The Impact of Public Spending on the Performance of Microfinance Institutions

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Abstract. This paper investigates the role of public expenditures and general government debt in microfinance performance. Our panel regression applied to the data of microfinance institutions (MFIs) in Latin America and the Caribbean confirms the high significance of public finance for the growth of MFIs, especially for the size of their total assets and for their yield on gross loan portfolio. Moreover, the results indicate that MFIs, operating in the country with higher growth of GDP, are characterized by higher rate of social efficiency. The positive influence on microfinance is besides public finance also associated with a growth of rural population or an economy openness of the given country.

Keywords: public finance, government expenditure, microfinance, microcredit, poverty.
JEL Classification: E6, G21, O11.

1. Introduction

Microfinance is generally considered to be an expedient method of financing low income people in less developed countries (Khandker, 2005; Janda a Turbat, 2013). Financial aid based on microfinance services has been growing for more than 30 years as an addition to

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[#] The research leading to these results has received funding from the People Programme (Marie Curie Actions) of the European Union's Seventh Framework Programme FP7/2007-2013/ under REA grant agreement number 609642. The work on this paper was further supported by the Czech Science Foundation (grants 403/10/1235 and 402/11/0948) and by University of Economic, Prague (grant IG102023 and institutional support IP100040). Karel Janda acknowledges research support provided during his long-term visits at Toulouse School of Economics, Australian National University and University of California, Berkeley and the support he receives as an Affiliate Fellow at CERGE-EI, Prague. The views expressed here are those of the authors and not necessarily those of our institutions. All remaining errors are solely our responsibility.

government-controlled subsidies and social programmes for low income people. The original intention of microfinance institutions (MFIs) to offer low-volume loans to microenterprises with insufficient credit history or lack of assets to be used as collateral has been gradually extended to other products such as microinsurance, savings products and payment services. In 1999 there were 159 MFIs recorded around the world managing a microcredit with a total volume of 1.8 billion USD. However, as of 2012 the number of these institutions has increased to 1,258 and their assets are made up of microcredit exceeding 99 billion USD (mixmarket.org).

The current level of microfinance performance is to some extent caused by the size of public expenditures allocated by government authorities to microfinance industry in the form of subsidies, grants or government loans (Morduch, 1999). A number of empirical studies have confirmed that the involvement of a local government in reducing the rate of low income people in a country has a higher degree of efficiency if social projects are financed indirectly by the government through the microfinance market. Balkenhol (2007) and Robinson (2001) argue that the business model based on direct financing through a state-owned bank has proved to be very expensive and in most cases inefficient. The reason for this is mainly an inadequate choice of a target segment, consisting mainly of wealthier debtors instead of so-called core poor. Another problem has been the price of loans which has usually been below the market interest rates and has not been covering costs. At the same time government loans have often been perceived by debtors as a donation, which have led to attempts to delay their repayment. Finally, government social programmes have been often characterized by a rigidity of their scope and insufficient level of subsequent services (e.g. savings products and payment services).

Although the share of public expenditures in the microfinance sector is not officially published, according to data provided by the International Food Policy Research Institute (IFPRI) the amount of government expenditures intended for social policy in the countries of Latin America and the Caribbean (LAC) has been increasing annually on average by about 4.6 per cent (between 1990 and 2011). The largest expenditures are reported in Argentina, Bolivia, Brazil, Colombia, Chile, Dominican Republic and Peru. The governments of individual countries represent a vital distribution channel for the allocation of financial capital coming from public and private sources. CGAP organization (Consultative Group to Assist the Poor) states that the estimated amount of the financial resources allocated to the

development of the financial sector (including microfinance) in less developed countries has reached 29 billion USD in 2012 (an increase of 16 per cent compared to 2011) - 4.5 billion USD of this sum have been allocated through government organizations. CGAP also reports that the amount of resources intended for the countries of LAC has decreased from 2.3 billion USD in 2011 to 2.2 billion USD in 2012 due to the closure of several large projects.

Researching existing literature we have not found any other more comprehensive studies examining the impact of rising public expenditures and the growing debt of local governments on microfinance sector in the context of macroeconomic development. One of the current problems of public finance is the issue of fiscal imbalance, which has been at the forefront especially after a financial crisis in 2008. International rating agencies monitor more strictly the economic activities of individual states including budget deficits and long-term ability to meet their obligations. The deterioration of public finance may in the future threaten generous state expenditures aimed at the development of the microfinance sector as well as the role of the state in the international transfer of capital from public and private donors and investors. Additionally, we may experience an instability in the macroeconomic environment whose development influences the growth of the microfinance sector (Vanroose, 2008; Hartarska and Nadolnyak, 2008; Montgomery and Weiss, 2011). Vanroose (2008) has found that MFIs operating in more developed countries with higher international assistance have a greater proportion of debtors in their loan portfolios. Hartarska and Nadolnyak (2008) and Montgomery and Weiss (2011) have discovered that MFIs are more efficient in countries with a high share of agricultural production and higher inflation.

