating a model proposed by Wooldridge (1995). Our results provide valuable insights into the determinants of access to formal credit. We found a number of variables, namely, age of the household head, race dummies,

† Further specification tests such as autocorrelation and heteroscedasticity tests were undertaken and their existence is confirmed, the model has been adjusted using cluster the standard errors. The coefficients and the adjusted standard errors for all the models are reported in Table 3.

educational levels, gender, employment, geographic location of households, to have a significant impact on propensity to borrow. Interestingly, households living in the poorest provinces (Eastern Cape, Kwazulu Natal, Limpopo etc,) were less likely to be approved for the loan than those residing in the Western Cape. Along the same lines, households living in traditional rural areas and farm areas were less likely to be approved for the loan than households in urban neighbourhoods. Our results confirm that the fact that credit market in South Africa have been less successful in providing credit to the poor households. What can be done to promote adequate access to financial services by the poor households? A number of interesting policy options have been proposed in the literature (see Mashigo 2007, Mujeri (2015) and Ksoll et al 2013). The one that stands out is by Mujeri (2015) who takes the view that government should entice financial institutions to enter the rural finance market by providing banks with monetary incentives which help cover the initial costs of entering this risky market. Moreover, given the astonishingly higher levels of poverty and unemployment in South Africa, it goes without saying that improved access to organized credit markets (i.e formal and semi-formal credit markets) by the poor rural dwellers (traditional rural areas) should be considered as an important policy instrument. Our study has shed some light on access to formal credit by rural households, with much less focus on semi-formal credit and informal credit (specifically referred to debts from relatives and friends). Further studies to analyse this aspect would be important.

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ARE CULTURAL AND GENDER DIVERSITY DRIVERS OF FIRM PERFORMANCE IN POST- CRISES EMERGENT ECONOMIES?

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Abstract. The study aims to see if it could offer a positive response to the question whether the company's financial performance depends on diversity of ownership structure, board and management team. Studies of this type have been made in the developed financial markets, but hardly any were made in recent years in emerging markets. The results of this study on the Romanian financial market indicate that relationships between ownership structure, board and management team composition and firm performance are mixed. ROA, ROE, ROS and P/BV as measures of firm performance are influenced by the presence of foreign shareholders, top foreign managers, and the percentage of women managers and by company's size. Boards including foreign members are more inclined to appoint foreign managers and women in firm's managerial teams, but a small number of such persons are not positively associated with an increased financial performance of the firm.

JEL Classification: C10, G34, M14, L25, M21

Keywords: corporate governance, diversity, firm performance, business economics, econometrics

1. Introduction

In a world weakened by the crisis, galvanized by disruptive innovations and increasingly interconnected, companies are constantly looking for new elements that foster their competitive advantages and allow them to achieve business performance. Post-crisis evolution of world economy has experienced an interesting dynamic, distorted

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by numerous technological and social innovations and political events. The explosive development of communications technology has revealed an unprecedented interconnection of all economic actors in a global world, where more and more detailed information on competitors, customers, markets and alternative products are available. The most recent political and social changes (mainly related to migration and the EU future status) have also contributed to changing perceptions about how stakeholders judge growth opportunities and business risks. Under these circumstances, there is an emerging theory that a more diverse ownership, board and management team can contribute to improve a sustainable development of the firm's business.

The company's shareholders are the first interested in its performance, the shareholding structure reflecting the structure of control over the company and its development. This paper seeks to determine how and if cultural diverse sources of capital shareholding (foreign versus Romanian shareholders) can influence firm performance. The paper also examines to what extent the structure of the board of directors (as representatives of shareholders) contribute to increasing the performance of the company. Studies have generally examined the following characteristics of boards: the size of the board, proportion of outsiders on the board, the number of board meetings and the women directors proportion (Chidambaran *et al*., 2006), the present work analysing also the cultural background of the shareholders and directors, according to area of origin. Directing the company's development and shaping its strategies are responsibilities of the board of directors and decisions taken by these underlying performance of the company, but as for conducting current operations, the board appoints a management team, and this team will put into practice the vision and goals strategic formulated by board. The paper examines possible link between the diversity of the management team and the company performance, particularly if performance improves when the management team is heterogeneous in terms of cultural and gender-makers.

