Influence of External Funding on Microfinance Performance

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Abstract

The aim of paper is to determine whether macroeconomic development and the size of banking sector affect the range of external funding and consequently the importance of these debt sources for microfinance performance. Our findings reveal that the growth of external sources is positively influenced by economic grow, level of corruption, unemployment or under certain conditions by the development of banking sector, as well. Likewise, their presence can have a positive impact on the number of clients, portfolio quality, margin or cost policy of MFIs. The opposite effect can appear if the ratio of external funding to total assets increases over time.

Key words: microfinance, macroeconomic indicators, banking sector, external funding

JEL Classification

G21, H25, O11, O17

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1. Introduction

Microfinance is considered to be a useful instrument for support of the low-income inhabitants in the developing countries. The client portfolio of the microfinance institutions (MFIs) consists mainly of the inhabitants who want to increase their living standards by means of investment in their own businesses, education of their children or to overcome unfavourable incidents in the period of floods, crop failure or the job loss of one of the family members. Due to their growing demand for microfinance credits and commercialization of the microfinance sector, it has began to broaden the primary way of the MFIs financing by means of the public expenditures on the private capital from the commercial banks, institutional and private investors in the last decades. The reason for the growing interest from the side of private sector consists in the possibility to reach relatively high profit, comparable with other debt instruments and in the possibility to diversify the investment portfolio appropriately (Janda et al., forthcoming).

The majority of the existing studies focusing on the development of the microfinance sector or the research of the efficiency of the individual sources of finance is based on the micro-level analysis without taking the causal relations in the broader macroeconomic context. The lack of macroeconomic studies in the microfinance literature prevents from more complex argument of the possible causes of the enormous growth of the microfinance market size and the number and size of the microfinance service providers. The general public believe that the microfinance development is the merit of the growing client number, gradual reduction of operating expenditures and interest rates, establishment of new technologies or more quality legislative conditions enabling greater transparency of the microfinance industry. We are lacking more complex assessment whether this success can also be significantly influenced by the environment where the MFIs work.

Minority of the studies that take into consideration the importance of the macroeconomic environment shows that, generally, the development of the microfinance is influenced positively by the economic growth, density of the population and higher rate of the activities related to the agricultural production in the given area. The MFIs working in these areas excel in the higher number of offered credits and higher efficiency of the operating expenditures. On the contrary, there can be slower development of the microfinance market in the places with higher percentage of the industrial production, insufficient legislation and high inflation

rate. Slower development is also observed in the developed countries where Schreiner and Woller (2003) see the main cause in the smaller market for the beginning micro-entrepreneurs who are usually oriented on the services rather than on the production.

Insufficient attention of the microfinance literature is also paid to the detailed analysis of the particular ways of the MFIs financing. The MFIs use, besides the social capital in the form of donations or special purpose subsidies, their own capital or disposable resources gained from the client deposits for their business activities. The external sources are the last financing option where we cannot find more detailed study examining its impact on the social and financial efficiency of the MFIs. Ghosh and Van Tassel (2011), and Ghosh and Van Tassel (2013) provide more detailed analysis of the external sources from the viewpoint of the competition and the comparison with the other sources. Ghosh and Van Tassel (2011) came to the conclusion that increasing competition among the microfinance service providers in gaining the external sources leads to higher social efficiency rate. In addition, applicability of these sources proves to be more beneficial in the areas with sufficient supply of the sources of finance. If the supply is low, the MFIs should be subsidized (Ghosh and Van Tassel, 2013).

Considering the above mentioned gaps in the literature, the aim of this study is to verify whether the macroeconomic environment influences the demand of the MFIs for the external sources by its development, and subsequently, whether the MFIs with the application of the debt financing reach higher social and financial efficiency rate in the sense of increasing number of the debtors, profit rate, decrease of the invested expenditures and risk operations. Study will be conducted on the panel data of 539 MFIs working in 21 countries in Latin America and Asia in 2007-2012. We will extend the macroeconomic environment represented by the indicators GDP, Inflation, Export, Rural population, Public debt, Unemployment, Corruption, Currency rate and the Tax burden by the size of the banking sector (total assets and the interest rate) which is the biggest creditor of the MFIs in the long term.

The final conclusions will have the impact on the creditors and investors interested in the social and financial efficiency of the microfinance service providers. The macroeconomic view will be also useful for more and more popular microfinance funds (MIV) which, besides the existing micro-level analysis, will be also able to assess the relevance of the macroeconomic development. Last but not least, it is possible to use the final conclusions in the frequent discussions between the economists and regulators about the question whether the MFIs should use rather their own sources or use the debt financing in their business activities.

The rest of the study is divided as follows. The next two sections summarize the overview of the existing literature focusing on the forms of sources of finance and the importance of the macroeconomic environment for the development of the banking sector and the microfinance market. Section 4 characterizes the selected panel data that determine this study more closely. The panel regression and its more detailed specification is given in Section 5. The final conclusions are argued in Section 6. The research findings are summarized in the conclusion.

2. The Influence of the Macroeconomic Environment and the Banking Sector on the External Sources of the MFIs

The demand of the microfinance service providers for the external sources has not been subjected to more detailed analysis from the point of view of the macroeconomic development and the size of the banking sector so far. This research intention follows some of the existing studies examining a similar topic in the banking sector. According to these studies, the activities of the banking institutions are influenced considerably by the stability and the size of the internal and external sources of finance (Bucher et al., 2013) as well as by the macroeconomic environment of each country (Love et al., 2014). Sehrish et al. (2011) revealed higher profit rate at the banking institutions which are characterized by bigger assets and higher percentage of sources of finance. Smaller banks rely on the disposable resources from the client deposits while the big and fast-growing banks prefer non-deposit (external) sources gained from capital markets (Demirgüç-kunt et al., 2010).

More detailed analysis of the banking sector balance shows (Bankscope) that 100 biggest banks in the region of Latin America (measured by the asset size) held in their liabilities approximately 55.4 billion USD in the short-term (SS) and 188.9 billion USD in the long-term sources (LS) in 2002. The liability side of these institutions increased in the case of the SS up to 245.2 billion USD as well as in the case of the LS up to 1.419 billion USD in year 2012. Similar scenario is also played out in the USA where 100 biggest commercial banks financed their business activities SS/LS in the amount of 4.033/2.783 billion USD in 2002. On the other hand, the bank balance on the liability side changed at the SS to 3.805 billion USD and at the LS to 10.290 billion USD in 2012. The decrease of the SS is caused by the financial crisis in 2008 and the unfavourable economic development. The more are these

institutions depending on the financing through capital markets, the higher is the probability of higher risk in case of the market shocks (Demirgüç-kunt et al., 2010).

The decrease of the demand of the banking institutions for the external sources in the period of the financial crisis indicates that the interest of the banking sector in financing the business activities by the debt sources can be strongly related to the macroeconomic development in the given country. The relation between the macroeconomic environment and the banking sector was studied by Makri et al. (2014), Bilal et al. (2013), Pouw et al. (2013) and Bekö and Festić (2008). The final conclusions show that the activities of the banking sector are strongly related to the economic cycle (Makri et al., 2014) and its profitability is increasing significantly in the period of the growing GDP (Bilal et al. 2013; Pouw et al. 2013). The depreciation of the domestic currency (Bekö and Festić; 2008), growing government debt, inflation rate and unemployment rate (Pouw et al. 2013; Makri et al., 2014) have a negative influence on the development of the banking sector. Then, Anum and Abdul (2012) reveal that the amount of import and export in the given country does not have any impact on the profitability of the banking sector. At the same time, the amount of the import and export can have crucial role in the GDP growth in the open economics.

In the first part of our study exploring the demand of the MFIs for the external sources with taking into consideration the environment where these institutions work, we will proceed from the similar conclusions that were discovered in the banking sector. Although the commercial banks are the biggest creditors of the MFIs in the long term (see following section), we will not limit the size of the external sources only to the banking sector but we will consider every possible counter-party, such as government and international organizations, institutional or private investors. Similarly, we will take into account some macroeconomic factors which have an influence on the development of the banking sector where we can assume similar impact on the size of the demand for the external sources from the side of MFIs. Besides the GDP, Inflation, Currency rate, Unemployment, Public debt and Export, we will broaden the list of the explaining variables with the Company tax, the Rural population proportion and the Corruption rate in the given country.

We can expect, hand in hand with the GDP growth, the consumption and investment growth, hence the growing demand of the poor for microcredits and also growing demand of the MFIs for the external sources. On the contrary, the size of the demand can be influenced negatively by the inflation growth that decreases the real profitability of the client credit, increases the expenditures on the credit and increases the size of the debtor's repayment and also the probability of the overdue credit in the long term credits. Similarly, we assume that

many credits can be offered to these institutions in the foreign currency (usually in USD) and the debt instruments are more expensive and less popular with the MFIs themselves due to the depreciation of the domestic currency. The demand for the external sources can be pushed positively by year-on-year unemployment growth. The number of the population without the job can increase their motivation to establish their own entrepreneurship and also the growth of the demand for the microcredits and need of their financing. The size of the government debt represents also an important factor influencing the price of the debt instruments. The government is an important (and sometimes the only) creditor of many MFIs in some countries. Along with the growth of the government debt, we can expect the decrease of the supply of the debt sources on the market and the growth of their price, either due to the decreasing supply or higher risk of the country that is perceived negatively by the investors and the creditors. This problem can be related closely to the openness of the economics which can neutralize the decreasing supply of the public sources on the market with more private external counter-parties. The dependence of the MFIs on the external sources can be related to the demographic viewpoint. The reason is the fact that the MFIs usually operate in the rural regions where the demand for the microfinance and for the external sources can be considerably depending on the size of the population and an entrepreneurial environment. The size of the demand for these sources can also depend on the corruption rate in the given country. The majority of the MFIs works in the developing countries where along with the bigger corruption can come about also the decrease of the supply of the external sources, higher prices and lower interest from the side of the MFIs.