Due to the lack of sufficient attention in existing literature this study aims to research the influence of government expenditures and government debt on the total size of the microfinance market, the number of debtors, risk operations, and profitability of MFIs. We are going to expand the amount of dependent variables by including an indicator of the total size of the assets held by the banking sector in order to analyze the impact of public expenditures on the microfinance sector as well as on the banking sector. The study is based on empirical data of 302 MFIs operating in 12 countries in LAC between 2006 and 2012. The macroeconomic environment of the individual countries will be compared based on the following indicators – GDP, Inflation, Rural population, Economic openness, Government expenditures and Government debt. The findings are meant to be used mainly by government authorities which intend to support the microfinance sector in the country that has experienced a long-term growth of the public expenditure as a percentage of GDP. The final results of this study will be useful for investors and creditors who might be considering the allocation of

their financial capital to the microfinance sector.

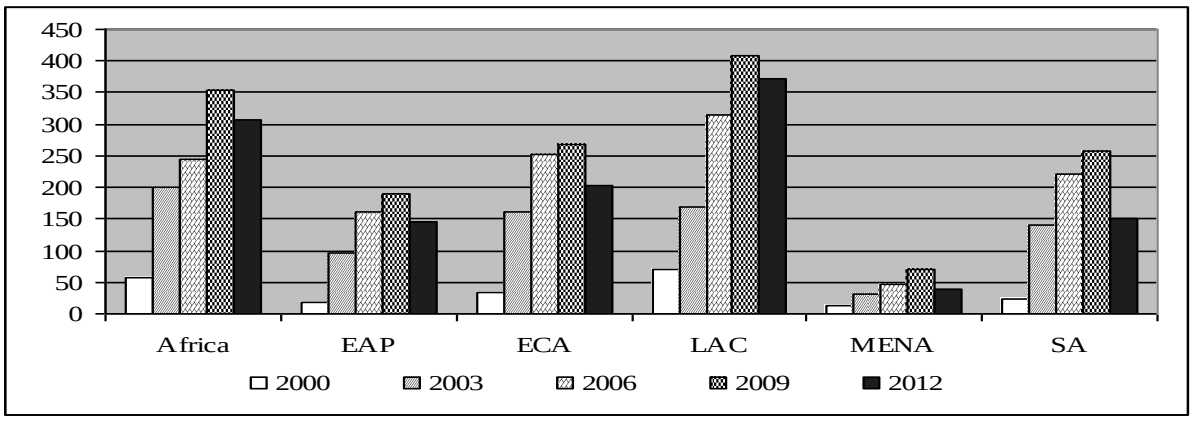
In order to achieve this objective, the article is structured as follows. The following section focuses on the current state of the microfinance market and explains how government authorities contribute to its future development. This section is followed by an empirical analysis of the panel data of MFIs operating in the region of Latin America and the Caribbean. Finally, we present the results of our study and generalize some of the findings for possible future research.

2. Microfinance Performance and the Role of Government

The role of government in the initial development of the microfinance sector after 1980 has consisted mainly of high expenditures on business activities of non-profit MFIs in order to improve the living standards of low income people and to reduce the unemployment rate. However, government expenditures have not sufficiently covered the growing demand for microfinance services in the long term and MFIs need to achieve financial self-sustainability. A different approach of government authorities to establish legislative rules in less developed countries which allow commercialization of the microfinance sector and options to finance MFIs with private equity is subsequently reflected in the uneven development of the microfinance sector. The long-standing most developed microfinance region (Figure 1) is Latin America and the Caribbean (LAC), followed by Sub-Saharan Africa and Asia. North Africa and the Middle East (MENA) have reported slower development mainly due to the lack of capital, insufficient market transparency and religious and cultural traditions.

Although microfinance services are quite accessible in developed countries as well, their social and financial efficiency is not as high as in less developed countries. Schreiner a Woller (2003) argue that the main reasons for this failure are in a different understanding of the core poor, social ties between debtors and a smaller size of the market for microenterprises. Additionally, outputs of these enterprises tend to resemble services rather than products and they are more demanding in terms of microenterprise management. Rather than microfinance regions they can be perceived as suitable providers of funds for the microfinance industry in less developed countries (Srnec et al., 2011).

