

From NGOs to Banks: Does Institutional Transformation Alter the Business Model of Microfinance Institutions?

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Summary. — In the microfinance industry an increasing number of providers are undergoing an institutional transformation from NGO to a shareholder-owned and typically regulated financial entity. Little is known about the extent to which this transformation affects the way microfinance institutions (MFIs) conduct their business. Our results obtained by applying an event study methodology to 66 transformed MFIs suggest that portfolio yield is driven down by 3.9 percentage points due to transformation, indicating that clients get more favorable interest rates. MFIs are able to significantly cut down their operational expenses, of which 1.1 percentage points can be attributed to transformation. Other findings include a steep increase in commercial debt leverage and deposits, a significant decrease in the fluctuation of funding costs and a sharp rise in average loan size, often taken as an indicator for mission drift. Profitability in terms of ROA drops in the short term, while ROE is driven up in the medium to long run, suggesting a more shareholder-oriented attitude. © 2016 Elsevier Ltd. All rights reserved.

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1. INTRODUCTION

Microfinance pledges to provide financial services to people without any access to banking. At the peak of public attention, roughly a decade ago, the microfinance movement was enthusiastically embraced by policymakers around the world, whereas in the aftermath of crises in oversaturated markets, concerns arose that profit-seeking behavior among microfinance institutions (MFIs) might harm their clients rather than benefit them (Dichter & Harper, 2007; Guérin, Labie, & Servet, 2015). Today it is acknowledged that microfinance *can* have a positive impact on poor people's incomes, albeit to a lesser extent than previously hoped by many.¹

The global microfinance sector has continued its growth regardless, though it has undergone structural changes. Initially a purely philanthropic idea, modern microfinance started out in the 1970s as a not-for-profit activity sponsored by donors. However, since PRODEM in Bolivia was transformed into the regulated bank BancoSol in 1992, the received wisdom is that MFIs will follow a natural evolutionary process and transform from non-governmental organizations (NGOs) into financial institutions (von Pischke, 1996). While the bulk of MFIs today are still NGOs and heavily depend on subsidies (D'Espallier, Hudon, & Szafarz, 2013), several NGO-MFIs have already transformed into banks or other kinds of regulated non-bank financial institutions (NBFIs). Transformed NGO-MFIs include regional leaders such as Banco Compartamos in Mexico, Banco FIE in Brazil or Bandhan and SKS in India, which are among the largest MFIs in the world.

The transformation process implies moving to a shareholder ownership structure; and most often it also includes becoming subject to prudential regulation by national banking authorities. In this paper we investigate how transformation affects an MFI's business model by focusing on its main cost and income components, funding structure, services offered and average loan sizes.

The arguments for transformation are manifold, including: the importance of becoming independent from donors, better

access to commercial funding, an improved governance structure and the possibility to provide clients with savings accounts (Frank, 2008; Mersland, 2009). However, some argue that commercialization and transformation tend to push MFIs away from their mission of serving the poor (Dichter & Harper, 2007). For example, studies such as Chahine and Tannir (2010) and Wagenaar (2014) suggest that transformed MFIs increase the size of their loans and tend to serve a lower percentage of women.

Our paper aims to make a threefold contribution to the existing empirical literature on MFI transformation. First, while the impact on social performance has frequently been studied, we look at the impact of transformation on the overall business model of MFIs. This comprises all the cost and income components (the MFIs' profit function), the decision whether to offer savings products, the funding structure of MFIs and the scale of their operations. By investigating the business impact of transformation we seek to shed light on the question whether transformation is indeed a useful option for MFIs to increase their financial viability, as is often proclaimed. This is a persistently relevant concern for an industry that does not regard itself as a "charity", yet is still largely financed by donations.

Second, the few empirical papers on transformation that are available have mainly exploited *between-MFI* information and compared transformed with untransformed organizations. The drawback of such an approach is the difficulty in

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controlling for unobserved differences between transformed and untransformed counterparts, especially since transformed MFIs typically make up only a very small part of the overall investigated sample. In order to better isolate the effects of transformation, we employ an event study methodology relying mainly on *within-MFI* information. Arguably, this methodology is better suited to documenting the changes caused by transformation; it is frequently used both in the finance literature (MacKinlay, 1997) and in the development literature (McIntosh, Villaran, & Wydick, 2011).

Third, we go beyond investigating effects at the mean, by looking at trends in variables before and after transformation along their distribution. More precisely, we assess whether different segments of the distribution (such as well-performing *vs.* low-performing MFIs prior to transformation) are affected differently after transformation.

Three main results stand out of our analyses. Firstly, nominal portfolio yield, a proxy for interest rates charged, falls by 5.9 percentage points (from 39.5% to 33.6%) on average after transformation. Correcting for the overall declining trend, we attribute 3.9 percentage points in the decrease of interest rate to transformation. This suggests that clients are offered more favorable interest rates after transformation.

Secondly, MFIs achieve substantial efficiency gains after transformation through an average reduction in operational costs of 9 percentage points, of which we estimate at least 1.1 percentage points are due to transformation.

Thirdly, transformation is followed by reduced volatility in funding costs as well as in overall profits, indicating that MFIs seek to decrease their operational risks, in part to comply with regulations imposing stricter risk management. We note a boost in debt leverage, which is associated with decreasing returns on assets and less operational self-sufficiency, and a rise in return on equity in the medium run, which is the most relevant profitability measure from an investor's point of view. Besides, MFIs at the lower end of the self-sustainability scale during their NGO period are able to increase their operational self-sufficiency after transformation.

Further results reveal a continued growth in the loan portfolio, largely financed by a strong increase in commercial funds whereas donations and subsidized debt dwindle. The expanding loan portfolio is a result of both reaching out to more customers and of issuing larger loans on average.

We conjecture that MFIs transform in order to take advantage of economies of scope and scale, and to tap into debt and deposit markets. Lower interest rates for clients are achieved by cutting operational costs but also by offering larger loans, which may entail a potential shift toward wealthier clients, such that mission drift cannot be ruled out.

The remainder of the article is structured as follows: Section 2 reviews the literature on institutional transformation in microfinance and the reasons why MFIs transform; Section 3 presents the methodology and describes the MFI dataset employed; Section 4 reviews the empirical results, and Section 5 provides conclusions.

2. INSTITUTIONAL TRANSFORMATION IN MICROFINANCE

(a) *Transformation as a profound, country-specific process*

Following Fernando (2004) we define MFI transformation as a shift from NGO to shareholder firm. It should be noted that this does not bar the NGO from being a shareholder of the transformed MFI. In most cases a transformed MFI will

also become regulated by national banking authorities. The shareholder-owned financial institution may be a regular bank, but also one of several types of NBFIs, which are similar to banks but have different limitations to their operations and services.

This definition seems to be clear-cut; it emphasizes the date on which the NGO status of an MFI legally ends and it starts operating as a formal financial institution, typically licensed by national banking authorities. In reality, however, transformation is a long and complex process heavily dependent on country-specific regulations. Thus, while many studies including ours consider the moment of transformation as a fixed point in time t , it actually requires extensive preparation. Moreover it causes tensions and changes within the organization, both before and after legal transformation takes place (Battilana & Dorado, 2010). For example, Rosengard, Rai, and Oketch (2000) document the transition of the formerly largest MFI in Kenya, K-Rep, from an NGO to a regulated financial institution. The authors report that the process took five years, from the initial decision in 1994 to obtaining a banking license in 1999. They describe the transformation as an “*extremely challenging process*” involving major strategic, operational and regulatory choices.

Frank (2008) notes that the transformation process impacts upon almost all organizational aspects of an MFI, including governance, capital structure, product design, and regulatory environment. Hudon and Louche (2014), in their study of organizational changes induced by transformation in Kenya and Vietnam, observe that transforming MFIs struggle with redefinition of identity, redrawing the boundaries of the firm and issues of legitimacy. These challenges arise because MFIs are by nature hybrid institutions floating between two institutional logics, namely the social logic of poverty alleviation and the commercial logic of becoming self-sustainable (Randøy, Strøm, & Mersland, 2015). Although this double bottom-line principle lies at the very heart of microfinance (Armendáriz & Morduch, 2010), many researchers doubt whether it is possible to achieve in the long run, and observe a potential trade-off between social and financial objectives (Dehejia, Montgomery, & Morduch, 2012; Hermes, Lensink, & Meesters, 2011). Other scholars believe that it is possible for MFIs to pursue this double logic and achieve success on both fronts (Cull, Demirci-Kunt, & Morduch, 2007; Mersland & Strøm, 2010; Morduch, 2000). What is certain, however, is that transformation is a profound process which forces MFIs to rethink their position with respect to both the financial and social logics and to strike a new balance between these possibly opposing goals.