Agenor et al. (2000), or Bilson et al. (2001) point out in their studies the possible influence of the macroeconomic factors on the explaining variables with a certain time delay. It is not possible to exclude that the demand of the MFIs for the external sources in the case of the condition change will be shown with a certain time delay due to the fact that they are usually financed from more sources (subsidies, client contributions, governments...). Although Wagner and Winkler (2013) state that the MFIs which are connected with the market more and their sources are more susceptible to the market shocks, many MFIs are not able to depend exclusively on the external sources similarly as the banks because of the small asset size and a local place of their operation. We think it would be useful to find out whether the demand for these sources is, in the case of a change on the side of the creditor or conditions on the market, reflected by the MFIs immediately or with a certain time delay. If it turns out that the external sources react to the explaining variable with a longer time delay, it

is difficult for the MFIs to react flexibly to these changes, e.g. by means of long term loans on the money market or with higher interest rate for the clients.

3. The Influence of the External Sources and the Macroeconomic Environment on the Microfinance Development

Financing of the business activities of the MFIs in comparison with the banking sector is rather different in some ways. While the banking institutions are characterized by the "problem-free" way of self-financing, there prevails a high dependence on the subsidies by the microfinance service providers in many regions (Nawaz, 2010; Caudill et al., 2009). Bogan (2012) states that there are mainly the regulated MFIs financed from the market in the region of Latin America and the Caribbean, in the states of Africa, East Europe and Central Asia (ECA), the Middle East and North Africa (MENA) there are mainly non-regulated MFIs and NGOs with the business activities interconnected strongly with the subsidy policy on the local or international level.

It is not a natural thing for the MFIs to use their own sources in the form of client deposits for their business activities. Even though the demand for the microfinance services surpasses the supply in the long term, the MFIs are not subordinated in many cases to any regulation and supervision and cannot accept the client deposits. The reasons are mainly the minimal requirements on the liquidity and additional expenditures connected with the higher level of information obligation in the relation to the regulator. On the other hand, the MFIs financed by these sources reach better results in the credit providing and they are more oriented on the social aims in the long term than if they relied only on the subsidies (Hollis and Sweetman, 1998). Last but not least, the special purpose self-financing by the means of deposits reduces the effect of the unfair competition between the MFIs that receive subsidies and that do not receive subsidies.

The last option of financing consists in the possibility of borrowing the sources of finance from the external counter-parties, usually in the form of standard, current account or conditioned credit. This way of the debt financing has been extended to the possibility of gaining disposable resources on the capital markets in the form of subscription, bond or securitization in the last years. While the banking institutions have usually the access to the capital markets, it is still rather marginal thing at the microfinance market. The reason is the

small average size of the MFIs and from it emerges the small demanded capacity of the sources, low degree of transparency and higher risk of the developing countries that can become evident in the price of the debt instruments.

Similarly as in the case of the banking sector, the popularity of the external sources (borrowings, overdrafts, bonds, subordinated debts and others) has been increasing recently at the MFIs. The biggest demand from the side of the microfinance service providers is noted in the countries of Latin America and the Caribbean, East Asia and the Pacific and South Asia (Table 1). The banking sector proves to be the most important creditor in this case. The financial institutions (Commercial Banks, Cooperative Societies, and Public Banks) hold almost 40 % of all external sources of the MFIs which is about 33 billion USD for the period 2007-2012 (mixmarket.org).

Table 1: General Overview of Funding Structure (2007-2012)

Region	Profit status	Total Amount (USD)[*]	Number of MFIs	Number in %	Average Number of MFIs[**]
Latin America and The Caribbean	Non-profit	13 526 715 929	239	97.95	244
Latin America and The Caribbean	Profit	22 128 228 418	138	93.24	148
Africa	Non-profit	1 355 869 498	119	77.78	153
Africa	Profit	3 031 331 005	83	64.34	129
East Asia and the Pacific	Non-profit	1 141 731 014	79	103.95	76
East Asia and the Pacific	Profit	3 657 541 533	82	115.49	71
Eastern Europe and Central Asia	Non-profit	3 623 309 835	107	83.59	128
Eastern Europe and Central Asia	Profit	13 651 953 184	94	72.87	129
Middle East and North Africa	Non-profit	3 710 128 554	49	94.23	52
Middle East and North Africa	Profit	0	0	0.00	4
South Asia	Non-profit	5 422 212 549	142	122.41	116
South Asia	Profit	11 515 325 278	100	120.48	83

Note: [*] It includes Bonds, Borrowings, Overdrafts, Subordinated Debts and Others. [**] Profit and Non-profit MFIs, unidentified institutions have been removed.
Source: It was elaborated on the basis of data from mixmarket.org.

More detailed analysis of the counterparties in each region reveals increased interest in the microfinance markets from the side of the institutional investors (Funds). Microfinance funds that are oriented on the region LAC (Table 2) have been representing frequent investment for the investors in the last years enabling to diversify the investment portfolio appropriately and

reach an interesting return (Galema et al., 2011). The most distinctive decrease in the external sources came between 2008-2009 when the Private Corporations, Individuals, NGOs and Foundations (Others) decreased their credit exposure by 24 %.

Table 2: Funding Structure in Latin America and the Caribbean (2007-2012)
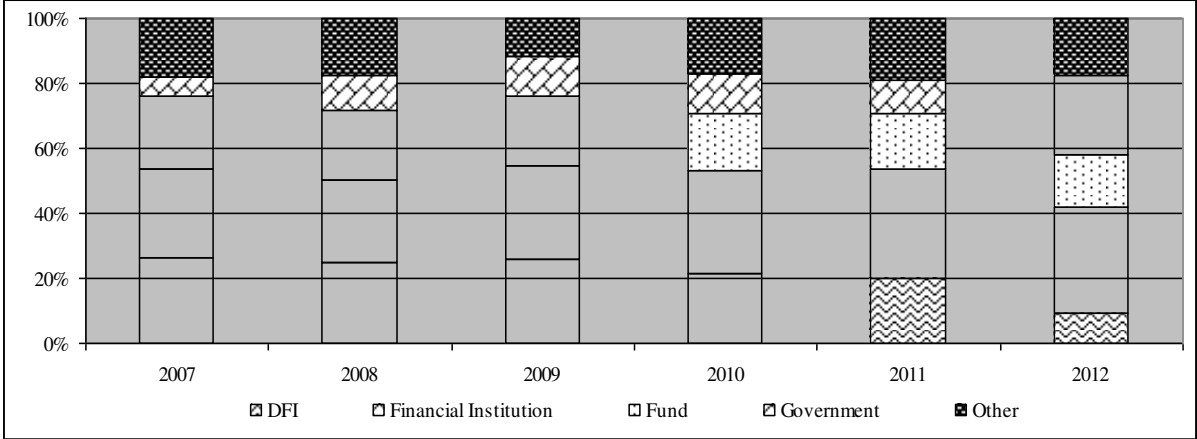
Source: It was elaborated on the basis of data from mixmarket.org.

Similarly, the increased interest in the external sources is shown in the region EAP (Table 3). The creditors as Private Corporations, Individuals, NGOs and Foundations have had very important role here. Their share represents 86 % of the total invested sum in 2012 which is approximately 1.5 billion USD. The financial exposure is decreasing at the Financial institutions and institutions classified as the Government (Multi and Bilateral Development Agencies, Development Programs, Government Agencies/Programs and Domestic Central Bank). It is mainly due to the financial crisis and the necessity to reduce the size of the investment credits and public expenditures on the social programs.

Table 3: Funding Structure in East Asia and the Pacific (2007-2012)
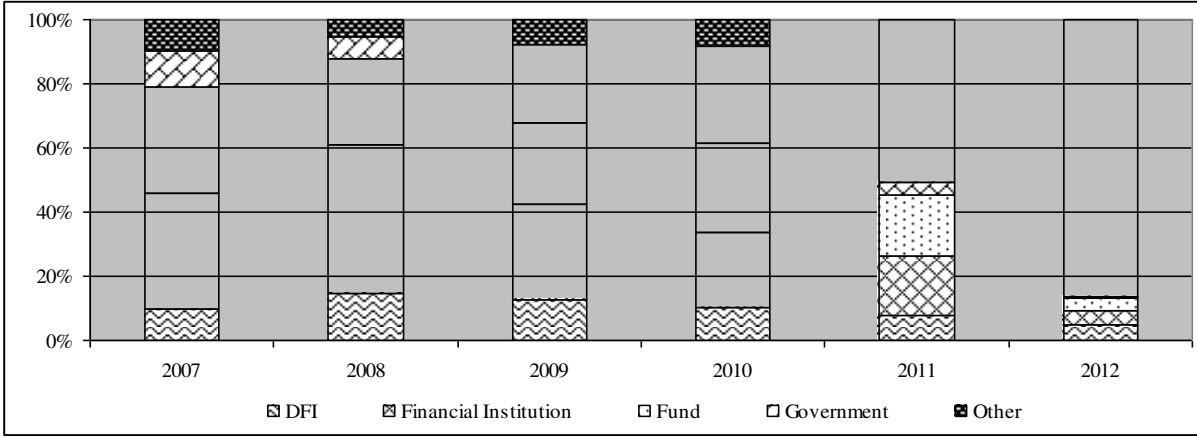
The countries of South Asia are the only regions where the debt sources have been decreasing in the long term (Table 4). Primarily between 2011-2012 (in 2012 the fall was by 86 %). The reason was the microfinance crisis in India "The Andhra Pradesh Crisis" in 2010. This country is the biggest receiver of the external sources in the given region, hence the decrease in the business activities of the local MFIs can lead to the decrease in the demand for the external sources. Ghosh and Van Tassel (2013) came in their study to the conclusion that it is more profitable for the creditor to provide the external sources (credits) in the period of a higher supply of these sources on the market. On the contrary, if the supply of the sources is low on the market, it is more efficient to finance the MFIs by subsidies.