2. Literature review

Although the concept is a very commonly used, there is no universally accepted definition of firm performance. Some authors consider it as a concept related to the effective use of human resources (Huselid *et al*., 1997), while others, more recently, consider it a subjective and multidimensional concept (Santos and Brito, 2012), or having multiple facets: quantitative and qualitative; strategic, financial (in terms of income or sales) and operational (in terms of loyalty and customer satisfaction, product quality, company reputation) (Fitzsimmons et al., 2005). Concerns regarding the shareholding structure and its influence on company performance have been the subject of studies, mainly on the American market, and nowadays, evidences are coming from the European market (Claessens and Tzioumis, 2006), but massively from emerging African or Asian markets such as China (Cull, Xu, 2005), Turkey (Aydin *et al.,* 2007), Indonesia (Abukosim *et al*., 2014), Ghana (Darko *et al*., 2016).

In Romania, a study by Vintilă and Gherghina (2015) looked at the link between ownership structure and firm performance in 2007-2011, but found no significant link between them, the shareholding structure being analysed only in terms of the type of shareholders (i.e. insiders, companies from financial intermediation sector, states and employees' organizations), but not in terms of the origin of capital. Previously,

in 2013, the same authors studied the relationship between board of directors' independence and firm value, which resulted in a positive influence of the percentage of independent directors on firm value, but down to a threshold of their representation of 47.23%, whereupon their influence becomes negative. Another paper that studied data on Romanian market, referring specifically to banking companies, showed only the links between corporate performance and CEO duality (Moscu, 2015).

Worldwide, as shareholders of companies separated from management, there have been developed researches into performance objectives of managers, as there were observed conflicts between shareholders' and managers interests, because managers rather pursued maximizing sales than profits (Baumol, 1959, Cyert and March, 1963). As a result, various features of the board and management teams began to be studied: board diversity, size, proportion of outsiders on the board, number of board meetings and performance (Jensen, 1993, Carter *et al*., 2003, Erhardt *et al*., 2003).

Generally speaking, there are two different approaches in terms of group diversity and performance: on one hand, diversity leads to a greater knowledge base, creativity and innovation, and therefore, becomes a competitive advantage (Richard, 2000; Roberge and van Dick, 2010). The keys to improved performance are integration and communication. Such groups easily cope with organizational and market changes. The board is making its decisions during board meetings and some authors consider that firm performance can be explained also by using board meetings as an explicative variable (Julizaerma and Sori, 2012; Rodriguez-Dominguez *et al*., 2012). On the other hand, diversity can potentially be a disadvantage in terms of group performance; mixed teams were slower in their activities and reactions and less likely than similar teams to respond to rivals' initiatives. Diverse team members tend to be more involved in conflict situations (van Knippenberg and Schippers, 2007, Zhen Zeng, 2011). More recently, Ferreira and Kirchmaier (2013) compared data for 22 European countries and discovered that good governance depends by country characteristics. The cultural variables as possible drivers of firm performance were first brought to attention in the 1980s, when Hofstede published his work on culture's consequences and the international differences in work-related values (Hofstede, 1983). As a result, an abundant literature is now supporting the idea that organizational culture is important in understanding firm performance. In a supplementary effort to better understand the complex world that we live in, more recent studies brought into attention additional drivers of firm performance, such as the type of operational processes of companies, and demonstrating that being eco or non-eco-friendly in the operational processes really counts. (Lin *et al*., 2015).

3. Research methodology

The paper's aim is to explore the existence of links between the diversity of the management team and the company performance in case of heterogeneous shareholder groups and management boards and teams, where heterogeneity will be expressed in terms of gender, cultural background and independence. For that purpose, the following hypothesis will be tested:

1. A direct relationship exists between financial performance and a diverse cultural shareholder structure.
2. A direct relationship exists between financial performance and a diverse cultural board.
3. A direct relationship exists between financial performance and board independence.
4. A positive relationship exists between financial performance and gender diverse board.
5. A positive relationship exists between financial performance and cultural diverse management teams.
6. A positive relationship exists between financial performance and gender diverse management team.