The transformation process depends very much upon the local regulatory context in which it takes place. For instance, in Bangladesh, where transformation is subject to the Microfinance Regulatory Authority Act of 2006, the licensing statute imposes requirements on all licensed MFIs concerning the total loan portfolio, the number of borrowers and loan applications (Khalily, Khaleque, & Badruddoza, 2014). Further, it caps annual interest rates and demands strict monitoring procedures. In most countries (but not Bangladesh), national banking authorities demand that regulated institutions be either member-based (credit unions, savings and credit cooperatives) or shareholder-owned. Since NGOs by definition have no owners (Mersland, 2009), most regulators consider them unsuited as banks since neither the authorities nor the depositors have any recourse if the bank gets into distress. Mersland (2009) points out that a change in ownership type, from NGO to shareholder-owned, will in itself alter the MFI's governance system substantially, and is

distinct from the impact of a change in regulation by public authorities.

(b) *Why do MFIs transform?*

According to Frank (2008) transformation is driven by three main motives: *access* to commercial funds, product *expansion* and organizational *sustainability*. First, to fulfill their mission, i.e., reaching as many clients as possible, and to take advantage of economies of scale (Hartarska, Shen, & Mersland, 2013), MFIs generally wish to grow their loan portfolios, which requires access to capital (Périlleux, Hudon, & Bloy, 2012). Since NGOs have no owners, they mainly have to rely on donor money and different kinds of subsidized funding (Hudon & Traca, 2011; Mersland & Urgeghe, 2013). Transformed MFIs, however, can open up to local and international investors and thereby broaden their financing mix. As a result, donor funds and subsidized borrowing can be supplemented with debt financing through commercial loans and bonds, as well as equity financing in the form of privately or publicly held shares. International investors generally appreciate the increased transparency and mandatory reporting requirements that come with transformation into a regulated financial institution.

Some authors argue that increased access to international commercial funds is in fact a necessary precondition to become independent from donor money. According to Funk (2007) for instance, USD 30 billion is needed each year to effectively reach the poor through microfinance services, an amount almost impossible to raise exclusively through donor funds. Fernando (2004) argues that relying on donor money is a risky strategy since the amount of donations depends upon economic conditions in donor economies and can therefore be unstable and uncertain.

The second main reason for transforming is to mobilize savings, something that, in most countries, only regulated financial institutions are allowed to do. NGOs typically are only allowed to issue credit; they therefore remain “one-legged” credit institutions. Delgado, Parmeter, Hartarska, and Mersland (2015) find that most MFIs enjoy economies of scope when holding savings alongside credit provision, and Awan (2009) highlights that savings can be a cheaper source of capital for MFIs. For instance, Rashid Bajwa, CEO of the largest Pakistani microfinance program, National Rural Support Program (NRSP), noted in an interview that “*if I borrow from commercial banks I have to pay up to 18%,... so deposit taking and thus transformation is a need, not a choice*” (Awan, 2009).

Offering savings accounts alongside credit is also important from a demand side perspective. Collins, Morduch, Rutherford, and Ruthven (2010) demonstrate that even people with a very low income demand savings products; they typically lack safe places to deposit their savings, and often use alternative and informal ways to save. Well-designed savings products can help them manage their volatile daily cash flow and smooth their consumption. They may serve as a buffer in case of an unexpected income shock, and they can also be used to take advantage of economic opportunities. Furthermore, offering formal savings products can help overcome behavioral constraints, such as a lack of self-commitment. If savings are available at any time, they are easily spent on short-term consumption instead of being conserved for their earmarked purpose (Dupas & Robinson, 2013).

The third reason to transform can be labeled “organizational sustainability”. Some managers of MFIs launching the transformation process argue that integration into the formal

financial system has allowed many historical microfinance initiatives to survive over time (Mersland, 2011). Partly this is because regulators typically require institutions to comply with strict governance rules and also to have a long-term strategic plan. In some cases, MFIs may be driven by regulators to transform when they become a systemic risk for the sector due to their growth (Hudon & Louche, 2014). Regulation also allows for more control and hence better client protection. Therefore, in order to obtain a license, NGO-MFIs changing to a shareholder ownership structure install better corporate governance systems, improve their management structures and rethink their operational procedures to become more efficient. Even though these changes are demanding and require considerable efforts, they usually bring organizational stability in the long term. Labie (2001) notes that ineffective governance—mainly within NGOs—has led to resounding failures in the microfinance industry.

To sum up, whether motivated by the possibility of increased access to funding, or the opportunity to mobilize savings, or the wish to improve sustainability through regulation and ownership, transformation primarily seems to be an answer to an urge to professionalize and grow. This urge seems to be a logical response to fierce sectoral competition, both with newcomers and with commercial banks that are downscaling their activities toward microfinance² (Assefa, Hermes, & Meesters, 2013; Bell, Harper, & Mandivenga, 2002) which, sometimes, is actively supported by government (as for instance in Malaysia, Nepal, and Thailand; Hermes *et al.*, 2011).

(c) *Anecdotal empirical evidence concerning the business model of transformed MFIs*

A number of studies analyze specific transformation cases or a sample of transformed MFIs within a country-specific setting. Rosengard *et al.* (2000) document the transformation of *K-Rep*, the once largest Kenyan microfinance program, into a regulated financial institution. Emphasizing the strategic and operational challenges faced during the process, the authors highlight the specificities of the microfinance business compared to the traditional financial sector and recommend four specific regulatory measures for microfinance: first, a higher minimum capital requirement due to higher volatility in financial revenue; second, an asset quality evaluation system taking account of the typically non-traditional nature of collaterals; third, a minimum organizational structure allowing for continued proximity and quality of services to clients; fourth, stricter liquidity requirements to counter greater exposure to liquidity risk. Further, Rosengard *et al.* (2000) argue that MFIs should be allowed to set interest rates freely, and that profitability should be measured in the same way as for other financial institutions in terms of return on assets (ROA) and return on equity (ROE). All recommendations were eventually implemented in 2006 by the State Bank of Kenya.

Awan (2009) documents the transformation of NRSP, the largest Pakistani microfinance scheme. The main recommendations for a smooth transition are a clear management structure, open communication and information distribution to both staff and clients, and contingency planning of the process. The study also emphasizes the importance of client-relationship building through proximity, openness and transparency, and the focus on trust and image.

Khalily *et al.* (2014) use stochastic frontier analysis to analyze the efficiency *pre-* and *post-*transformation of 182 licensed MFIs in Bangladesh. Their main finding is that transformation reduces cost-inefficiencies thanks to higher staff

productivity and, to a lesser extent, greater operational efficiency. They report a reduction in the effective interest rate from around 36% to 27% due to the ceiling imposed by regulation, while dependence on subsidies diminished among transformed MFIs.

Rhyne (2001) provides an interesting overview of the transformation landscape in Bolivia, describing how MFIs not used to having owners or regulatory supervisors suddenly find themselves under pressure from owners, along with a regulator demanding strict supervision. At the same time the author argues that the commercialization process, including NGO transformation, has shaped the industry and made Bolivia one of the most advanced microfinance markets.

Finally, the World Bank-commissioned guidebook by Ledgerwood and White (2006) presents reasons why NGO-MFIs ought to consider transforming and how the process should be managed. The book shows that transformation impacts most parts of the organization, including the management information system (MIS), manuals and processes, internal controls, and customer service. It also covers an interesting case study: the transformation of the Ugandan Microfinance Union into Uganda Microfinance Limited in 2005.³

(d) Cross-country empirical evidence

A number of studies investigate how regulatory and ownership status affect both poverty outreach and financial sustainability in a cross-country setting. Mersland and Strøm (2008), analyzing a sample of 132 NGO-MFIs and 68 shareholder firms, find that NGOs are neither more socially oriented, nor are shareholder firms more commercially-oriented. They conclude that it is up to policymakers to decide whether NGOs should be allowed to mobilize savings and become regulated without changing their ownership status. Hudon and Périlleux (2014) analyze the surplus distribution of MFIs and find that NGOs and shareholder-firm MFIs do not allocate their surplus in a significantly different way. Looking at the other dimension of transformation, Hartarska and Nadolnyak (2007) find that regulation neither affects social performance (measured by outreach), nor does it affect financial performance (measured by operational sustainability).

These studies empirically verify whether and how shareholder-owned (and typically regulated) MFIs are different from non-regulated NGOs, but do not take into account any information before and after transformation. It is thus difficult to attribute observed differences unambiguously to regulation or a change in ownership. Put differently, it is hard to isolate the effect of transformation from the effect of other unobserved inter-group differences. A handful of studies single out the effect of transformation on both social and financial indicators by either employing information *before* and *after* transformation, or by constructing a control group of similar untransformed MFIs. The main emphasis of these studies is to verify whether transformation leads to mission drift, defined as a shift away from the poor (Woller, Dunford, & Woodworth, 1999).