Table 4: Funding Structure in South Asia (2007-2012)
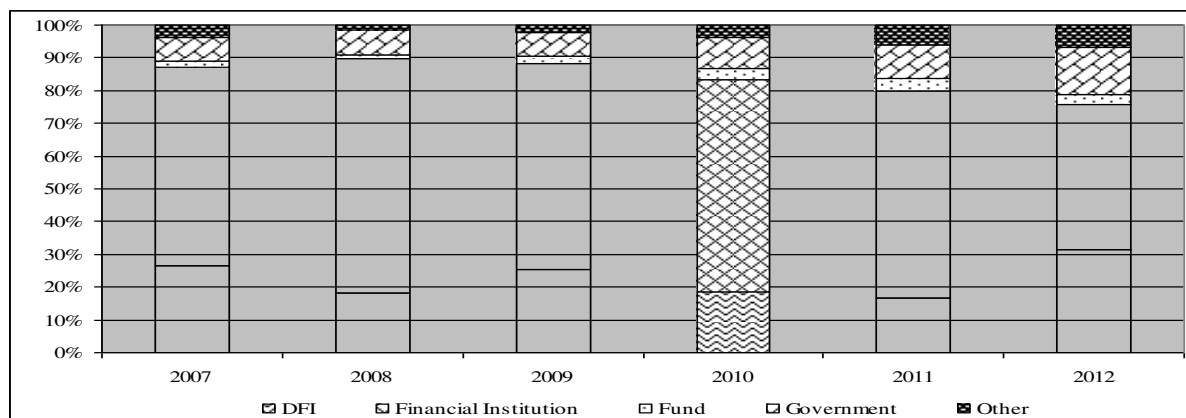
Source: It was elaborated on the basis of data from mixmarket.org.

Although the banking institutions represent an important source of the MFIs financing, their joined activity on the market does not have any definite conclusion for the microfinance sector. Cull et al. (forthcoming) and Vanroose and D´Espallier (2013) believe that the MFIs have a chance for faster progress in the branches where the banking sector is not developed very well. Furthermore, bigger competition among the MFIs for the external sources leads to higher level of social efficiency and poverty decrease (Ghosh and Van Tassel, 2011). On the other hand, Sodokin and Donou-Adonsou (2010) and Knight et al. (2009) support the mutual cooperation between the commercial banks and the microfinance service providers. It is still

an open question, whether the banking sector can influence the demand for the external sources by its policy in the given country, or what impact it could have on the chosen indicators of the microfinance sector.

Besides the satisfactory access to the sources of finance, there are some authors convinced that the different development of the microfinance industry in each region can be influenced also by the environment where the MFIs act (Vanroose, 2008; Ahlin et al., 2011). Ahlin et al. (2011) found out that the microfinance development is influenced positively by the economic growth. The MFIs reach higher profitability rate and bigger size of the credit portfolio in the region where GDP grows faster. Khandker (2005) states that the MFIs can help to reduce poverty but their impact on the economic growth is rather local. Rhyne (2001) comes to the conclusion that the stable macroeconomic environment with lower inflation rate influences positively the growth of the microfinance service providers. According to Montgomery and Weiss (2011) and Berhane and Gardebroek (2011) higher efficiency of the MFIs is in the rural areas and regions with higher percentage of the agricultural production. Finally, Bond (2013) found out in his study that instable political environment and high indebtedness rate of the country slow down the development of the MFIs.

From the above mentioned, it is clear that although the external financing can be an efficient instrument for solving of the lack of sources in the microfinance sector in the long term, existing studies focusing on the microfinance are significantly limited in their conclusions. We cannot find more complex study which would confirm the fact that enormous development of the microfinance is the merit of the subsidies and its own sources or also of more costly form of the external financing. At the same time, the external sources have had an upward trend recently with the growing number of the MFIs. To answer this question, it proves to be very important to take into consideration the environment where the MFIs act. We have reduced the extent of macroeconomic variables to indicators GDP, Inflation, Rural population and Unemployment. Considering the fact that many microfinance service providers are not oriented on the external sources because of their position on the market and the size of their assets, we will also examine the importance of the change of the impact of the explaining variables on the microfinance development while taking into consideration the time and the size of the banking sector.

It is necessary to see, unlike to the banking sector, not only the financial indicators but also the indicators of the social efficiency behind the microfinance expansion. When determining the subject of the research, we follow the general assumption that the external sources are associated with high expenditures in comparison with other possibilities of

financing that these institutions want to take into consideration in the higher price possible for the offered services. The reason of high expenditures that limit more extent using of the external sources is the insufficient supply on the market, low transparency of the MFIs, higher potential risk related to the aim segment and last but not least, the size of the MFIs that limits the negotiating ability with the counterparty and makes the MFIs the "price-taker". We will examine the applicability of these sources in the relation to the social efficiency where the growing expenditures can push the MFIs to the preference of the more solvent debtors and to the increasing of the interest rates. It is the impact on the profitability and invested expenditures from the point of view of the financial efficiency. The separate field will be the risk operations because the increased expenditures on the debt financing can lead to the lowered aversion to risk and to preference of more risky debtors from the side of the microfinance service providers.

4. Data

The data used in this study are from several sources. The first source is the database mixmarket.org (MIX) that gathers the current information about the MFIs. Specifically, we are focusing on the countries in Latin America and Asia; Argentina, Bolivia, Brazil, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Peru, Bangladesh, India, Nepal, Pakistan, Sri Lanka, Cambodia, Indonesia, the Philippines and Vietnam. The chosen localities are characterized by the high number of the MFIs and relatively high capacity of the external sources of finance. We distinguish for each state whether the final sum belongs to the profitable or non-profitable MFIs. We will estimate our regressive model on the data from the period of 2007-2012 because MIX has been gathering the required data about the financial exposure since 2007. Individual descriptive statistics of our data are captured in the Table 5.

The first subject group represents the size of the external sources (*EF_ln*) and the proportion of these sources to the total assets of the MFIs (*EF/TA*). MIX lists under the name external sources borrowings, overdrafts, bonds, subordinated debts and others. The second group shows the indicator of the proportion of the risk credits where the clients are due date by more than 30 days (*PAR_30*) or 90 days (*PAR_90*). There is a high probability that the client will not repay his credit. In this case the MFIs must write off the losing credits from

their portfolios (*Write-off*). The third group consists of the indicators of the profitability of the MFIs from the performed business activities. Specifically, it is the real profit from the credit portfolio (*Yield_R*), the size of the profit margin (*Margin*) and the rentability of the assets (*ROA*). The data in the next group, that represent the development of the number of the credit clients (*Num_ln*), the size of the credit portfolio to the total assets (*GLP/TA*) and the percentage of the women in the credit portfolio (*Female*), are chosen as the indicators of the social efficiency. The indicators of the invested expenditures are the separate group. There we are interested mainly in the proportion of the total expenditures to the total assets (*TE/TA*) where the total expenditures are counted by the addition of the financial and the operating expenditures. We set aside the operating expenditures as a separate item due to the fact that the MFIs have high percentage of the manual laboriousness at their business activities (*OE/TA*). We will consider similarly the indicator of the expenditures on the employee salaries (*PE/TA*). The last indicator shows the average size of the offered credits on one debtor (*ALB_ln*).

