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Study of the determinant factors of the growth of municipal savings and credit cooperatives in Peru

Estudio de los factores determinantes del crecimiento de las cajas municipales de ahorro y crédito del Perú

Gerardo Gómez[1], Ana Mena[1] and Robert Beltrán López[2*]

[1]*Universidad Nacional de Piura, Perú*
[2] *Tecnológico Nacional de México / Instituto Tecnológico de Chetumal, México*

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Abstract

The objective of this work is to determine the factors that influence the growth of municipal savings banks in Peru. The literature regarding the factors that influence the growth of financial companies is scarce, so this study constitutes a first approximation to understand the factors that influence the growth of financial companies. The data were obtained from the Superintendency of Banking and Insurance and Pension Fund Administrator (SBS for its acronym in Spanish), which is the supervisory body of the microfinance system in Peru and covers the 2005-2014 period. The panel data model with fixed and random effects was used to compare the hypotheses. Two measures of business growth were used: financial income, and the number of workers. The independent variables used were: Placements, deposits, interest rate, delinquency, economic growth, and age. Deposits were found to positively influence the growth of municipal savings banks while delinquency negatively influence the growth of municipal savings banks in Peru.

JEL Codes: G21, G23, G32
Keywords: Savings banks; Microfinance theory; Panel data

* Corresponding author.
E-mail address: rbeltran@itchetumal.edu.mx (Robert Beltrán López)
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Resumen

El objetivo de este trabajo es determinar los factores que influyen en el crecimiento de las cajas municipales del Perú. Existe escasa literatura referida a los factores que influyen en el crecimiento de empresas financieras por lo que este estudio se constituye en una primera aproximación a entender sobre los factores que influyen en el crecimiento de empresas financieras. Los datos fueron obtenidos de la Superintendencia de Banca y Seguros y Administradora de Fondos de Pensiones (SBS), que es órgano supervisor del sistema microfinanciero en Perú, y comprende el período 2005-2014. Para contrastar las hipótesis planteadas se ha utilizado el modelo de datos de panel con efectos fijos y efectos aleatorios. Se utilizaron dos medidas de crecimiento empresarial: Los ingresos financieros y el número de trabajadores. Las variables independientes utilizadas fueron: Colocaciones, depósitos, tasa de interés, morosidad, crecimiento económico y edad. Se encontró que los depósitos influyen de manera positiva en el crecimiento de las cajas municipales y la morosidad influye de manera negativa en el crecimiento de las cajas municipales en el Perú.

Códigos JEL: G21, G23, G32
Palabras clave: Cajas municipales; Teoría de microfinanzas; Datos de panel

Introduction

Microfinance institutions in Peru are an important part of the Peruvian financial system, aimed at channeling economic resources to micro and small enterprises. In the beginning, these institutions gained an important space in the Peruvian economy, because the credits caused small entrepreneurs to have access to financing and, additionally, were able to generate self-employment. This dual economic and social impact allowed microfinance institutions to evolve and expand throughout Peru. The microfinance system in Peru consists of the Municipal Savings and Loan Banks (CMAC for its acronym in Spanish), the Rural Savings and Loan Banks (CRAC for its acronym in Spanish), and the Small and Micro Enterprise Development Entities (EDPYME for its acronym in Spanish).

CMACs were created under the model of the German savings banks. Portocarrero (2000) stated that CMACs have managed to stealthily win over microentrepreneurs by generating confidence in them through the stability and solidity of these institutions, which contribute to the projection of a perfect image of solvency in the financial system. This confidence gained in the financial system has led the CMACs to grow in a sustained manner, both in terms of placements and the collection of savings, which constitutes them as leading entities in the Peruvian microfinance system.

The objective of this research is to study the causes of the business growth of these institutions. Blázquez Santana, Dorta Velázquez, and Verona Martel (2006) state that investigating the factors of business growth constitutes a leading role given the process of globalization in which the world economy finds itself. As CMACs are credit institutions, they build their growth on factors that distinguish them from non-financial companies, but like any other company, the idea of growth is the origin for obtaining economic benefits.

The work is divided into the following sections: Section 1 provides a brief summary of the macroeconomic environment of Peru during the 2005-2014 period; section 2 reviews the literature on microfinance and the determinants of business growth; section 3 develops the empirical analysis, which includes the description of the methodology, the description of the

variables, the description of the sample, the statement of hypotheses, the estimation of the model, and the discussion of the results; section 4 deals with the conclusions; finally section 5 shows the bibliographical references used in this research.