Frank (2008) compares 25 transformed MFIs with a control group of 25 untransformed MFIs. The main finding is that transformed MFIs expand their client base and loan portfolio, which supports the argument that they transform in order to grow and serve more clients. Regarding social performance, the study finds a drop in the proportion of female clients and an increase in average loan sizes among transformed MFIs. Like Frank (2008), Chahine and Tannir (2010) compare the social and financial performance indicators of 68 transformed MFIs with a matched control sample of 68

non-transformed MFIs on a year-by-year basis. They find that the transformed institutions have more active borrowers than their non-transformed counterparts, but also higher average loan sizes. Wagenaar (2014) goes beyond this year-by-year comparison of transformed *versus* non-transformed MFIs by using a large international MFI panel dataset based on the MIX Market. In line with the aforementioned studies, she finds an increase in average loan size and a decrease in the share of female customers. All of the above studies suggest that mission drift may be a result of transformation, which they conclude from an increase in average loan sizes and/or a drop in the share of female clients.

Our approach of estimating the effect of transformation substantially contributes to existing empirical studies: to our knowledge we are the first to apply event study methodology in this context which we believe can add to the debate by exploiting within-MFI information. In addition, we investigate how transformation influences the MFI's overall business model, including the MFI's profit function, the mix of funding sources and the scope of services provided, which we hope draws a more complete picture of transformation. Moreover, while most studies focus on effects in the mean, we study whether effects differ along the distribution of variables.

3. DATA AND METHODOLOGY

(a) Data and summary statistics

The dataset was mainly gathered through a survey of Fernando (2004), Hishiguren (2006), Frank (2008), a CGAP study by Lauer (2008) and a spreadsheet on legal status transition published by MIX Market (www.mixmarket.org). Additional transformed MFIs were identified manually by screening academic papers, industry notes, and documents. Next, data on transformed MFIs were gathered from the MIX database.

Table 1 reports summary statistics on the 66 transformed MFIs in the database over the period 1993–2011 in Panel A and breaks down several indicators by region in Panel B. The influence of extreme values is omitted by winsorizing the main variables at the top and bottom 1% of the distribution.⁴ As displayed in Panel A, the median MFI in our sample manages a total loan portfolio of USD 7.2 million for around 16,600 borrowers and has been operating for nine years. The average loan size is USD 430. The median value for the inflation-adjusted portfolio yield is 23%, while the ROA and ROE are 3% and 13%, respectively. Panel B demonstrates substantial heterogeneity among MFIs in different regions. For instance, while the average number of borrowers for South Asian MFIs is higher than 270,000, Eastern European and Russian MFIs have a mean borrower base of only around 8,000.

As illustrated in the previous sections, the current literature investigates differences between transformed and untransformed MFIs. Therefore, most studies on transformation identify *whether* MFIs have transformed, but not *when* the change actually occurred. This could be due to lack of longitudinal data or simply to the fact that the time of transformation is not observable. When this is the case, one can only employ between-MFI information and analyze how MFIs that have transformed at any given time are different from a non-transformed control group. As already mentioned, this poses a problem because the differences observed might not be the result of transformation at all, but of some other unobserved differences between transformed and non-transformed MFIs.

Table 1. *Summary stats*

Panel A. Summary statistics for the sample of 66 MFIs observed over the period 1993–2011. To remove the influence of outliers, the following variables were winsorized at the top and bottom 1%: portfolio yield nominal, portfolio yield real, operating expense ratio, ROA, ROE, OSS, debt-to-equity ratio, portfolio growth, total assets growth, borrowers and donations ratio							
Variables	Definition	<i>n</i>	Mean	Median	Min	Max	
<i>General variables</i>							
TA	Total assets in US\$'000	713	51,800	9,736	30.074	1,160,000	
Borrowers	Number of active borrowers	706	100,723	16,626	173	2,811,553	
GLP	Gross loan portfolio in US\$'000	716	41,800	7,254	4.704	961,000	
Age	Number of years since established	723	9.98	9	1	29	
Average loan	Average loan balance per borrower in US\$	707	1,031	430	8.00	41,809	
Average loan to GNI per capita	Average loan balance relative to PPP-adjusted GNI per capita	691	0.24	0.16	0.01	3.30	
Deposits	Deposit amount in US\$'000	681	13,900	0	0	911,000	
Depositors	Number of depositors	664	34,599	0	0	3,254,913	
Portfolio growth	Pct growth in gross loan portfolio	648	63.61	41.29	−86.94	500.00	
Total assets growth	Pct growth in total assets	645	56.66	38.41	−43	402	
Debt-to-equity ratio	Ratio of external debt to equity	708	4.358	2.425	0.00	30.00	
GNI per capita	Gross national income per capita, PPP-adjusted, in US\$	703	3,900	2,720	610	19,850	
Donations ratio	Donations as pct. of average liabilities	641	172	0.45	0	10,319	
Subsidized debt ratio	Subsidized funds (difference between financial expenses and market rate cost of funds) as pct. of average liabilities	440	0.54	0	0	7.09	
<i>Profit drivers and overall profits</i>							
Portfolio yield (nominal)	Financial revenues as pct. of GLP	627	35.67	31.67	11.00	90.00	
Portfolio yield (real)	Nominal portfolio yield corrected for inflation	606	27.24	23.85	1.59	84.00	
Cost of funds	Financial expenses as pct. of average liabilities	637	8.89	8.01	0.00	97.85	
Operating expense ratio	Operational costs as pct. of annual average outstanding loan balance	645	25.17	19.71	5.00	95.00	
Par 30	Portfolio at risk 30 days in arrears	676	3.24	1.67	0.00	52.10	
Write-off rate	Written off portfolio as pct. of GLP	594	1.42	0.59	0.00	56.59	
Return on assets (ROA)	Net operating income as pct. of total assets	644	2.81	3.07	−51.00	25.00	
Return on equity (ROE)	Net operating income as pct. of equity	643	13.63	13.37	−87.00	95.00	
Operational self-sustainability (OSS)	Operating revenue as pct. of the sum of financial expense, loan-loss provision expense and operating expense	703	117.37	117.63	0.00	200.00	
Panel B. Regional distribution of key indicators, averaged over MFIs and years							
Region	# of MFIs	# of borrowers	Total assets growth (in pct.)	Avg. loan size (in US\$)	Age at transformation	Share of MFIs offering savings (%)	Share of regulated MFIs (%)
Sub-Saharan Africa	3	33,032	24.6	307	15.7	100	100
East Asia and the Pacific	8	62,689	48.6	432	9.4	100	100
Eastern Europe and Russia	10	8,414	41.5	4233	9.1	10	90
Central Asia	16	12,298	63.4	722	6.3	38	100
Latin America and The Caribbean	14	62,107	30.2	929	12.9	79	86
Middle East and North Africa	1	8,516	48.5	823	5.0	0	100
South Asia	14	274,343	106.9	123	7.3	86	86

This issue is particularly problematic because the sub-sample of transformed MFIs is typically small in relation to the overall sample investigated. Hishiguren (2006) reports 43 cases of transformed MFIs out of thousands of NGOs (status of 2006), while the sample used by Wagenaar (2014) contains 59 transformed MFIs (only 5% of the sample) covering the period up to 2010. The relatively small number of transformed MFIs should, however, not be misinterpreted as transformations being irrelevant for the sector. Figure 1 illustrates that the share of transformed MFIs in the global market, measured through various indicators, is not negligible and growing. The share of borrowers catered for by transformed MFIs has been rising steadily, up to almost a quarter of the entire market in 2010. Furthermore, transformed MFIs employ a significant share of the global microfinance workforce. The number of depositors and the share in gross loan portfolio also show a tendency to grow, albeit at a slower pace. Figure 1 does not

only show the significance of transformations, but also fuels concerns about the assumption that the observables of transformed and untransformed MFIs are similar *except for* transformation itself.

(b) Methodology: exploiting within-MFI information

Having sufficiently many data points available for each transformed MFI, we exploit within-MFI information for a sample of 66 transformed MFIs over the period 1993–2011. Within this sample-period, all MFIs under study underwent transformation during a known year t_0 , changing from the status of an NGO to that of a bank or NBF. By doing so, we single out and quantify the changes in the MFI's business model induced by transformation, rather than measuring differences between transformed MFIs and non-transformed counterparts.

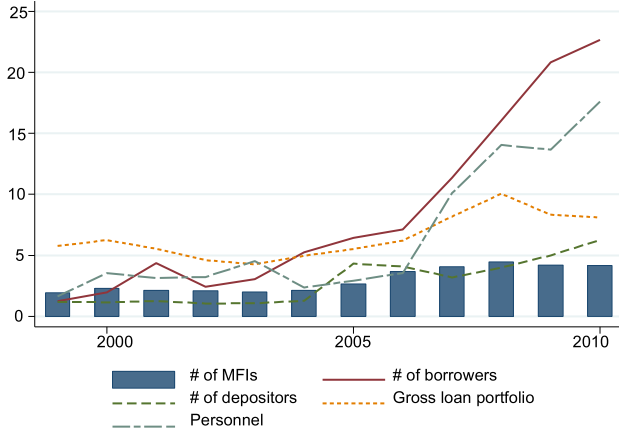


Figure 1. The growing significance of transformed MFIs in the global microfinance market (1999–2010). Share of MFIs in the global market in percent per year for various indicators. Data obtained from MIX market dataset and through own compilation.