Figure 1: Overview of the number of MFIs in the individual regions

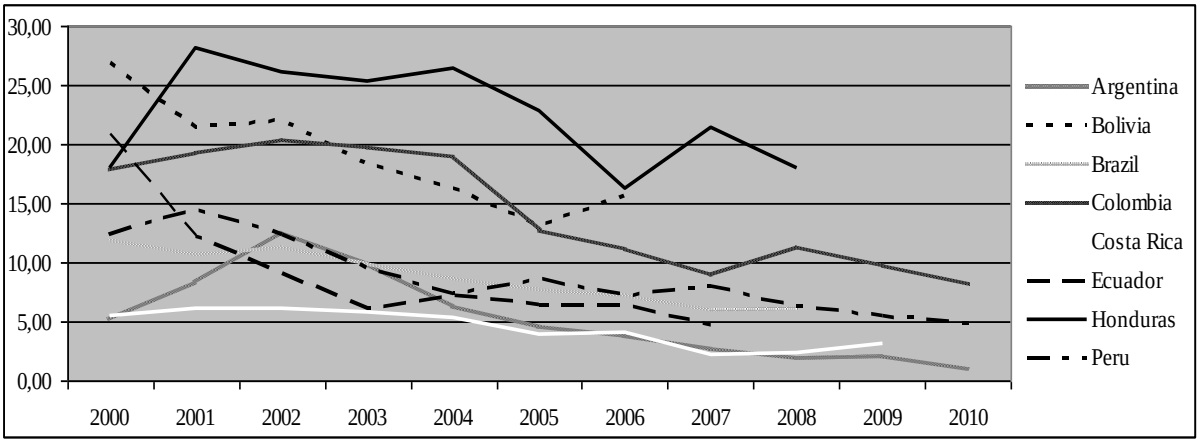


Note: EAP – East Asia and the Pacific, ECA – Eastern Europe and Central Asia, LAC – Latin America and The Caribbean, MENA – Middle East and North Africa, SA – South Asia

Source: www.mixmarket.org

Commercialization of the microfinance sector in the last 30 years has helped to uncover several rules that the government can follow in order to increase the efficiency of MFIs and to effectively reduce the share of low income people in less developed countries. According to Al Atoom and Abu Zerr (2012), Mendoza and Vick (2008), Duflos and Imboden (2004) and Ledgerwood (1998) the government's involvement in the process should include creating a flexible regulatory framework and an efficient supervision of the microfinance market in order to improve its development and transparency. As well as to make capital markets more accessible for the MFIs and to increase the involvement of the private sector in financing the microfinance industry and the fight against poverty, last but not least to provide a stable macroeconomic environment using the tools of fiscal and monetary policy. The necessity to obey these rules as well as mutual cooperation of the microfinance sector with the government is especially important after the international UN summit in 2000 where several goals had been set (Millennium Development Goals) among which is an eradication of extreme poverty and hunger (MDG-1) in member states by the year 2015. As Figure 2 shows, the share of core poor in the region of LAC decreases in the long-term particularly in Bolivia, Brazil, Ecuador and Honduras. Pérez et al. (2012) and Montgomery and Weiss (2011) have analyzed the impact of microfinance on achieving the goals of MDG-1 in Nicaragua and Pakistan. They have found out that the microfinance sector significantly contributes to both reduction of poverty as well as fulfilling the objectives related to external poverty.

Figure 2: Population below $1 (PPP) per day, percentage



Source: www.un.org

2.1 Microfinance and Regulation and Supervision

The importance of regulation and monitoring of microfinance market is discussed by Ahmed et al. (2013), Ayayi (2012), Cull et al. (2011), Mersland and Strøm (2009) and Hartarska and Nadolnyak (2007). These studies partially recognize the need to regulate and monitor MFIs in order to ensure oversight over the management of client deposits, higher efficiency of credit risk management, increasing the transparency of the microfinance sector as well as a protection of clients from MFI malpractices. Cull et al. (2011), however, point out that such regulation can be considerably costly particularly in the initial phase when setup of the reporting or training of employees is required. MFIs might respond to this kind of expenditures either by increasing the loans price or increasing the loans volume which will in effect impact the target segment. Another important finding is introduced by Hartarska and Nadolnyak (2007) and Mersland and Strøm (2009). Both papers pinpoint the fact that the introduction of MFIs regulation results neither in social efficiency improvement nor in acceleration of their future development. Finally, Duval (2004) underlines the high occurrence of interest rate caps often used by local governments in order to regulate the client interest rates from microloans.

2.2 Microfinance and Capital Markets

Capital markets allow sustainable and profitable MFIs to access a funding source in the form

of public offering of its shares or long-term bonds without the need to rely on subsidies or grants. Another benefit of the public offering is the issuer's ability to approach more investors/creditors in shorter periods of time. Investors/creditors benefit as well because capital markets ensure greater transparency of the issuer compared to a situation in which the creditor deals directly with the debtor. Although the majority of MFIs currently operates outside financial markets, a complete reversal of this situation cannot be ruled out in the future. Two recent IPOs in Mexico in 2007 (2 billion USD) and in India in 2010 (1.5 billion USD) have surpassed all expectations and have provided these MFIs with an enormous increase in both the number of clients as well as the size of the loan portfolio (Rosenberg, 2007; Chen et al., 2010). However, critics warn that similar activities can lead to a substantial increase in interest rates for microfinance clients and damage not only the good name of microfinance in general but also the cause for which the microfinance industry had been designed (Cull et al., 2009).