The data for the study were gathered from the main Romanian companies listed at Bucharest Stock Exchange (BSE), and panel data analysis covering the 2014-2015 period of time has been used. According to Torres-Reyna (2007) "panel data (also known as longitudinal or cross-sectional time-series data) is a dataset in which the behaviours of entities are observed across time.[…] Panel data allows you to control for variables you cannot observe or measure like cultural factors or difference in business practices across companies". To test the above mentioned hypothesis, first a descriptive statistic was performed, followed by a correlation analysis and a general linear regression model (see equation (1)).

The regression model is aimed at discovering the possible links between the financial performance as the dependent variable (Y) and other 10 independent and control variables (X1 to X10). The company's performance has been expressed as being the return on assets ratio (ROA), return on sales ratio (ROS), return on equity ratio (ROE) and, finally, as the price to book ratio (P/V). The independent and control variables (X1 to X10) are included in table 1 and explained further on.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \xi_i \quad (1)$$

Table 1. Description of variables

Variable type	***Description***
Dependent variables ROA = EBIT/total assets ROE= Net income/Common equity ROS = Net income/Net sales P/BV= Market capitalization/ Book value of company	 Return on assets Return on equity Return on sales Price to book ratio
Independent variables X1 - FRN_SHL X2 - FRN_BRD	 Proportion of foreign shareholders Proportion of foreigners in board

Variable type	*Description*
X3 - EXEC_BRD	Percentage of executive members of board
X4 - WOM_BRD	Ratio of women in board
X5 - FRN_MN	Ratio of foreigners in management team
X6 - WOM_MN	Ratio of women in top management team
X9 - MEET	Number of annual board meetings
X10 - ENV	Type of company's operational process
Control variables	
X7 - SIZE	Log (Net sales), size of the company
X8 - AGE	Years in business for the company

Data of listed companies were used because those companies must comply with the obligation to publicly disclose detailed information about their board and management team structure, along with detailed reports on financial data, as it is stipulated in the BSE Code of Corporate Governance. The analysed data set contain detailed information gathered from the premium and first tier companies, belonging to different industrial sectors: mining and quarrying, manufacturing (food, drinks, textile, paper, machineries, pharmaceutical, etc.), electricity, gas, steam and air conditioning production and supply, construction, wholesale and retail, transport and storage, hotels and restaurants, real estate activities and financial intermediation and insurance domain. Initially all the 84 listed companies were considered, because they systematically reported data related to corporate governance beginning only with 2014. After a preliminary analyse, all 13 listed companies in financial intermediation and insurance domain were excluded, because of their specificity in disclosing their financial data. Another 10 companies experiencing various litigations (being under special judicial procedures) were excluded also, and other three were disqualified for data incompatibility (one company was listed in the last part of 2014, and the other two experienced negative equity and losses and some financial ratios such as ROE would be misinterpreted). As a result, data of 58 companies covering 2014-2015 period of time were considered for this study and the data were collected from various sources: the BSE website (www.bvb.ro), the Ministry of Finance website (www.mfinante.ro), companies annual board reports, balance sheets, income statements, financial auditors' reports and companies' websites.

First, for each company, data related to their domain of activity, number of years in business and ownership structure (Romanian versus foreign) has been gathered and analysed. On the BSE website, information about each shareholder that owns at least 10% of firm's capital is disclosed, otherwise being included in the category of "other shareholders" (except for the state ownership that is disclosed at any percentage). The proportion of foreign capital out of total (FRN_SHL) was taking into consideration as the variable that will be used to modelling the influence of different cultural background of shareholders. Also, a proxy control variable (AGE) was developed to designate the company's organizational culture based on the number of years since the firm exists in business. Each company has been categorized using its major domain of activity into friendly and non-friendly environment company using a dummy variable (ENV),

with assigned values of 0 for companies with less polluting activities (such as hotels and restaurants, real estate activities), and 1 for companies whose activity is not environmental friendly (mining and quarrying, manufacturing, transport and storage, construction, etc.)