Table 5. General Description of Microfinance Variables

		MFIs (Profit)			MFIs (Non-Profit)		
ID	General Description	Obs.	Mean	Std.dev.	Obs.	Mean	Std.dev.
EF_ln	Sum of External Funds (abs.)	90	18.782	1.285	101	17.937	1.559
EF/TA	External Funds/Total Assets (%)	90	26.555	14.616	101	34.384	20.949
PAR_30	Portfolio at Risk > 30 days (%)	90	5.192	3.982	101	4.627	3.226
PAR_90	Portfolio at Risk > 90 days (%)	90	3.257	2.473	101	3.048	2.571
Write-off	Write Offs/Gross Loan Portfolio (%)	90	1.597	1.525	101	1.259	0.978
Yield_R	Real Yield on Gross Portfolio (%)	90	23.638	14.786	101	22.283	12.312
Margin	Profit Margin (%)	90	8.005	13.776	101	10.298	9.224
ROA	Return on Assets (%)	90	1.309	3.349	101	2.331	2.224
Num_ln	Number of Active Borrowers (abs.)	90	9.343	1.604	101	8.482	1.498
GLP/TA	Gross Loan Portfolio/Total Assets (%)	90	77.455	9.111	101	80.120	7.777
Female	Number of Active Women Borrowers / Number of Active Borrowers (%)	90	62.798	21.852	101	75.233	19.020
TE/TA	Total Expense/Total Assets (%)	90	24.797	12.534	101	25.264	14.032
PE/TA	Personnel Expense/Total Assets (%)	90	8.863	5.386	101	10.630	7.519
OE/TA	Operating Expense/Total Assets (%)	90	16.175	9.831	101	17.987	13.701
ALB_ln	Average Loan Balance per Borrower (abs.)	90	6.478	1.016	101	5.913	1.034

Source: mixmarket.org

The macroeconomic data for the each country (Table 6) are from the database of the World Bank and the International Monetary Fund. Specifically, it is the Gross Domestic Product (*GDP*), Inflation (*Infl*), Export (*Export*), Rural population (*Rural*), the Government debt (*Debt*) and Unemployment rate (*Unemp*). The score published by organization Transparency International is used as an indicator of the corruption rate (*Legal*). It is a point assessment of

the given country in the range from 0 to 10 where 0 is big corruption and 10 shows non-corrupted environment. The next figure is the year-on-year change of the real currency rate (E_r) counted on the bases of the nominal currency rates from the server oanda.com. The currency rates for individual countries are considered to USD because the size of the external sources is shown in this currency. In the countries with USD as a domestic currency is the real rate counted as a quotient of the price levels of the foreign and domestic economics. The last macroeconomic figure shows the size of the company tax (*Tax*) adopted from the web pages of the Deloitte company. We will use this indicator as a proxy indicator showing the conditions of the business development in the given country.

The banking sector represents the last subject group where we consider the indicator of the Net Interest Margin (*NIM*) that will be used for estimation of the impact of the development of the commercial bank's interest policy to the MFIs and *TA_ln* depicting the size of the total assets of the banking industry in the chosen areas. Both indicators are adopted from the server Bankscope and their descriptive statistics are also in the Table 6.

Table 6: General Description of Macroeconomic Variables and Banking Industry

			MFIs (Profit)			MFIs (Non-Profit)	
ID	General Description	Obs.	Mean	Std.dev.	Obs.	Mean	Std.dev.
GDP	Gross Domestic Product (% change)	90	4.730	2.791	101	4.798	2.550
Infl	Inflation (% change)	90	6.635	3.519	101	6.973	3.352
Export	Exports of Goods and Services (% of GDP)	90	29.410	12.925	101	28.997	14.521
Rural	Rural Population (% of total population)	90	47.333	23.259	101	45.564	21.341
Debt	General Government Gross Debt (% of GDP)	90	43.333	16.431	101	43.503	16.851
Unemp	Unemployment (% of total labor force)	90	7.109	1.921	101	6.852	2.222
Legal	Degree of Corruption between 10 (highly clean) and 0 (highly corrupt)	90	2.916	0.554	101	3.039	0.697
E_r	Real Exchange Rate (% change)	90	-0.002	0.015	101	-0.002	0.015
Tax	Corporate Tax Rate (%)	90	28.756	4.358	101	27.946	6.807
NIM	Net Interest Margin (%)	90	421.760	731.490	101	535.380	795.390
TA_ln	Total Assets of Banking Sector (abs.)	90	11.052	1.921	101	11.259	1.688

Source: World Bank, IMF, Transparency International, Oanda, Deloitte and Bankscope

5. Methodology and Hypotheses

The aim of the first part of this study is to verify whether the macroeconomic environment creates quality conditions for the growth of the external sources, meaning the efficient supply and demand between the counterparties involved. Let us have the first hypothesis saying that the macroeconomic factors and banking environment influence the size of the external sources of financing of the MFIs. At the same time, the regressive model introduced in the

equation 1.1 determines the level of the external sources of financing *EF_ln* in year *t* and in the country *c* as a dependent variable and the independent variables are: *GDP*, *Infl*, *Export*, *Rural*, *Debt*, *Unemp*, *Legal*, *Er*, *Tax*, *NIM* and *TA_ln*.

$$EF\_ln_{tc} = \alpha_0 + \beta_1 GDP_{tc} + \beta_2 Infl_{tc} + \beta_3 Export_{tc} + \beta_4 Rural_{tc} + \beta_5 Debt_{tc} + \beta_6 Unemp_{tc} + \beta_7 Legal_{tc}$$
$$+ \beta_8 Er_{tc} + \beta_9 Tax_{tc} + \beta_{10} NIM_{tc} + \beta_{11} TA\_ln_{tc} + \varepsilon_{tc.} \tag{1.1}$$

Similarly, we consider the equation 1.2 where the size of the external sources to the size of the assets of the MFIs (*EF/TA*) in year *t* and the country *c* is used as a dependent variable. The reason why we modify the dependent variable from the equation 1.1 is that we can compare the relative size of the external sources to the size of the microfinance markets with its ratio to the total assets.

$$EF/TA_{tc} = \alpha_0 + \beta_1 GDP_{tc} + \beta_2 Infl_{tc} + \beta_3 Export_{tc} + \beta_4 Rural_{tc} + \beta_5 Debt_{tc} + \beta_6 Unemp_{tc} + \beta_7 Legal_{tc}$$
$$+ \beta_8 Er_{tc} + \beta_9 Tax_{tc} + \beta_{10} NIM_{tc} + \beta_{11} ln\ TA_{tc} + \varepsilon_{tc.} \tag{1.2}$$

We will change the regressive equation on the right side of factor of a year delay *t-1* in the next step (1.3, 1.4). A summarizing overview of the independent variables and their correlation rates are presented in the Table 7. Since there are mainly the macroeconomic indicators where we can assume a mutual influence, we verified the problem of the multicollinearity by the method Variance Inflation Factor[1]. The resulting figures did not surpass the general coefficient 10 at any of the explaining variable (Gujarati and Porter, 2009), hence the multicollinearity was not proved.

$$EF\_ln_{tc} = \alpha_0 + \beta_1 GDP_{t-1c} + \beta_2 Infl_{t-1c} + \beta_3 Export_{t-1c} + \beta_4 Rural_{t-1c} + \beta_5 Debt_{t-1c} + \beta_6 Unemp_{t-1c} +$$
$$\beta_7 Legal_{t-1c} + \beta_8 Er_{t-1c} + \beta_9 Tax_{t-1c} + \beta_{10} NIM_{t-1c} + \beta_{11} ln\ TA_{t-1c} + \varepsilon_{t-1c.} \tag{1.3}$$

$$EF/TA_{tc} = \alpha_0 + \beta_1 GDP_{t-1c} + \beta_2 Infl_{t-1c} + \beta_3 Export_{t-1c} + \beta_4 Rural_{t-1c} + \beta_5 Debt_{t-1c} + \beta_6 Unemp_{t-1c} +$$
$$\beta_7 Legal_{t-1c} + \beta_8 Er_{t-1c} + \beta_9 Tax_{t-1c} + \beta_{10} NIM_{t-1c} + \beta_{11} ln\ TA_{t-1c} + \varepsilon_{t-1c.} \tag{1.4}$$

Other hypotheses will focus on the research of the influence of the external sources on the chosen indicators of the microfinance sector where we reduce the macroeconomic variables

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[1] $VIF_j = 1/1 - R_j^2$; where R_j^2 is adjusted determination coefficient

on the *GDP*, *Infl*, *Rural* and *Unemp*. Let us consider another hypothesis: The external sources of finance influence the risk operations of the MFIs. The indicators *PR_30*, *PR_90* and *Write-off* will be the explaining variable *Y* in time *t* and the country *c* in the equation 1.5 and in the equation 1.6. When we are choosing the explaining variable we proceed from more detailed analysis of the indicators of the risk operations of the MFIs where their growth is reached in the observed period, which was probably caused by the financial crisis and higher repayment inability of the debtors. Generally, there is an effort to reduce these operations, e.g. by means of the credit registers following the bonus of the debtor or by appropriate business strategy aimed to women (Janda and Turbat, 2013).

$$Y_{tc} = \alpha_0 + \beta_1 EF\_ln_{tc} + \beta_2 EF\_TA_{tc} + \beta_3 GDP_{tc} + \beta_4 Infl_{tc} + \beta_5 Rural_{tc} + \beta_6 Unemp_{tc} + \beta_7\, NIM_{tc} + \beta_8 TA\_ln_{tc} + \varepsilon_{tc.} \tag{1.5}$$

$$Y_{tc} = \alpha_0 + \beta_1 EF\_ln_{t-1c} + \beta_2 EF\_TA_{t-1c} + \beta_3 GDP_{t-1c} + \beta_4 Infl_{t-1c} + \beta_5 Rural_{t-1c} + \beta_6 Unemp_{t-1c} + \beta_7 NIM_{t-1c} + \beta_8 TA\_ln_{t-1c} + \varepsilon_{t-1c.} \tag{1.6}$$

Similarly, let us have the third hypothesis: The external sources of finance do not influence the profitability rate of the MFIs where the indicators *Yield_R*, *Margin* and *ROA* are the explaining variable Y_{tc} in the equation 1.5 and 1.6. We are proceeding from the long term decrease of these indicators caused by the possible growing competition on the market and by the pressure on the decrease of the interest rates. If it turns out that the growth of the external sources leads to the decrease of the profitability, it can show a certain inefficiency that would prove right the supporters of the self-financing of the MFIs.

