Link between single governance issues, portfolio quality and financial performance in Rwandan Saccos

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Outline

1. Introduction

1.1 Motivation

Not just since cases like Enron (2001) has corporate governance made its way into the major headlines of newspapers and fueled public discussion. The term itself means to set up a system of checks and balances within a firm to mitigate conflicts of interest and prevent fraud. It aims to balance the interests of various stakeholders within a company and to ensure trust.

It is nevertheless not limited to big corporations but necessary in every organisation (be it NGOs, political parties or companies) where we have an information discrepancy between “better-informed insiders” and “less-informed outsiders”. Reducing this information asymmetry and protecting less-informed agents is the main goal of corporate governance. Opinions are diverging whether good corporate governance is primarily driven by company-specific factors such as internal control systems or country-specific through supervision and legislation

Corporate governance in banks has attracted special interest. Banks have specific characteristics which require a tighter set of rules and supervision: They operate with higher leverage and thus higher risk. Furthermore, traditional retail banks have on their liability side “atomized depositors“ who lack the incentive to monitor (Dewatripont and Tirole, 1994). The business of banks is often described as opaque leading to large information asymmetries (Diamond and Dybvig, 1983) and (Grossman and Stiglitz, 1980). Good corporate governance is one tool for signalling abidance to the rules and trust, key features of a sound financial system. Additionally, the importance of the banking sector for the “real economy” creates moral hazard incentives and delivers the reasoning for supervision and regulation.

The master thesis will take a closer look at corporate governance issues in banks using data from savings and credit cooperatives (“Saccos”) in Rwanda between 2013 and 2016 which I obtained and use with the permission of the Savings Banks Foundation for International Cooperation (SBIFC). I put a focus on the link between single governance issues, portfolio quality and financial performance. These cooperatives were founded in 2011 on initiative of the Rwandan state in every adinistrative sector of the country to increase financial inclusion and are required to hand in regular reports about their performance, balance sheet, income statement and other variables.

With their large depositor (and thus member) base in geographically contained communities they offer the chance to examine banking governance issues in a developing country. The school of New

Institutional Economics explains the extra ordinary development of the western world within the last 200 years with the emergence of strong institutions and principle-based rules fostering market development and prosperity.

Developing countries face many challenges Western countries were confronted with decades or centuries ago. According to Vasilescu (2008), developing and emerging countries suffer from a constant "lack of a legal infrastructure, as well as lack of regulations about property rights". (p. 8) Doidge, Karolyi, and Stulz (2004) use firm-level data on international governance and transparency ratings for a large sample of firms from around the world. They find that country characteristics explain nearly all variation in governance ratings across firms in developing countries whereas in more developed countries, firm characteristics have a larger share, too

The OECD Development Centre (Oman and Blumen, 2005) notes in one of its briefings that "the poor quality of local systems of corporate governance lies at the heart of one of the greatest challenges most countries in the developing world currently face: how successfully (…) to transform local systems of economic and political governance(…) into systems that are more effectively rules-based". (p. 1-2)

The East-African country of Rwanda has made significant efforts in the last decade to become a middle-income economy by 2020. In 2008, a study by FINMARK (FINMARK, 2008) revealed that more than eighty percent of the Rwandan population had no access to formal or informal financial services. The problem was especially evident in rural and remote areas and among women and young people.

As a response, the Rwandan government decided at the end of 2008 to set up one member-based savings and credit cooperative (Sacco) in each of its 416 sectors (Umurenge), called Umurenge Saccos. In November 2011, the Umurenge Saccos began operating. Due to regulation, the Umurenge Saccos are obliged to report financial data as well as loan and credit specific information regularly to the National Bank of Rwanda which acts as a supervisory body. I will use the reports between 2013 to 2016 for my thesis.

In the analytical part, I use regressions to explore links between different predictors suggested by literature or by myself and efficiency. In contrast to literature, I find strong evidence that depositor concentration has negative effects on a Sacco's performance, the same goes for borrower concentration. Further insider lending, especially lending to staff has a negative effect as well.

Deposits seem to have a positive effect the more long-term they are, further higher leverage is an indicator for worse performance

1.2 Literature Review

1.2.1 Corporate Governance in general

Becht, Bolton and Röell (2005) point out that the term "corporate governance" is rather new and symbolizes the gradual transfer of power from states to non-state actors as their growing complexity requires institutionalized governance. Berle and Means (1932) see separation between ownership and control as the main reason for the establishment of corporate governance to represent owners' interests and are founding fathers of corporate governance literature.
Further, Becht, Bolton and Röell (2005) define corporate governance with being "concerned with the resolution of collective action problems among dispersed investors and the reconciliation of conflicts of interest between various corporate shareholders". (p.1) At the root of corporate governance issues lies the information asymmetry between outsiders (e.g. depositors) and insiders (e.g. managers) as well as the incentive problems for monitoring. Jensen and Meckling (1976) state that "contractual relations are the essence of the firm, not only with employees but with suppliers, customers, creditors, and so on. The problem of agency costs and monitoring exists for all of these contracts". (p.8) Becht, Bolton and Röell (2005) identify among others the following mechanisms from previous literature which help to alleviate the problem of "collective action".

i) *partial concentration of ownership and control in the hands of one or a few large investors;*
ii) *delegation and concentration of control in the board of directors;*

Mechanism **i)** is also referred to as *Blockholding*. In our case of member-based cooperatives, shares are not tradable, and I will use big depositors as a proxy for concentrated ownership as they can exert influence by threatening to move deposits away and thus posing a risk to the bank. Installing boards **(ii)** to represent investors seems at first like a great idea, however, one may not forget that boards' and investors' interests may not be aligned. I will test this using the impact of insider lending on performance variables.

1.2.2 Corporate Governance in Banks

Fonteyne (2007) lists several challenges for corporate governance in cooperative banks. First, shares in a cooperative cannot be traded and just be given back at face value, dividend pay-outs are

nevertheless possible. Next, cooperatives are not merely profit-driven by design but have additional social objectives. In the case of Rwanda, it is the increase of financial inclusion. For every sector in our dataset we have the amount of bankable population as well as the number of members, allowing us to calculate the penetration of each sector by the Saccos.

Further, the credit cooperative model – one vote per member – has its origins in small rural cooperatives in 19th century Germany. Nearly each village had its own cooperative with a few hundred members, often even smaller. These rural societies were often homogeneous groups with a lot of informal knowledge about each other allowing them to reduce information asymmetries (Guinnane, 2001). Larger cooperatives with more members incur higher coordination costs while at the same time losing the information advantage leading to higher non-performing loans (NPL).

Regulation and Supervision

Banks receive deposits and use them to hand out loans by processing information. Llewellyn (1998) makes the point for public supervision and regulation to have a sound financial system as negative external effects caused by bank failures are high. However, strong public supervision might distort incentives for private monitoring ("free riding"). Public supervision might be even at odds with corporate governance as Llewllyn (1998) notes. Whereas governance aims to decrease coordination costs and align incentives between owners and managers, supervisors seek to limit the bank's risky activities. If owners want the managers to take more risk, this might be in direct contrast to the regulator. Further, the regulator due to information asymmetry and collusion might not even be aware of it.

In this thesis, I initially planned to test if regulatory on-site visits as well as inspections have any positive effect on efficiency variables. As I have no information whether these visits are random respectively if they are initiated by the Sacco or by the regulator, I cannot exclude reverse causality and thus abstained. Apart from that, the dataset reveals any cases of embezzlement in the SACCO as well as "suspense accounts" meaning the amount of money at years end which cannot be traced back. I will use the suspense account as a proxy for bad governance.

The role of small depositors

In banks, on the one side the depositors have a claim against the bank, on the other side they consume a service. Freixas and Rochet (1997) argue that banks normally do not face large creditors but a wide number of small uninformed depositors. These depositors might have neither the skills nor the incentives necessary to exert monitoring and thus choose free riding. If there is deposit

insurance, this effect is aggravated. This could explain why banks can afford higher debt levels than regular firms. In my thesis, I will look for a link between higher depositor dispersion and higher leverage as well as negative effects on efficiency variables.

Calomiris and Kahn (1991) explain the choice of banks for demandable debt as the main financing instrument with lower long-term capital costs. This seems counterintuitive at first, as demandable debt allows depositors "to vote with their feet" (p.497) leading to liquidation and idle costs. As a countermeasure, banks need to have a certain amount of money available at any time to satisfy depositors' withdrawals. They show that the bank can reduce its cost of capital by "submitting the threat of liquidation under appropriate circumstances". (p.498) The "first come, first serve" principle plays a big role as it compensates for the costs incurred by a depositor who chose to monitor and puts a price tag on "free-riding" as those depositors are "last in line".

Literature thus argues for giving partial control to depositors as they are more open for liquidation in the case of mismanagement and to reduce shareholder claims. The reason is that depositors have a fixed claim and in case of liquidation get a disproportionate share compared to shareholders who have a residual claim. It is easy to see that shareholders are inclined to risk more to avoid liquidation given their limited downside but unlimited upside. Giving the depositors power and provided they actively monitor, managers have an incentive to act responsibly. (Becht, Bolton and Röell, 2005)

Gorton and Schmid (1999) use the Austrian cooperative system to test the impact of the number of members on efficiency variables. Their data covers 73 Austrian cooperatives over four years and shows that performance measured by return on assets decreases with a higher number of members due to diminished monitoring incentives. Further, they find that because of more free-riding due to the higher number of members, efficiency wages paid are higher being the sole main reason for the decline in firm performance. Building on the results of Gorton and Schmitt (1999), I will examine the effects of the number of members on efficiency variables. Assuming that higher owner dispersion leads to higher coordination costs I will use the number of cooperative members and hence owners and test their influence on efficiency variables such as non performing loans (NPL), return on equity (ROE) and return on assets (ROE) assuming that more members lead to higher coordination costs and lower monitoring effects.

Banks – Insider Lending

Calomiris and Carlson (2016) examine the relationship between ownership and insider lending for a sample of American banks in the late 19th century when there was no deposit insurance yet in place.

They find out that the amount of lending in total is not affected by ownership or governance. In fact, ownership and governance influence who gets the insider loan. In case management hold greater equity, they receive more insider loans. If governance by board members is tougher, they receive a higher amount of loans. Further, they find that banks with higher stakes for the managers relied heavier on cash and less on equity than banks without. Regarding insider lending there are two opposing views. La Porta, Lopez-de-Silanes and Zamarripa (2003) differentiate between the "information view" and the "looting view". Proponents of the information view argue that lending to insiders helps to overcome information asymmetry reducing adverse selection and moral hazard. The looting view contends that insider lending leads to collusion and "loots" the company's resources.

Following Calomiris and Carlson (2016), I will test whether lending to different insiders (Board of Directors, Members, Staff, related Parties) reveals information about the efficiency of the respective Sacco. I expect higher share of insider loans to have a negative effect on a Sacco's profitability.

Blockholding

Becht, Bolton and Röell (2005) describe blockholding as having "at least one large shareholder, who has an interest in monitoring management and the power to implement changes". (p. 17) Edmans and Holderness (2017) stress that "having a large number of shareholders is not the same as having a diffuse ownership". (p.546) A company with many shareholders might have one or several large and many smaller ones. In contrast, a company with diffuse ownership has only small shareholders. They state that "the latter is unlikely to survive because of severe free-rider problems among its shareholders; the former may survive because of the large shareholder". (p.546) A shareholder deciding to monitor bears the full cost of monitoring while at the same time receives just a fraction (according to his share) of the profits giving him an incentive to free ride. The smaller his share, the less incentive he has.

For cooperatives, the question is whether blockholding exists and if yes, to what extent. As every member of the cooperative has one vote, accumulation of several votes by one member is not possible. However, it makes sense to assume that a depositor with a higher deposit has more to lose and thus a higher incentive to monitor the cooperative. Consequently, one could argue that through having a large deposit which he could withdraw he has some leverage. Hence, I expect cooperatives with higher depositor concentration to be better managed using efficiency variables as a proxy.

In the case of the Umurenge Saccos, the clients are shareholders (through their obligatory membership in the cooperative) as well as creditors through their deposits. The value needed to

acquire a share differs between the different Saccos. Further, some members have just managed to pay their share partially or not at all. One could assume that for cooperatives where a higher number of shares has been already paid for by its members, this might increase incentives for monitoring. Negative potential negative effects of blockholders might exist, too. Following their own interests, blockholders might use their power to channel resources from the firms away (e.g. by engaging in favorable insider lending).

In the dataset, we have the share of top ten depositors as of all deposits which I will use as a proxy for blockholding. Suggesting that rural areas offer less opportunities for diversification (as Umurenge Saccos are often the only financial institution), I will look at differences in blockholding effects between rural and urban areas. As Aghion and Tirole (1997) have pointed out, over-monitoring through large shareholders can have negative effects as well if the management feels too pressured and thus refrains from taking any decision. Taking this into account, I will check whether there is a negative effect the larger the depositor concentration is.

I build this idea on Guinnane's research on the failure of Irish cooperatives (Guinnane, 1994). He examines why the cooperative model failed in Ireland in contrast to other countries like Germany and Austria. He finds as the main reasons that it was the lack of support of the elites which were were not engaged and thus did not provide any monitoring.

For large deposits, there could be unobservable factors which distort our results in the form of group deposits and public project accounts. Both might be large enough to constitute one or several of the ten biggest deposits while at the same time having weak monitoring incentives. Group loans consist of several members susceptible to free riding. Public money faces the same issues.

2. Institutional Details

2.1 Background Rwanda General (The World Factbook, 2018)

Rwanda (officially: Republic of Rwanda) is a landlocked country in Eastern Africa which borders Uganda to the north, Tanzania to the east, Burundi to the south and the Democratic Republic of Congo to the west. The current population of Rwanda (as per May 29, 2018) is 12.47 million people according to estimates of the United Nations. The total size of Rwanda is 26.388 sq. km. and thus slightly smaller than Belgium (30.528 sq. km.). This makes Rwanda one of the most densely populated countries in the world (230 inh. per sq. km.). The capital is called Kigali.