Secondly, information about board structure was collected: board size, proportion of executive and non-executive directors, Romanian and foreigners, men and women, and also the number of board meetings, because the board is exerting its delegated power and duties during board meetings.

The board structure is an important issue, due to the communication and decision-making process that is taking place during board meetings, although the roles and responsibilities of the board may vary depending on the type of business entity. Executive directors are appointed by shareholders and are considered those that were assigned to conduct the companies' operations. Usually, in Romanian companies, they are occupying the position of top manager or financial manager. Non-executive directors are also appointed by shareholders, based on their prestige, connections and experience, but have no roles in conducting daily activities of the company.

Consequently, based on these data, new variables were added to the model: the percentage of foreign board members (FRN_BRD), percentage of executive members of board (EXEC_BRD), the proportion of women in the board (WOM_BRD) and the number of board meetings during each year (MEET). Further on, the management teams structure was analysed and information about the Romanian and foreign managers were gathered, along with gender information and two more variables were set: FRN_MN (as being the proportion of foreigners in the management team) and WOM_MN (representing the proportion of women in the management team).

Financial data for each company were gathered from balance sheets, income statements and the BSE website referring to: fixed and current assets, equity, net sales, earnings before income and taxes, net income, and also market capitalization for calculating various financial indicators of company performance (ROA, ROE, ROS and P/BV). ROA (return on assets), ROE (return on equity), ROS (return on sales) and P/BV (price to book ratio) are indicated by the vast majority of researchers as being adequate measures of the financial performance of the companies taking into account the variety of stakeholders that are interested in company's evolution. In the paper they are considered as dependent variables of a regression model that will be developed.

The firm performance in relationship with management team is appropriately expressed by using ROA as the measure, because it represents the operational profits that managers are able to obtain using the company's assets regardless of its financial and fiscal policies. Managers decide how to acquire and use fixed and current assets, what kind of operations to develop and also the type and amount of material and human resources that will be used in the process. Moreover, managers decide the commercial partnerships that the company will enter in and the customers and suppliers characteristics that are beneficial for company's profitability. So, using ROS as a firm performance measurement is also appropriate, because net income and net sales both depend on companies' relationship with customers and suppliers. However, how the company is financed remains one of the main attributes of shareholders, that decide if the company goes in debt or not. Ultimately, the financial structure of the company derives both from shareholders' will and financial markets evolution (via interest rates and exchange ratios). The level and structure of taxation is the state attribute, and companies must comply with and using ROE as an indicator of

shareholders interest in company's financial performance is relevant under the above circumstances. But for the potential investors that are judging company's results based on market price, a more appropriate measure of performance seems to be P/BV, that is comparing market perception about company's attractiveness (via market price per share) with the book value of the company (that is to be found in its financial statements).

4. Results

4.1. Descriptive statistics

According to information obtained from companies and summarized in table 2, data on the ownership structure of companies listed on the BSE shows that there are companies who includes no foreign shareholders, and correspondingly companies where the proportion is over 90% (0.9341), with an average of 18.21% (0.182135). The structure of the board of companies is also one variant, either with no foreign board, or composed entirely of foreigners, their average presence in the board being of 16.18% (0.161771). But foreigners are rather uncommon in the structure of management team, their average percentage being of only 5.86% (0.058603), lower even than women's participation (17.81% e.g. 0.178091). Indeed, women are present in the management teams of the companies, but at a much lower proportion than men, and there are cases in which no woman is included in the management team or on the board of some companies. If women are included in the management team, they are usually occupying the CFO position, sales manager or quality manager positions. The newest founded company (of those listed on the stock exchange) has existed for 16 years, but there are companies centenarians, most of them operating rather in the areas with polluting technologies (gas, oil, mining and quarrying).