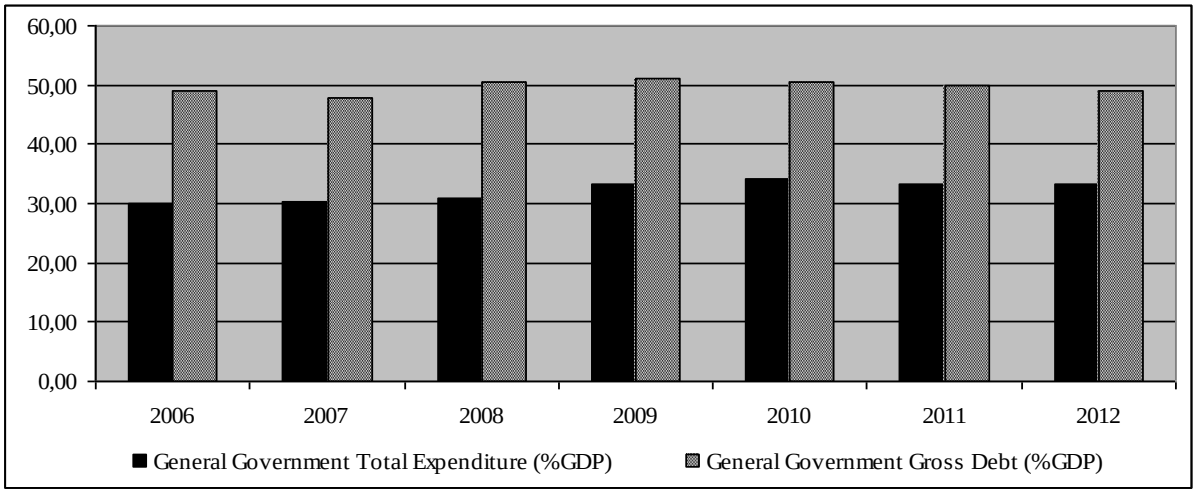
2.3 Microfinance and Private Sector

Commercialization of the microfinance industry allows MFIs to meet the increasing demand for the source of funding on the interbank market or directly from private investors. Janda et al. (forthcoming), Galema et al. (2011) and Janda and Svárovská (2010) have analyzed whether a revenue from an investment in the microfinance sector can be considered an alternative to a revenue from an investment into other investment instruments. Empirical analyses of data on microfinance funds (MIV) have not only confirmed the possibility to achieve an interesting revenue but also the possibility to conveniently diversify client's investment portfolio. Galema et al. (2011) have also indicated that higher revenues can be achieved with investments into MFIs operating in Latin America where the microfinance sector is sufficiently developed.

Commercialization of the microfinance sector represents an opportunity for government authorities to reduce the amount of subsidies intended as a support of this sector. However, individual states do not regularly publish the amount of these subsidies. In addition, MFIs themselves have sometimes a tendency to misinterpret or conceal the amount of subsidies received (Nawaz, 2010). To be more specific, we present a general overview of the size of public expenditures and budgetary imbalance between 2006 and 2012 (Figure 3). A slight decrease in government debt in the recent years has mainly been caused by increasing prices

of agricultural products on commodity markets.

Figure 3: General Overview of Government Policy in Latin America and the Caribbean



Source: www.imf.org

Some available conclusions regarding the expedience of subsidies have indicated that existing microfinance sector is considerably dependent on subsidies (or is 'over-subsidized'), which puts pressure on financial efficiency of MFIs in the long-term (Nawaz, 2010; Pati, 2009). Using government subsidies to finance business activities of MFIs can only be justified with institutions which are unable to raise funds on the interbank market or do not posses internal funds. Morduch (1999) and Hudon and Traca (2011) state that subsidies ought to be closely related to the needs of MFIs and should not exceed a certain threshold beyond which the inefficiency starts to manifest itself. Hollis and Sweetman (1998) and Caudill et al. (2009) demonstrate that MFIs financed by internal sources (deposits) are characterized by a higher social efficiency and are also more efficient in managing costs in comparison with MFIs which rely solely on social capital. Ghosh and Tassel (2013) suggest allocating subsidies into the microfinance sector only if there is limited supply of other sources of funding. If the number of other sources is sufficiently high, it is much more efficient to fund MFIs with loans.