First, we report mean and median values for all variables under consideration *pre-* and *post-*transformation, and test the significance of the differences observed. Second, we graphically report the median values and quartiles for variables under consideration in the interval $[t_0 - 7; t_0 + 7]$. This enables us to observe natural trends and how those trends altered around point t_0 , as well as whether different segments in the distribution of a variable are affected differently.

Next, we use insights from event study methodology to isolate the effect of transformation for the variables under consideration. The aim is to estimate a *normal* value for each observation of the variables under consideration, using linear prediction based on an underlying regression analysis. In this underlying regression we use different cost and income drivers as the dependent variable. As explanatory variables we use broad MFI-level controls: total assets (in logs) as a proxy for size, the MFI's age in years and the number of active borrowers (also in logs). To circumvent endogeneity caused by the asset variable, we use one-period lags. We also include Gross National Income (GNI) per capita (in logs and PPP), to take the potential influence of fluctuations in the overall economy into account. Furthermore we include MFI fixed effects to control for any time-constant unobserved difference between the MFIs. We also take up year dummies, to reduce the impact of industry-wide trends and natural patterns over time. For each observation, fitted values that can be considered *normal* values for a specific MFI in any given year and region are computed for the variable under consideration. The difference between the *actual* value and the fitted value then results in the *abnormal* value or *excess* value for a given MFI-year.

If we denote by $Y_{i,t}$ the value for the dependent variable of interest for MFI i at year t , let $X_{i,t}$ be a vector of MFI characteristics and let $T_{i,t} \in \{0,1\}$ indicate whether the observed year lies before or after the transformation year t_{0i} for a given MFI (that is, $T_{i,t} = 1$ if $t_i > t_{0i}$), our model elaborates as follows:

$$Y_{i,t}^{abnormal} = Y_{i,t} - E[Y_{i,t}|T_{i,t} = 0], \quad \text{where}$$

$$E[Y_{i,t}|T_{i,t} = 0] = \hat{\alpha}_i + \hat{\theta}_t + \hat{\beta}X_{i,t} + \hat{\gamma}GNI_{i,t} \quad \text{if } T_{i,t} = 0$$

$\hat{\alpha}_i$ indicates the MFI fixed effects and $\hat{\theta}_t$ the year dummies, while $\hat{\beta}$ and $\hat{\gamma}$ are the point estimates for the coefficients of MFI characteristics and per-capita GNI, respectively. For each variable Y we report the *actual* ($Y_{i,t}$), *fitted*

($E[Y_{i,t}|T_{i,t} = 0]$) and *abnormal* ($Y_{i,t}^{abnormal}$) values, averaged over all MFIs in each year relative to transformation within the interval $[t_0; t_0 + 7]$, thereby assessing the impact of transformation up to seven years after the event. Averaging the abnormal values (AV) over the N MFIs for a given t yields the overall annual abnormal values:

$$AV(t) = \frac{1}{N} \sum_i AV_i(t)$$

We also report the *average* abnormal value (AAV) over the observed sample period after transformation ($T = 7$) for each variable under study:

$$AAV = \frac{1}{T \cdot N} \sum_t \sum_i AV_i(t)$$

Since the results from the event study critically depend on the estimated normal values and therefore on the quality of the underlying regression model, we undertake several robustness checks assuming different underlying reduced-form regression specifications. The results of the robustness checks are reported in Section 4(e).

4. MAIN RESULTS

(a) Results of the underlying event study regressions

Table 2 presents the parameter estimates from the underlying regression model presented above. Since the regressions are based on observations prior to transformation of a given MFI, the number of years that enter the estimation varies for each MFI. On average, MFIs transform nine years after their establishment. While 40% of the MFIs in the sample transformed during 2005–07, the earliest transformation was recorded in 1992. Overall, the regressions cover a period of 18 years.

Panel A displays the regressions for the four main profit drivers. For each regression we report the *R*-squared of the mean-deviated regression, labeled “within *R*-squared”. Levels vary from .076 for the write-off ratio to .475 for operating expenses (Column 4), which indicates a reasonably good model fit.

Panel B contains the regression coefficients for the three profitability indicators: ROE, ROA and operational self-sustainability (OSS). The number of borrowers has a highly significant (1% level) and positive coefficient in all three specifications. All within *R*-squared values are satisfactorily high, with the ROA specification (.35) standing out.

(b) Transformation and the main profit drivers

For clarity concerns, we present for each variable under study a combined analysis of the univariate mean and median comparisons, the median and quartile trend analysis derived from the graphs, and results obtained from the event study methodology. To test changes in the means and median for significance, we apply 2-tailed *t*-tests and Pearson chi-square statistics, respectively.

Comparing the median and mean values for portfolio yields shown in Table 3, we find that both nominal and real (inflation-adjusted) portfolio yields go down significantly after transformation. The median nominal portfolio yield falls from 37% to 30%, while the median real portfolio yield declines from 28% to 21%. The graphs in Figure 2 reveal the trends across the distribution. As can be seen, portfolio yield rises between seven and three years prior to transformation, before

Table 2. Underlying regressions to derive fitted values for cost and income components, and overall profits

Panel A. Regressions of the four main profit drivers. <i>t</i> -Stats given in parentheses. *, ** and *** indicate significance at 10%, 5% and 1% levels, respectively						
	(1)	(2)	(3)	(4)	(5)	(6)
	Portfolio yield nominal	Portfolio yield real	Cost of funds ratio	Operating expense ratio	Par 30	Write-off ratio
<i>Independent variables</i>						
Total assets lagged (log)	−1.166 (−0.64)	−1.443 (−0.76)	3.944 (1.53)	−4.669 (−2.14)**	0.391 (0.91)	−0.163 (−0.49)
Age	−3.391 (−4.19)***	−3.150 (−3.83)***	1.271 (0.93)	−1.464 (−1.72)*	2.435 (12.16)***	1.366 (6.75)***
# of borrowers (log)	2.688 (1.58)	2.235 (1.07)	−5.928 (−1.29)	−4.078 (−1.18)	0.00619 (0.02)	−0.0684 (−0.16)
GNI p.c. PPP (log)	−19.98 (−0.83)	13.42 (0.37)	−26.88 (−1.42)	−24.93 (−1.32)	−12.79 (−1.60)	5.691 (1.33)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
<i>Model statistics</i>						
Within <i>R</i> -squared	0.192	0.143	0.109	0.475	0.095	0.076
Observations	268	268	275	281	276	254
Panel B. Underlying regressions to derive the fitted values as the linear prediction for overall profits						
	(7)	(8)	(9)			
	ROE	ROA	OSS			
<i>Independent variables</i>						
Total assets lagged (log)	−0.821 (−0.14)	1.676 (0.98)	5.959 (1.45)			
Age	−28.31 (−7.85)***	−1.455 (−1.96)*	−8.515 (−3.61)***			
# of borrowers (log)	11.23 (2.72)***	5.199 (2.19)**	10.70 (2.46)**			
GNI p.c. PPP (log)	48.67 (1.39)	7.717 (0.58)	31.02 (0.71)			
Year dummies	Yes	Yes	Yes			
<i>Model statistics</i>						
Within <i>R</i> -squared	0.231	0.354	0.277			
Observations	279	280	285			

Table 3. Profit drivers and overall profitability before and after transformation

	Mean values			Median values		
	Before <i>t</i>	After <i>t</i>	Sig. (<i>t</i> -test)	Before <i>t</i>	After <i>t</i>	Sig. (Pearson χ^2)
<i>Income/interest rates</i>						
Portfolio yield (nominal)	39.53	33.57	−4.42***	37.06	30.27	15.01***
Portfolio yield (real)	30.94	25.12	−4.32***	28.05	21.87	19.25***
<i>Operational costs</i>						
Operating expense ratio	31.09	21.75	−6.62***	24.43	16.86	42.09***
<i>Financial costs</i>						
Cost of funds	9.41	8.62	−1.14	6.54	8.50	19.16***
<i>Losses</i>						
Par 30	2.62	3.65	1.52*	1.40	1.95	2.70
Write-off ratio	1.37	1.45	0.31	0.73	0.54	3.49*
<i>Overall profitability</i>						
ROA	2.62	2.92	0.40	4.55	2.72	6.32**
ROE	14.77	12.98	−0.77	11.81	13.19	0.29
OSS	115.40	118.73	1.27	118.34	116.79	0.10