Macroeconomic environment

Table 01 shows the evolution of the Peruvian macroeconomic environment during the 2005-2014 period. Peruvian economic growth for this period has two stages in its evolution. The first one covers the period from 2005 to 2008, a period in which the growth is incremental, with the Peruvian economy growing 9.1% in the year 2008. In 2009, the economy of Peru grew only 1.0% due to the effects generated by the international financial crisis, mainly on Peruvian exports. The second stage goes from 2010 to 2014 where the economy grew moderately, that is to say it passed to a period of economic deceleration due to the fall in prices of the minerals in the international market and to internal events, such as the social conflicts in the scope of the mining activity.

Table 1 also shows the evolution of inflation for the 2005-2014 period. Inflation has been maintained at low levels and always trying to remain in the target range set by the Central Reserve Bank of Peru, which is between 1% and 3% annually. However, in 2008 inflation stood at 6.65% as a result of the rise in wheat and flour, inputs that are imported for the manufacture of food. 2011 was also a year with high inflation (4.74%), which was generated by the rise in prices of vegetables and legumes and by the rise in fuel prices.

The Peruvian stock exchange is dominated mainly by shares of mining companies, which creates a dependence on the price of minerals in the international context. With respect to stock market capitalization, the evolution of the Peruvian capital market has had an increasing trend. In other words, in 2005 the capitalization of the Peruvian stock market was USD $36,196 million, while by 2014 it was USD $121,230 million which generated a growth of 234.93%. In 2008, the stock market capitalization of the Peruvian stock exchange decreased (USD $ 57 231 million) due to the effects of the international financial crisis. In the same way, in 2013, the stock market capitalization fell (USD $120 653 million) due to global instability and the decrease in commodity prices, especially gold and silver quotations.

The financial system regulated by the Superintendency of Banking and Insurance and Pension Fund Administrators (SBS) covers the pension, insurance, and financial intermediation systems in Peru. As can be seen in Table 01, the assets of the financial system have evolved in an increasing manner throughout the analysis period. In 2005 the assets of the system were USD $41,571 million and in 2014 they were USD $175,115 million, which represented an increase in assets of 321.24%. These data confirm that in Peru the financial system is more important than the stock market as a source of financing for economic agents. In addition, the sustained growth in the level of assets showed that the international financial crisis did not affect the Peruvian financial system.

CMACs in Peru represent the most important financial institutions in the microfinance sector. During the 2005-2014 period there have been 12 institutions that have provided financial services to the micro and small enterprise sector. In 2014 the number of CMACs decreased because the SBS intervened to the CMAC Pisco, but this intervention did not cause a significant impact on the stability of the financial system because it was a small financial institution.

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Table 1
Macroeconomic Indicators

Indicadores	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
PBI Real	6.30%	7.50%	8.50%	9.10%	1.00%	8.50%	6.50%	6.00%	5.80%	2.40%
Inflación	1.49%	1.14%	3.93%	6.65%	0.25%	2.08%	4.74%	2.65%	2.86%	3.22%
Capitalización Bursátil (Millones US$)	36 196	60 020	108 220	57 231	107 325	160 867	121 596	153 404	120 653	121 230
Activos Sistema Financiero (Millones US$)	41 571	52 278	72 690	79 961	94 506	119 346	130 225	160 671	166 688	175 115
N CMAC	13	12	12	12	12	12	12	12	12	12

Fuente: BCRP, BVL, SBS

Review of the literature

Microfinance

Microfinance is one of the most important financial phenomena in emerging countries. This is because these microfinance institutions (MFIs) have helped the micro and small enterprise sector—often excluded by banking institutions—to obtain financing, which allows them to make improvements in their businesses, mainly in terms of short-term investments. This financing has made it possible for this micro and small business sector to become accentuated in the economy of emerging countries in order to face the problem of unemployment and poverty. In other words, MFIs have helped micro and small entrepreneurs to have the opportunity to do business on a small scale and thereby improve the living conditions of people who did not have any alternatives for improvement but obtained financing. The importance of financing these business units goes beyond the economic and transcends the social. It is these aspects that have made microfinance a success in emerging economies. Aveh, Dadzie, and Krah (2013) state that the success of microfinance refers to a set of measures that, when adopted, will significantly improve the life and operations of MFIs. This means that behind the funding provided to micro and small entrepreneurs must be the economic success of MFIs. This economic success is generated by two aspects. On the one hand, there is profitability, which is the natural success factor of a business, and, on the other hand, there is the growth of MFIs, which is a factor generated after the economic success experienced by businesses in general.