Table 7: Correlation Matrix 1

MFIs (Profit)		(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(0)	GDP	1										
(1)	Infl	0.155	1									
(2)	Export	0.086	-0.165	1								
(3)	Rural	0.199	0.336	0.052	1							
(4)	Debt	-0.073	0.318	-0.331	0.039	1						
(5)	Unemp	-0.035	0.098	-0.448	-0.160	0.189	1					
(6)	Legal	-0.013	-0.237	-0.391	-0.423	0.140	-0.020	1				
(7)	E_r	-0.113	0.220	0.107	0.191	0.178	-0.047	-0.148	1			
(8)	Tax	0.098	0.203	-0.575	-0.238	0.500	0.192	0.334	-0.108	1		
(9)	NIM	0.028	-0.041	-0.279	-0.433	0.230	-0.012	0.414	-0.166	0.401	1	
(10)	TA_ln	0.122	-0.067	-0.527	-0.405	0.278	-0.019	0.538	-0.294	0.582	0.599	1
MFIs (Non-Profit)		(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(0)	GDP	1										

		(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	*Infl*	0.102	1									
(2)	*Export*	0.087	0.075	1								
(3)	*Rural*	0.090	0.360	0.055	1							
(4)	*Debt*	0.011	0.302	-0.149	0.051	1						
(5)	*Unemp*	-0.026	-0.015	-0.368	-0.305	0.241	1					
(6)	*Legal*	-0.072	-0.193	-0.026	-0.432	-0.026	0.087	1				
(7)	E_r	-0.069	0.273	0.121	0.189	0.235	-0.091	-0.162	1			
(8)	*Tax*	0.145	0.101	-0.167	-0.214	0.501	0.476	0.103	-0.027	1		
(9)	*NIM*	-0.034	-0.131	-0.299	-0.532	0.288	0.075	0.414	-0.066	0.294	1	
(10)	*TA_ln*	0.232	-0.116	-0.304	-0.290	0.336	0.101	0.317	-0.244	0.381	0.664	1

We will gradually substitute the indicators *Num_ln*, *GLP/TA* and *Female* on the left side of the equation 1.5 and 1.6 for the explaining variable Y_{tc} to examine the social efficiency. It is valid for all dependent variables, besides the female proportion in the credit portfolio, that there is a distinct growing trend in the observed period. The importance of the microfinance for the low income inhabitants was also confirmed several times, e.g. Khandker (2005). Therefore, we believe that a big merit in this can have the long term growth of the debt services. Let us define another hypothesis: The external sources influence the social efficiency of the MFIs.

The aim of the last hypothesis is to verify the importance of the external sources from the point of view of the invested expenditures. Let us define a hypothesis: The external sources of finance influence the financial efficiency of the MFIs when we substitute the chosen indicators *TE/TA*, *PE/TA*, *OE/TA* and *ALB_ln* for the explaining variable Y_{tc} into the equations 1.5 and 1.6. Finally, we attach the correlative relations among the given explaining variables in the Table 8. Similarly as in the previous case, the VIF method did not confirm the multicollinearity problem among the variables.

Table 8: Correlation Matrix 2

MFIs (Profit)		(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(0)	*EF_ln*	1							
(1)	*EF_TA*	0.235	1						
(2)	*GDP*	0.067	-0.030	1					
(3)	*Infl*	-0.218	0.245	0.156	1				
(4)	*Rural*	-0.176	0.072	0.199	0.337	1			
(5)	*Unemp*	0.037	0.165	-0.035	0.098	-0.159	1		
(6)	*NIM*	-0.062	-0.004	0.028	-0.041	-0.433	-0.012	1	
(7)	*TA_ln*	0.198	0.038	0.122	-0.067	-0.405	-0.019	0.599	1
MFIs (Non-Profit)		(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(0)	*EF_ln*	1							
(1)	*EF_TA*	0.196	1						
(2)	*GDP*	-0.000	-0.082	1					

(3)	*Infl*	-0.167	0.206	0.102	1			
(4)	*Rural*	-0.097	-0.021	0.090	0.359	1		
(5)	*Unemp*	0.099	0.115	-0.026	-0.015	-0.305	1	
(6)	*NIM*	0.113	0.126	-0.031	-0.131	-0.532	0.075	1
(7)	*TA_ln*	0.174	-0.007	0.232	-0.116	-0.289	0.101	0.664	1

6. Final Results

We have tested the influence of the chosen factors on the size of the provided external sources of finance (Table 9) in time t and t-l with the difference between the profit and non-profit MFIs on the above mentioned representative sample of data (with the help of application Gretl) by the regressive model with the fixed robust effects (FE) and random effects (RE). Then, we examined the influence of the chosen explaining variables from the equations 1.5 and 1.6 on the chosen indicators of the microfinance sector with the difference whether they are the profit (Table 10) or non-profit MFIs (Table 11). We have verified the choice of the applicable model by Hausman test. If the p-value of the Hausman test surpasses significant level 0.05, it is possible to use the method with random effects for each searching of the applicable model. In the opposite case, we have used the fixed effects method.

Factors Influencing the External Sources of the MFIs

The macroeconomic environment proves to be an important factor for the external financing, mainly in the case of the profit MFIs where we assume bigger connection to the market, hence higher susceptibility to the exogenous forces (Table 10). The demand for the debt sources is growing with the economic growth in the given country, growing unemployment rate, corruption rate, and growing national debt. If we consider only the oversize expenditures of the country on the consumption and investments, such an increase is usually related to higher demand of the poor for the credits and also for the external sources. Similar scenario can happen on the side of the supply when the country provides more favourable credits to MFIs thanks to its expansive/social policy. Negative influence is related to the growth of the company tax, economic openness and inflation rate that can increase the total sum of the external sources artificially.

The size of the banking sector is also important because its growing asset rate and interest rate lead significantly to the growth of the demand for the external sources (*EF_ln*). While the

growth of the banking assets (*TA_ln*) is related to the growth of the external sources (*EF_ln*), it leads to the decrease of the demand for the debt financing in the long term in comparison to the total size of the microfinance sector (*EF/TA*). The reason is that the size of the banking sector makes the debt sources more affordable and in demand for the MFIs. The growing share in liabilities of the microfinance service providers leads to the higher rate of profitability (see below), but the MFIs can reduce these sources and substitute them with their own cheaper sources of finance with a certain time delay.

The Importance of the External Sources and other Chosen Variables for the Microfinance Development

The aim of the panel regression was to analyse the impact of the debt financing on the risk operations, profitability rate, the size of the invested expenditures and social efficiency. We can say from the analysis of the results in the Tables 10-11 that the size of the risk operations is influenced positively by the external sources only in the case of the profit MFIs. The additional 1% growth of the size of the external sources (*EF_ln*) leads to the decrease of the classified credit rate by 1.12 and 0.63 percentage point on the 5% level of statistical significance. On the contrary, the non-profit MFIs prove to be less aversive to the risk and their activities can become evident in the growth of the risk credit rate with a certain time delay (*PAR_90*). We can see a certain threat in the case of growing proportion of the debt sources to the total size of the microfinance market (*EF/TA*). The uncontrolled financing can lead to the growing number of the overdue credits and to a higher rate of the written-off credits (*Write-off*) at the both types of the MFIs. This case can occur mainly in the regions where the sufficient conditions for the development of the microfinance sector are not present or the market is facing some negative incidents.

Financing of the business activity by the foreign capital proves to be more efficient from the point of view of the profitability at the profit MFIs. The growth of the debt financing is related not only to the growth of the assets profitability (*ROA*) but can also be shown in the size of the profit margin (*Margin*) from the microfinance services. The payback period and the size of the microfinance market have also an important role. The year-on-year 1% growth of the external source increases the size of the profit margin by 4.33 percent point on average. At the same time, the results show that the same year-on-year change is present in the decrease of the profit margin by 4.04 percent point on average with the time factor taken into consideration *(t-l)*. We think that the reason is growing competition on the market that can

push the margin rate down in the long term. Similarly, the MFIs are not able to ensure in the short term that the financial expenditures are lower than the financial profit in the region where the microfinance market is stagnating or is developing slowly (we assume that the financial expenditures and profits relate to the borrowing and lending money). Here also comes the growth of the profit margin (*Margin*) with the growth of the proportion of the debt sources to the total size of the microfinance market (*EF/TA*) with a certain time delay.

The profitability of the debt sources depends on the size of the microfinance market for the non-profit MFIs. The year-on-year growth of the external sources by 1% decreases the real profit from the credit portfolio (*Yield_R*) by 3.22 percent point on average. If the proportion of the external sources to the total size of the microfinance market (*EF/TA*) grows, it will cause the opposite effect. It can cause not only the growth of the risk credits discussed above, but also higher profitability from the provided credits. It is necessary to mention that the indicator *Yield_R* is perceived as a proxy indicator of the interest rate on clients in some studies (Janda and Zetek, 2014). In this case it would be beneficial for the investors to allocate the debt sources in the non-profit MFIs working in more developed regions where the decrease of the interest rate on a client leads to higher level of the social efficiency.