Mean and median values for different profit drivers before and after transformation. Significance of differences tested using 2-tailed *t*-tests for mean values and Pearson χ^2 -statistics for median values. *, ** and *** indicate significance at 10%, 5% and 1% levels, respectively.

a steady decline sets off in $t_0 - 3$ until $t_0 + 7$. This pattern can be observed across the entire distribution. The results of the event study reported in Table 4 support the conclusion that

transformation at time t_0 reinforces the falling trend in portfolio yield both in nominal and in inflation-adjusted terms. The average abnormal value of -3.9 per annum states that,

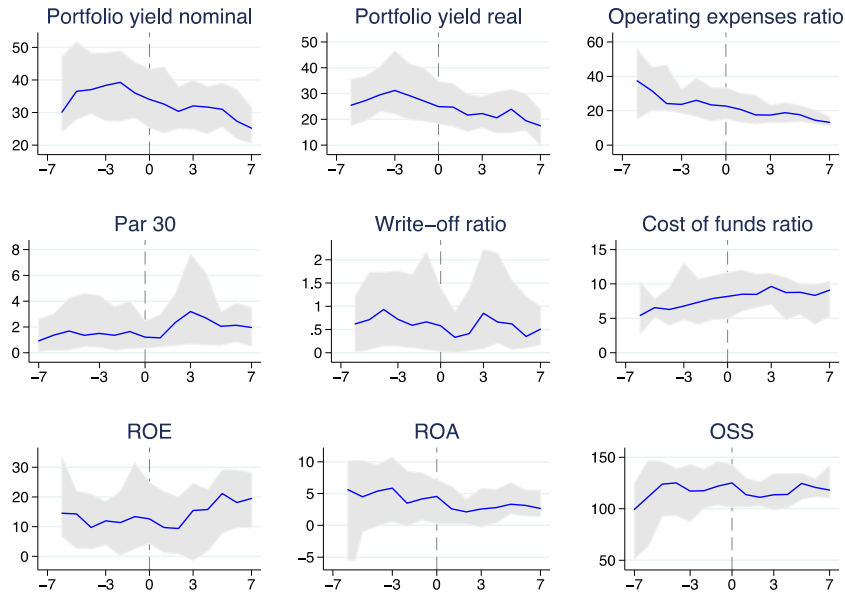


Figure 2. Trends in profit drivers and overall profitability before and after transformation. Median values and interquartile ranges for profit drivers and profits in an interval $[t_0 - 7; t_0 + 7]$ around transformation. No values are reported for any variable at time t if less than 10 observations at t .

considering all seven years after transformation, the observed nominal portfolio yield is on average 3.9 percentage points lower than in a predicted scenario without transformation. Similarly, real portfolio yield is on average 6.2 percentage points lower than predicted over the same period. Taken together, the results suggest that transformation induces a drop in interest rates charged to microborrowers.

Turning to the operating expenses ratio, Table 3 shows a significant decrease in operating costs in both median (from 24.4% to 16.9%) and mean value (from 31.1% to 21.8%), the differences being significant at the 1% level. The graph in Figure 2 confirms the steady decrease but reveals some interesting pattern in the distribution of operating costs: after transformation, both the median and the upper quartile approach the lower quartile, which mostly remains at the same level. Thus seven years after transformation, most MFIs are able to cut back their operating costs ratio to similar levels in the range of 11–16%. Results of the event study depicted in Table 4 show that operating costs are consistently lower after MFIs had transformed, compared to an estimated counterfactual situation without transformation. Compared to the drop in yield, the transformation-induced reduction in operational costs is lower (1.1 percentage points) though still at economically significant levels. Moreover, the consistency in direction and the relatively high within-R-squared in the underlying regression (.48) strengthens the validity of the results.

Turning to funding costs, we observe a significant increase in the median in Table 3, while at the same time the mean funding costs fall slightly. This hints at differential trends concerning funding costs along the distribution. Indeed, looking at the graph in Figure 2, one can observe different behaviors of the upper and lower quartiles of funding costs. The upper quartile exhibits an increasing trend before transformation, which is reversed after transformation. The lower quartile, in contrast, mainly fluctuates around a steady level, with the exception of the first three post-transformation years, where it experiences a temporary increase from 5% to 7%. The event study results presented in Table 4 complement the univariate analysis, showing that in the interval $[t_0; t_0 + 7]$ funding costs are on average 4.4 percentage points lower than the predicted

values. This is mainly because the predicted values forecast a strong trend toward increased funding costs after transformation, while actual funding costs remain at the same level post-transformation.

We also note that the dispersion of funding costs within MFIs, as measured by the standard deviation across years, decreases significantly (at the 5% level) during the observed post-transformation period (figures not shown). In combination with the observed insignificant change in the *mean* funding cost (see Table 3), this implies a mean-preserving contraction of the distribution of funding costs after transformation. Since a mean-preserving spread in the distribution of a random variable can be perceived as an increase in risk (Stiglitz & Weiss, 1981), we analogously understand the observed mean-preserving contraction in the distribution of funding costs to be a decrease in the risk surrounding funding stability.

Another component in the profit function are loan losses, measured by (i) portfolio at risk after 30 days and (ii) the loan write-off ratio. Table 3 shows a significant rise in the mean of portfolio at risk (10% level), while the increase in the median is insignificant. Conversely, no significant change in the mean write-off ratio can be found, whereas the median falls significantly (10% level). No clear tendencies emerge from the graphs in Figure 2, where especially the upper quartiles are volatile in both cases. Regarding the results of the event study in Table 4, we do not observe a meaningful effect of transformation on loan losses, either. We therefore conclude that in the medium run, transformation does not seem to have any observable effect on the loan losses of MFIs.

Summarizing the results on profit drivers, we find a significant reduction in real and nominal portfolio yield, which corresponds to a lowering in interest rates charged to customers. This goes along with decreased operational costs, especially for MFIs with previously high levels of operational costs. The univariate trend in the cost of funds is somewhat ambiguous, but we do observe a significant decline in the spread of funding costs after transformation, suggesting a decrease in risk linked to funding costs i.e., a more stable funding environment for MFIs. Finally, loan losses do not seem to be affected by the process of transformation.

Table 4. *Actual, fitted and abnormal values for the main profit drivers and profits after transformation. Average annual abnormal values are typeset in italics, and the overall 8-year average abnormal values are typeset in bold*

Profit driver	Values	t_0	$t_0 + 1$	$t_0 + 2$	$t_0 + 3$	$t_0 + 4$	$t_0 + 5$	$t_0 + 6$	$t_0 + 7$	Mean
Panel A. Profit drivers after transformation time t_0 , average per MFI										
<i>Income/interest rates</i>										
Portfolio yield nominal	Actual	37.73	35.46	33.41	34.18	33.22	33.96	31.45	30.04	–
	Fitted	36.75	36.58	37.11	37.94	38.13	39.73	38.23	36.08	–
	<i>Abnormal</i>	<i>0.98</i>	<i>–1.12</i>	<i>–3.7</i>	<i>–3.76</i>	<i>–4.91</i>	<i>–5.77</i>	<i>–6.78</i>	<i>–6.04</i>	<i>–3.89</i>
Portfolio yield real	Actual	29.93	27.67	24.61	24.54	24.19	24.71	23.49	19.71	–
	Fitted	28.76	28.43	29.19	29.68	30.14	33.27	35.37	33.18	–
	<i>Abnormal</i>	<i>1.17</i>	<i>–0.76</i>	<i>–4.58</i>	<i>–5.14</i>	<i>–5.95</i>	<i>–8.56</i>	<i>–11.88</i>	<i>–13.47</i>	<i>–6.15</i>
<i>Operating costs</i>										
Operating expense ratio	Actual	27.62	24.74	22.37	21.36	22.32	20.22	17.94	15.35	–
	Fitted	26.59	25.63	25.04	24.27	23.43	21.83	18.13	15.85	–
	<i>Abnormal</i>	<i>1.03</i>	<i>–0.89</i>	<i>–2.67</i>	<i>–2.91</i>	<i>–1.11</i>	<i>–1.61</i>	<i>–0.19</i>	<i>–0.5</i>	<i>–1.11</i>
<i>Funding costs</i>										
Cost of funds ratio	Actual	8.26	9.31	9.04	9.72	8.14	8.3	8.02	8.2	–
	Fitted	9.09	10.67	11.26	12.67	13.44	15.44	15.49	15.69	–
	<i>Abnormal</i>	<i>–0.83</i>	<i>–1.36</i>	<i>–2.22</i>	<i>–2.95</i>	<i>–5.3</i>	<i>–7.14</i>	<i>–7.47</i>	<i>–7.49</i>	<i>–4.35</i>
<i>Loan losses</i>										
Par 30	Actual	2.31	2.91	3.5	5.1	5.1	2.66	4.31	2.89	–
	Fitted	2.43	2.84	2.75	2.96	3.22	4.3	4.63	5.65	–
	<i>Abnormal</i>	<i>–0.12</i>	<i>0.07</i>	<i>0.75</i>	<i>2.14</i>	<i>1.88</i>	<i>–1.64</i>	<i>–0.32</i>	<i>–2.76</i>	<i>0.00</i>
Write-off ratio	Actual	1.27	1.11	2.03	1.79	1.62	1.28	0.73	0.92	–
	Fitted	1.38	1.47	1.4	1.32	1.36	2.21	3.08	3.55	–
	<i>Abnormal</i>	<i>–0.11</i>	<i>–0.36</i>	<i>0.63</i>	<i>0.47</i>	<i>0.26</i>	<i>–0.93</i>	<i>–2.35</i>	<i>–2.63</i>	<i>–0.63</i>
Panel B. Overall profits after transformation time t_0 , average per MFI										
<i>Overall profitability</i>										
ROE	Actual	16.05	8.84	7.9	11.34	9.35	19.78	18.91	15.39	–
	Fitted	17.13	13.01	14.69	15.5	16.88	3.58	–0.74	–16.96	–
	<i>Abnormal</i>	<i>–1.08</i>	<i>–4.17</i>	<i>–6.79</i>	<i>–4.16</i>	<i>–7.53</i>	<i>16.2</i>	<i>19.65</i>	<i>32.35</i>	<i>5.56</i>
ROA	Actual	3.13	2.55	2.25	2.35	2.46	4.25	3.8	3.24	–
	Fitted	4.18	4.34	4.94	5.88	6.68	7.65	8.78	8.76	–
	<i>Abnormal</i>	<i>–1.05</i>	<i>–1.79</i>	<i>–2.69</i>	<i>–3.53</i>	<i>–4.22</i>	<i>–3.4</i>	<i>–4.98</i>	<i>–5.52</i>	<i>–3.40</i>
OSS	Actual	124.2	116.75	114.33	114.85	115.27	123.89	124.39	123.54	–
	Fitted	127.46	128.31	129.95	132.02	132.88	128.48	130.82	124.79	–
	<i>Abnormal</i>	<i>–3.26</i>	<i>–11.56</i>	<i>–15.62</i>	<i>–17.17</i>	<i>–17.61</i>	<i>–4.59</i>	<i>–6.43</i>	<i>–1.25</i>	<i>–9.69</i>