Bayona (2013) states that microfinance companies have contributed to financial deepening and, with it, improved the quality of life of microentrepreneurs in Peru. This has made Peru the number one country in the world in the development of the microfinance sector. Microfinance in Peru has definitely generated a real change in the micro and small enterprise sector. The economic environment and growth perspectives of the economy in Peru have made microfinance part of the financing alternatives that small business units have.

Microfinance appears as a product of the evolution of the concept of microcredit. In the beginning, MFIs began to disburse loans only to small entrepreneurs so that they could improve the economy of their businesses. The success of microcredit led MFIs to begin to provide a series of greater services to this business sector, so that microfinance is not only oriented to granting loans, but also to offering other financial products and services that small entrepreneurs can use today when they have relationships with organizations dedicated to microfinance. Minzer (2011) stated that non-bank financial institutions provide services similar to those of a bank, although they are set up in a different type of category. Such a distinction may be due to

lower capital requirements, limitations on the services offered, or supervision by a different regulatory body. Furthermore, because they are regulated, these institutions must regularly publish their audited financial statements and be subject to minimum capital criteria, which contributes to greater transparency and a greater degree of institutional financial stability of the sector. Finally, these institutions have a large pre-existing physical infrastructure of branches, which can be used to reach a large number of clients at low operating costs.

Globally, the development of microfinance has not been the same for all economies in different regions and countries. Vanroose (2008) stated that some regions and countries have developed large microfinance markets, while others have not. For example, in Cameroon and Gabon, being neighboring countries, the development of the microfinance market is greater in Cameroon than in Gabon even though these countries have similar economic characteristics. These differences in the development of microfinance opened a line of research by knowing the factors that influence the development of this financial sector more in one country than in another.

Determinant factors of the growth of MFIS

The literature on the factors influencing the growth of microfinance institutions and commercial banks is scarce, and most research addresses the determinants of non-financial business growth. Wachira Njeri, Mwirgi Mugambi, and Muthama Mutua (2013) conducted an exploratory study on the growth determinants of microfinance organizations in Kenya. To this end, they conducted a survey of people involved in the small and micro-entrepreneur program in the city of Voi and analyzed secondary information with respect to MFI-specific factors. The results were that the amount of the investment of MFIs, the educational level of the clients, the loans received, and the number of participants affect the growth of microfinance organizations.

González-Vega, Schreiner, Meyer, Rodríguez, and Navajas (1996) studied the factors that influenced the growth of BancoSol in Bolivia. The results showed that the existence of tangible and intangible assets accumulated at the beginning of its operations was the cause of the rapid growth of this microfinance organization. These tangible and intangible assets refer to credit technology, knowledge of its niche market, customer-business relationships, and the experience of human capital throughout the organization. Additionally, in its maturation period, BancoSol grew due to the rapid creation of office networks in Bolivia. Aveh *et al*. (2013) studied the success factors of MFIs in Ghana. The results found suggest that the increase in larger clients, effective and efficient loan procedures, effective record keeping, increased savings, internal and external audits, high staff remuneration, and low staff turnover influence the success of MFIs.

A more recent study is that of Liñarez-Zegarra and Wilson (2018) who studied the relationship between the size and growth of microfinance institutions. To this end, they studied a sample of MFIs from 120 countries with different forms of ownership (Microbanks, Non-Governmental Organizations, Credit Unions, and Non-Banking Financial Institutions) and with different commercial orientations (for-profit and nonprofit institutions). The study covered the 2000-2014 period. Using the dynamic panel data model, they found little evidence indicating that size confers advantages on MFI growth. The results show that there is a negative relationship between size and growth in credit unions and nonprofit MFIs.

The measures of business growth in the existing literature are varied. González-Vega et al. (1996) stated that growth is reflected in the variation of asset quality. On the other hand, Becchetti

and Trovato (2002) measure business growth as the variation in the number of employees of a company. Blázquez Santana, Dorta Velázquez, and Verona Martel (2006) count the measures of business growth used, including total net assets, number of employees, sales volume, and net investment. Correa (1999) also utilizes various measures to quantify business growth, such as growth in total net assets, growth in net fixed assets, growth in equity, growth in staff expenses, growth in net profit, among others. In the same way, González and Correa (1998) proposed business growth measures similar to those of Correa (1999), such as the growth of total net assets, growth of operating income, growth of own resources, among others. Rahaman (2011) measures business growth as the variation in the number of workers in a company. Variyan and Kraybill (1992) used employment growth as a measure of enterprise growth.

Placements. The financial institutions in general have centered their business in the placements that they make to the economic agents of the real sector of the economy and, with it, a greater or smaller expansion of the monetary mass is generated in a country. As the placements of a financial institution increase, financial income increases due to the interest rate charged to borrowers and, with it, the economic benefits increase. Thus, the placements of an MFI are the most important asset of a financial institution. It is expected that there will be a direct relationship between growth and placements because if placements increase, more material and human resources will be needed to deal more efficiently with the growth of MFIs.