Table 2. Independent and control variable - Descriptive statistics

	Range	Minimum	Maximum	Mean	Std. Deviation
X1 FRN_SHL	0.9341	0.0000	0.9341	0.182135	0.2969510
X2 FRN_BRD	1.0000	0.0000	1.0000	0.161771	0.3052753
X3 EXEC_BRD	1.0000	0.0000	1.0000	0.183535	0.1768178
X4 WOM_BRD	0.6667	0.0000	0.6667	0.178091	0.2041438
X5 FRN_MN	1.0000	0.0000	1.0000	0.058603	0.1892633
X6 WOM_MN	1.0000	0.0000	1.0000	0.253197	0.2819936
X7SIZE	9.4475	14.0798	23.5273	18.550120	1.9057499
X8 AGE	109	16	125	56.97	27.364
X9 MEET	65	1	66	10.18	10.174
X10 ENV	1	0	1	0.88	0.327

4.2. Correlations analysis

Analysing the significant Pearson coefficients presented in table 3 (both for a 95% and 90% confidence level), a series of correlations can be observed between the model variables. At 90% confidence level, the assets profitability (ROA) is strongly and positively correlated with sales profitability, ROS (0.654) and with return on equity ratio, ROE (0.641) and positively but moderate correlated with the price to book ratio, P/BV (0.323).

Also, at 95% confidence level, ROA is positively weak correlated with the presence of women in the management team, WOM_MN (0.180), with the company's size, SIZE (0.325) and with polluting technologies, ENV (0.184) and weak negatively correlated with the presence of foreigners in boardrooms, FRN_BRD (-0.197). Likewise, ROS is positively (but moderate) correlated with the company's size (0.352) and polluting technologies (0.223) and weakly negative correlated with foreign shareholders (-0.178), foreign board members (-0.212) and their presence in management teams (-0.198), and also with more executives' members in boardrooms (-0.168). ROE is positively but weakly correlated with women's presence in managerial teams (0.200) and weak-negatively with foreign shareholders (-0.215), foreign members in boardrooms (-0.250) and with the appointment of foreign managers (-0.268). On the other hand, foreign shareholders tend to appoint more foreign board members (as 0.641 strong correlation level indicates) but also rather foreign than Romanian managers (as 0.221 correlation level shows). One can see that the higher the company's P/BV ratio is, the bigger the interest of foreign shareholders to own it (a significant 0.264 positive correlation level shows it).

A more diverse board is more inclined to appoint a more diverse management team (to include also foreign managers, as strong correlation coefficient indicates). A board that includes women is more inclined to appoint women in management team, too (at 0.271, correlation coefficient being significant). It seems that larger companies are positively correlated with a higher number of board meetings, which can be explained through the company's increased complexity of activity (as the positive significant level of 0.393 indicates). And finally, the data shows that larger and older companies included in the study have rather non-environmental friendly technologies (as the correlation coefficients shows).

4.3. Regression Models

For a better understanding of the relationship between firm performance and its drivers, after correlation calculus, regression models were built and tested using SPSS.

First, the relationship between ROA and its explicative factors has been tested (see equation 2) and the values of "β_i" coefficient presented, along with the values of p level for t-test, to indicate their relevance for the model (see table 4).Beta coefficients are relevant if corresponding p-values are less than 0.05.

$$ROA = \alpha + \beta_1 FRN\_SHL + \beta_2 FRN\_BRD + \beta_3 EXEC\_BRD + \beta_4 WOM\_BRD + \beta_5 FRN\_MN + \\ + \beta_6 WOM\_MN + \beta_7 SIZE + \beta_8 AGE + \beta_9 MEET + \beta_{10} ENV + \xi_i \quad (2)$$

Successive iterations were performed in SPSS to test the model's validity, excluding step by step the variables with the highest values of p-level (and greater than 0.05). For all iterations, the values of R^2, Adjusted R^2 and Fisher-Snedecor were emphasised to see how well the model fits the data. The higher the R^2 and Adjusted R^2 values, the more one can rely on selected independent variables to explain the variations in companies' performances. Also Durbin-Watson error autocorrelations were tested to exclude auto-correlation errors of the model.