Agricultural land makes up nearly three quarter of land (74.5%) and, a third of the land is arable. In contrast to many other African countries, Rwanda possesses no significant raw materials. Further, the degree of urbanization is among one the lowest in the world with 26.5% in 2015 according to the Worldbank. The main language spoken in everyday life is Kinyarwanda (93.2%). French and English are further official languages.

History

After World War One, Rwanda was handed over to Belgium from Germany gaining formal independence in 1959. Since then, ethnic tensions between the majority Hutus and minority Tutsis turned more and more violent and culminated in the Rwandan Genocide of the Tutsis in 1994. It is estimated that over one million Tutsis and moderate Hutu were killed between April and July 1994. In July 1994, the rebels under Paul Kagame took control of Kigali thus ending the genocide and forming a new government. Since 2000, Paul Kagame is the President of Rwanda.

Administrative level

Rwanda has five provinces (Eastern, Southern, Western, Northern and Kigali). Below the provincial level, there are 30 districts which are made up of 416 sectors called “Umurenge” (sg. “Imirenge”) in Kinyarwanda. Each sector (Imirenge) has its own Umurenge Sacco.

Economic Data

Rwanda has several times been called the economic miracle of Africa. After the genocide, Rwanda was seen as the least developed country in the world. In the Human Development Index (HDI) used

by the United nations to measure the progress of a country, Rwanda has a score of 0.498 (2015) putting it in the low-income category with rank 159/188. Since 1990, Rwanda's HDI has thus more than doubled (1990: 0.244) representing the highest gain of all countries in absolute terms during this time frame even before China. According to the World Bank's 'Doing Business' ranking (2018), Rwanda takes place 41/190. Transparency International lists Rwanda on rank 48/180 in its Corruption Perception Index.

The Vision 2020 programme lists as the main goal to transform Rwanda into a middle-income country by 2020. To reach this goal, the gross national income (GNI) per capita must be above 1006 USD. At the end of 2016, Rwandan figures stood at 702,8 USD per capita. In 2016, Rwanda's overall GDP was 8.736 bn. USD having quintupled since 2000 (1.735 bn USD). Real GDP grew by 8% on average between 2001 and 2016. The main driver was the rapid expansion of the service sector which contributed more than half (50.9%) to GDP in 2016. Annual inflation averaged 4.2% over the last six years.

Financial Inclusion

According to the latest study by FINMARK in 2016 which measures Access to Finance in Rwanda every 4 years through different indicators, 89% of adults in Rwanda (5.2 m. people) are financially included, formally or informally. Formal financial inclusion (68%) refers to using formal financial products / services including bank and non-bank products. A formal service provider is subject to regulation and rules. Of those formally served, 48% used a formal savings product. People informally served (72%) use moneylenders or take part in savings clubs. These providers do not operate under any formal governance. Informal inclusion is especially widespread in rural areas and among women. Around one quarter (26% or 1.5 million) of the adult population is banked. This group for example took loans from a bank, possesses a debit card or uses mobile banking. 43% of the population use other forms of formal non-bank financial products such as remittances and insurance products.

The percentage of people not having access in any form to formal or informal financial products is 11% (0.7 million). The highest levels of financial exclusion are recorded among the poor, women, youth and inhabitants of remote areas. The levels of financial exclusion between the separate districts vary a lot between 3% in Kicukiro district in the capital Kigali and 22% in Karongi district in Western province. More than a quarter of the bankable population (27%) save with Umurenge Saccos. Nearly 9 out of 10 Rwandans (86%) save in one form or another. The main reason to save is to set aside a buffer. Nearly as high as savings, almost three quarters of Rwandans (72%) borrow. The two main reasons therefore are for investing or covering living expenses. On average, it takes people

less than an hour in each province to reach their banking service provider with mobile agents being the most widespread ones. Mobile money is getting more and more popular and was used in 2016 by 38% of the population, primarily to send remittances.

2.2 Umurenge Saccos

Background

In 2008, the company FINMARK was tasked by the Rwandan government to measure access to finance for the Rwandan population. This task was embedded within a greater push amid the development of a Financial Sector Development Program I (FSDP I).

The results (FINMARK, 2008) showed that Rwanda had the lowest percentage of population being banked (14%) compared to all other East African countries. More than half of all Rwandans (52%) did not use any kind of financial product and were thus financially excluded. A quarter of the population used just informal products with the remaining 7% using other forms of formal products. Of those being banked, there was one bank network clearly dominating with 97% of those 14% being banked having a product of a cooperative or credit union network.

When asked why they did not use any kind of formal banking product, most respondents answered a lack of income as the main reason. An inadequate payment system as well as long distances and no or not affordable public transport were cited as other reasons. Despite citing lack of income as one of the main reasons for not using formal products, 54% of adults interviewed did save in one form or the other, around a quarter was having a loan (27%).

As of September 2008 (RCA, 2009), there were 108 licensed microfinance institutions (MFIs) registered by the National Bank of Rwanda (BNR) covering 706.947 clients. With more than a quarter of MFIs each in Kigali (26%) and Western Province (26%), other provinces were poorly served. Additionally, more than 60% of clients were residing in the capital Kigali.

The founding of the Umurenge Saccos (RCA, 2009)

Building on the study's results, the government decided to set up a savings and credit cooperative (Sacco) in each administrative sector (Umurenge) during a National Dialogue Meeting held in December 2008. The idea of Umurenge Saccos was born. One of the key differentiating point in contrast to normal banks should be that they were "user-owned financial intermediaries". (p.6)

For the Rwandan government, there have been two main reasons to choose the cooperative model to increase financial inclusion. First, the concept of member-based cooperatives has already been familiar in Rwanda. Prior to the Umurenge Saccos, financial as well as non-financial cooperatives had existed, especially in the field of agriculture. People were thus already familiar with this type of model. Second, as cooperatives are formed and governed by the members themselves, they get a feeling of ownership. The relatively modest cost to acquire a share offers poorer people the chance to participate. The minimum amount required to set up a MFI is 5 million Rwandan Francs (RWF) (=5813 USD).

Timeline (AFI, 2014)

In June 2009, every district began working on the implementation of the Umurenge Sacco strategy by holding awareness campaigns for the population. In August 2009, boards were elected for the Umurenge Saccos in each of the 416 sectors. In October 2009, all Saccos were given legal status by the Rwandan Cooperative Agency (RCA) allowing them to operate. Mobilisation of share capital deposits started in June 2010 although lending was still not allowed. In November 2011, the Umurenge Saccos made their official launch in each of the 30 districts by taking deposits. From January 2012 on, all Saccos were given the permission to hand out loans. Nevertheless, as a kind of precautionary measure, the liquidity ratio had to be maintained at 80% or above in contrast to the 30% normally prescribed by law. In December 2012, 304 out of 416 Saccos were able to attain break-even without government subsidies. In June 2013, the liquidity ratio was reduced to 60%, and one month later, subsidies for the former 304 Saccos were ended due to their profitability. 218 Saccos could further reduce their liquidity ratio to 30%. In December 2013, 355 Saccos managed to reach break-even without government support and all 416 SACCOS could have a minimum liquidity ratio of 30%.

Supervision and Regulation

Parallel to that, public authorities worked on establishing a corporate governance system. In 2011, the National Bank of Rwanda (NBR) appointed two inspectors per district, in total 60, which are tasked to supervise the Saccos and ensure their compliances with the regulation. To facilitate their job, the inspectors are based in their respective districts and not in the capital. Each of them has a motorbike, a laptop and roaming WI-FI. Additional to in-house training, they underwent training by the World Bank. Before the establishment of the Umurenge Saccos, there were 17 inspectors in the NBR headquartered in Kigali responsible for all Rwandan MFIs and Saccos.

At the beginning of 2012, the NBR enacted a law banning local political officials from being on the boards of Saccos to prevent corruption and embezzlement. Additionally, it published a savings and credit policy guide to establish minimum standards in the Saccos for loan decisions. Learning of cases of fraud and embezzlement in the first year of full operation, the NBR issued internal control guidelines.

The local governments have assisted the establishment of the financial cooperatives in the beginning. Support included public campaigning for the Sacco as well as technical assistance, the providing of office space and assistance with finding a plot and getting the necessary permits.

2.3 Regulatory Framework

In general, I will refer to rules according to Rwandan regulation for MFIs which are also applicable to the Umurenge Saccos. In case, there is a deviation from the general rule, I will explicitly outline it and refer then in particular to Saccos.

There are two main documents for the regulatory oversight of the Umurenge Saccos. The first one is the Law 40/2008 of August 26 2008 ESTABLISHING THE ORGANISATION OF MICROFINANCE ACTIVITIES. The second is its applicable Regulation 02/2009 ON THE ORGANISATION OF MICROFINANCE ACTIVITY. The regulation is the practical implementation of the law. Neither one of those two legally binding documents are solely applicable to Umurenge Saccos but fall into the broader category of regulation of MFIs. However, both have special provisions for Saccos if necessary.

In Art. 2 of the law a “Savings and credit cooperative” is defined as “a cooperative established for the purpose of accepting deposits from its members in order to make them increase in value, provide loans and other services and financial products in accordance with this Law”.

According to Art. 3 (Law) which deals with the different categories of MFIs, the Umurenge Saccos fall in the second category of “microfinance institutions which are governed by laws on saving and credit cooperatives” if they have less than 20 million RWF and just one branch (Art. 2. Reg). Otherwise if they exceed 20 million Rwf in deposits they fall into the third category and must follow the rules of management and prudential norms set in the regulation”. (Art. 2, Reg.)

If it falls into the third category, the SACCO has to hand in a “proof of payment in a blocked account at NBR of the minimum capital of Rwf 5 million”. (Art. 6, Reg.)

Art. 5 (Law) lists that these kind of MFIs "having the legal status of savings and credit cooperatives" can get "a specific regime of prudential norms with alleviating provisions applicable to this category". If the deposits received by a Sacco in the second category cross a certain threshold set by the NBR, then it migrates into the third category of MFIs and requires higher capital. (Art. 10, Law)

Governance

Article 20 (Law) states "The Board of Directors of a micro finance institution (…) shall have the responsibility to guarantee that norms of good governance are observed". The "norms of good governance" are set by the Central Bank. Before taking on their duty, each member of the Board of Directors must be approved by the Central Bank. (Art. 21, Law) "Any changes to the board of directors, the surveillance committee, the director general or manager (…) must be formally forwarded to the Central Bank for assessment." To be eligible for serving on the Board of Directors, the applicant may not have been sentenced to more than 6 months in prison, not declared insolvency abroad or in Rwanda and not have contributed to the bankruptcy of a company or MFI (Art. 22, Law). Further, all people "exercising any activity within a microfinance institution" may not be convicted of any criminal activity related to finance. (Art. 23, Law) A member of the board of directors is not allowed to take on a role on a board of another company or another MFI as long as he serves on the board of one MFI. (Art. 25, Law) The board of directors must be made up of at least 5 people. (Art. 18, REGULATION N°06/2008 ON CORPORATE GOVERNANCE OF BANKS).

Insider Lending and Embezzlement

Art. 37 until Art. 41 in the regulation outline in detail that any advantageous treatment of insiders is strictly forbidden and that conflicts of interest must be avoided where possible. Directors lose their position if they have a loan payment which is more than 60 days overdue, same goes for "any overdraft or credit facility not repaid at maturity". (Art. 44, Reg.) The MFI has to report to the NBR "the name of any employee who has committed embezzlement, fraud or any offence within their institution". (Art. 45, Reg.)

Prudential Rules

All Saccos in the third category must request information about potential borrowers at the CREDIT INFORMATION BUREAU, a special entity set up by the NBR, to get information about any loan exceeding 200.000 Rwf the potential borrower borrowed from another entity. Further, it must ask for the credit history of the borrower. (Art. 17, Reg.) Vice versa, each MFI is obliged to report a weekly oversight of its debtors exceeding 200.000 to the regulator. (Art. 18, Reg.) Further, Saccos in

the third category “must keep a credit file containing all information and documents in their possession concerning the indebtedness and credit history of every debtor”. (Art. 20, Reg.) Any person who has not paid back a loan to a “financial institution in Rwanda” is prohibited from getting a loan. (Art. 21, Reg.)

All MFIs must have a minimum cash ratio (liquidity ratio) computed according to the formula set by the NBR. (Art. 26, Law) The ratio is calculated as cash plus cash equivalents divided by sight deposits and contingent liabilities. The ratio must be always above 30%. (Art. 53, Reg.) The net worth (Net equity capital) must be at least 15% of total assets (Art. 55, Reg.) As explained, at the beginning the Saccos were obliged to have cash ratios of 80% or more. Further, all MFIs must have a minimum solvency ratio set by the Central Bank.

Each MFI must prepare a financial statement with closing date 31st December certified by an auditor which has to be sent to the Central Bank before 31st March the following year. MFIs from the second category are exempted from having the reports externally certified. The financial statements must include among others the balance sheet and all off-balance sheet commitments; statement of income and expense as well as further documents which allow the regulator to better understand the operations. (Art. 29, Reg.)

As an insurance to the financial system, every MFI is required to be a forced member of a “national stabilization fund for the purpose of providing financial assistance to member micro finance institutions in financial difficulties and to safeguard the interests of depositors in cases of liquidation of a member micro finance institution”. (Art. 38, Law) To acquire a member share in a SACCO, one must pay in cash. (Art. 42, Law) Until the net equity capital ratio is above the minimum level set by the regulator, any surplus has to be added to the reserve fund.

Inspection process (RCA, 2018)

Inspections are carried out by the RCA. In general, an inspection can be initiated by the RCA or the Sacco itself. The inspectors check the governance by the General Assembly, the Board of Directors (BoD) as well as the supervisory committee. Addtionally, they check for the soundness of the financial operations performed (cash, loans, book keeping). In the end, a report is produced which is forwarded to the management of the Sacco as well as to RCA together with recommendations.