(c) *Transformation and overall profitability*

The three main profit indicators considered in this study are return on assets (ROA), return on equity (ROE), and operational self-sustainability (OSS), the latter measuring the share of operational costs that are covered by an MFIs' own income.

Starting with ROA, we do not detect a significant change in the mean (Table 3), while the median ROA falls significantly from 4.6 to 2.7. The analysis in Figure 2 indicates that the median and upper quartile ROA are decreasing in the long term, though not smoothly. Interestingly, the lower quartile stands in contrast to this trend, as it sees its ROA mostly constant or rising, but hardly decreasing during the observed period. As with funding costs, described above, the fluctuation in ROA after transformation is lower than before transformation. Event study results, shown in Table 4, reveal a constantly negative effect of transformation on ROA (averaging -3.7 percentage points in the period t_0 to $t_0 + 7$).

ROE, arguably a more interesting measure from an investor's point of view, does not display any significant changes,

neither in the mean nor in the median (Table 3). Figure 2 reveals that ROE experiences a drop one year after transformation, but then follows a relatively stable growth path from two years after transformation onward. Turning to the event study results in Table 4, we observe that the abnormal values are consistently negative in the interval $[t_0; t_0 + 4]$, hinting at an initial loss in ROE due to transformation. Subsequently however, from $t_0 + 5$ to $t_0 + 7$, ROE rises, offering returns substantially higher compared to a scenario without transformation—in the range of 16–32 percentage points.

Turning to OSS, we do not observe any significant changes in median or mean values after transformation, as shown in Table 3. The graphical analysis in Figure 2 shows that the median OSS does not exhibit an overall trend over the entire period. The drop in OSS observed in the year after transformation is offset by an increase three years later. The overall trend in the lower quartile i.e., in the less profitable MFIs is upward-sloping, indicating that in general even least performing MFIs are gradually moving toward self-sufficiency levels. After transformation, most MFIs (at least 75%) are able to

cover their operational costs through their own operational revenue every year, whereas seven years prior to transformation, this was the case for only 50% of the sample MFIs. The abnormal values in Table 4 suggest that in the first four years after transformation, OSS is substantially lower compared to the predicted values. The difference is less stark in the interval $[t_0 + 5; t_0 + 7]$, but altogether our results indicate a decrease in the MFI's OSS or at least a slowdown in an overall improving OSS.

Taken together, two out of three indicators suggest a negative impact on the average profitability in the short to medium run after transformation. Previously low-performing MFIs are able to increase their self-sufficiency compared to pre-transformation levels. However, investors and shareholders are mainly interested in ROE. Here we find a strong increase induced by transformation in the medium run, starting approximately five years after transformation.

(d) Debt funding, deposits and mission drift indicators

Table 5 presents mean and median values before and after transformation for indicators concerning debt-financing, subsidized borrowing and donations, portfolio growth, deposits and average loan size. Figure 3 plots the median values for the same indicators seven years before and after transformation. Table 5 indicates that debt leverage sharply increases after transformation, as shown by the significant increase in the debt-to-equity ratio both in mean and median. At the same time, donations and subsidized funds fall significantly. After transformation, at least half of the MFIs do not rely on subsidized funds or on donations of any kind. This is also illustrated by Figure 3, showing the opposing trend of commercial debt on the one hand, and subsidized debt plus donations on the other hand. Interestingly we see a one-off dip in the mean debt-to-equity ratio in the year of transformation, probably driven by equity injections from investors as well as minimum equity requirements imposed by banking regulators. In subsequent years, however, growth in debt is clearly higher than growth in equity, which is the same natural pattern usually observed for shareholder-owned banks.

Table 5 further demonstrates that the number of depositors increases substantially after transformation, on average from

8,241 to 53,117. It also shows that growth in both portfolio and assets slows down significantly after transformation although a natural reduction in "percentage" growth is not unusual when MFIs grow in absolute figures. In any case, growth remains high, and never falls below 25% on average. Figure 3 confirms the long-term increase in the number of depositors after transformation, as well as the generally declining trend in asset and portfolio growth.

In line with previous empirical studies, which we discussed in 2(d), we also find a significant increase in average loan size after transformation, from USD 566 to USD 1368 on average (Table 5). This finding is not altered if average loan size is scaled by GNI per capita. In Figure 3 we see that even though loan sizes tend to grow modestly before transformation, they soar in the year when MFIs transform and in the subsequent year.

(e) Robustness checks

As a robustness check to the event study methodology, we compute average abnormal values for different underlying regression models, in order to ensure that the results are not driven by the specification or a particular set of independent variables. Table 6 shows the average abnormal values calculated over our interval of interest $[t_0; t_0 + 7]$ for different control regressions. Model 1 is a pooled OLS model ignoring MFI and time effects, whereas in the second model, those dummies are considered exclusively. Model 3 replaces the MFI dummies with country dummies, essentially pooling all MFIs within a country. Models 4 and 5 use alternative MFI characteristics as independent variables, specifically the regulatory framework (Model 4) and the amount of deposits taken (Model 5). The regulatory framework is measured by a dummy indicating whether or not a MFI is regulated.⁵ Controlling for deposits as in Model 5 is generally desirable, since they constitute an alternative source for debt financing. However, deposits cause endogeneity problems, since they reflect the choice of the MFI to collect deposits, which is why we did not include them in the baseline regression model. Model 6 runs a specification similar to the preferred one, but cross-sectionally for each year, such that it produces different coefficients for each year. For direct comparison purposes, Column 7 shows the

Table 5. Deposits, external debt, growth, and average loans before and after transformation

	Mean values			Median values		
	Before t_0	After t_0	Sig. (t -test)	Before t_0	After t_0	Sig. (Pearson χ^2)
<i>Funding sources</i>						
Debt-to-equity ratio	3.54	4.93	3.03***	0.97	3.61	122.29***
Subsidized debt ratio	1.07	0.39	-4.53***	0.00	0.00	10.13***
Donations ratio	363.80	31.12	-3.64***	4.48	0.00	108.64***
<i>Deposits</i>						
Depositors	8,241	53,117	3.69***	0.00	97.5	35.01***
Deposits	135,990	22,753,471	4.33***	0.00	0.00	90.06***
<i>Growth</i>						
Portfolio growth	90.87	48.09	-6.31***	55.57	35.47	14.12***
Total assets growth	76.56	45.48	-5.37***	48.67	33.13	15.09***
<i>Average loan size</i>						
Avg. loan	566	1368	4.51***	257	652	53.04***
Avg. loan/GNI p.c.	0.17	0.29	5.76***	0.11	0.20	38.47***

Mean and median values before and after transformation for variables related to the loan size, use of deposits, use of external debt and growth. Significance of differences tested using t -tests for mean values and Pearson χ^2 -statistics for median values. *, ** and *** is significance at 10%, 5% and 1%, respectively.