Taking into account all these aspects, the valid regression model for ROA has been developed, as depicted in equation (3). Similar rationing was performed for ROE, ROS and P/BV, with valid regression models depicted in equations (4) to (6).

$$ROA = -0.199 - 0.054 \cdot FRN\_SHL + 0.054 \cdot WOM\_MN + 0.013 \cdot SIZE \quad (3)$$

Valid model for ROE is confirming the identified link between ROE and the ownership structure and also between ROE and the presence of foreign managers in the management team (both pairs being found negatively correlated as data in table 3 indicated, too). The presence of women in the management team, on the other hand, seems to confirm the positive influence that the correlation coefficient has previously indicated in calculations from table 3. ROE is increasing with the company's size, as well.

$$ROE = -0.094 \cdot FRN\_SHL - 0.141 \cdot FRN\_MN + 0.090 \cdot WOM\_MN + 0.002 \cdot SIZE \quad (4)$$

The statistical significant coefficients indicate that an increase in sales profitability is negatively influenced by the presence of foreign shareholders in the ownership structure and also by the presence of executive members of the board, but positively by the presence of women in the managerial team. And this is more visible if the company is larger - see equation (5).

$$ROS = -0.629 - 0.172 \cdot FRN\_SHL - 0.162 \cdot EXEC\_BRD + 0.130 \cdot WOM\_MN + 0.037 \cdot SIZE \quad (5)$$

But the market perception regarding firm's value compared with the book one is telling a different story. The presence of foreign shareholders seems to contribute to an increase in the company's market image, and this is observable with increasing the company's size - see equation (6).

$$P/BV = 0.788 \cdot FRN\_SHL - 0.515 \cdot FRN\_BRD + 0.039 \cdot SIZE \quad (6)$$

4.4. The main findings

The main findings of the regression analysis shows that the ownership structure (FRN_SHL) has significant negative influence on the accounting measure of assets profitability (ROA) and equity (ROE), but especially on sales profitability (ROS), hence a positive influence on P/BV. From table 3 we can see that a correlation between company's performance (in terms of sales and equity) and the ownership structure

exist and is slightly negative (correlation level -0.178 respectively -0.215), but positive in term of market to book value ratio (0.264). Zeitun and Tian (2007) also noticed that such effects exist, while other researchers find rather positive influences. A possible explanation is that some studies were conducted on developed markets, while others on emergent markets, such as the present one with different history of existence and cultural background.

If the board is including executive members (that are appointed as CEOs for those companies), their influence tends not to be beneficial for increasing sales profitability (as the negative coefficient of -0.162 in equation (5) indicate), having however no effect on ROA, ROE and P/BV, and being coherent with similar findings of Vintilă and Gherghina (2013) on the same market.

The presence of foreign managers influences only ROE, by diminishing it (by - 0.141 times) when they are included in the management team. Companies seem to benefit from women's presence in the management team, but not in the boardrooms, as the regression equations coefficients of WOM_MN show in relations (3), (4) and (5). Smith *et al*. (2006) found similar results on a panel of Danish companies, and also Dezso and Ross (2012), but more recent research on Vietnamese financial market by Nguyen *et al*. (2015) indicated the existence of such relationship in transitional economies characterized by an underdeveloped corporate governance system, especially when the number of women in boardroom increase. For the board of directors, the presence of one or two foreign persons or of women is not enough to make it sufficiently diverse and therefore to remarkably influence the firm's performance. Same results were also obtained by Charles *et al*. (2015) indicating that unless there are at least three women on board, their presence has an insignificant effect on firm performance.

But there is a positive influence coming from the company's size: the bigger the company is, the better the chances are to have high performances, even if their board is having frequent or less frequent meetings or their activity is more or less polluting. And if they, additionally, appoint women in managerial positions, the company's performance is even significant.

5. Conclusions

The paper considered panel data analysis from the period 2014-2015 on the Romanian financial market, being among the first of its kind in the field on this market that addresses both cultural and gender diversity correlated with the financial performance of companies.