In case the MFI is chosen for an on-site inspection by the supervisory body, then the result of the on-site inspection must be presented to the board of directors and a copy be sent to the surveillance committee of the institution. (Art. 75, Reg.) To ensure enough internal control, every MFI is required

to set up an “internal control system in its organisational chart responsible for monitoring its organisation and its functioning”. (Art. 37, Law) These rules are set by the Central Bank.

2.4 Internal Control Guidelines

The NBR has further enacted Internal Control Guidelines for Saccos (NBR, 2013) as a minimum level of internal control they must follow. In case of non-compliance, sanctions in form of penalty fees or consequences against individuals can be enacted.

Suspense Accounts

One point of concern is unexplained “surpluses and deficits”. One number given in our dataset as “suspense accounts” refers to deficit of cash which cannot be traced back to a proper account and is thus stored in this substitution account temporarily. To prevent the occurrence of such events “the Saccos should put in place a strong policy on the management of cash surpluses and deficit and sanctions required for discouraging the repetition of such deficiencies including the payment and dismissal”. (NBR, 2013, p.8). Each branch must have at last three staff to ensure corporate governance. (NBR, 2013, 7.3)

Embezzlement

In case of embezzlement, the Central Bank must be informed for blacklisting the people involved. If there is suspicion for embezzlement, the Sacco must work closely together with the responsible inspectors, the Central Bank, RCA as well as the police. If possible, an immediate audit must be carried out by the auditor. (NBR, 2013, 11.7 - 11.9)

2.5 Governance Structure of a SACCO

Elected Organs

Supervisory / Audit / Control Committee (NBR, 2013, 10.6)

The Supervisory Committee should meet at least every month and check for all operations of the Sacco. At least one member should have an accounting background. It checks for the accuracy of reports, daily cash controls and the granting of loans in accordance with the established process. Their findings and recommendations have to be reported to the BoD and have to be represented additionally at the Generally Assembly including the recommendations to the BoD and their

implementation status. Additionally, it has to check the work of other committees. In case of any recommendation by the Central Bank or RCA, the Supervisory Committee has to esure their implementation.

Board of Directors (BoD) (NBR, 2013, 10.7)

The BoD is the recipient of all reports by other committees as well as staff. It should meet at last once every three month. The BoD has the final say in deciding on the implementation of the recommendations and cases brought up in the reports. Further, it must write a report about internal control activities once every year and submit it to the NBR (no later than 31st March).

Credit Committee (NBR, 2013, 10.8)

The Credit Committee as the name suggests is tasked with the decision about loans building on the analysis of the Loan Officer. It is further tasked with monitoring the NPL ratio and submit a report about NPL at least every three months to the BoD.

3. Data, Methodology and Descriptive Statistics

3.1 Data

I have the reports of the Umurenge Saccos for the years 2013 to 2016 which were sent to the NBR and aggregated there. In total, I received 1598 reports showing that not all Saccos sent their numbers (416 sectors, 30 districts, 5 provinces, four years). Just for the final year, all reports are available. The table below shows that the number of handed-in reports steadily increased each year. For each year, I have more than 90% of all reports. The reason why these reports are missing as well as whether there are specific characteristics of these Saccos was not further investigated but might be interesting to explore in a future work.

Year	2013	2014	2015	2016
Number of reports	391	395	396	416
% of all reports	94.0%	95.0%	95.2%	100.0%

The dataset covers the balance sheet, the income statement, off-balance sheet write-offs as well as supplementary information. The supplementary part contains information about the split of loans and deposits by gender and groups. For loans, we have the split by economic sector. Further, we

have the share of top ten depositors of total deposits, same for top ten borrowers. Additionally, we have the bankable population as well as split of members by gender and groups. For the member share, we also get detailed information to which extent they have been paid. We get the number of embezzlement cases if any were recorded as well as insider lending to the Board of Directors and Committees, to Staff and to related parties. We also have detailed information about the share of deposits belonging to public institutions and projects. Regarding supervision, we obtain the number of visits, full-on site inspections and other meetings per Sacco. We also get the amount of the biggest loan handed out. In the appendix, I included a list with the most promising variables of the dataset.

3.2 Descriptive Statistics

To make understanding easier in the following section, I will report the descriptive statistics in EUR. The exchange rate used from RWF (Rwandan Francs) to EUR is 1000 RWF. A precise description of each variable is enclosed in the appendix. I will write the name of the respective variable in italic and enclose further information in the appendix. If not indicated differently, I always refer to the arithmetic mean of the years 2013 to 2016 when providing numbers. The average balance sheet size of an Umurenge Sacco in our time frame is 154,790 EUR. The size ranges from 16,923 EUR for the smallest to close over four million (4,031,658 EUR).

In average, nearly half of all assets (0.482) are liquid assets *(Total Liquid Assets)*; the *Liquidity Ratio* (liquid assets / deposits) is 0.7587. Cash held in a vault *(Cash in vault)* plays no role for most Saccos. Most assets are held in accounts of other banks with a majority (0.32) in savings accounts *(Cash in banks and other FIs (Savings account))* and to a smaller extent (0.15) in current accounts *(Cash in banks and other FIs (Current Account))*. Current accounts are seen as short-term accounts providing the bank with a possible liquidity tap in case of emergency. Loans make up one third of all assets (0.35) after considering provisions *(Net Loans)*. As expected with these small cooperatives, financial instruments are negligible *(Financial Instruments)*. The ratio of non-performing loans to gross loans is 0.086 *(NPL)* which is relatively high. In the 75%-percentile it is already 0.11 with ten percent of all observation points being above 0.17.

More than three quarter of all Saccos do not rely on borrowing from other banks at all *(Borrowings from other FIs and Non FIs)*. Liabilities *(Total Liabilities)* make up 0.70 of assets and thus slightly over two third of the balance sheet. Hereby deposits *(Total Deposits)* are the main source of funding

(0.65), being split between *Current Deposits* (0.57), *Term Deposits* (0.05) and *Security Savings* (0.06). The high amount of instantaneously demandable debt could be a credible threat for the Sacco to work diligently following Calomiris and Kahn (1991). Equity represents 0.31 of assets in average *(Capital Adequacy Ratio*).

The *Transformation Ratio* meaning how much of the deposits was converted into loans is 0.57, however, the standard deviation is rather high with 0.22. *Personnel Expenses* make up nearly half (0.46) of all expenses, with a third for loan losses *(loan losses)* and *Administrative Expenses* (0.32). The *Cost to Income ratio* is 0.79. The Interest Income on Loan Portfolio is 0.245, meaning that in average a SACCO makes 24.5% of interest per year on the loan portfolio. This represents nearly half of all income (0.486). Considerable income comes also from fees and commissions (*Income on Deposits in banks and other FIs*, 0.18), and deposits in other banks (*Income on Deposits in banks and other FIs*, 0.17). The interest paid on deposits *(Interest on deposits)* in relation to deposits is close to zero (0.0001). The arithmetic average inflation rate between 2013 and 2016 was 4,7%. That means the Sacco made an average of 19,8% after inflation on their loans.

The *Suspense Accounts* define an account where the amount is recorded temporarily as the true account could not be found. It is often regarded as suspicious and a relatively high percentage can indicate fraud or unskilled employees. The average of suspense accounts in relation to total assets is 0.009 of total assets, the median however is zero meaning that in more than half of the observation points there have been no suspense accounts at all. The return on equity (*ROE*) is 0.118, the return on assets (*ROA*) 0.04.

The average number of *bankable population* in one sector is 19.925 (above 16 years old). Men account for 0.53 of all share subscriptions *(Men_Subscribed_memb)*, women *(Women_Subscribed_memb)* for 0.39 and the rest being groups *(Group&Entities_Subscribed_memb)* with (0.08). In average it seems that groups (Groups&Entities_fullypaid_%_of_subscribed) are more reliable when it comes to paying for the subscribed share (0.78) while just 0.60 of men *(Men_fullypaid_%_of_subscribed)* and women *(Women_fullypaid_%_of_subscribed)* have fully paid the subscription relatively to the respective amount subscribed.

The majority number of loans *(Men_nb_loans)* is taken by men (0.69) as well as the total amount *(Men_am_loans)* with 0.67. Groups take in average just 0.05 of all loans *(Group&Entities_nb_loans)*,

nevertheless, the average amount is nearly twice as high *(Group&Entities_am_loans)* with 0.09 of the total amount. Splitting the loans by sector, we see that half the money in average (0.48) is lent to *Commerce, Restaurants, Hotel_val_loans*. A fourth is given to *Agriculture, Livestock, Fishing_val_loans* with 0.25 and a tenth to *Public works (Construction), Building_val_loans* (0.11). This is quite surprising given the high dependence of Rwanda on the agricultural sector. In average, the top ten borrowers got 0.30 of all loans *(Percentage_toptenborrower)*. If we look at the number of accounts and the amount of deposits, we can see that groups *(Group&Entities_nb_accounts)* hold just 0.09 of all accounts but represent one third (0.34) of all deposits *(Group&Entities_am_deposits)*. It seems that groups are more used for saving than for taking out loans. Whereas their loans size is twice as large as average, they account for nearly four times the size of average deposits. The share of top ten depositors *(Percentage_toptendepositors)* is comparably high (0.34). This given strong rise to the suspicion that top ten depositors are mostly made up of group deposits. Groups depositors have lower monitoring incentives as a normal depositor with the same amount as their individual share is smaller.

Embezzlement occurred in 257 cases in the four years. The amount embezzled in these cases was in average 4359 EUR. The staff is evenly split between men and women *(Men_SACCO_staff_%_all)*. Above one tenth of all loans are given in the form of *Insider lending* (0.11), the median is even higher at 0.13. Out of these, 0.04 go to the Board of Directors *(Loans to BoD and Committees)* and 0.04 to staff *(Loans to staff)*. Around 0.02 go to related parties.

VUP stands for Vision Umurenge Programme *(Amount of VUP deposits)*. As part of a special programme, the Saccos keep government money for disabled people as deposits. These account in average for 0.05 of all deposits, deposits of big sectorwide public projects (health etc.) make up 0.10. Concerning interaction with the regulator, we have 294 datapoints in the four years with at least one visit (*visits*), 60 with at least one *Full on-site Inspection* and 210 *Other Meetings* (Informal meetings with the Sacco). The Sacco's success in financial inclusion is shown by the high degree of bankable population *(bank penetration)* being a member in the Sacco (0.41). However, this figure is even underrated as I did not include shares held by groups but just shares held by one man or one woman.

3.3 Correlation Matrix

After performing the descriptive statistics, I went on to do a correlation matrix of all variables of which I will portray selected results (for further results, see appendix) I am aware that correlation cannot prove causality. Further, outliers might distort the picture. The results have thus to be interpreted with caution.

There is a strong positive correlation between the share of liquid assets *(Total Liquid Assets)* and the *Cash in bank and other FIs* (0.69). This could be an indication that the Sacco managers know about the risk of bank runs and hold a higher portion of cash available in the short-term when they put a higher portion into savings accounts at other banks. Supporting this claim is the positive correlation between *Total Liquid Assets* and *Current deposits* (0.18). There is a positive correlation (0.11) between *NPL* and *Total Liabilities*. This could mean that a higher portion of debt and less equity reduces incentives for members to monitor. The *Cash in bank and other FIs (Current Account)* is negatively correlated with *Net Loans* (-0.24). It might be seen as an alternative by the treasurer of the Saccos.

Total Liquid Assets also tend to increase relatively with larger size (*Total Assets log*, 0.35). Our *ROE* (0.10) as well as *ROA* (0.31) are positively correlated with SACCO size as well. An explanation might be that asset size contributes to efficiency. Further, *NPL* has a negative correlation (-0.37) with *Personnel Expenses*. One reason for NPLs could thus be understaffing. In the regression part, I will look whether more staff contributes to lower NPL while taking into account Sacco size. As expected, *NPL* is negatively correlated with efficiency variables such as *ROA* (-0.23) and *ROE* (-0.18). Regarding the number of loans, the correlation between *NPL* and group loans (*Group&Entities_nb_loans*) is negative (-0.08) while for men (*Men_nb_loans*) it is positive (0.04). The results are similar for loan amounts. We get exactly the opposite intuition when we look at the correlation between the amount of group deposits *(Group&Entities_am_deposits)* and *NPL* (0.08) and the same with men (-0.06, *Men_am_deposits*). An explanation would be that men provide more monitoring than groups are worse in repayment. Including the share of all member equity subscribed by men *(Men_subscribed_memb)* we get again a negative correlation with *NPL* (-0.07) and a positive one for groups *(Group&Entities_subscribed_memb,* 0.08) and *NPL*.

Regarding the loans by sector, agriculture loans (*Agriculture, Livestock, Fishing_val_loans)* are negatively (-0.06) correlated with *NPL* while other loans (*Others_val_loans*) are positively (0.10). Further, it could be that rural Saccos in which agriculture is strong experience fewer NPL. I will use

thus a dummy. The higher the percentage of the top ten borrowers (*Percentage_toptenborrower*) of total loans, the higher is *NPL* (0.09). The same is true for the share of the top ten depositors (0.08). This gives rise to the suspicion that larger depositors do monitor less. *Insider lending* reveals a positive relationship with *NPL*, too, especially *Loans to BoD and Committees* (0.11) and *Loans to Staff* (0.16).
An indication for favourable insider lending is the negative correlation with *Interest Income on Loan Portfolio* (-0.13). Another strong correlation is with the *Top Borrower to Total Equity* (0.36). A reason could be that the top borrower is simultaneously an insider.