The impact of the external sources on the invested expenditures has also a positive influence. There is not only a decrease of the total expenditures but also of the operating expenditures and expenditures on an employee under the influence of the debt financing (*EF_ln*). It shows that there are no significant additional expenditures for the MFIs or they are not misused on the growth of the client worker's salaries or manager's salaries. The negative effect is brought about again with the proportion of the external sources to the total size of the microfinance market (*EF/TA*). The insufficient demand for the microfinance services, more precisely credits, can have negative influence on, besides the risk credits and profit rate, the growth of the expenditures of both, profit and non-profit MFIs.

It is worth noting the indicator of the average credit size (*ALB_ln*) that we perceive as an ability of the MFIs to reduce the average expenditures for one credit to minimum. Since these institutions provide their services mainly to the poor, the low credit capacity is usually related to high expenditures per unit. The result of the panel regression shows that the additional 10% growth of the external sources (*EF_ln*) is shown by the decrease of the average size of the credit by 1.4 % at the profit MFIs. On the other hand, the same year-on-year change *EF_ln* leads to the growth of the average size of the credit by 1.8 % at the non-profit MFIs. Some economists (Mersland and Strøm; 2010) argue this indicator also in the relation to the analysis of the social efficiency. Generally, it is true that higher rate of this indicator can be related to

the decrease of the social efficiency, because the MFIs prefer more bonus clients to the core poor. In this case, the external sources should be offered primarily to the profit MFIs where the additional growth of the external sources is shown by the decrease of the average size of the microcredit on a borrower.

The last examined area is the impact on the social efficiency. In the case of 10% growth of the debt sources (*EF_ln*), the number of the active debtors (*Num_ln*) increases on average by 6.4 % at the profit and by 2.4 % on the 1% level of the statistical importance, by the 2.4 % on the 5% level of the statistical importance at the non-profit MFIs. While the usage of the debt sources leads to the increase in the percentage of women in the credit portfolio (*Female*) at the profit MFIs, at the non-profit institutions it leads to the increase of the size of the credit portfolio (*GLP/TA*). If we consider the indicator of the proportion of the external sources to the total size of the microfinance market, then, its additional growth can mean not only the decrease of the clients number for the microfinance service providers but it can also be represented negatively by the decrease of the size of the credit portfolio with a certain time delay. The legislators who emphasize the social efficiency of the MFIs should adjust appropriately the control mechanisms in a way that does not allow the uncontrolled debt financing in the places with insufficient demand for the microfinance services and conditions for the development of the microfinance sector.

GDP

The results show that the MFIs working in the places with faster economic growth have better conditions for their future development. For one thing, this growth influences significantly the demand for the credits (*GLP/TA*), the profit margin rate (*Margin*), or the return of the assets (*ROA*), but it also significantly decreases the percentage of the classified and written-off credits in the register of the MFIs. Besides the growth of the women proportion in the credit portfolios and the decrease of the total rate of the invested expenditures, there can be also the decrease in the credit rates on clients at the profit MFIs. It results from our findings that the economic growth has bigger importance for the development of the microfinance rather than way of financing by the external sources.

Inflation

The influence of the growing price level is a negative factor as was pointed out by Ahlin et al. (2011). According to their findings, the growth of the average interest rate and expenditures on financing go hand in hand with the growing inflation. We reveal that the unexpected growth of the price level can influence "immediately" the development of the indicators, mainly at the profit MFIs. From this point of view, we are talking about the growing size of the portfolio and decrease in the number of the overdue credits. The long term effect represents for the microfinance market a certain level of risk in the form of significant decrease in assets return (*ROA*), profit margin (*Margin*) and the real profit from the portfolio (*Yield_R*). The payment morale of the debtors is getting worse and there are more overdue credits with higher inflation. Last but not least, the inflation rate is mirrored in the credit price and in the decrease of the size of the credit portfolio.

Rural Population and Unemployment

Recently, many studies have been trying to find out whether it is better to work in the rural areas for the MFIs (Berhane and Gardebroek, 2011) or whether it is better to focus on the urban areas where the conditions for the development can be much more favourable (Bashar and Rashid, 2012). Although the addition of the variable *Rural* into the panel regression did not confirm the influence on the size of the external sources, its development seems to have a positive influence on the social efficiency, size of the invested expenditures and the proportion of the risk operations of the MFIs. Surprisingly, the improvement of the profitability of the MFIs does not occur with the growth of the rural population. We did not succeed to prove any impact on the return of the assets or the size of the profit margin. The given variable works negatively only in the size of the real profit from the portfolio that decreases with its growth no matter what type of the MFIs it is. We deduce from this fact that the MFIs working in the rural areas have a positive impact on the poverty reduction at the cost of decreasing financial efficiency rate.

There is an ambiguous effect in the case of an unemployment rate (*Unemp*). Similarly as in the previous section (Table 9), the number of the unemployed people is not shown anyhow in the economics of the non-profit MFIs. For the profit MFIs the additional growth of the explaining variable, on a 5% level of importance, is related to 0.29 % growth of *ROA* and

68.8 % decrease in the number of clients having any form of the credit (*Num_ln*). At the same time, it is true that the unemployment policy influences the microfinance market with a certain time delay. The final importance for the microfinance will depend on the development of the other factors and a time period.

Banking Sector

Growing size of the banking industry (*TA_ln*) means mainly bigger opportunity of profitability for the microfinance market that shows itself in the growth of the real profit of portfolio, profit margin rate or assets return. Faster economic growth of the given country, pushed by the banking sector, can cause the area-wide pressure on the salary growth not only in the microfinance sector. Purchasing power of the inhabitants is represented in some MFIs by the decrease of the risk credits or by the effort of the institutions to offer higher average capacity of the credit (*ALB_ln*). Our study did not definitely confirm that the banking sector represents a threat by means of decrease of the number of clients of the MFIs. Although the explaining variable influences negatively the number of the clients at profit MFIs, this decrease proves to be insignificant and can be compensated by the effort to offer higher capacity of credits (see above). The opposite effect is at the non-profit institutions where the client growth can be significantly related to the decrease of the indicator *ALB_ln* after some time. A certain financial insufficiency is rather favourable for the clients from the point of view of the social efficiency.

   If we have a look on the banking interest rates, we find out that their growth influences the level of the invested expenditures of the MFIs, but at the same time, it is not shown in the profitability rate. The growth of the input prices can be mirrored in the attempt to prefer the debtors with higher probability of the return of the provided credit (*Female*).

7. Conclusion

The aim of this study was to find out whether the growing demand for the external sources is influenced positively by the macroeconomic environment and by the size of the banking sector which is the biggest creditor of the MFIs. Afterwards, the study examined the impact of the growing demand for these sources on the risk operations, social efficiency, profitability

rate and expenditure optimization of the MFIs. The performed research of the period 2007-2012 was applied on the chosen countries of Asia, Latin America and the Caribbean where is the biggest demand for the debt financing from the MFIs.

Our results show that the demand for the external sources is strongly depending on the environment where the MFIs work. Higher rate of interconnection to the macroeconomic development is more at the profit MFIs which are more exposed to the market conditions and special purpose financing. The growing demand of the MFIs for the external sources is positively influenced by the economic growth, growing unemployment rate, size of the banking sector and corruption index. Growing tax burden rate and price level have a negative and important impact on the debt sources. It has been revealed for both types of the institutions that the growth of the public debt of the country leads to the growing proportion of the external sources to the total assets rate (*EF/TA*) which can be dangerous in the future for the microfinance sector from the point of view of the market shocks.

We have also revealed that the external sources are not suitable as an individual source of finance but rather as a complement to the existing sources of finance. In the areas where the microfinance market depends strongly on the external sources and where the sufficient conditions for the assets growth are not fulfilled, the growing proportion *EF/TA* mirrors negatively in the growth of risk operations, invested expenditures, or in the case of the profit MFIs in the decrease of the social efficiency. Our research of the impact on the indicators of the financial efficiency did not come to any definite conclusion. While the immediate impact of the debt sources (*EF_ln*) on these variables indicate the growing profitability rate, we side more to their decrease in the long term. We recommend performing another research which would focus more on the contribution of these sources from the financial side. We also recommend to the government institutions to regulate or control more the access to these sources to prevent the decrease of the social efficiency and slower development of the microfinance sector.