The research conducted is useful for many categories of users. First, it can be used by shareholders in order to make better investment decisions, when it comes to find best criteria for future investments. Secondly, the results can be used by the BSE board for improving the Code of Corporate Governance regarding ownership and board structure and behaviour. Thirdly, universities policy-makers can encourage more women to study business administration, because their contributions to firms' performances tend to be more appreciated. And finally, governmental policy-makers can use the results for a better adjustment of social, educational and economic policies, based on the fact that diversity in gender and culture can lead to positive results.

The descriptive statistics of the gathered data indicated that some companies have no foreign shareholders; while others are over 90% owned by foreigners, but the average foreign ownership is slightly over 18%. The boards of the analysed companies can include either no foreign managers or can be entirely constituted by foreign members, with an average level of 16.18%. But foreigners are rather uncommon in the structure of management team, their average percentage being of only 5.86% lower even than women's participation (17.81%). If women are to participate in companies' management, usually they are not in top positions (as top manager or similar), but in the position of CFO, sales managers or quality managers. We consider that supplementary encouragement for considering managerial career for women should be encouraged, because their contributions to companies start to become more significant.

Correlation analysis results from table 3 and regression models developed (see relations (3) to (6)) indicate that a direct relationship between all financial performance ratios and a diverse cultural shareholder, boards and management structure exists, but is not a strong one. The return on assets, sales and equity ratios are rather negatively influenced by the presence of foreign shareholders, while the P/BV is positively influenced. The presence of women in the management teams also tend to have positive influence on companies' performances, regardless of the companies' age in business, but correlated with their size. Larger companies tend to appoint more women in managerial positions, but not in their boards, regardless of the domain of activity.

The firm performance (in terms of P/BV) is indeed influenced by the presence of foreign members of the board and foreign ownership, but the accounting values of financial performance (ROA, ROE, ROS) are not sensitive to such cultural influence, nor to a gender diverse board structure, only to board independence (ROS case) and to gender structure of managerial teams (ROA, ROE and ROS cases).

Moreover, the study revealed that boards that are culturally diverse are more inclined to appoint foreign managers and women in firm's managerial teams, but because of the small number of such persons, we cannot say that this can be strongly positive associated with an increased financial performance of the firm.

The results obtained are mixt, equations (3) to (6) showing that relationships exist, but the influence of the analysed variables on companies performance need to be analysed in a future study on a longer period of time to a better understanding of their evolution and behaviour.

Likewise, taking into consideration the obtained results, further investigations should be made in order to detect also a possible relationship of performance in line with certain fiscal behaviour of shareholders, because many of the listed companies are registered in fiscal paradises such as Cyprus, Cayman Islands and Luxembourg (22.4% of listed BSE companies), only 15.5% having foreign shareholders registered in Austria, Germany, Greece, Netherland, Saudi Arabia or US, and the rest being registered in Romania.

But, in the end, giving the fact that we are living in a more complex, competitive and multi-cultural world, with more learning opportunities both for men and women, but also living in a more challenging environment, the policy-makers should take into consideration that a more gender and cultural diverse ownership board and management team can contribute to the increase of companies performance.

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Table 3. Correlation coefficients