For *Suspense Accounts*, there is a very strong correlation with *Total Liabilities* (0.54) meaning that a higher share of liabilities might go along along with less tracking of missing accounts. *NPL* and *Suspense Accounts* are positively correlated (0.15). If you find a SACCO with high NPL there is a good chance that it has also considerable suspense accounts. Correlation between *Suspense Accounts* and *Loans to Staff* is positive (0.08). Including the previous results, it seems that insider lending is a sign for or goes along with another variable which provokes higher NPL and suspense accounts. Additionally, *Other Assets* is strongly correlated with the *Amount Embezzled* (0.44). It might be an indication that fraud is hidden behind obscure items like *Other Assets*. The higher the *Personnel Expenses*, the lower is the *Amount Embezzled* (-0.1) and *NPL* (-0.29).

ROE (0,10) as well as *ROA* (0,30) are both positively correlated with balance sheet size. If the SACCO has more assets it seems to have a better chance of being profitable pointing towards location-specific effects. Top ten depositors *(Percentage_toptendepositors)* is negatively correlated (-0.07) with loans for *Agriculture, Livestock, Fishing_val_loans* but positively with loans for *Commerce , Restaurants, Hotels_val_loans* (0.08). Further, *Agriculture, Livestock, Fishing_val_loans* is positively correlated with the number of accounts held by men (*Men_nb_accounts*, 0.16) and groups (*Group&Entities_nb_loans*, 0.17). A reason could be that men and groups take out these loans primarily. The correlation with groups could mean that women take out these loans just as groups. Groups are normally made up of women. The number of NPLs is positively correlated with the share of top ten borrowers (*Percentage_toptenborrower*0.10) as well as with *Loans to BoD and Committees* (0.10) and especially *Loans to Staff* (0.15).

A Sacco with a higher borrower concentration has also a higher number of insider loans. A reason could be that insider loans are larger than normal loans. The higher the percentage of women

working as staff *(Women_SACCO_staff_%_all)*, the higher is the share of women deposits (*Women_am_deposits,* 0.23). It might be interesting to see whether the location (urban/rural) plays a role.

The share of top ten depositors is highly correlated with the share of *VUP deposits* (0.32) and *Mutual Health and Other Projects deposits in the sector* (0.32). It might be appropriate to assume that the largest depositors in our dataset are to a considerable degree made up of accounts by public entities.

4. Results

To test my hypotheses, I run simple regressions and will further add predictors which I deem as useful too test for significance. I employ dummy variables and interaction terms when I deem it useful. I will just report coefficients when they are significant or if they are close to and it is useful to mention them. Significance levels will be indicated by stars (5% = *, 1% = **, 0.1% = ***). The results are reported in the regression table at the end, the number in brackets (..) indicate the respective column in the regression table.

4.1 Blockholding

$$(3)\ NPL_i = \alpha + \beta_1 * Percentage\_toptendepositors + \beta_{1+i} * Control\ Variables + \varepsilon_i$$

In a first step, I checked whether we have evidence of positive / negative effects of blockholding. Therefore, I use non-performing loans *(NPL)*, return on assets *(ROA)* and return on equity *(ROE)* as dependent variables. This follows the idea that effects of depositor concentration should be visible in the relative amount of bad loans and / or in the overall profitability of a SACCO. First, I regressed *NPL*, *ROA* and *ROE* on the share of the top ten depositors. The coefficient **(3)** for *NPL* is positive (0.038***) meaning that Saccos with higher depositor concentration also have to deal with worse loans. For *ROA*, our result **(2)** is significant, too (-0.043***). Again, our result is negative indicating that higher depositor concentration might indeed have a negative effect on our Sacco's profitability. This runs counter to the idea that blockholding provides positive incentives through its concentration of depositors who thus do better monitoring.

VARIABLES	(1) ROE	(2) ROA	(3) NPL
Percentage_toptendepositors	0.004	-0.043***	0.038***
	(0.066)	(0.009)	(0.011)

Constant	0.117***	0.056***	0.073***
	(0.026)	(0.003)	(0.004)
Observations	1,598	1,598	1,598
R-squared	0.000	0.014	0.007

Although our preliminary results are counterintuitive as they suggest a negative effect of higher depositor concentration on efficiency variables, the share of top ten depositors might be correlated with other variables which might also have a causal effect on *NPL* and *ROA*. To check for these effects, I added several more predictors and repeated the regression **(4-6)**. To see whether the overall size of assets has any effect on the cooperative, I added the logarithm of the total assets to our regression. I used the logarithm to not overweigh outliers. One could argue that the higher the share of total assets the more economies of scale and thus efficiencies can be achieved. Further, I included the share of men deposits of total deposits.

I renounced from including the share of women because of its collinearity with the share of groups and entities. Furthermore, I strongly suspect that the reason for our counterintuitive results is the positive relation between group deposits and top ten depositors. Put differently, I think that group deposits make up most of the top ten depositors. If true, groups might be worse in monitoring than single depositors of comparable size as each group member's relative share of the group's deposits is again small. To check for this, I included an interaction term of top ten depositors and the relative share of group deposits of total deposits. On top of that, I added the respective share taken by men and women relative to all loans to see whether there are differences in gender. I left out loans to groups because of the collinearity with loans to women. The reason for our bad NPL and ROA could also lie in higher borrower default rates in particular economic sectors. I thus included the respective share of loans to the different economic sectors, namely: agriculture; public works, buildings, Residences / Homes; commerce, restaurants and hotels transport, warehouses, communication.

Last but not least, I included a dummy variable for rural which is 1 if more than fifty percent of the respective sector was classified as rural in the Rwandan Housing Census of 2012. It is fair to assume that rural / urban structure did not change that much in Rwanda in the four years after. As noted in a previous section, Rwanda has one of the lowest rates of urbanization in the world (14%). I will thus

use the degree of urbanization in the sector as a fixed effect on which the Sacco did not have any influence on.

VARIABLES	(4) NPL	(5) ROA	(6) ROE
Percentage_toptendepositors	0.101***	-0.068***	0.255
	(0.032)	(0.018)	(0.197)
Group&Entities_am_deposits	0.101***	-0.018	0.354
	(0.039)	(0.022)	(0.242)
c.Percentage_toptendepositors#c.Group&Entities_am_deposits	-0.192***	0.077**	-0.700*
	(0.064)	(0.037)	(0.402)
Men_am_deposits	0.001	-0.000	0.009
	(0.037)	(0.021)	(0.233)
Men_am_loans	0.021	-0.041***	-0.127
	(0.025)	(0.014)	(0.158)
Women_am_loans	-0.016	0.001	0.024
	(0.032)	(0.018)	(0.201)
Total Assets Log	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Agriculture Livestock Fishing_val_loans	-0.115***	-0.057***	-0.029
	(0.027)	(0.015)	(0.170)
Public works (Construction), Buildings, Residences/Homes_val_loans	-0.098***	-0.042**	0.062
	(0.034)	(0.019)	(0.209)
Commerce, Restaurant, Hotels_val_loans	-0.083***	-0.063***	0.083
	(0.026)	(0.015)	(0.163)
Transport, Warehouses, Communication_val_loans	-0.034	0.070***	0.199
	(0.044)	(0.025)	(0.273)
Rural_2012	-0.008	-0.001	0.052
	(0.006)	(0.003)	(0.037)
Constant	0.119***	0.036	-0.011
	(0.041)	(0.023)	(0.257)
Observations	1,227	1,227	1,227
R-squared	0.032	0.052	0.007

The results are reported in the regression table above. Just significant or nearly significant results are reported. For *NPL,* the coefficient for top ten depositors stays positive and significant (0.101***). The coefficient for groups and entities is equally significant (0.101***). The interaction term of both is

negative (-0.192***) indicating that higher group deposits lead in combination with higher depositor concentration lead to lower *NPL*. Further, loans to sector portray negative coefficients (agriculture: -0.115***, public work: -0.0998*** and commerce: -0.083***).

For *ROA*, top ten depositors stayed negative (-0.068***). Further, the coefficient for group deposits alone is not significant but the interaction term of both is positively significant (0.077**) indicating that if group deposits are higher, depositor concentration has a more positive effect on *ROA.* Interestingly, I find that that the coefficient for the amount of loans to men is negative (-0.041***). One could argue that this might be an indication that the repayment morale of men is less strong as that of women and groups but then we should see a similar effect in the regressions with *NPL* as the dependent variable. The sector concentration of loans shows positive coefficient: agriculture: 0.057***, public work: 0.042**, commerce: 0.063*** and transport: 0.070***). It might be noted that other loans where the sector cannot be specified was excluded from the regression because of collinearity. For *ROE,* I find the interaction term of top ten depositors and group deposits to have a large coefficient (-0.70*). If true, this indicates a clearly negative effect of strong group depositors. An explanation therefore might be the difficult incentive schemes within the groups.

Instead of top ten depositors one could also think of taking VUP deposits or mutual health and other big project deposit as a proxy for blockholding. For a single regression with VUP, the coefficients are significant for *NPL* (0.092***) as well as for *ROA* (-0.034*). If we perform again a single regression with mutual health, we receive significant coefficient for *NPL* (0.101***) as well as for *ROA* (-0.0238***). **(38-43)**

	(38)	(39)	(40)
VARIABLES	NPL	ROA	ROE
VUP_deposits	0.092***	-0.034*	-0.052
	(0.023)	(0.019)	(0.138)
Mutual Health_deposits			
Constant	0.081***	0.043***	0.122***
	(0.002)	(0.002)	(0.014)
Observations	1,598	1,598	1,598
R-squared	0.010	0.002	0.000

	(41)	(42)	(43)
VARIABLES	NPL	ROA	ROE
VUP_deposits			

Mutual Health_deposits	0.101***	-0.238***	-0.200
	(0.021)	(0.016)	(0.126)
Constant	0.074***	0.070***	0.143***
	(0.003)	(0.002)	(0.019)
Observations	1,598	1,598	1,598
R-squared	0.014	0.119	0.002

In a separate regression, I added the share of deposits for the Vision Umurenge SACCO Programme (VUP) of total deposits as well as the interaction terms with top ten depositors as well as the share of deposits which will be used and for mutual health and other big projects in the sector, I further replaced group deposits with group loans. For *NPL*, group deposits show a strong positive effect (0.311***) as well as for *ROA* (1.624***) and *ROE* (-1.489***). The interaction term is solely significant for NPL (-0.376***). VUP deposits seem indeed to have a negative effect on *ROA* (-0.137***) as well as positive on *NPL (0.294***).* This supports the argument that public or factual deposits do just exercise very weak monitoring and thus do not act as a credible threat for the management. This is supported by the positive effect of mutual health deposits on *NPL* (0.146***) as well as the negative on *ROA (-0.131***)* and *ROE* (-0.496***). **(44-46)**

VARIABLES	(44) NPL	(45) ROA	(46) ROE
Percentage_toptendepositors	0.041**	-0.026***	0.083
	(0.016)	(0.009)	(0.099)
Group&Entities_am_deposits	-0.026	0.035**	0.206
	(0.028)	(0.016)	(0.168)
c.Percentage_toptendepositors#c.Group&Entities_am_deposits			
Men_am_deposits	-0.008	0.026	0.105
	(0.032)	(0.018)	(0.190)
Men_am_loans	0.343***	1.584***	-1.613***
	(0.091)	(0.052)	(0.547)
Women_am_loans	0.323***	1.649***	-1.396**
	(0.092)	(0.053)	(0.555)
Total Assets Log	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Agriculture Livestock Fishing_val_loans	0.088***	-0.044***	-0.040

	(0.021)	(0.012)	(0.127)
Public works (Construction), Buildings, Residences/Homes_val_loans	-0.078***	-0.056***	0.106
	(0.026)	(0.015)	(0.159)
Commerce, Restaurant, Hotels_val_loans	-0.059***	-0.046***	0.007
	(0.021)	(0.012)	(0.125)
Transport, Warehouses, Communication_val_loans	-0.036	0.054***	0.149
	(0.036)	(0.020)	(0.214)
Group&Entities_am_loans	-0.311***	-1.624***	-1.489***
	(0.093)	(0.053)	(0.559)
VUP_deposits	-0.294***	-0.137***	-0.161
	(0.051)	(0.029)	(0.309)
Mutual Health_deposits	-0.146***	-0.131***	-0.496***
	(0.027)	(0.016)	(0.165)
c.Percentage_toptendepositors#c.Vup_deposits	-0.376***	0.084	-0.448
	(0.099)	(0.057)	(0.597)
Constant	-0.221**	-1.568***	-1.655***
	(0.096)	(0.055)	(0.576)
Observations	1,598	1,598	1,598
R-squared	0.057	0.524	0.013

To sum it up, we find no evidence for the initial hypothesis that large depositor concentration has positive effects on the efficiency and profitability of a cooperative as it is suggested by literature. In contrary, we find strong evidence in our results that the effect is in fact negative which is triggered by a strong correlation between depositor concentration and group deposits. Group deposits seem to be among the top ten depositors. Further, the sector of the borrower seems to play a role at least for *NPL* and *ROA* whereas the share of loan amount of men seems to have an effect on *ROA*. Several explanations come to mind. First, groups have a different dynamic. Whereas a single depositor has paid for his share and risks losing all his deposits, a group has bought the share together and also paid in the deposits together. Every group member cares thus not for the group deposits in total but only for share of it. At the same time, each member engages into free riding and expects the other members to monitor diligently instead. In the end, none of the members monitors at all. As we do not know the average size of a group as well as the average deposit size, it is unclear if the deposit share per member is higher, equal or smaller than the deposit size of single depositors. A lower size per group member might lead to less monitoring incentives although the group deposit as a whole

ranks among the highest deposits in total. A second explanation might be reverse causality: A bank operating in riskier areas might be in need of better governance and monitoring and thus attract higher depositor concentration as smaller depositors abstain who have not the ability to monitor diligently. Through that, Saccos with lower operating performance as well as a higher share of non-performing loans also have higher depositor concentration. A third explanation might be that higher depositor concentration leads in fact to a higher influence on the Sacco but the effect is negative. Large depositor might exert pressure on the management to get involved into riskier lending practices and thus provoke worse performance.