Table 1 shows the development of the number of MFIs in selected countries of Latin America which depend on subsidies. The level of dependency is demonstrated by index FSS (Financial Self-Sufficiency). The advantages and disadvantages of FSS are discussed by Pati (2009), Yaron and Manos (2007). Overall, the table confirms that the level of financial self-sufficiency of MFIs has not been improving significantly. The difference between the total number of MFIs (Total) and those institutions financially self-sufficient (FSS) is only decreasing in Bolivia in the long-term. At the same time we may observe that the share of MFIs dependent on subsidies rises extremely following a financial crisis when microfinance markets exhibited high percentage of risk and unpaid credits accompanied by a drop in revenue of realized business transactions. Table 1 also captures index OSS (Operational Self-Sufficiency) monitoring the ability of MFIs to cover operating costs by revenue. This area is also dominated by MFIs operating in Bolivia. In contrast, a large number of MFIs which are not capable of covering their operating costs in the long-term can be found in Mexico.

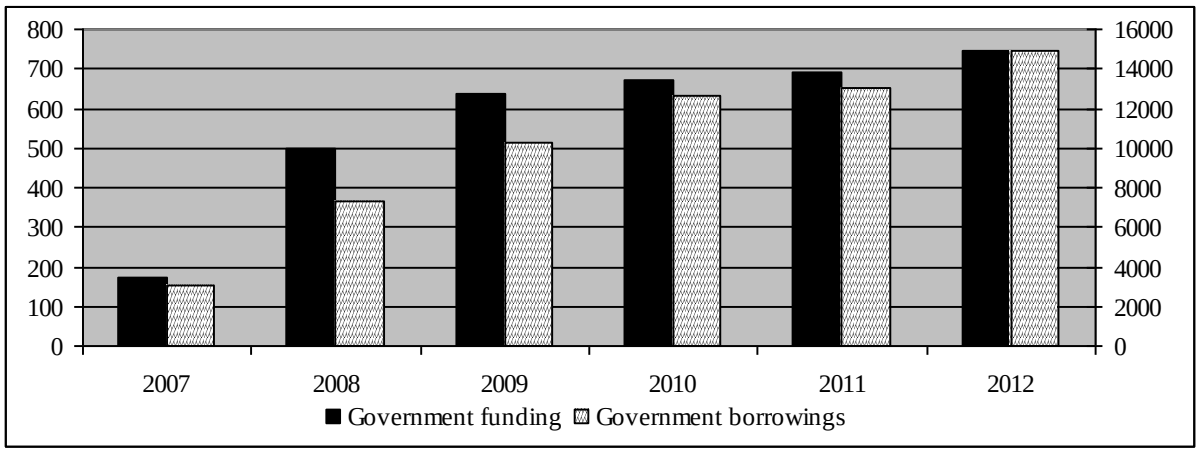
Table 1: Financial and Operational Self-Sustainability (2007-2012)

Year	2006			2007			2008			2009			2010			2011			2012		
Country	FSS	OSS	Total	FSS	OSS	Total	FSS	OSS	Total	FSS	OSS	Total	FSS	OSS	Total	FSS	OSS	Total	FSS	OSS	Total
Bolivia	18	22	25	21	25	25	17	20	24	18	21	25	19	22	26	15	19	24	18	18	21
Brazil	4	8	11	5	7	30	15	24	31	12	18	24	12	20	28	9	21	29	9	13	17
Ecuador	27	35	46	30	38	48	29	44	48	26	38	49	37	43	48	35	45	46	16	39	42
Honduras	10	13	15	8	13	16	8	11	18	5	10	22	10	15	25	10	16	24	5	17	21
Mexico	19	20	36	24	30	54	23	28	53	20	27	55	29	36	63	24	33	59	4	34	57
Peru	39	48	54	41	46	63	46	55	61	48	52	60	35	52	60	38	49	61	41	39	51

Source: www.mixmarket.org

Alternative ways of credit funding has been on the rise in the last six years (Figure 4). Between 2007 and 2012 MFIs operating in Latin America had borrowed 255.4 billion USD (mixmarket.org) from creditors. The biggest year-to-year increase came in 2012 when MFIs in Columbia borrowed 142 billion USD and MFIs in Ecuador 102 billion USD. The size of government loans had increased from 151.6 million USD to 14.9 billion USD during the same period of time. In 2012 MFIs in Ecuador had borrowed the largest sum from the government. The total sum amounted to 13.9 billion USD. The value of government loans and the total amount of government funding for 2012 is demonstrated on Y-axis. Apart from a standard loan - which is still the most frequent form of financing - other ways of debt financing such as bonds, bank overdrafts or subordinated debt have been increasing. Their usability is, nevertheless, rather marginal when compared to standard loans.