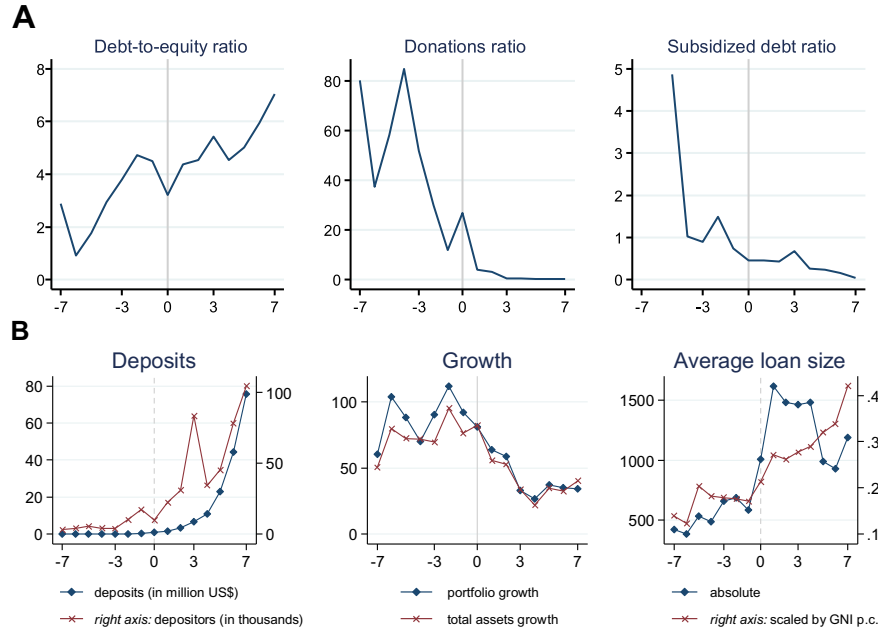


Figure 3. Loan size, use of deposits, use of external debt, and growth before and after transformation. Panel A. Mean values for debt-to-equity ratio, subsidized debt, and donations in an interval $[t_0 - 7; t_0 + 7]$ around transformation. Panel B. Mean values for deposits, percentage growth figures, and average loan size in an interval $[t_0 - 7; t_0 + 7]$ around transformation.

Table 6. Average abnormal values over interval $[t_0; t_0 + 7]$ with different underlying regressions

Panel A. Results of robustness checks							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Income/interest rates</i>							
Portfolio yield nominal	-4.16	-7.13	-4.67	-3.77	-6.27	-0.12	-3.89
Portfolio yield real	-5.34	-8.43	-5.99	-4.01	-7.77	0.31	-6.15
<i>Funding costs</i>							
Cost of funds ratio	-0.20	-1.91	-1.94	-0.25	-2.43	-1.70	-4.35
<i>Operational costs</i>							
Operating expense ratio	2.04	-5.68	-2.68	-5.67	-6.96	-0.23	-1.11
<i>Loan losses</i>							
Par 30	0.72	0.93	0.61	1.34	1.05	0.36	-0.00
Write-off ratio	-0.21	0.38	-0.36	0.42	0.32	-0.28	-0.63
<i>Overall profits</i>							
ROE	-6.33	-8.70	-8.00	-8.41	-6.61	2.92	5.56
ROA	-6.72	-3.27	-2.37	-0.52	-1.94	-1.99	-3.40
OSS	-19.98	-13.28	-8.50	-5.92	-10.58	-6.76	-9.69
Panel B. Overview of regression models used as robustness checks							
Model #	Estimated specification				Remarks		
Model 1:	$Y_{i,t} = \alpha + \beta X_{i,t} + \gamma GNI_{i,t} + \varepsilon_{i,t}$				No MFI fixed effects or year dummies		
Model 2:	$Y_{i,t} = \alpha_i + \theta_t + \varepsilon_{i,t}$				Only MFI fixed effects and year dummies		
Model 3:	$Y_{i,t} = COUNTRY_k + \theta_t + \beta X_{i,t} + \gamma GNI_{i,t} + \varepsilon_{i,t}$				MFI fixed effects replaced by country fixed effects		
Model 4: ^a	$Y_{i,t} = \alpha_i + \theta_t + \delta REGULATION_i + \varepsilon_{i,t}$				Independent variable: dummy for being regulated		
Model 5:	$Y_{i,t} = \alpha_i + \theta_t + \xi LOG(DEPOSITS)_{i,t} + \varepsilon_{i,t}$				Independent variable: log deposits		
Model 6: ^b	$Y_{i,t} = \alpha_{i,t} + \beta_t X_{i,t} + \gamma_t GNI_{i,t} + \varepsilon_{i,t}$ for $t \in T = \{2002, \dots, 2006\}$				Separately run for each year $t = 2002, \dots, 2006$		
Model 7:	$Y_{i,t} = \alpha_i + \theta_s + \beta X_{i,t} + \gamma GNI_{i,t} + \varepsilon_{i,t}$				Preferred specification from Table 4		

^a Random effects model, where α_i are random MFI effects. The Hausman test for consistency does not reject models for real portfolio yield, cost of funds, operating expenses, Par 30, write-off ratio, ROA and OSS (at 5% level).

^b Only for years with a minimum of 10 observations for transformed and untransformed MFIs.

average abnormal values obtained through our baseline specification (as shown in Table 4).

With the exception of ROE, none of the previous findings are challenged by the additional specifications. ROE, in contrast, displays negative average abnormal values in every model, except for Model 6. Thus, the initial negative impact on equity profitability after transformation, as previously estimated (Table 4), could even outweigh the steep rise experienced thereafter, at least taken together over the first seven years after transformation. Our findings concerning ROE should thus be interpreted with care. Other findings, notably the decrease in interest rates and in operational costs, and the relatively low ROA and OSS due to transformation, are confirmed by the abnormal values computed through the control regressions.

Furthermore, as a falsification exercise, we compare the annual abnormal values obtained for the interval $[t_0; t_0 + 7]$ in our preferred estimation model with the annual abnormal values *before* transformation, that is in the interval $[t_0 - 7; t_0 - 1]$.⁶ For almost all variables we notice unsystematic fluctuations in the annual abnormal values before transformation which further confirms the previous event study results. A notable exception however, is ROA, where we observe a decreasing trend in abnormal values that seem to begin three years before the legal transformation is actually finalized. We conjecture that a decline in profitability already occurs during the planning and preparation stages of transformation, which is understandable in light of our description of transformation as a profound and time-consuming process. Specifically, this might be caused by a combination of several adjustments at different levels of the institution (i.e., loan officer, client, management or investor-level) which may contribute to a significant overall drop in profitability as early as in the preparation phase of transformation.

(f) Discussion of empirical results

We believe that the reduction in portfolio yield is perfectly consistent with the process of transformation described above for several reasons. First, when an MFI becomes regulated, it can no longer “play around” with mandatory savings, fees, insurance and commissions, which drive up the cost of borrowing for clients. Increased transparency, and in some cases also caps on interest rates imposed by regulators, lead to a decrease in portfolio yield. Second, expanding MFIs will naturally enter new market segments, where they often experience tougher competition that will push them to reduce prices. Likewise, larger loan sizes will reduce MFIs’ costs and enable them to lower their prices to clients (Rosenberg, Gaul, Ford, & Tomilova, 2013). In any case, clients seem to benefit eventually from lower interest rates considered to be one of the major challenges in the industry (Hudon & Sandberg, 2013). For now we cannot however discern whether new or existing clients benefit most from the decline in interest rates.

From a financial perspective the main benefit of transformation seems to be the reduction in operational costs. Mersland and Strøm (2014) report that these costs wipe away more than 60% of an MFI’s revenue and are the main challenge in making the microfinance business model sustainable. In our sample, operating costs eat up almost 80% of the revenues before transformation, while for funding costs this figure amounts to 14%.

The reduction in operational costs is also compatible with the process of transformation outlined above. Standardization and economies of scale bring economic benefits to MFIs. For instance, regulators frequently request the use of a new, or at

least better developed Management Information System (MIS), allowing for submitting more accurate and more frequent data but also helping MFIs to become more efficient. This is an interesting point because it is well-known that being regulated is costly for MFIs (Cull, Demirguç-Kunt, & Morduch, 2011; Hartarska & Nadolnyak, 2007). Growth and professionalization also allow for economies of scale, which further brings down operational costs, as illustrated by Hartarska *et al.* (2013).