4.2 Block Lending

$$(7)\ NPL_i = \alpha + \beta_1 * Percentage\_toptenborrower + \beta_{1+i} * Control\ Variables + \varepsilon_i$$

As there are several variables given which refer to borrower concentration, I did several regressions and used block lending as the overall term. I tested the effect of the share of top ten borrowers of loans on *ROA*, *ROE* and *NPL*. Running a linear regression, I expect high borrower concentration to have a negative effect on the SACCO's performance because it increases the effects of one borrower's default and thus is a sign for bad risk management. High borrower concentration means a huge dependence on few large loans which increases the idiosyncratic risk. The results of the regressions confirm the idea for *NPL* (0.049***) as well as for *ROA* (-0.050***). **(7-9)**

	(7)	(8)	(9)
VARIABLES	NPL	ROA	ROE
Percentage_toptenborrower	0.049***	-0.050***	-0.069
	(0.013)	(0.011)	(0.078)
Constant	0.072***	0.056***	0.139***
	(0.004)	(0.004)	(0.026)
Observations	1,598	1,598	1,598
R-squared	0.009	0.014	0.000

In a next regression I now added the loans borrowed by different sectors as before. Further, I added the amount of loans by men as well as by groups. To see whether the gender of the employees plays a role I added the share of employees who are male. Further, I added also the total number of staff to see whether the number of employees plays a role. More staff could lead to higher coordination costs within the Sacco and lead to less control of the employees through the management which then turns into lower efficiency. One could also argue that it is neither the number of assets nor the

number of staff which counts but how much staff is available relatively to the size of the Sacco. For that reason I created a variable called assets per staff where I divided total assets by the number of staff. I further added the dummy variable for urban and the VUP deposits as well as mutual health deposits.

In contrast to previous regressions, our number of observation points is rather low (133). The effect **(10-12)** of top ten borrowers is only significant for *ROE* (-0.173*) where it is negative. It is thus not clear per see whether block lending overall is bad for our Sacco although there is evidence that it might be.

	(10)	(11)	(12)
VARIABLES	NPL	ROA	ROE
Men_am_loans	0.000	-0.033	-0.077
	(0.059)	(0.037)	(0.113)
Agriculture Livestock Fishing_val_loans	0.062	-0.029	-0.062
	(0.065)	(0.041)	(0.125)
Public works (Construction), Buildings, Residences/Homes_val_loans	-0.055	0.067*	0.241**
	(0.055)	(0.034)	(0.105)
Commerce, Restaurant, Hotels_val_loans	-0.031	0.043	0.123
	(0.048)	(0.030)	(0.093)
Transport, Warehouses, Communication_val_loans	0.055	-0.119*	-0.363*
	(0.109)	(0.069)	(0.209)
Rural_2012	0.017	0.013	0.038
	(0.014)	(0.009)	(0.026)
Percentage_toptenborrower	0.064	-0.036	-0.173*
	(0.049)	(0.031)	(0.094)
Group&Entities_am_loans	-0.016	-0.040	-0.052
	(0.071)	(0.045)	(0.136)
Men_Sacco_Staff_%_all	-0.002	-0.005	-0.018*
	(0.005)	(0.003)	(0.010)
Staff_Total	0.003	0.005**	0.015**
	(0.004)	(0.002)	(0.007)
VUP_deposits	0.047	-0.012	0.002
	(0.167)	(0.105)	(0.320)
Mutual Health_deposits	-0.007	-0.013	-0.075
	(0.060)	(0.038)	(0.115)
Assets per Staff	0.000*	0.000	0.000
	(0.000)	(0.000)	(0.000)
Constant	0.052	0.048	0.172
	(0.063)	(0.040)	(0.120)
Observations	133	133	133
R-squared	0.078	0.265	0.281

For *NPL*, I find none of the included variables significant. In terms loans per sector I find a positive coefficient public work loans loans on *ROA* (0.067*) as well as *ROE* (0.241**) and a negative coefficient for loans to transport, warehouses and communication for *ROA* (-0.119*) and *ROE* (-0.363*). Especially, the strong coefficients for *ROE* in both in both sectors are surprising. It could be that there is an effect which we do not capture which is related to the development of a sector. The dominating borrowing sector in a Sacco could be an indicator therefore.

Regarding the results from a staff perspective, we can see a slightly negative coefficient for the relative share of male employees on *ROE* (-0.018*). As Rwanda follows a strict gender equality strategy this is surprising. An explanation could be that the male share of employees is higher in very rural and traditional regions which still offer fewer opportunities for development and where the empowering of women through education started later. Interestingly, the total number of employees has a positive coefficient for *ROE* (0.015**) as well as *ROA* (0.005**). This would mean that bigger cooperative fare in fact better than smaller cooperative. Whether the reason therefore lies in the economies of scale or the fact that they are big is an indicator that they are in a more developed region which provides better ground for making money is not clear.

4.3 Insider Lending

In our dataset, we have the exact amount of loans given to insiders. Further, insider loans are split up into loans given to members of the BoD or Committees, loans given to staff as well as loans given to related parties (e.g. relatives). Literature is divided whether insider loans have positive effects, e.g. through less information asymmetry, or negative effect, e.g. collusion and favorable rates. I thus performed several analyses to find out about the effects of insider lending on efficiency variables but also fraud. I regressed *NPL*, *ROA* and *ROE* on insider loans to BoD, to staff and to related parties **(13-15)**.

	(13)	(14)	(15)
VARIABLES	NPL	ROA	ROE
Loans to BoD and Committees	0.213***	0.025	-0.243
	(0.045)	(0.039)	(0.286)
Loans to Staff	0.287***	-0.258***	-0.826***

	(0.050)	(0.043)	(0.318)
Loans to Related Parties	0.026	0.003	-0.095
	(0.030)	(0.026)	(0.191)
Constant	0.058***	0.053***	0.173***
	(0.004)	(0.003)	(0.024)
Observations	1,598	1,598	1,598
R-squared	0.037	0.022	0.005

For *NPL*, I find loans to BoD (0.213***) as well as loans to Staff (0.287***) to have a strongly positive coefficient. Put differently, for every 1% increase in lending to the Board of Directors in relation to total loans, our non-performing loans increase by 0,2%, for lending to staff nearly 0,3%.For *ROA* (-0.258***) and *ROE* (-0.826***), I find strong negative coefficients for lending to staff. Again, here the results indicate that for every 1% increase in lending to staff, the ROE decreases by 0,8%.The results in fact indicate that lending to staff as well as lending to the BoD have a negative impact on the Sacco's performance. The argument is thus supported that insider lending has in fact a detrimental effect in banking. It might be interesting to explore in a future work whether the reasons therefore can be further elaborated in detail to see for example whether default rates are higher of borrowing costs are kept lower. Lending to staff is significant for all three while lending to related parties seems to have no impact at all.

4.4 Other

For now on, we have looked at the depositor concentration as a proxy for blockholding. The results indicate that there exists indeed a link between deposit concentration and the efficiency of Saccos although in a different direction than which we assumed. Further, there are signs that the type of loans (which sector) and the type of depositor (men, women or groups) have influence on efficiency variables. Further, we looked at the effect of borrower concentration on efficiency variables and see evidence that high borrower concentration of loans is an indicator for high *NPL* and low *ROA*.

Until now, we have always focused on depositor distribution or borrower distribution (at least on top ten ranks) and implications for monitoring. However, it could also be the case that leverage meaning how much assets of the Saccos are financed with debt and how many with equity determines whether a Sacco is run diligently. The higher a SACCO is levered (meaning the more debt it has), the higher is the risk for depositors to have to absorb losses in case the cooperative fails. The explanation

therefore is that debt represents a nominal claim and ranks first order in case of default whereas equity is a residual claim and ranks in second order.

$$(16)\ NPL_i = \alpha + \beta_1 * Total\ Deposits + \beta_{1+i} * Control\ Variables + \varepsilon_i$$

Regressing *NPL, ROE and ROA* **(16-18)** on deposits in relation to total assets shows significant effects for all three variables examined. For *NPL*, the coefficient is positive (0.049***) while for *ROE* (-0.214***) and *ROA* (-0.161*) it is strongly negative. The results suggest that a higher share of deposits to total assets has in contrary a negative effect on our SACCO. More leverage in this case leads would lead to riskier loans and less return on assets. This is counterintuitive, as one might assume that depositors should watch more closely their SACCO when it is highly levered as the risk to lose increases. One problem might be that each depositor is at the same time also a shareholder and thus an equity as well as debt holder. This circumstance might distort incentives.

	(16)	(17)	(18)
VARIABLES	NPL	ROA	ROE
Total Deposits	0.049***	-0.214***	-0.161*
	(0.017)	(0.012)	(0.097)
Constant	0.054***	0.180***	0.224***
	(0.011)	(0.008)	(0.064)
Observations	1,598	1,598	1,598
R-squared	0.006	0.161	0.002

Following the idea of Calomiris and Kahn (1991) that holders of current savings provide a credible threat to management to withdraw their deposits I will now look for differences in the effect of larger share in current savings, term deposits or security savings **(19-27)**. Current deposits show positive coefficient for *NPL* (0.054***) as well negative for *ROA* (-0.216***) and *ROE* (-0.228***). This result is in direct contrast to what Calomiris and Kahn (1991) suggest. Interestingly, the result for term deposits as well as for security savings support indeed their claim. For term deposits, there is a positive coefficient on *ROA* (0.100**). The strongest positive effect on a Sacco's efficiency is spotted when using term deposits as a predictor which is significant for all three: *NPL* (-0.169***), *ROA* (0.357***) and *ROE* (1.268***). What we actually see is that the maturity of deposits seems to play a role but not as indicated by Calomiris and Kahn (1991). In fact, the more long-term the deposits are

invested, the more do our efficiency variables improve. It remains unclear in term of causality which effect was first. One explanation could be that people who invest the deposits more long-term do provide higher monitoring. Another opposing explanation is that people who invest long-term look for a well-run Sacco in advance and thus the Sacco was well-run a priori. It is easy to imagine that if you find a Sacco trustworthy you are willing to invest your money more long-term. In the adverse scenario, if you do not think that the Sacco is well managed might be just willing to entrust your money if you know that you could withdraw it every day. To finish, I regress *NPL (0.075***), ROE (-0.253***) and ROA (-0.278***)* on total liabilities to total assets (28-30) which supports the prior remarks that higher leverage shows worse performance. Higher leverage ca be set equal with less skin in the game.

	(19)	(20)	(21)
VARIABLES	NPL	ROA	ROE
Current Deposits	0.054***	-0.216***	-0.228**
	(0.015)	(0.012)	(0.095)
Constant	0.052***	0.165***	0.093***
	(0.009)	(0.007)	(0.004)
Observations	1,598	1,598	1,598
R-squared	0.008	0.000	0.004

	(22)	(23)	(24)
VARIABLES	NPL	ROA	ROE
Term Deposits	-0.027	-0.100**	0.040
	(0.059)	(0.050)	(0.365)
Constant	0.083***	0.043***	0.021***
	(0.002)	(0.002)	(0.004)
Observations	1,598	1,598	1,598
R-squared	0.174	0.003	0.027

	(25)	(26)	(27)
VARIABLES	NPL	ROA	ROE
Security Savings	-0.169***	0.357***	1.268***
	(0.064)	(0.054)	(0.396)
Constant	0.250***	0.118***	0.045*
	(0.056)	(0.014)	(0.026)
Observations	1,598	1,598	1,598

R-squared	0.004	0.000	0.006

As mentioned already above, due to the cooperative model and its implication for the shareholder / depositor structure, specific suggestions about higher leverage or equity always come with a grain of salt not permitting us to clearly disentangle the incentive structure. Thus, I now introduce a variable called paid-in-capital. This variable set the amount of actually paid up capital in relation to the total committed capital. In other words, how much of the money pledged for the erection of the SACCO was actually paid. One might suspect that a higher ratio suggests that people are more involved and the SACCO is better monitored and managed as members show higher signs of involvement. Next, I did a multi regression and included the deposit maturities, the share of total liabilities as well as the share of paid up capital in percent of total equity. Up to now, the basic question remains how good corporate governance and thus monitoring effects are achieved. From the liability perspective, we will now again shift our focus to the equity position. The results for NPL show that total liabilities stay significant (0.104**) as do security savings (-0.225***) and paid in capital in relation to total equity (0.024***). For *ROA*, total liabilities (-0.275***), security savings (0.376***) and paid in capital (-0.028***) while for *ROE* just paid up capital to equity (-1.412***) seems to play a role. **(31-33)**

	(31)	(32)	(33)
VARIABLES	NPL	ROA	ROE
Total Liabilities	0.104**	-0.275***	-0.000
	(0.045)	(0.031)	(0.166)
Current Deposits	-0.043	0.031	0.137
	(0.043)	(0.030)	(0.161)
Term Deposits	-0.089	0.014	-0.034
	(0.073)	(0.051)	(0.271)
Security Savings	-0.225***	0.376***	0.463
	(0.077)	(0.054)	(0.287)
Paid up capital	0.024***	-0.028***	-1.142***
	(0.006)	(0.004)	(0.023)
Constant	0.044***	0.203***	0.440***
	(0.013)	(0.009)	(0.047)
Observations	1,598	1,598	1,598
R-squared	0.030	0.269	0.611

In a next regression **(34-37)** I used top ten depositors, the amount of group deposits, top ten borrowers, number of members, VUP and mutual health deposits, current, term and security deposits as well as loans to BoD, staff and related parties as predictors. As the dependent variables I used *NPL*, *ROA*, *ROE* and *Suspense Accounts*. I introduced suspense account as another dependent variable for efficiency. The lower the size of suspense accounts, the better is the Sacco run. The idea is to test several predictors together which have shown to be significant alone before. For *NPL,* top ten borrowers (0.031**), VUP (0.117***), mutual health (0.106***) , loans to BoD (0.193***) and loans to staff (0.27***) are significant. It appears that there is not one single reason for non-performing loans but that weak monitoring by depositors as well as weak internal control guidelines regarding insider lending might be among the reasons. For ROA and ROE, the results confirm the previous results. For *Suspense Accounts*, top ten depositors (0.02*), top ten borrowers (0.021*), VUP (-0.071***), mutual health (-0.040*), current deposits (0.362***, term deposits (0.264***), security savings (0.647***) and loans to staff (0.202***) are significant. It is noteworthy that the predictors which were identified to be significant in the previous regressions are also significant for *Suspense Accounts*.