Figure 4: Funding Structure in Latin America and the Caribbean (2007-2012)



Source: www.mixmarket.org

2.4 Microfinance and Macroeconomic development

The relation between microfinance performance and macroeconomic environment is confirmed by Janda and Zetek (2014), Imai et al. (2012), Kazi and Leonard (2012), Ahlin et al. (2011), Vanroose (2007) and Ahlin and Lin (2006). MFIs are in this respect positively influenced primarily by the GDP growth and their development proves to be more efficient in the regions with lower share of industry and higher inflation rate. In this regards, Janda a Zetek (2014) point at the significant importance of growing population in rural areas that

leads to lowering of interest rates from microloans and growing share of agricultural production which boosts the MFIs profitability. However, the conclusions up to now do not sufficiently cover the topic of increasing public expenditures and increasing public debt of developing countries. Therefore we will focus on these in the following parts.

3. Data

The regression model with fixed and random effects is applied on panel data containing information concerning MFIs based in the following countries: Argentina, Bolivia, Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Mexico, Nicaragua and Peru. This data is regularly published on the mixmarket.org portal. The macroeconomic data for individual countries are downloaded from IMF, OECD or World Bank. The complete list of variables is listed in Table 2.

Table 2: General description of the variables (2006-2012)

Variable	Description	Obs.	Mean	Std.dev.	Median	5th %ile	95th %ile
GDP	Gross domestic product (% change)	84	4.4929	2.8289	4.4705	-1.1295	8.8775
Inflation	Inflation, average consumer prices (% change)	84	6.1978	3.3151	5.5795	1.8953	11.488
Rural	Rural population (% of total population)	84	31.171	12.489	32.677	7.8927	51.019
Export	Export volume of goods and services (% change)	84	4.3377	7.1951	4.5320	-10.755	14.747
Expenditure	General government total expenditure (% of GDP)	84	27.284	7.8235	27.605	14.385	40.215
Debt	General government gross debt (% of GDP)	84	40.517	19.772	36.041	20.087	81.610
TA_MI	Total assets of microfinancial institutions (USD)	84	15.663	1.0681	15.600	13.467	17.489
Yield_R	Yield on gross loan portfolio (real)	84	27.777	14.313	25.340	9.8775	64.520
PAR_90	Portfolio at risk 90 days (%)	84	2.9770	1.2920	2.7050	1.4350	5.9025
Number_B	Number of active borrowers	84	8.6317	1.0267	9.0035	6.5500	9.8123
TA_BA	Total assets of banking industry (USD)	84	24.882	1.7861	24.378	22.532	28.498

Source: mixmarket.org, oecd.org, imf.org, worldbank.org, bankscope database.

The *GDP* indicator represents an annual change of gross domestic product. This indicator will

be used as a proxy variable representing the each country's economy development level. The higher the *GDP* the greater the size of the country's microfinance sector is expected. The second macroeconomic indicator, *Inflation*, represents an annual price level change. The *Rural* indicator captures the share of population living in the countryside. The higher the rural population the faster the development of microfinance market is expected. The *Export* variable serves as a proxy for each country's degree of economic openness. It is expected that the more open the state is towards foreign investors, the cheaper the sources of finance for MFIs should be available, thus their development should be also faster. The next variable, *Expenditure*, stands for the volume of public sector expenditures spent by the government of the given country for various goods and services. This indicator will be used as a proxy for the size of public expenditures flowing to microfinance sector. *Debt* as the last independent variable represents the level of indebtedness as a percentage of GDP. The growing share of public sector debt presents a threat for the microfinance sector as it worsens the country's credibility and can exert an upward pressure on the prices of external sources of financing for MFIs.

The total assets of MFIs (*TA_MI*) will be used as a dependent variable expressing the size of the microfinance sector. Similarly we will find out whether the increasing public expenditures influence risk operations (*PAR_90*) and social efficiency of MFIs (*Number_B*). The *Number_B* variable represents the number of active debtors who own some form of microloan at given MFI. This indicator is often used as a proxy for MFIs social efficiency. The last indicator, *TA_BA*, captures the sum of total banking sector assets. Via this variable we will try to figure out what is the influence of public expenditures on the banking sector.

4. Methodology

For the above mentioned variables we construct a general regression equation 1.1, where independent variables: *GDP*, *Inflation*, *Rural*, *Export*, *Expenditure* and *Debt* in time t and in the country c will always be on the left side. The correlation matrix of independent variables is described in the Table 3.

$$Y_{tc} = \alpha_0 + \beta_1 GDP_{tc} + \beta_2 Inflation_{tc} + \beta_3 Rural_{tc} + \beta_4 Export_{tc} + \beta_5 Expenditure_{tc} + \beta_6 Debt_{tc} + \varepsilon_{tc.} \quad (1.1)$$

The dependent variables *TA_MI*, *Yield_R*, *PAR_90*, *Number_B* a *TA_BA* will be analyzed gradually on the right side of the equation 1.1. The aim of the paper is to find out whether the macroeconomic environment together with *Expenditure* and *Debt* indicators influence the size of the microfinance sector, the number of debtors, profits from portfolios, risk operations and size of the banking sector.