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Table 9: Macroeconomic Environment, Banking Sector and External Funds

	MFIs (Profit)				MFIs (Non-Profit)			
	EF_ln	EF/TA	EF_ln	EF/TA	EF_ln	EF/TA	EF_ln	EF/TA
	RE_t	RE_t	RE_{t-1}	FE_{t-1}	RE_t	RE_t	RE_{t-1}	RE_{t-1}
Const.	15.832***	79.871**	17.514***	20.771	16.076***	52.722	20.617***	75.034**
	(0.000)	(0.050)	(0.000)	(0.828)	(0.000)	(0.179)	(0.000)	(0.040)
GDP	-0.011	0.178	0.057***	0.845	-0.037	-0.091	-0.014	0.428
	(0.625)	(0.726)	(0.009)	(0.164)	(0.327)	(0.898)	(0.652)	(0.527)
Infl	0.045***	0.727*	0.007	0.097	0.029	0.701	0.008	-0.051
	(0.007)	(0.067)	(0.675)	(0.804)	(0.325)	(0.229)	(0.769)	(0.929)
Export	-0.004	-0.369	-0.027	-0.452	-0.012	-0.250	-0.022	-0.436*
	(0.824)	(0.177)	(0.113)	(0.298)	(0.596)	(0.359)	(0.309)	(0.098)
Rural	0.006	-0.089	0.002	1.663	0.008	0.049	0.019	0.043
	(0.721)	(0.539)	(0.901)	(0.352)	(0.716)	(0.820)	(0.428)	(0.839)
Debt	0.012	0.353**	-0.004	0.105	0.019	0.386*	0.0002	0.507**
	(0.169)	(0.019)	(0.765)	(0.666)	(0.160)	(0.071)	(0.989)	(0.027)
Unemp	0.094	0.561	0.189***	3.896***	-0.049	-0.258	-0.008	-1.267
	(0.126)	(0.649)	(0.005)	(0.002)	(0.581)	(0.862)	(0.924)	(0.403)
Legal	-0.283	-4.541	0.393	11.760	0.123	7.229	-0.162	9.712*
	(0.268)	(0.332)	(0.192)	(0.106)	(0.732)	(0.152)	(0.659)	(0.051)
E_r	0.484	-28.661	3.663	-32.452	-1.535	-157.776	2.585	141.489
	(0.884)	(0.723)	(0.278)	(0.761)	(0.794)	(0.171)	(0.649)	(0.563)
Tax	-0.118***	-1.542**	-0.052	-0.402	-0.039	-0.657	0.015	-0.358
	(0.000)	(0.011)	(0.123)	(0.251)	(0.419)	(0.283)	(0.787)	(0.169)
NIM	0.0002	-0.0005	-0.0001	-0.001	0.001**	0.008	0.002***	0.009
	(0.229)	(0.869)	(0.524)	(0.783)	(0.025)	(0.179)	(0.001)	(0.169)
TA_ln	0.484***	-0.518	0.078	-11.056***	0.119	-3.688	-0.322	-5.928**
	(0.001)	(0.792)	(0.581)	(0.001)	(0.580)	(0.178)	(0.156)	(0.030)
R^2		0.286	0.176	0.829		0.245	0.305	0.555
Hausman test	0.134	0.094	0.162	0.0002	0.681	0.699	0.171	0.209

Note: p-statistics are provided in parentheses below coefficient estimates; *, **, *** denote significance at the 10, 5, 1 % level.

Table 10: Final Results for Microfinance Performance (Profit-MFIs)

	PAR_30		PAR_90		Write-off	
	RE_t	RE_{t-1}	RE_t	RE_{t-1}	RE_t	RE_{t-1}
Const.	24.146**	17.679	17.579***	11.123	1.707	-0.414
	(0.010)	(0.113)	(0.003)	(0.102)	(0.638)	(0.918)
EF_ln	-1.121**	-0.523	-0.629**	-0.141	0.072	0.173
	(0.019)	(0.359)	(0.033)	(0.679)	(0.697)	(0.400)
EF/TA	0.048	0.067**	0.0002	0.035	0.0008	0.022*
	(0.103)	(0.038)	(0.991)	(0.113)	(0.949)	(0.084)
GDP	-0.322***	-0.310***	-0.255***	-0.293***	-0.089*	-0.088*
	(0.006)	(0.009)	(0.003)	(0.001)	(0.072)	(0.073)
Infl	-0.177*	0.201**	-0.199***	0.109	-0.039	0.091**
	(0.078)	(0.041)	(0.007)	(0.133)	(0.353)	(0.026)
Rural	-0.011	-0.049	-0.001	-0.035	-0.015	-0.032**
	(0.751)	(0.279)	(0.961)	(0.148)	(0.242)	(0.036)
Unemp	0.081	-0.388	0.099	-0.198	0.089	0.010
	(0.759)	(0.226)	(0.559)	(0.333)	(0.402)	(0.932)
NIM	0.0005	0.0001	0.0004	0.0004	0.001*	-0.0001
	(0.529)	(0.912)	(0.419)	(0.567)	(0.099)	(0.856)
TA_ln	0.289	0.068	-0.080	-0.236	-0.087	-0.047
	(0.502)	(0.901)	(0.752)	(0.433)	(0.597)	(0.798)
R^2	0.338	0.221	0.325	0.349	0.203	0.447
Hausman test	0.369	0.089	0.922	0.146	0.053	0.756

Note: p-statistics are provided in parentheses below coefficient estimates; *, **, *** denote significance at the 10, 5, 1 % level.

	Yield_R		Margin		ROA	
	RE_t	RE_{t-1}	RE_t	FE_{t-1}	FE_t	FE_{t-1}
Const.	59.706***	12.281	-68.969**	12.260	-15.072	-11.176
	(0.005)	(0.567)	(0.039)	(0.851)	(0.473)	(0.499)
EF_ln	-1.346	-0.412	4.324**	-4.041**	1.111*	-0.558
	(0.240)	(0.721)	(0.013)	(0.019)	(0.064)	(0.169)
EF/TA	0.079	0.097*	-0.233**	0.185***	-0.047	0.023
	(0.145)	(0.077)	(0.021)	(0.003)	(0.241)	(0.174)
GDP	-0.168	-0.378**	0.757**	0.718***	0.235**	0.118***
	(0.356)	(0.036)	(0.045)	(0.002)	(0.046)	(0.009)
Infl	-0.469***	0.127	0.009	-0.696***	0.022	-0.138***
	(0.004)	(0.397)	(0.979)	(0.004)	(0.790)	(0.009)
Rural	-0.296**	-0.276**	0.169	-0.161	0.046	0.189
	(0.026)	(0.032)	(0.235)	(0.869)	(0.891)	(0.408)
Unemp	0.377	-0.101	-0.183	0.265	0.016	0.285**
	(0.441)	(0.856)	(0.838)	(0.595)	(0.952)	(0.037)
NIM	-0.0009	-0.0007	0.002	0.0003	0.0002	0.0001
	(0.572)	(0.693)	(0.523)	(0.907)	(0.831)	(0.897)
TA_ln	0.229	2.796**	-0.793	6.847**	-0.620	1.064*
	(0.854)	(0.032)	(0.625)	(0.025)	(0.307)	(0.062)
R^2	0.278	0.529	0.207	0.861	0.825	0.879
Hausman test	0.054	0.308	0.121	0.037	0.023	0.031

	Num_ln		GLP/TA		Female	
	RE$_t$	FE$_{t-1}$	RE$_t$	RE$_{t-1}$	RE$_t$	RE$_{t-1}$
Const.	-0.426	20.855	70.795***	64.256***	-33.185	-48.534
	(0.895)	(0.365)	(0.000)	(0.001)	(0.415)	(0.263)
EF_ln	0.635***	-0.215	1.249	1.326	4.844**	5.845**
	(0.000)	(0.719)	(0.193)	(0.179)	(0.028)	(0.012)
EF/TA	-0.022*	0.022	-0.074	-0.089*	0.019	-0.017
	(0.080)	(0.225)	(0.116)	(0.074)	(0.865)	(0.879)
GDP	-0.087	-0.064	0.359**	0.083	0.768*	0.505
	(0.123)	(0.329)	(0.027)	(0.626)	(0.056)	(0.215)
Infl	0.094*	-0.013	0.308**	-0.274*	-0.598*	-0.527
	(0.055)	(0.664)	(0.028)	(0.059)	(0.084)	(0.124)
Rural	0.012	-0.031	-0.074	-0.053	0.436**	0.460**
	(0.276)	(0.921)	(0.458)	(0.562)	(0.037)	(0.027)
Unemp	0.049	-0.523**	0.047	0.215	-1.448	-1.289
	(0.613)	(0.026)	(0.911)	(0.674)	(0.163)	(0.284)
NIM	0.0002	-0.002**	0.001	-0.001	-0.001	0.001
	(0.517)	(0.034)	(0.309)	(0.399)	(0.787)	(0.800)
TA_ln	-0.251*	-0.174	-1.454	-0.568	-0.470	-0.921
	(0.066)	(0.789)	(0.157)	(0.577)	(0.833)	(0.689)
R^2	0.328	0.638	0.146	0.451	0.376	0.529
Hausman test	0.194	0.0003	0.355	0.151	0.100	0.469

	TE/TA		OE/TA		PE/TA		ALB_ln	
	RE$_t$	RE$_{t-1}$	RE$_t$	RE$_{t-1}$	FE$_t$	FE$_{t-1}$	RE$_t$	RE$_{t-1}$
Const.	76.328***	68.074***	30.290***	19.159**	3.968	12.349**	59.620***	55.546***
	(0.001)	(0.002)	(0.000)	(0.032)	(0.467)	(0.040)	(0.001)	(0.000)
EF_ln	-2.729**	-1.703	-1.063**	-0.318	-0.141*	-0.135	-1.933**	-1.564**
	(0.021)	(0.131)	(0.019)	(0.502)	(0.068)	(0.167)	(0.019)	(0.025)
EF/TA	0.156***	0.093*	0.042**	0.017	-0.0003	0.001	0.098**	0.032
	(0.008)	(0.089)	(0.047)	(0.440)	(0.893)	(0.857)	(0.011)	(0.293)
GDP	-0.415**	-0.018	0.012	-0.011	-0.005	-0.014	0.066	-0.007
	(0.043)	(0.918)	(0.879)	(0.882)	(0.789)	(0.441)	(0.598)	(0.935)
Infl	0.175	0.293*	-0.027	-0.010	-0.005	0.015	-0.068	-0.018
	(0.321)	(0.054)	(0.661)	(0.870)	(0.833)	(0.379)	(0.536)	(0.824)
Rural	-0.332***	-0.295**	-0.126**	-0.122**	-0.002	-0.142	-0.267***	-0.221**
	(0.005)	(0.013)	(0.019)	(0.019)	(0.977)	(0.117)	(0.006)	(0.016)
Unemp	-0.191	-0.156	-0.158	-0.184	0.013	-0.029	-0.337	-0.063
	(0.722)	(0.778)	(0.404)	(0.425)	(0.619)	(0.566)	(0.325)	(0.839)
NIM	-0.002	-0.001	-0.001	-0.0004	0.0003*	0.00003	-0.002	-0.0003
	(0.169)	(0.557)	(0.292)	(0.577)	(0.085)	(0.704)	(0.113)	(0.767)
TA_ln	1.301	-0.053	0.442	0.224	0.464**	0.338***	0.565	-0.003
	(0.288)	(0.965)	(0.371)	(0.666)	(0.013)	(0.001)	(0.527)	(0.997)
R^2	0.427	0.593	0.381	0.539	0.908	0.954	0.396	0.553
Hausman test	0.554	0.079	0.629	0.209	0.001	0.00002	0.631	0.469