VARIABLES	(34) NPL	(35) ROA	(36) ROE	(37) Suspense Accou
Percentage_toptendepositors	0.003	-0.021**	0.042	0.020*
	(0.014)	(0.010)	(0.083)	(0.012)
Group&Entities_am_deposits	-0.020	0.033***	0.100	-0.005
	(0.017)	(0.012)	(0.105)	(0.015)
Percentage_toptenborrower	0.031**	-0.034***	-0.013	0.021*
	(0.013)	(0.010)	(0.080)	(0.011)
Members_Total	-0.000	0.000	0.000	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
VUP_deposits	0.117***	-0.046**	-0.138	-0.071***
	(0.029)	(0.021)	(0.176)	(0.025)
Mutual Health_deposits	-0.106***	-0.140***	-0.146	-0.040*
	(0.028)	(0.020)	(0.169)	(0.024)
Current Deposits	0.014	-0.172***	-0.128	0.362***
	(0.019)	(0.013)	(0.112)	(0.016)
Term Deposits	-0.023	-0.165***	0.048	0.264***
	(0.062)	(0.045)	(0.374)	(0.053)
Security Savings	-0.078	0.084*	1.086***	0.647***
	(0.069)	(0.049)	(0.414)	(0.059)
Loans to BoD and Committees	0.193***	0.020	-0.295	-0.030
	(0.048)	(0.034)	(0.289)	(0.041)

Loans to Staff	0.270***	-0.178***	-0.703**	0.202***
	(0.054)	(0.039)	(0.326)	(0.047)
Loans to Related Parties	0.030	-0.011	-0.123	0.016
	(0.032)	(0.023)	(0.191)	(0.027)
Constant	0.039***	0.170***	0.157*	-0.257***
	(0.015)	(0.011)	(0.088)	(0.013)
Observations	1,598	1,598	1,598	1,598
R-squared	0.066	0.248	0.014	0.301

5. Discussion

The results of my regression should be seen with several caveats:

I have used all datapoints which were available between 2013 to 2016, all in all 4 years. However, the Saccos have just started fully operating in 2012 and the staff had mostly not had any prior experience in banking before. This said, there is a high chance that operational errors could be in the dataset. Further, it took one or more years for some of the Saccos to operate in a self-sufficient manner without receiving subsidies from the government. As a result, especially in 2013 and 2014, the results might be distorted by initial problems some Saccos faced.

One way to counter this problem is to exclude the year 2013. I modified the dataset in a way so that it does not include data from 2013 anymore and repeated selected regressions. The results are reported in the appendix and show no different signs for the main indicators.

The econometric methodology used in this paper is fairly basic and needs to be expanded in the future. While it is useful to use regressions for getting some general understanding and ideas for further research, they are not sufficient to establish a clear a logical link between explanatory and explaining variables. To capture effects of time as well as of different individual cooperatives we could use panel analysis which takes more than one dimension into account. Until now, every data point was used with the same weight, nevertheless it will be interesting to see to what extent effects change over time and whether there are external effects which can explain the changes.

Further, through gathering more sector-specific data, we can take Sacco-fixed effects into account. Currently, I treat every SACCO equally. Nevertheless, it is easy to agree on that there might be other effects which might a priori determine a SACCO's performance. In a future analysis, one could incorporate more of the results of the 2012 nationwide survey from which I have taken the data for urban and rural. Further variables of use might be the demographic composition of the single sectors

as well as access to electricity, running water and internet. Additionally, one could include economic variables for the different sectors or at least districts such as average income, unemployment and main agricultural output per sector or district.

Although the dataset is very rich in information, there are limits to the depth of data. For example, as already noted, the share of top ten depositors is not perfectly suited for research on monitoring effects as it is not obvious from the data to which degree groups are having a share in them. We can thus not disentangle those effects based on the given data. For several variables, such as regulatory inspections, it is not clear whether they are the cause or the result as they can be called by the Sacco or initiate the process by themselves. It might be very useful in a future paper to take those findings and then do research in the field with a chosen sample of Saccos to find more evidence and explanation for the results.

Regarding the degree of urbanization per sector, it might be interesting to see whether competition in urban areas has any effect on our Saccos. One could also look with google maps how far the respective cooperative is away from an urban centre and see whether this plays a role.

6. Summary and Conclusion

In my analysis, I focussed mainly on non-performing loans (NPL), Return on Assets (ROA) and Return on Equity (ROE) as three indicators of good, respectively bad corporate governance. In the dataset I find no evidence to support findings in literature about positive effects of blockholding. In the contrary, I find indications for a negative influence of the share of top ten depositors on a SACCO's performance. One explanation therefore could be the high number of group deposits among those top ten depositors which then counteracts the incentive argument for monitoring.

Further, I find strong evidence that public-owned deposits for mutual health as well as those for the Vision Umurenge Programme (VUP) are among the top ten depositors and go along with bad performance variables as well as low portfolio quality.

Another interesting findings concern the incentive scheme of deposits with different maturity. A higher share of current deposits does not seem to have a positive influence and does not pose a credible threat to the Sacco for liquidity problems. However, security savings tend to be higher in Saccos with better management. Either, monitoring through those depositors is very high or they chose already a priori relatively well operating Saccos. Total liabilities in contrast are connected with

worse performance variables debunking the argument that leverage decreases incentives for wrongdoing.

From the borrowing side, high concentration of loans seems to have a negative effect. The same goes for the amount lent to men whereas more loans to groups seem to be positive. Regarding insider lending, lending to staff shows negative effects for all our performance variables. Further, there is some evidence for negative effects of lending to the Board of Directors and Committees as well.

The aim of this master thesis was to establish a link between link between single governance issues, portfolio quality and financial performance in Rwandan Saccos. It built on existing research in the general field of corporate governance as well as bank-specific and cooperative-specific literature. The data used from the Rwandan Umurenge Sacco sector provides a unique insight into the daily operations of a microfinance institution in developing countries. As far as literature is concerned, mainstream research focusses mostly on data from developed economies as the US, Japan or Germany, current as well as historic data. However, little access is granted to current data of emerging financial systems. As has been shown in the paper, for the Umurenge SACCO system in Rwanda there are several issues which need to be addressed to reach a new level of operating efficiency. The operating of the SACCO is still to a large degree relation-ship driven as has been seen on the effects of insider lending on NPL, ROA and ROE. Further, the incentive structure for shareholders and depositors alike to exercise their monitoring duty needs to be more refined.

The negative effects of big deposits by groups and state-driven projects indicate in the case where there is no clear ownership of big deposits, monitoring might even be worse than with small depositors. Microfinance per se is not a self-fulfilling prophecy per se to economic development. Emerging countries should use state-of-the art research from developing and developed financial systems and learn from the mistakes and findings which have been already discovered in literature. By incorporating these findings into the set-up of microfinance institutions and internal as well as external corporate governance systems, microfinance institutions will be able to increase their portfolio quality as well as their financial performance. Those two aspects are crucial to create viable long-term oriented financial systems which in contrary to raising concerns for the economy, can actively contribute and deliver a real benefit for the real economy while at the same time advancing its social objective of increasing financial inclusion.

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Appendix

Variables

Variables	Definiton
Assets	
Total Liquid Assets	Total Liquid Assets / Total Assets
Cash in vault	Cash in vault / Total Assets
Cash in bank and other FIs (Current account)*	Cash in bank and other FIs (Current account) / Total assets
Cash in bank and other FIs (Savings account)*	Cash in bank and other FIs (Savings account) / Total Assets
Gross Loans	Gross loans / Total Assets
Provisions excl. Security Savings	Provisions excl. Security Savings / Total Assets
Net Loans	Net Loans / Total Assets
NPL	NPL / Gross Loans
Financial Instruments	Financial Instruments / Total Assets
Fixed Assets (net)	Fixed Assets (net) / Total Assets
Other Assets	Other Assets / Total Assets
Suspense Accounts	Suspense Accounts / Total Assets
Total Assets Log	LN(Total Assets)
**FIs = Financial Institutions*	
Liabilities and Equity	
Liabilties	
Total Liabilities	Total Liabilities / Total Assets
Borrowings from other FIs and Non FIs	Borrowings from other FIs and Non Fis / Total Assets
Total Deposits	Total Deposits / Total Assets
Current Deposits	Current Deposits / Total Assets
Term Deposits (Term+Savings)	Term Deposits (Term+Savings) / Total Assets
Security Savings	Security Savings / Total Assets
*Other liabilities**	*Other liabilities / Total Assets*
** (payables+suspense+other liabilities)*	
Equity	
Total Equity	Total Equity / Total Assets
Subsidies (for equipment or financing Equity)	Subsidies (for equipment or financing Equity) / Total Equity
Retained profits / Acc losses	Retained profits(Acc losses) / Total Equity
Paid up capital	Paid up capital / Total Equity
Balance Sheet Ratios	
Transformation Ratio	Gross Loans / Total Deposits
Liquidity Ratio	Liquid assets / Total Deposits

Capital Adequacy Ratio	Equity / Total Assets
Conversion of resources into loans	Gross Loans / Total Assets
Investment in fixed assets	Fixed Assets / Total Equity
Income Statement	
Income	
Interest Income on Loan Portfolio_GL	Interest Income on Loan Portfolio / Gross Loans
Interest Income on Loan Portfolio_TI	Interest Income on Loan Portfolio / Total Income
Fees and Commissions on Loan Portfolio	Fees and Commissions on Loan Portfolio / Total Income
Incomes on Deposits in banks and other Fis	Incomes on Deposits in banks and other Fis / deposits (current + saving)
Incomes on Deposits in banks and other Fis	Incomes on Deposits in banks and other Fis / Total Income
Incomes on Accounts' fees, passbooks&other commissions	Incomes on Accounts' fees, passbooks&other commissions / Total Income
Recoveries on Loans (prov. Back+recovered write-offs)	Recoveries on Loans (prov. Back+recovered write-offs) / Total Income
Other operating Incomes	Other operating Incomes / Total Income
Financial Income	Financial Income / Total Income
Expenses	
Financial Expenses	Financial Expenses / Total Expenses
Interest on Deposits	Interest on Deposits / Total Expenses
Interest on borrowings from Fis and Non FIs	Interest on borrowings from Fis and Non Fis / Total Expenses
Bank Charges,Commissions and other Financial Exp.	Bank Charges,Commissions and other Financial Exp. / Total Expenses
Personnel Expenses (Gross amount)	Personnel Expenses (Gross amount) / Total Expenses
Administrative Expenses	Administrative Expenses / Total Expenses
Loan Losses + Write-offs	(Loans Losses + Write-Offs) / Total Expenses
Performance Ratios	
Cost to Income Ratio	Total Expenses / Total Income
ROA	Net Income / Total Assets
ROE	Net Income / Total Equity
Loans	
Men_nb_loans	Number of Loans held by men / Total Number of Outstanding Loans
Women_nb_loans	Number of Loans held by women / Total Number of Outstanding Loans
Group_nb_loans	Number of Loans held by groups / Total Number of Outstanding Loans

Men_am_loans	Amount of Loans held by men / Total Amount of Outstanding Loans
Women_am_loans	Amount of Loans held by women / Total Amount of Outstanding Loans
Group_am_loans	Amount of Loans held by groups / Total Amount of Outstanding Loans
Agriculture, Livestock, Fishing_val_loans	Amount of Loans to Agriculture, Livestock, Fishing / Total Loans
Public Works (Construction), Buildings, Residences/Homes_val_loans	Amount of Loans to Public Works (Construction), Buildings, Residences/Homes / Total Loans
Commerce, Restaurants, Hotels_val_loans	Amount of Loans to Commerce, Restaurants, Hotels / Total Loans
Transport, Warehouses, Communications_val_loans	Amount of Loans to Transport, Warehouses, Communications / Total Loans
Others_val_loans	Amount of Loans to Others / Total Loans
Percentage_toptenborrower	Amount Top Ten Borrowers / Gross Loans
Deposits	
Men_nb_accounts	Number of Accounts owned by men / Total Number of Accounts
Women_nb_accounts	Number of Accounts owned by women / Total Number of Accounts
Group&Entities_nb_accounts	Number of Accounts owned by groups / Total Number of Accounts
Men_am_deposits	Amount of Deposits owned by men / Total Deposits
Women_am_deposits	Amount of Deposits owned by women / Total Deposits
Group&Entities_am_deposits	Amount of Deposits owned by groups / Total Deposits
Percentage_toptendepositors	Top ten Depositors / Total Depositors
VUP_deposits	Amount of VUP deposits / Total Deposits
Mutual Health_deposits	*Mutual Health+other big projects deposits / Total Assets*
Other members' deposits	Other members' deposits / Total Deposits
Members	
Men_subscribed_memb	Number male members / Total Number Members
Women_subscribed_memb	Number female members / Total Number Members
Group&Entities_subscribed_memb	Number group members / Total Number Members
Men_fullypaid_%_of_subscribed	Number of men who paid fully for their share / Number of men subscribed
Women_fullypaid_%_of_subscribed	Number of women who paid fully for their share / Number of women subscribed