Table 3: Correlation matrix

		(0)	(1)	(2)	(3)	(4)	(5)
(0)	GDP	1					
(1)	Inflation	0.0932	1				
(2)	Rural	-0.2283	0.1348	1			
(3)	Export	0.4754	0.0596	0.0137	1		
(4)	Expenditure	-0.1342	0.1434	-0.4924	-0.0494	1	
(5)	Debt	-0.1017	0.2341	-0.2546	0.1853	0.4698	1

Similarly we will determine another general regression equation 1.2 where the influence of chosen independent variables in time *t-1* will be considered. It is appropriate to take into account the macroeconomic variables, which can influence the dependent variable with certain time delay.

$$Y_{tc} = \alpha_0 + \beta_1 GDP_{t-1c} + \beta_2 Inflation_{t-1c} + \beta_3 Rural_{t-1c} + \beta_4 Export_{t-1c} + \beta_5 Expenditure_{t-1c} + \beta_6 Debt_{t-1c} + \varepsilon_{t-1c.} \quad (1.2)$$

5. Results

The final results are captured in the Tables 4 and 5 in the Annex. For each dependent variable the values for Fixed model with robust estimation FE_t / Random model RE_t are listed first (Table 4) and followed by the results for the same regression with modified independent variables according to the equation 1.2 with the labels FE_{t-1} a RE_{t-1} (Table 5).

The policy of growing public expenditures has a positive impact on the future development of the microfinance market. Additional growth of the *Expenditure* indicator is associated with 5% (p = 0.0063) increase in size of total MFI assets. Moreover, the public expenditures demonstrate to be financially efficient from the long term perspective as they increase the real yield on gross loan portfolio of MFIs (p= 0.0002). On the contrary the size of

total assets proves to be surprisingly decreasing in the case of increasing share of rural population (*Rural*). The possible reason is the increasing competition on the market and downward pressure on the microloans prices. At the same time we have to take into consideration a lower purchasing power of the rural population when compared to urban population. In conclusion, the panel regression did not prove that the growth of public expenditures has significant impact on the banking sector development.

The indicator of public debt (*Debt*) shows also ambiguous results. This indicator is relatively significantly associated with the growth of borrowers MFIs' portfolio ($\beta = 0.0135$). However, we suppose that the final result is rather caused by growing public expenditures than by actual rate of indebtedness of the given country. As no other statistically significant conclusions were identified, we recommend undergoing public debt further scientific scrutiny.

The analysis of macroeconomic variables confirms the higher rate of social efficiency of those MFIs that are based in the countries with higher GDP growth. The additional economic growth is associated with 3.7% increase of number of borrowers ($p = 0.0089$) in the credit portfolio of MFIs. The association between GDP growth and MFIs financial effectiveness was not confirmed, however. The *Rural* and *Export* indicators also yield satisfactory results. Their growth is associated with the decrease of rate of portfolio at risk (PAR_90). The rural population represents a certain rate of uncertainty for the banking sector as an additional increase in number of citizens living in the countryside leads to significant decrease of the size of the banking sector (TA_BA). Here the difference between microfinance and commercial banking is confirmed again.

6. Conclusions

The panel data regression has confirmed that public expenditures have positive impact on the development of microfinance sector in the Latin America region. To be more precise, the representative sample of MFIs shows a growing volume of total assets and real yield of gross loan portfolio. The ambiguous results are shown for the public sector debt of the country, which can manifest in the growth of active MFIs' debtors in the long term. We assume that the increasing state expenditures are the reason rather than the public debt indicator itself. For this reason it is deemed appropriate that forthcoming studies will focus on the importance of growing government indebtedness and its future impact on the microfinance development.

The macroeconomic development shows to be an important factor of the microfinance field progress. The states with higher growth of GDP are characterized by higher rate of social

efficiency. The positive influence on microfinance is also associated with growth of rural population or economy openness of the given country.

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Annex 1

Table 4: Final Results (t)