Correlation matrix	Y2	Y3	Y4	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
Y1 ROA	.654**	.641**	.323**	-.145	-.197*	.034	-.039	-.089	.180*	.325**	.036	.046	.184*
	(.000)	(.000)	(.000)	(.060)	(.017)	(.359)	(.339)	(.172)	(.026)	(.000)	(.350)	(.311)	(.024)
Y2 ROS		.533**	-.088	-.178*	-.212*	-.168*	-.085	-.198*	.125	.352**	.105	.134	.223**
		(.000)	(.175)	(.028)	(.011)	(.036)	(.183)	(.017)	(.091)	(.000)	(.131)	(.075)	(.008)
Y3 ROE			.054	-.215*	-.250**	.028	.060	-.268**	.200*	.119	.026	-.064	.115
			.283	(.010)	(.003)	(.384)	(.263)	(.002)	(.016)	(.102)	(.392)	(.248)	(.109)
Y4 P/BV				.264**	.241**	.166*	-.053	.162*	.013	.030	-.028	.003	-.131
				(.002)	(.005)	(.037)	(.285)	(.041)	(.445)	(.373)	(.384)	(.488)	(.080)
X1 FRN_ SHL					.641**	-.049	-.131	.221**	.124	.233**	-.110	.019	.020
					(.000)	(.299)	(.080)	(.009)	(.093)	(.006)	(.119)	(.419)	(.417)
X2 FRN_ BRD						-.059	-.155*	.617**	.023	.014	-.102	-.078	.023
						(.263)	(.048)	(.000)	(.403)	(.440)	(.139)	(.203)	(.403)
X3 EXEC _BRD							.108	.076	.102	-.066	-.132	-.120	-.077
							(.124)	(.208)	(.137)	(.241)	(.079)	(.100)	(.206)
X4 WOM _BRD								-.060	.271**	-.133	-.086	-.062	-.086
								(.262)	(.002)	(.077)	(.179)	(.253)	(.180)
X5 FRN_ MN									-.121	-.030	-.143	-.094	-.072
									(.098)	(.376)	(.063)	(.158)	(.221)
X6 WOM _MN										-.104	-.127	-.152	-.125
										(.133)	(.088)	(.052)	(.091)
X7SIZ E											.036	.393**	.261**
											(.351)	(.000)	(.002)
X8 AGE												.039	.247**
												(.337)	(.004)
X9 MEET													-.004
													(.484)

** - Correlation is significant at 0.01 level (Sig. 1-tiled)

* - Correlation is significant at 0.05 level (Sig. 1-tiled)

Table 4 – Drivers of asset profitability (ROA)

ROA	Coefficients (value of p level for t-test)											R^2 (Adj. R^2) F (Signif.) Durbin-Watson		
	Const.	FRN_SHL	FRN_BRD	EXEC_BRD	WOM_BRD	FRN_MN	WOM-MN	SIZE	AGE	MEET	ENV			
#1	-.196	-.040	-.032	.005	-.031	.031	.061	.012	-.000	.000	.023	.257	3.640	1.921
	(.001)*	(.098)	(.265)	(.862)	(.230)	(.391)	(.002)*	(.000)*	(.989)	(.487)	(.174)	(.187)	(.000)	
#2	-.196	-.040	-.032	.005	-.031	.031	.061	.012		.000	.022	.257	4.083	1.920
	(.000)*	(.096)	(.263)	(.859)	(.227)	(.386)	(.002)*	(.000)*		(.485)	(.162)	(.194)	(.000)	
#3	-.195	-.040	-.032		-.031	.032	.062	.012		.000	.022	.257	4.631	1.921
	(.000)*	(.095)	(.249)		(.228)	(.365)	(.001)*	(.000)*		(.470)	(.162)	(.202)	(.000)	
#4	-.185	-.039	-.033		-.031	.034	.064	.011			.024	.254	5.241	1.909
	(.000)*	(.100)	(.243)		(.224)	(.328)	(.001)*	(.000)*			(.129)	(.205)	(.000)	
#5	-.185	-.046	-.015		-.029		.061	.011			.022	.247	5.995	1.894
	(.000)*	(.048)*	(.478)		(.253)		(.001)*	(.000)*			(.162)	(.205)	(.000)	
#6	-.193	-.056			-.028		.061	.012			.021	.243	7.076	1.961
	(.000)*	(.001)*			(.277)		(.001)*	(.000)*			(.172)	(.209)	(.000)	
#7	-.201	-.053					.056	.012			.022	.235	8.532	1.952
	(.000)*	(.002)*					(.002)*	(.000)*			(.161)	(.208)	(.000)	
#8	-.199	-.054					.054	.013				.221	10.619	1.969
	(.000)*	(.002)*					(.003)*	(.000)*				(.201)	(.000)	

Note: * - indicate $p < 0.05$ (p-level are in parentheses)