Groups&Entities_fullypaid_%_of_subscribed	Number of groups who paid fully for their share / Number of groups subscribed
Men_am_subscribed	Amount subscribed by men / Total amount subscribed
Women_am_subscribed	Amount subscribed by women / Total amount subscribed
Groups&Entities_am_subscribed	Amount subscribed by groups / Total amount subscribed
Number of people involved_embezzlement	Number of people involved in embezzlement
Number of Occurance_embezzlement	Number of Occurances of embezzlement
Amount Embezzled	Amount Embezzled
Total_Members	Total number of members
Total_Staff	Total number of staff
Insider Lending	
Loans to BoD and Committees	Loans to BoD and Committees / Gross Loans
Loans to Staff	Loans to Staff / Gross Loans
Loans to Related Parties	Loans to Related Parties / Gross Loans
Insider Lending	Insider Loans / Total Loans
Supervision	
Visits	Number of Visits by the Regulator
Full On-site Inspections	Number of Full on-site inspections
Other meetings with USACCOs	Other meetings with the Sacco
Other	
Top Borrower to Total Deposits	Top Borrower / Total Deposits
Top Borrower to Total Equity	Top Borrower / Tota Equity
Urban_2012	1 if more than 50% of the sector classfied as urban acc. To to the 2012 Rwandan Housing Census
Rural_2012	1 if more than 50% of the sector classfied as rural acc. To to the 2012 Rwandan Housing Census
Men_bankable_pop	Men bankable population in the sector
Women_bankable_pop	Women bankable population in the sector
Men_SACCO_staff_%_all	Male Staff / Total Staff
Women_SACCO_staff_%_all	Female Staff / Total Staff
Bank penetration	(Male Members + Female Members / Total Population)
Assets per Staff	Total Assets / Total Staff

Descriptive Statistics

	Mean	Median	Standard Deviation	Range
Cash in vault	0.013	0.004	0.023	0.449
Cash in bank and other FIs (Current account)	0.147	0.110	0.128	0.999
Cash in bank and other FIs (Savings account)	0.323	0.332	0.177	0.821
Gross Loans	0.363	0.353	0.119	1.086
Provisions excl. Security Savings	0.015	0.009	0.024	0.584
Net Loans	0.348	0.342	0.114	0.880
NPL	0.086	0.064	0.084	0.858
Financial Instruments	0.002	0.000	0.010	0.219
Fixed Assets (Net)	0.153	0.148	0.091	0.522
Other Assets	0.016	0.003	0.039	0.547
Suspense Accounts	0.010	0.000	0.083	2.988
Total Assets Log	8.190	8.186	0.215	2.377
Total Liabilities	0.696	0.697	0.125	2.923
Borrowings from other FIs and Non FIs	0.010	0.000	0.036	0.510
Total Deposits	0.651	0.655	0.126	2.934
Current deposits	0.573	0.577	0.130	2.726
Term Deposits (Term+Savings)	0.019	0.008	0.034	0.372
Security Savings	0.058	0.055	0.031	0.296
Other liabilities (payables+suspense+other liabilities)	0.036	0.019	0.049	0.358
Total Equity	0.314	0.310	0.107	2.596
Subsidies (for equipment or financing Equity)	0.121	0.096	0.136	2.820
Retained profits/Acc losses	0.312	0.310	0.324	13.514
Paid up capital	0.368	0.337	0.336	11.860
Transformation ratio	0.575	0.554	0.221	2.800

Liquidity Ratio	0.759	0.739	0.247	2.252
Capital Adequacy Ratio	0.314	0.310	0.107	2.596
Conversion of resources into loans	0.359	0.352	0.117	0.990
Investment in fixed assets	0.504	0.456	0.559	22.864
Insider lending	0.127	0.101	0.177	4.474
Financial Income	0.905	0.931	0.100	0.779
Interest Income on Loan Portfolio	0.246	0.237	0.089	0.933
Interest Income on Loan Portfolio_totalincome	0.487	0.491	0.129	0.820
Fees and Commissions on Loan Portfolio	0.034	0.027	0.026	0.269
Incomes on Deposits in banks and other Fis_total_deposits	0.093	0.077	0.073	1.033
Incomes on Deposits in banks and other Fis_total_income	0.171	0.165	0.093	0.511
Incomes on Accounts' fees, passbooks&other commissions	0.181	0.153	0.126	0.859
Recoveries on Loans (prov. Back+recovered write offs)	0.071	0.046	0.084	0.779
Other operating Income	0.022	0.000	0.054	0.411
Non Operating Incomes	0.003	0.000	0.016	0.244
44.Financial Expenses (45+46+47)	0.019	0.009	0.032	0.441
Interest on deposits	0.005	0.001	0.011	0.108
Interest on borrowings from Fis and Non FIs	0.004	0.000	0.020	0.313
Bank Charges,Commissions and other Financial Exp.	0.010	0.003	0.022	0.439
Loan losses (provisions+write offs of the period)	0.169	0.129	0.141	0.877
Personnel Expenses	0.464	0.466	0.123	0.782
50.Administrative Expenses	0.325	0.319	0.123	0.828
Donations (Financing Operating Expenses)	0.297	0.148	0.604	15.175
Cost-to-income	0.794	0.727	0.477	9.892
% of Financial Income	0.905	0.931	0.100	0.779
ROA	0.041	0.047	0.067	2.046
ROE	0.119	0.149	0.491	22.583

Men_nb_loans	0.686	0.698	0.107	0.916
Women_nb_loans	0.266	0.253	0.100	0.873
Group_nb_loans	0.047	0.028	0.056	0.552
Men_am_loans	0.671	0.686	0.127	0.950
Women_am_loans	0.237	0.225	0.102	0.856
Group_am_loans	0.091	0.056	0.107	0.883
Agriculture, Livestock, Fishing_val_loans	0.248	0.196	0.203	1.000
Public Works, Buildings, Residences/Homes_val_loans	0.115	0.086	0.111	0.881
Commerce, Restaurants, Hotels_val_loans	0.480	0.479	0.201	0.993
Transport, Warehouses, Communications_val_loans	0.047	0.019	0.067	0.631
Others_val_loans	0.110	0.082	0.104	1.000
Percentage-toptenborrower	0.296	0.279	0.158	2.918
Men_nb_accounts	0.527	0.529	0.065	0.483
Women_nb_accounts	0.385	0.383	0.074	0.535
Group&Entities_nb_accounts	0.088	0.086	0.035	0.265
Men_am_deposits	0.417	0.408	0.127	0.799
Women_am_deposits	0.234	0.236	0.091	0.532
Group&Entities_am_deposits	0.349	0.338	0.163	0.925
Percentage_toptendepositors	0.341	0.319	0.186	1.948
106.Men_bankable_pop	0.478	0.470	0.119	1.000
107.Women_bankable_pop	0.501	0.529	0.121	1.000
Men_subscribed_memb	0.537	0.535	0.072	0.671
Women_subscribed_memb	0.388	0.388	0.075	0.638
Group&Entities_subscribed_memb	0.075	0.073	0.035	0.288
Men_fullypaid_%_of_subscribed	0.602	0.606	0.258	1.203
Women_fullypaid_%_of_subscribed	0.606	0.604	0.309	4.474
Groups&Entities_fullypaid_%_of_subscribed	0.780	0.878	0.581	19.688
Total_%_of_subscribed	0.610	0.619	0.255	1.130
Full and partial payment_%_of_subscribed	0.895	0.958	0.143	1.097

Men_am_subscribed	0.536	0.533	0.072	0.671
Women_am_subscribed	0.388	0.388	0.075	0.642
Groups&Entities_am_subscribed	0.076	0.074	0.037	0.288
Men_am_fullypaid_%_totalampaid	0.527	0.526	0.079	0.723
Women_am_fullypaid_%_totalampaid	0.375	0.378	0.087	0.773
Groups&Entities_am_fullypaid_%_totalampaid	0.098	0.088	0.054	0.541
Full and partial payment%_am_subscribed	0.756	0.781	0.185	1.337
Number of people involved_ambezzlement	118	0.000	2944	82500
Number of Occurance_embezzlment	1632	0.000	65235	2608600
Amount embezzled_embezzlement	937900	0.000	4778175	121372000
Men_SACCO_staff	3.738	3.000	2.488	55.000
Men_SACCO_staff_%_all	0.525	0.533	0.190	1.000
Women_SACCO_staff	3.129	3.000	2.115	60.000
Women_SACCO_staff_%_all	0.462	0.444	0.188	1.000
Loans to Staff_%_of_grossloans	0.049	0.041	0.039	0.356
Loans to Related Parties_%_of_grossloans	0.010	0.000	0.064	0.986
Loans to BoD and Committees_%_of_grossloans	0.051	0.043	0.043	0.180
Total_Insider_Loans	0.110	0.092	0.089	1.069
VUP_deposits_%_of_total_assets	0.053	0.000	0.089	0.536
Mutual Health+other big projects_%_of_total_assets	0.119	0.101	0.097	1.321
Other members' deposits_deposits_%_of_total_assets	0.476	0.480	0.142	2.551
Visits	0.233	0.000	0.595	9.000
Full On-site Inspections	0.060	0.000	0.468	11.000
Other meetings with USACCOs	0.283	0.000	0.984	14.000
Top Borrower to Total Deposits (Max 2.5%)	0.025	0.020	0.034	0.598
Top Borrower to Total Equity (Max 5%)	0.064	0.040	0.252	7.652
Bank penetration	0.409	0.370	0.230	3.426
Total Assets in EUR	154791	153363	0.002	0.238

Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1 Total Liquid Assets	1.00																																												
2 Cash in vault	-0.09	1.00																																											
3 Cash in bank and other FIs (Current account)	0.17	-0.01	1.00																																									
4 Cash in bank and other FIs (Savings account)	0.69	-0.20	-0.59	1.00																																									
5 Gross loans	-0.70	0.01	-0.23	-0.39	1.00																																							
6 Net Loans	-0.71	0.02	-0.24	-0.39	0.98	1.00																																						
7 NPL	0.05	-0.05	0.08	-0.01	-0.05	-0.19	1.00																																					
8 Suspense Accounts	-0.09	0.05	0.02	-0.09	0.12	0.08	0.15	1.00																																				
9 Total Assets log	0.66	-0.25	-0.09	0.89	0.08	0.09	-0.06	-0.10	1.00																																			
10 Total Liabilities	0.13	0.07	0.20	-0.05	-0.03	-0.06	0.11	0.54	-0.01	1.00																																		
11 Borrowings from other FIs and Non FIs	-0.11	0.04	0.04	-0.13	0.00	0.00	0.06	0.09	-0.01	0.20	1.00																																	
12 Total Deposits	0.09	0.08	0.14	-0.04	0.03	0.00	0.07	0.52	-0.05	0.68	-0.11	1.00																																
13 Current deposits	0.18	0.07	0.19	-0.01	-0.07	-0.10	0.09	0.48	-0.03	0.83	-0.12	0.94	1.00																															
14 Term Deposits (Term+Savings)	-0.06	0.00	-0.06	0.01	0.01	0.01	-0.01	0.01	-0.04	0.08	-0.03	0.11	-0.14	1.00																														
15 Security Savings	-0.30	0.00	-0.19	-0.10	0.40	0.43	-0.07	0.11	0.00	0.02	0.06	0.03	-0.20	-0.06	1.00																														
16 Total Equity	-0.22	-0.03	-0.22	-0.01	0.13	0.14	-0.03	0.16	-0.06	-0.74	-0.16	-0.61	-0.59	-0.08	0.07	1.00																												
17 Paid-up capital	-0.02	0.12	0.02	-0.05	0.01	-0.04	0.11	0.02	-0.11	0.12	0.00	0.10	0.12	-0.01	-0.08	-0.12	1.00																											
18 Insider Lending	-0.13	0.05	-0.02	-0.09	0.22	0.18	0.11	-0.02	0.02	0.12	0.03	0.09	0.07	0.03	0.05	-0.15	0.64	1.00																										
19 Personnel Expenses (Gross amount)	-0.04	0.04	-0.08	0.02	-0.08	-0.01	-0.37	-0.03	-0.27	-0.16	-0.10	-0.10	-0.05	0.09	0.16	-0.10	-0.10	-0.10	1.00																									
20 Administrative Expenses	-0.06	0.05	0.05	-0.08	-0.01	0.03	-0.23	-0.07	-0.01	-0.08	-0.01	-0.06	-0.06	0.04	-0.05	0.04	-0.09	-0.08	-0.23	1.00																								
21 Cost to Income Ratio	-0.11	0.17	0.15	-0.22	-0.04	-0.09	0.24	0.04	-0.29	0.37	0.06	0.31	0.32	0.05	-0.14	-0.40	0.35	0.37	-0.21	-0.07	1.00																							
22 ROA	0.00	-0.08	-0.22	0.17	0.21	0.26	-0.23	0.01	0.31	-0.47	-0.08	-0.40	-0.42	-0.05	0.16	0.56	-0.21	-0.11	0.19	0.11	0.74	1.00																						
23 ROE	0.05	-0.04	-0.03	0.07	-0.04	0.03	-0.18	-0.01	0.10	-0.07	-0.04	-0.04	-0.06	0.00	0.08	-0.78	-0.49	0.12	0.10	-0.42	0.32	1.00																						
24 Men_nb_loans	-0.11	0.07	0.10	-0.17	-0.07	-0.07	0.04	0.03	-0.13	-0.10	0.01	-0.10	-0.10	0.00	0.01	0.13	0.01	0.01	0.00	0.06	-0.02	0.01	1.00																						
25 Women_nb_loans	0.14	-0.05	-0.13	0.21	0.01	0.00	0.01	-0.02	0.12	0.02	0.03	0.01	0.01	0.02	-0.02	-0.03	0.00	0.03	0.01	-0.06	-0.04	0.11	0.01	1.00																						
26 Group_nb_loans	-0.08	-0.05	-0.03	-0.04	0.15	0.16	-0.06	-0.02	0.04	-0.03	-0.07	0.01	0.03	-0.03	-0.03	0.02	0.01	-0.07	0.02	0.02	-0.08	0.09	0.02	-0.36	-0.17	1.00																		
27 Men_am_loans	-0.10	0.08	0.04	-0.12	-0.03	-0.03	0.06	0.05	-0.13	-0.07	-0.01	-0.04	-0.06	0.05	0.03	0.11	0.02	0.06	0.00	0.06	-0.01	-0.06	-0.01	0.63	-0.42	-0.41	1.00																	
28 Women_am_loans	0.18	-0.05	-0.07	0.20	-0.06	-0.05	-0.01	-0.03	0.13	0.02	0.02	-0.01	-0.02	0.00	0.03	-0.04	-0.05	0.01	0.03	-0.03	-0.05	0.12	0.04	-0.48	0.63	-0.18	-0.57	1.00																
29 Group_am_loans	-0.07	-0.04	-0.01	-0.04	0.10	0.11	-0.05	-0.03	0.04	-0.04	-0.01	-0.03	0.00	-0.06	-0.05	0.02	0.04	-0.07	-0.01	0.04	-0.07	0.06	0.01	-0.25	-0.09	0.66	-0.27	1.00																
30 Agriculture, Livestock, Fishing_val_loans	-0.06	0.08	0.05	-0.09	0.03	0.04	-0.05	0.00	-0.08	0.01	-0.07	0.02	-0.01	0.05	0.05	0.00	0.03	0.02	0.07	-0.02	-0.01	-0.06	-0.03	0.14	-0.14	0.01	0.00	-0.07	0.07	1.00														
31 Public Works (Construction), Buildings, Realte	0.07	-0.07	-0.06	0.11	0.00	0.01	-0.02	-0.02	0.10	0.02	-0.01	0.01	-0.02	0.09	0.01	-0.04	-0.05	-0.01	0.02	-0.04	-0.06	0.06	-0.04	-0.11	0.12	0.00	-0.08	0.15	-0.04	-0.28	1.00													
32 Commerce, Restaurants, Hotels_val_loans	0.02	-0.06	-0.04	0.05	-0.01	-0.02	0.02	-0.02	0.06	-0.12	0.01	-0.11	-0.06	-0.11	-0.05	0.11	0.00	0.00	-0.02	-0.01	-0.02	0.08	0.00	-0.02	0.04	-0.01	0.09	-0.05	-0.04	-0.68	-0.26	1.00												
33 Transport, Warehouses, Communications_val	0.04	-0.07	-0.05	0.08	0.04	0.03	0.02	-0.01	0.22	0.02	0.07	-0.01	-0.01	-0.03	0.05	-0.03	-0.01	0.00	-0.07	-0.06	-0.06	0.05	0.13	-0.08	0.08	0.02	-0.05	0.04	0.03	-0.23	0.06	-0.07	1.00											
34 Others_val_loans	-0.05	0.09	0.04	-0.08	-0.05	-0.06	0.06	0.07	-0.20	0.08	0.09	0.08	0.07	-0.03	-0.04	0.00	-0.04	0.04	-0.04	-0.02	0.07	-0.06	0.00	-0.03	0.03	0.00	-0.03	0.03	0.00	-0.28	-0.06	-0.26	-0.11	1.00										
35 Percentage_toptenborrower	0.11	0.02	0.06	0.04	-0.27	-0.28	0.06	0.05	-0.23	0.06	0.00	0.02	0.06	-0.06	-0.10	-0.03	0.02	-0.04	0.05	-0.01	0.14	-0.12	-0.12	0.01	0.02	-0.03	-0.06	0.01	0.07	-0.07	0.03	0.08	-0.09	0.02	1.00									
36 Men_nb_accounts	-0.16	0.08	0.11	-0.21	0.08	0.09	-0.03	0.02	-0.15	0.05	-0.02	0.07	0.03	0.09	0.04	-0.05	0.00	0.02	0.00	0.03	0.13	-0.05	0.01	0.27	-0.30	0.01	0.17	-0.22	0.00	0.16	0.02	-0.14	-0.12	0.02	-0.05	1.00								
37 Women_nb_accounts	0.13	-0.08	-0.09	0.18	-0.11	-0.12	0.01	-0.02	0.13	-0.10	0.06	-0.13	-0.10	-0.04	-0.04	0.09	0.02	0.01	0.00	0.02	-0.07	0.03	-0.04	-0.25	0.29	-0.02	-0.15	0.20	-0.10	-0.22	0.00	0.17	-0.74	0.00	0.05	-0.88	1.00							
38 Group&Entities_nb_accounts	0.02	-0.02	-0.01	0.02	0.10	0.10	0.03	0.01	0.02	0.11	-0.09	0.15	0.16	-0.09	0.01	-0.11	-0.04	-0.06	0.01	-0.10	-0.06	0.03	0.05	0.03	-0.05	0.02	0.00	-0.02	0.01	0.17	-0.04	-0.11	-0.06	-0.05	-0.01	0.00	-0.47	1.00						
39 Men_am_deposits	-0.19	0.00	-0.02	-0.14	0.19	0.20	-0.06	-0.09	-0.01	0.02	0.01	0.02	0.03	0.08	0.05	0.00	0.04	0.05	0.01	-0.05	-0.06	0.04	0.01	0.12	-0.16	0.06	0.12	-0.13	0.01	0.01	0.01	0.00	0.05	-0.06	-0.11	0.38	-0.16	0.01	1.00					
40 Women_am_deposits	0.05	-0.03	-0.08	0.11	0.01	0.01	-0.05	-0.07	0.10	-0.06	0.03	-0.07	-0.09	-0.03	0.11	0.01	0.01	0.02	0.07	-0.03	-0.05	0.08	0.00	-0.23	0.27	-0.03	-0.21	0.29	-0.02	-0.19	0.12	0.07	0.07	0.06	0.02	-0.23	0.27	-0.13	0.10	1.00				
41 Group&Entities_am_deposits	0.12	0.02	0.06	0.05	-0.16	-0.16	0.08	-0.03	-0.05	0.03	-0.03	0.03	0.06	0.00	-0.12	-0.05	0.01	-0.04	-0.07	0.01	0.05	-0.08	0.01	0.03	-0.03	-0.03	0.02	-0.06	0.01	0.10	-0.08	-0.04	-0.08	0.01	0.07	-0.01	-0.03	0.06	-0.09	-0.83	-0.63	1.00		
42 Percentage_toptendepositors	0.07	0.00	0.11	0.02	-0.16	-0.17	0.08	-0.01	-0.07	0.02	0.05	-0.01	0.02	0.01	-0.13	-0.02	0.04	-0.04	-0.07	-0.01	0.07	-0.12	0.00	0.12	-0.08	-0.10	0.13	-0.06	-0.10	0.13	-0.05	-0.09	-0.10	0.02	0.03	0.06	-0.09	0.09	-0.90	-0.43	0.55	1.00		
43 Loans to Staff / Gross Loans	0.02	0.11	0.07	-0.05	-0.20	-0.22	0.16	0.08	-0.16	0.04	0.13	-0.01	0.01	0.03	-0.10	0.02	0.06	0.18	-0.02	-0.03	0.14	-0.15	-0.07	0.08	-0.02	-0.10	0.07	0.03	-0.11	0.04	-0.04	-0.09	-0.05	0.18	0.15	-0.07	0.13	-0.14	-0.03	0.01	0.02	0.09	1.00	
44 Loans to Related Parties / Gross Loans	0.00	0.01	0.02	-0.02	0.01	0.00	0.02	0.01	0.02	0.00	0.02	-0.01	-0.02	0.01	0.03	-0.10	0.02	0.00	0.43	-0.05	0.01	0.05	0.00	-0.01	0.07	-0.05	-0.04	0.06	-0.03	-0.04	0.00	-0.04	0.04	0.03	-0.05	-0.06	0.00	0.02	-0.04	0.01	-0.05	0.02	0.01	0.02 1.00

Regression Results (2013 Excluded)

VARIABLES	(1) NPL	(2) ROA	(3) ROE
Percentage_toptendepositors	0.0335**	-0.0447***	0.0325
	(0.0132)	(0.0113)	(0.0863)
Constant	0.0765***	0.0568***	0.108***
	(0.00515)	(0.00443)	(0.0338)
Observations	1,207	1,207	1,207
R-squared	0.005	0.013	0.000

VARIABLES	(4) NPL	(5) ROA	(6) ROE
Percentage_toptendepositors	0.112***	-0.053***	0.423*
	(0.0333)	(0.020)	(0.221)
Group&Entities_am_deposits	0.108***	-0.019	0.394
	(0.0395)	(0.023)	(0.262)
c.Percentage_toptendepositors#c.Group&Entities_am_deposits	-0.205***	0.067*	-0.914**
	(0.0684)	(0.040)	(0.453)
Men_am_deposits	0.0208	0.011	0.0337
	(0.0375)	(0.022)	(0.248)
Men_am_loans	0.169**	1.780***	-0.953*
	(0.0863)	(0.051)	(0.571)
Women_am_loans	0.155*	1.836***	-0.780
	(0.0882)	(0.052)	(0.583)
Total Assets Log	-0	-0.000	0
	(0)	(0.000)	(0)
Agriculture Livestock Fishing_val_loans	-0.0912***	0.048***	-0.0780
	(0.0247)	(0.014)	(0.163)
Public works (Construction), Buildings, Residences/Homes_val_loans	-0.0890***	0.061***	0.109
	(0.0313)	(0.018)	(0.207)
Commerce, Restaurant, Hotels_val_loans	-0.0563**	0.052***	0.0143
	(0.0242)	(0.014)	(0.160)
Transport, Warehouses, Communication_val_loans	-0.0257	0.052**	0.137

	(0.0412)	(0.024)	(0.273)
Rural_2012	-0.00407	-0.007**	-0.0113
	(0.00630)	(0.004)	(0.0417)
Constant	-0.0673	-1.783***	0.852
	(0.0882)	(0.052)	(0.583)
Observations	1,207	1,207	1,207
R-squared	0.032	0.554	0.009

VARIABLES	(7) NPL	(8) ROA	(9) ROE
Mutual Health_deposits	0.0989***	-0.274***	-0.135
	(0.0244)	(0.0197)	(0.160)
Constant	0.0759***	0.0751***	0.136***
	(0.00384)	(0.00310)	(0.0253)
Observations	1,207	1,207	1,207
R-squared	0.013	0.139	0.001

VARIABLES	(10) NPL	(11) ROA	(12) ROE
Total Liabilities	0.0719***	-0.266***	-0.240**
	(0.0182)	(0.0139)	(0.120)
Constant	0.0379***	0.227***	0.286***
	(0.0130)	(0.00987)	(0.0851)
Observations	1,207	1,207	1,207
R-squared	0.013	0.233	0.003

VARIABLES	(13) NPL	(14) ROA	(15) ROE
Total Deposits	0.0505***	-0.233***	-0.129
	(0.0182)	(0.0143)	(0.119)
Constant	0.0552***	0.193***	0.203**
	(0.0121)	(0.00950)	(0.0794)
Observations	1,207	1,207	1,207
R-squared	0.006	0.181	0.001

VARIABLES	(16) NPL	(17) ROA	(18) ROE
Total Liabilities	0.131**	-0.302***	-0.000798
	(0.0518)	(0.0385)	(0.207)
Current Deposits	-0.0689	0.0424	0.155
	(0.0509)	(0.0378)	(0.203)
Term Deposits	-0.101	0.0304	0.0508
	(0.0849)	(0.0630)	(0.340)
Security Savings	-0.247***	0.434***	0.496
	(0.0910)	(0.0676)	(0.364)
Paid up capital	-0.0181***	-0.0253***	-1.201***
	(0.00661)	-0.00491	(0.0265)
Constant	0.0463***	0.210***	0.443***
	(0.0139)	(0.0103)	(0.0554)
Observations	1,207	1,207	1,207
R-squared	0.026	0.282	0.636

VARIABLES	(19) NPL	(20) ROA	(21) ROE
Loans to BoD and Committees	0.156***	0.047	-0.388
	(0.055)	(0.052)	(0.393)
Loans to Staff	0.278***	-0.235***	-0.794*
	(0.059)	(0.055)	(0.422)
Loans to Related Parties	0.023	0.001	-0.067
	(0.036)	(0.033)	(0.254)
Constant	0.062***	0.051***	0.178***
	(0.004)	(0.004)	(0.032)
Observations	1,207	1,207	1,207
R-squared	0.027	0.015	0.004

VARIABLES	(22) NPL	(23) ROA	(23) ROE	(24) Suspense Accounts
Percentage_toptendepositors	0.001	-0.016	0.065	0.017
	(0.017)	(0.013)	(0.110)	(0.015)
Group&Entities_am_deposits	-0.019	0.042***	0.112	0.004
	(0.021)	(0.016)	(0.137)	(0.019)
Percentage_toptenborrower	0.038**	-0.029**	0.092	0.022
	(0.017)	(0.013)	(0.114)	(0.016)

Members_Total	0.000	0.000	-0.000	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
VUP_deposits	0.093***	-0.064**	-0.158	-0.086***
	(0.035)	(0.027)	(0.234)	(0.032)
Mutual Health_deposits	0.100***	-0.173***	-0.113	-0.078**
	(0.033)	(0.025)	(0.224)	(0.030)
Current Deposits	0.019	-0.180***	-0.115	0.415***
	(0.021)	(0.016)	(0.141)	(0.019)
Term Deposits	-0.015	-0.159***	0.208	0.326***
	(0.072)	(0.055)	(0.482)	(0.066)
Security Savings	-0.068	0.122*	1.225**	0.818***
	(0.082)	(0.062)	(0.545)	(0.074)
Loans to BoD and Committees	0.134**	0.025	-0.471	-0.014
	(0.059)	(0.045)	(0.398)	(0.054)
Loans to Staff	0.274***	-0.167***	-0.767*	0.161***
	(0.065)	(0.049)	(0.432)	(0.059)
Loans to Related Parties	0.025	-0.007	-0.085	0.019
	(0.038)	(0.029)	(0.255)	(0.035)
Constant	0.037**	0.167***	0.110	-0.297***
	(0.017)	(0.013)	(0.115)	(0.016)
Observations	1,207	1,207	1,207	1,207
R-squared	0.054	0.265	0.012	0.343