	TA_MI		Yield_R		PAR_90		Number_B		TA_BA	
	FE_t	RE_t	FE_t	RE_t	FE_t	RE_t	FE_t	RE_t	FE_t	RE_t
constant	21.7117***	14.4864	-9.4602	38.6102***	21.0259**	3.3134**	10.3046***	7.7786***	39.2257***	32.2307***
	(0,000004)	(0,000005)	(0.7054)	(0.0067)	(0.0178)	(0.0389)	(0.000006)	(0.000003)	(0.000001)	(0.000001)
GDP	0.0280	-0.0173	-0.0842	0.1054	-0.0113	-0.1002	0.0370***	0.0172	0.0022	-0.0361**
	(0,3018)	(0.5019)	(0.7173)	(0.6476)	(0.8977)	(0.1051)	(0.0089)	(0.3685)	(0.8082)	(0.0244)
Inflation	0.0121	-0.0096	-0.8803***	-0.8300***	-0.0273	-0.0291	0.0177	0.0056	0.0043	-0.0048
	(0.2208)	(0.6235)	(0.00002)	(0.000008)	(0.4604)	(0.5221)	(0.1112)	(0.6978)	(0.5093)	(0.6876)
Rural	-0.2506***	0.0057	1.1759	-0.1893	-0.5387**	0.0059	-0.0904	0.0132	-0.4483***	-0.2325***
	(0.0033)	(0.8011)	(0.1309)	(0.5064)	(0.0168)	(0.8084)	(0.1823)	(0.4963)	(0.00002)	(0.00001)
Export	-0.0017	0.0126	-0.0227	-0.1019	-0.0676*	-0.0334	-0.0047	0.0008	-0.0054	0.0081
	(0.8277)	(0.1652)	(0.7747)	(0.2107)	(0.0552)	(0.1219)	(0.3971)	(0.9005)	(0.1397)	(0.1487)
Expenditure	0.0582***	0.0590	0.3203	0.0766	-0.0323	0.0049	0.0221	0.0133	-0.0078	0.0138
	(0.0063)	(0.0056)	(0.2810)	(0.7098)	(0.5791)	(0.8844)	(0.2896)	(0.4109)	(0.5231)	(0.3535)
Debt	-0.0005	-0.0130	-0.0548	-0.0471	0.0034	0.0030	0.0071	-0.0009	-0.0042	-0.0080
	(0.9260)	(0.0684)	(0.7558)	(0.5017)	(0.9143)	(0.7912)	(0.3111)	(0.8699)	(0.2113)	(0.1172)
R^2	0.9095		0.9490		0.5142		0.9386		0.9932	
Hausman test	0.00003		0.0183		0.0036		0.0001		0.000004	

Notes: p-statistics are provided in parentheses below coefficient estimates.

*, **, *** denote significance at the 1, 5, 10 % levels.

Annex 2

Table 5: Final Results (t-1)

	TA_MI		Yield_R		PAR_90		Number_B		TA_BA	
	FE_{t-1}	RE_{t-1}	FE_{t-1}	RE_{t-1}	FE_{t-1}	RE_{t-1}	FE_{t-1}	RE_{t-1}	FE_{t-1}	RE_{t-1}
constant	19.3899***	13.8371***	-17.3821	25.8885*	15.1684**	2.5563	9.4260***	7.3400***	38.2796***	32.6786***
	(0.00006)	(0.000004)	(0.3651)	(0.0877)	(0.0431)	(0.1730)	(0.0002)	(0.00002)	(0.000001)	(0.000001)
GDP	0.0058	-0.0241	-0.0087	0.0496	-0.0246	-0.0600	0.0179	0.0043	0.0106	-0.0130
	(0.8284)	(0.3671)	(0.9707)	(0.8468)	(0.7017)	(0.4029)	(0.2185)	(0.8239)	(0.1783)	(0.3444)
Inflation	-0.0006	-0.0166	0.1309	0.1183	-0.0027	0.0116	0.0103	0.0020	0.0068*	0.0012
	(0.9743)	(0.3746)	(0.3400)	(0.5112)	(0.9691)	(0.8155)	(0.3556)	(0.8846)	(0.0970)	(0.8973)
Rural	-0.1919***	0.0142	0.6863	-0.3270	-0.3197*	0.0142	-0.0699	0.0156	-0.4221***	-0.2506***
	(0.0075)	(0.5851)	(0.2301)	(0.2845)	(0.0964)	(0.6179)	(0.2987)	(0.5112)	(0.00003)	(0.000003)
Export	0.0093	0.0162	-0.0242	-0.0579	0.0088	0.0219	0.0033	0.0061	-0.0043	0.0026
	(0.3700)	(0.1124)	(0.7519)	(0.5515)	(0.7761)	(0.4293)	(0.6116)	(0.4058)	(0.1818)	(0.6130)
Expenditure	0.0741***	0.0685***	0.7315**	0.3864*	-0.0245	0.0221	0.0257	0.0187	-0.00007	0.0172
	(0.0002)	(0.0024)	(0.0214)	(0.0845)	(0.6994)	(0.5776)	(0.1360)	(0.2703)	(0.9951)	(0.1839)
Debt	0.0070	-0.0064	0.0762	0.0228	-0.0314	-0.0094	0.0135**	0.0061	-0.0031	-0.0063
	(0.2069)	(0.3983)	(0.4656)	(0.7663)	(0.1390)	(0.4810)	(0.0366)	(0.3006)	(0.2154)	(0.1616)
R^2	0.9148		0.9537		0.4496		0.9469		0.9957	
Hausman test	0.0003		0.0276		0.2483		0.0172		0.00001	

Notes: p-statistics are provided in parentheses below coefficient estimates.

*, **, *** denote significance at the 1, 5, 10 % levels.