Table 11: Final Results for Microfinance Performance (Non-profit-MFIs)

	PAR_30		PAR_90		Write-off	
	RE_t	RE_{t-1}	RE_t	RE_{t-1}	RE_t	RE_{t-1}
Const.	15.762***	14.352**	8.059*	7.216	1.232	4.113*
	(0.003)	(0.014)	(0.066)	(0.139)	(0.514)	(0.082)
EF_ln	-0.041	0.271	0.183	0.402*	0.010	-0.008
	(0.861)	(0.339)	(0.366)	(0.097)	(0.908)	(0.946)
EF/TA	0.027*	0.025	0.008	0.013	0.014**	0.003
	(0.083)	(0.200)	(0.538)	(0.436)	(0.014)	(0.682)
GDP	-0.383***	-0.156	-0.246***	-0.094	-0.068*	-0.069*
	(0.000)	(0.124)	(0.004)	(0.294)	(0.069)	(0.071)
Infl	-0.127	0.302***	-0.086	0.212***	0.016	0.012
	(0.117)	(0.001)	(0.234)	(0.008)	(0.583)	(0.719)
Rural	-0.038	-0.096***	-0.019	-0.055**	-0.014	-0.010
	(0.108)	(0.001)	(0.367)	(0.020)	(0.108)	(0.375)
Unemp	0.013	-0.155	0.012	-0.107	-0.047	-0.065
	(0.939)	(0.412)	(0.930)	(0.508)	(0.443)	(0.395)
NIM	0.001	0.0006	0.0008	0.0009	0.0001	0.0005
	(0.331)	(0.511)	(0.203)	(0.270)	(0.971)	(0.185)
TA_ln	-0.649**	-1.042***	-0.578**	-0.882***	0.046	-0.161
	(0.039)	(0.006)	(0.031)	(0.005)	(0.686)	(0.289)
R^2	0.434	0.562	0.325	0.486	0.245	0.299
Hausman test	0.148	0.404	0.094	0.839	0.552	0.456

Note: p-statistics are provided in parentheses below coefficient estimates; *, **, *** denote significance at the 10, 5, 1 % level.

	Yield_R		Margin		ROA	
	RE_t	RE_{t-1}	RE_t	RE_{t-1}	RE_t	RE_{t-1}
Const.	78.666***	34.266*	0.785	15.602	-3.001	2.935
	(0.000)	(0.052)	(0.968)	(0.387)	(0.523)	(0.471)
EF_ln	-3.225***	-2.198**	0.721	-0.124	0.304	0.017
	(0.000)	(0.012)	(0.392)	(0.889)	(0.152)	(0.931)
EF/TA	0.111**	0.113**	-0.068	-0.072	-0.017	-0.012
	(0.017)	(0.035)	(0.158)	(0.228)	(0.206)	(0.399)
GDP	-0.240	-0.232	0.876***	0.468	0.207***	0.145*
	(0.340)	(0.213)	(0.002)	(0.107)	(0.004)	(0.057)
Infl	-0.769***	0.170	0.181	-0.606**	0.091	-0.194***
	(0.000)	(0.301)	(0.422)	(0.019)	(0.129)	(0.004)
Rural	-0.212**	-0.409***	-0.026	0.092	-0.016	0.018
	(0.029)	(0.001)	(0.789)	(0.313)	(0.477)	(0.359)
Unemp	-0.243	-0.551	-0.721	-0.153	-0.158	-0.107
	(0.639)	(0.256)	(0.187)	(0.793)	(0.267)	(0.428)
NIM	0.005*	-0.004	0.0001	0.003	0.001	0.001**
	(0.062)	(0.164)	(0.964)	(0.357)	(0.399)	(0.043)
TA_ln	1.171	4.309***	-0.072	-0.277	0.022	-0.045
	(0.316)	(0.001)	(0.952)	(0.812)	(0.940)	(0.861)
R^2	0.535	0.616	0.138	0.466	0.139	0.503
Hausman test	0.559	0.592	0.240	0.177	0.323	0.276

	Num_ln		GLP/TA		Female	
	RE_t	RE_{t-1}	RE_t	RE_{t-1}	FE_t	FE_{t-1}
Const.	1.561	1.687	54.599***	48.370***	96.767	118.217*
	(0.529)	(0.558)	(0.001)	(0.005)	(0.289)	(0.069)
EF_ln	0.236**	0.174	0.529	1.809**	-1.705	-2.307*
	(0.042)	(0.226)	(0.425)	(0.024)	(0.238)	(0.051)
EF/TA	-0.005	-0.010	-0.010	-0.098*	0.147*	-0.008
	(0.556)	(0.305)	(0.771)	(0.053)	(0.063)	(0.935)
GDP	-0.009	-0.002	0.292	0.199	0.199	-0.094
	(0.867)	(0.979)	(0.123)	(0.309)	(0.518)	(0.738)
Infl	0.025	-0.018	0.154	-0.261	0.073	0.161
	(0.589)	(0.729)	(0.328)	(0.136)	(0.625)	(0.313)
Rural	0.019	0.029**	0.004	0.088	0.416	0.486
	(0.104)	(0.031)	(0.965)	(0.378)	(0.776)	(0.602)
Unemp	-0.112	0.037	-0.046	0.266	-0.318	-0.187
	(0.177)	(0.698)	(0.909)	(0.580)	(0.661)	(0.759)
NIM	-0.001	-0.0003	-0.001	0.001	0.013**	0.025**
	(0.110)	(0.468)	(0.545)	(0.624)	(0.025)	(0.019)
TA_ln	0.265*	0.252	1.266	-0.197	-1.879	-3.152
	(0.076)	(0.165)	(0.211)	(0.859)	(0.534)	(0.342)
R^2	0.259	0.464	0.106	0.454	0.933	0.957
Hausman test	0.164	0.962	0.309	0.962	0.009	0.0001

	TE/TA		OE/TA		PE/TA		ALB_ln	
	RE_t	RE_{t-1}	RE_t	RE_{t-1}	RE_t	RE_{t-1}	RE_t	RE_{t-1}
Const.	60.941***	63.394***	25.516***	24.739***	9.177***	6.474***	57.644***	42.999***
	(0.000)	(0.000)	(0.006)	(0.009)	(0.000)	(0.00)	(0.000)	(0.007)
EF_ln	-2.056***	-2.260***	-1.027***	-1.164**	0.053	0.189**	-2.245***	-1.490**
	(0.002)	(0.001)	(0.006)	(0.012)	(0.439)	(0.023)	(0.000)	(0.048)
EF/TA	0.086**	0.063	0.068***	0.029	-0.009**	-0.008	0.108***	0.048
	(0.012)	(0.107)	(0.001)	(0.271)	(0.036)	(0.302)	(0.001)	(0.272)
GDP	-0.093	0.277**	-0.089	0.191**	0.035	-0.007	-0.049	0.326**
	(0.588)	(0.021)	(0.359)	(0.031)	(0.223)	(0.820)	(0.749)	(0.020)
Infl	0.163	0.137	-0.012	-0.012	-0.034	-0.008	0.030	0.009
	(0.258)	(0.194)	(0.886)	(0.878)	(0.152)	(0.783)	(0.817)	(0.943)
Rural	-0.289**	-0.395***	-0.185***	-0.187**	-0.028***	-0.029***	-0.299***	-0.389***
	(0.011)	(0.007)	(0.003)	(0.013)	(0.000)	(0.000)	(0.006)	(0.004)
Unemp	0.043	-0.009	-0.309	-0.203	0.048	0.090	0.023	-0.189
	(0.911)	(0.978)	(0.159)	(0.393)	(0.321)	(0.104)	(0.948)	(0.621)
NIM	0.005**	0.0003	0.00004	-0.0002	0.0001	0.0001	0.003*	-0.001
	(0.012)	(0.879)	(0.969)	(0.886)	(0.498)	(0.608)	(0.065)	(0.578)
TA_ln	0.698	1.518	1.105*	1.391*	-0.260***	-0.274***	0.785	1.693
	(0.504)	(0.162)	(0.064)	(0.053)	(0.005)	(0.010)	(0.423)	(0.156)
R^2	0.501	0.575	0.484	0.578	0.531	0.637	0.509	0.520
Hausman test	0.432	0.443	0.368	0.568	0.116	0.196	0.439	0.227