Deposits. Deposits constitute the funding that financial institutions mostly use to place them in the real sector of the economy. The collection of savings in the CMAC is the main source of financial resources used to meet the supply of credit to micro and small enterprises. For this reason, these obligations are the main liabilities that MFIs have. If deposits are increased, the CMACs will have greater financial resources to be able to meet the loans required by credit demanders and, therefore, these financial institutions are expected to tend to grow. For this reason, a positive relationship is expected between growth and customer deposits.

Interest Rate. Loan placements to economic agents have an added interest rate. The interest rate represents the opportunity cost of the money that a financial institution gives to a borrower and represents the risk that the MFI assumes in recovering that resource. MFIs such as CMACs, when directing their loans to micro and small enterprises, mostly do so without a guarantee or collateral to protect the loan. These decisions made by CMACs make interest rates higher than other financial institutions such as commercial banks. The interest resulting from the application of the interest rate represents financial income for CMACs and represents an approximation to growth. If the interest rate rises, an increase in financial income and thus greater growth would be expected. Therefore, the relationship between the interest rate and growth is expected to be positive.

Delinquency. Delinquency represents default by borrowers of a financial institution. Delinquency represents the risk incurred when deciding to grant a loan. The consequences of delinquency range from reduced levels of liquidity by the MFI to the assumption of economic losses when these loans are not recovered, especially when they are unsecured. In the financial loan business, delinquency is part of it, so the client appraisal process is critical to avoid making the wrong decision. Increased delinquency leads to a deterioration of the loan portfolio and thus creates problems in the financial income and economic benefits of MFIs. If delinquency increases, it is understood that the growth of CMACs will tend to decrease. Therefore, a negative relationship is expected between delinquency and growth.

Economic Growth. Economic growth represents an external factor that affects the growth of companies in general. It is understood that, if the economy of a region or country is doing

well, then companies tend to grow as a result of the economic dynamics generated by the welfare state of economic agents. In the case of MFIs, economic growth may have a greater influence on growth and economic benefits, since the consequences of this are directly felt in the increase in delinquencies, the decrease in placements, the increase in interest rates, the decrease in savings or deposits, among others. Therefore, economic growth represents a factor that impacts on financial institutions. The expected relationship between CMAC growth and economic growth is positive.

Age. The growth of a company is generated in the measure that the business works and acquires experience throughout the years of operation. Therefore, the experience, expressed in the years of life of the company, makes growth able to occur. In the field of financial institutions, the confidence of borrowers and savers make the expansion to new geographical areas to occur with the passage of time. Rahaman (2011) stated that the age of a company is a determining factor in the variability of performance and growth of companies. The expected relationship between CMAC growth and age is positive.

Empirical analysis

Description of the methodology

In order to determine the factors influencing the growth of CMACs in Peru, an econometric panel data model was used to efficiently take advantage of the data structure. For this purpose, the data have been worked on, obtaining a cross-section of twelve companies and a time series of 10 years corresponding to the 2005-2014 period. The main objective of using the panel data methodology is to capture unobservable heterogeneity, either among economic agents or study agents, as well as in time, given that this heterogeneity cannot be detected either with time series studies or with cross-sectional studies.

The panel data model has two basic application forms. The first is a panel data model with fixed effects and is represented as follows:

$$Y_{it} = \alpha + \beta X_{it} + \eta_i + \mu_{it} \qquad (1)$$

Where: *i* is the company; *t* is the time period; Y_{it} is the debt level; β is the vector of estimated k parameters (one for each explanatory variable); X_{it} is the observation of the i-th company at moment t for the explanatory variables k; η_i is the fixed effect attributable to each company and is constant over time; and μ_{it} is the term for random error.

The second is the panel data model with random effects and is represented as follows:

$$Y_{it} = \alpha + \beta X_{it} + (\eta_i + \mu_{it}) \qquad (2)$$

The random-effects model has the same specification as the fixed-effects model except that instead of η_i being a fixed value for each individual and constant over time, it is a random variable with a mean value η_i and a variance different to zero. This model is more efficient (the variance of the estimate is smaller) but less consistent than that of fixed effects.