Funding costs exhibit differential trends along the distribution as we have discussed earlier. The increase in median financial costs for MFIs can be explained by restricted access to subsidized debt, prompting them to turn to regular commercial debt markets (Mersland & Urgeghe, 2013). Transformed MFIs that tap into commercial lenders on bond markets, for example, experience a rise in their funding cost ratios. The reason why we do not observe an increase in upper parts of the distribution is probably that MFIs with high funding costs prior to transformation had already tapped into those markets before. Those MFIs actually experience a decline in their funding costs, as they could now take advantage of a larger pool of potential debt-financing sources. Overall, transformed MFIs, now owned by shareholders, may also lose access to various types of subsidies, including grants (D’Espallier *et al.*, 2013; Mersland, 2009). Reduced variability in funding cost after transformation corresponds to a decrease in the risk that surrounds expected profits. Once an MFI has transformed into a shareholder firm, private equity is at stake and its shareholders are liable for potential losses. Keeping costs at a stable level is thus a prudential response to intrinsic revenue risk in the microfinance industry, in particular when uncertainties arise due to the expansion of services and operations on a larger scale. In addition, the regulatory framework often stipulates improved risk management mechanisms for MFIs.

Returns on assets initially fall after transformation and the increase in OSS before transformation slows down. When MFIs grow, they leverage an increasing share of their assets with debt, which will in most cases naturally lead to a drop in ROA, and corresponds to the steep rise that we found in the debt-to-equity ratio. These results should not, however, be interpreted as meaning that transformation leads to lower profits for the MFI’s shareholders. Investors are interested in the return on their own capital. We observe that ROE follows the pattern of a natural business case: after an initial drop, the investment (in this case, the transformation) starts paying off through higher returns, even though the initial period in which losses were incurred could amount to several years. Our findings hint toward transformed MFIs having a more profit-oriented focus, potentially driven by shareholders demanding a return on their investments, or by regulators demanding more financially sound banks and NBFIs.

The gradually increasing amount of debt taken on by MFIs is also noteworthy as it mirrors increased leverage ratios of traditional banks. Yet, MFIs’ leverage ratios remain much lower than those of traditional banks. For instance, Kalemli-Ozcan, Sorensen, and Yesiltas (2012) analyzed 180,460 banks and found a mean equity of USD 0.8 billion and a mean debt of USD 10.7 billion, which makes a debt-to-equity ratio of 13.37. The same ratio was 7.05 for MFIs in our sample, seven years after transformation. It will be important for future research to ascertain whether stable growth in MFIs’ debt leverage will continue or whether it will settle at lower levels than those of traditional banks.

Regarding the range of services offered, we observe that transformation enables many MFIs to offer savings products

to their clients, in line with the theory of mission expansion (Mersland, 2011). At the same time, increased mobilization of savings represents part of the higher debt leverage.

In line with previous studies (Chahine & Tannir, 2010; Khalily *et al.*, 2014; Wagenaar, 2014) we find a significant increase in average loan size, both in absolute terms and scaled by GNI per capita. Commonly, this is attributed to a drift away from the MFI's stated mission to primarily serve the poor. While this may well be the case, it could also be that MFIs expand their mission (Mersland, 2011) and start serving wealthier segments alongside original segments. Likewise, the increased average loan size could also stem from the fact that transformed MFIs are more able to attract funding and thereby give out larger loans to existing clients with a reliable repayment capacity. In any case, more research is warranted on the influence that transformation can exercise on the MFI's mission, and on indicators that measure mission drift more persuasively, i.e., going beyond changes in average loan size.

5. CONCLUDING REMARKS

In this paper we study how the business model of MFIs changes when they transform from NGOs into shareholder-owned financial entities. We thereby complement the empirical literature on institutional transformation in three ways. First, we draw a broader picture of transformation by focusing on the entire MFI business model, rather than keeping a narrow focus on social performance in terms of average loans and percentage of female clients. By focusing on the components of the MFI's profit function as well as on growth rates, the funding structure, and the expansion in services, we obtain a more complete picture of all the organizational changes induced by transformation. Further, we are better able to gauge the effect of transformation on financial sustainability.

Second, in our analysis we mainly rely on *within-MFI* rather than *between-MFI* information, which allows studying the transformation process and the resulting changes in the business model in greater detail. We believe that this is an important addition to the literature, which has mostly observed differences between transformed and untransformed counterparts. To this end we apply an event study methodology to 66 transformed MFIs, and compare actual and predicted values in order to derive the excess values attributable to transformation for all cost and income components under study.

Third, we do not limit the analysis to effects in the mean, but also investigate changes along the distribution of the variables. Specifically, we study the trend in median values as well as in the lower and upper quartiles and find differential effects for some variables.

A number of empirical results stand out. We note that the annual interest rates charged by MFIs falls by 5.9 percentage points on average (from 39.5% to 33.6%) after transformation. While interest rates start to decrease prior to transformation, our estimates show that 3.9 percentage points in the reduction can be attributed to transformation itself.

Another main benefit of transformation concerns operational costs. Comparing seven years after transformation with seven years before, operational costs are pushed down by 9 percentage points on average. We estimate that 1.1 percentage points thereof can be attributed to transformation. This could however underestimate the overall benefit of transformation in cutting back operational costs, since it does not count efficiency gains already achieved through adjustments during the preparatory phase prior to transformation.

Turning to funding and clients, we note a significant increase in the debt-to-equity ratio and funding expenses, a decline in donated funds and a sharp upturn in deposits. To finance the continued growth of their portfolios, transformed MFIs increasingly mobilize savings and tend to take on more debt. The volatility of their funding costs decreases significantly. Overall, reduced volatility in the cost of funds can be understood as another benefit stemming from transformation.

Looking at overall financial profitability, we find that transformation initially has an average negative effect on ROA due to increased leverage levels. Furthermore the growth in OSS particularly observed at the lower end of the distribution slows down after transformation, again supporting an initial short-run decrease in level of profitability. In contrast, we find that the abnormal values for ROE turn positive some years after transformation. Although this result is sensitive to the underlying specification used, the findings do suggest that at least in case of the more profitable MFIs, investor returns are driven up in the medium term, providing strong incentives for equity investments. In light of expressed concerns about the adverse effects of increasingly profit-seeking behavior in the microfinance sector (Bateman, 2010), investigating how this may influence MFIs' missions is an important future research avenue.

Naturally, our results hinge upon assumptions underlying the event study methodology such as selective choice of the event-window and restrictions in the sample period to estimate predicted values. Also key to the event study method is the validity of the underlying regression model. For instance, we run the risk of suffering from omitted variable bias in underlying regressions. The fact that our study controls for time-constant individual MFI characteristics, as well as for the year of observation and for economic cycle effects, mitigates that risk. Furthermore, the underlying regression rests on the assumption of linearity in coefficients at the cost of missing out on potential non-linear effects. The robustness checks presented in 4(e) indicate that the results are not heavily affected by various alterations in the underlying models.

While the exploitation of within-MFI data to detect the effects of transformation has the advantage of controlling for time-constant unobservables between MFIs, its shortcoming is that the MFIs under study are selected according to the explanatory variable, that is transformation. Put differently, we do not have a control group with which we could compare results. Therefore, the question we answer in this study is: what happens to an MFI's business model *if* the MFI transforms? Matching transformed MFIs with a control sample based on similarities in observables could potentially cope with those shortcomings. However, this approach also entails various problems such as performing appropriate matching in a dynamic panel setting and questionable exogeneity of the transformation-“treatment”. Specifically it could be that the decision to transform itself distinguishes transformed from untransformed NGO-MFIs. Notwithstanding these caveats, there is scope for future research to elaborate on matched control sample methods, particularly if MFIs continue transforming and thus a larger sample covering a longer period becomes available.

Further research is also warranted to analyze more precisely the social impact of transformation on the clientele of transformed MFIs and to interpret the significance of increased average loan sizes. A higher average loan size could be a sign of mission drift if MFIs stop serving their historical clientele and gravitate toward wealthier clients. However, it could also signal mission fulfillment if larger loans are granted to the existing clientele, or if the client base is expanded rather than substituted.

NOTES

1. A recent series of six in-depth studies on the impact of microfinance in different geographic settings using experimental methods, as summarized by Banerjee, Karlan, and Zinman (2015), presents new evidence of the limited impact of microfinance in lifting the poor out of poverty in the short to medium term.
2. For example, the two largest commercial Ecuadorian banks, Banco de Pichincha and Banco de Guayaquil, have sizeable microfinance departments.
3. Later, in 2008, Uganda Microfinance Limited was acquired by the Kenyan Equity Bank, further illustrating how organizational structures in microfinance continue to evolve.
4. To ensure robustness, we carried out the same set of analyses including extreme values, which did not alter the results.
5. It should be noted that only five out of the 66 sample MFIs were not regulated.
6. We are thankful to an anonymous referee for raising this point. Tables are not shown here, but available from the authors upon request.

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