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According to Montero (2011), the difference between the fixed and random effect models lies in the assumptions that sustain the residues ($\eta_i + \mu_{it}$) of both models. In the fixed effects model η_i represents a fixed, constant part for each individual. This means obtaining a general trend by regression by giving each individual a point at a different origin. While μ_{it} represents the random part that meets the requirements of Ordinary Least Squares (OLS), i.e. if the fixed effects model is chosen, it would have been better to apply a linear regression model with OLS. While in the random effects model η_i represents a random variable. This means that the exact value in the origin that each individual may have is not known, but it is thought that this will probably gravitate around a central value. The random effects model employs the Generalized Method of Moments (GMM), which is a more efficient extension than OLS. On the other hand, Labra and Torrecillas (2014) state that the fixed effects estimator is less efficient than the random effects estimator, both being consistent estimators, so it is often necessary to work with the random effects model.

Thus, the theoretical model is defined in the following manner:

$$CRECI_{it} = \beta_0 + \beta_1 COLOC_{it} + \beta_2 DEPOS_{it} + \beta_3 TASA_{it} + \beta_4 MOROS_{it} + \beta_5 CE_t + EDAD_{it} + \varepsilon_{it} \qquad (3)$$

Where the dependent variable represents the growth of the CMAC (CRECIit), for which two measures have been used. The first measure is the variation in financial income and the second is the variation in the number of employees. The independent variables, in accordance with the hypotheses put forward, are defined operationally as follows: Placements (COLOCit) were measured by the variation in the number of total placements (the sum of current, refinanced and restructured loans and overdue loans). Deposits (DEPOSit) were measured by the change in the amount of the deposits made by the public. The interest rate (TASAit) was measured by dividing the financial income by direct credits between the direct credits of the CMACs. Delinquency (MOROSit) was measured by the ratio dividing overdue loans by total loans. The economic growth (CEt) was measured by the variation of the Gross Domestic Product of Peru and the age (EDADit) was measured by the natural logarithm of the years of operation of the CMAC. Variable data have been obtained from secondary information provided by the SBS and the Central Reserve Bank of Peru (BCRP). The statistical software used to estimate the model was STATA 10.

Description of the variables

Table 02 shows the descriptive statistics of economic growth, measured through the financial income and the workers of the CMACs in the 2005-2014 period. In general, the average financial income has grown, but with two stages clearly established. In the 2005-2011 period the increase in financial income has been changing, but particularly with high growth in the years 2005, 2008, and 2009, where income grew on average 25.22%, 25.19%, and 24.03 %, respectively. For the 2012-2014 period, the growth of financial income was downwards, having grown in 2014 only by 5.23%. On an individual level, in 2014, a CMAC generated a 9.14%

drop in its financial income, which reflects the fall that all the CMACs had in general in that year. On the other hand, in 2005 a microfinance institution increased its financial income by 45.27%, confirming that in the first years the growth of financial income was high.

Concerning the number of CMAC workers, Table 2 shows that the trend is similar to that of financial income. In the 2005-2010 period the number of workers increased, on average, in a sustained manner. The years 2007, 2008, and 2009 were the periods of greatest growth of staff with 23.96%, 29.45%, and 23.39%, respectively. For the 2011-2014 period, the increase in staff grew, but with a downward trend. In 2014 the average increase in the number of workers was 5.22 %. In 2010 a CMAC decreased the number of workers by 19.72%, while in 2008 another CMAC increased its staff by 81.40%.

Table 3 shows the descriptive statistics of the explanatory variables of the model to be validated for the 2005-2014 period. The average placements of the CMACs have increased by 19.29%, with a maximum increase of 72.22% and a drop-in placements of 9.36%. The average deposits of the municipal savings banks system in Peru have grown by 22.20% in the study period. The maximum growth of deposits was 56.80%, whereas, on the side of minimum variations, deposits fell by 14.56%. The interest rate charged by the CMACs averaged 24.44% during the study period. The maximum interest rate was 38.14% and the minimum interest rate was 17.65%.

The average delinquency rate of the CMACs during the study period was 5.50%. The maximum delinquency rate was 17.05%, while the minimum delinquency rate of the CMACs was 1.84%. The growth of the Peruvian economy averaged 6.04% for the study period. The Peruvian economy had a maximum growth of 9.14% and a minimum growth of 1.05%. In terms of age, this was 22 years on average for the study period, with one microfinance institution that has 32 years of operation and another that has 13 years in the Peruvian financial system.

Table 4 shows Pearson correlations for the variables involved in the model. As can be seen, the relationship between financial income and CMAC placements and deposits is positive and significant (0.739 and 0.621, respectively), which means that placements and deposits influence the generation of financial income. Placements through the interest generated by them and deposits because they are the most important source of funding to generate resources to be placed. On the other hand, financial income is negatively and significantly related to delinquency and the age of the CMACs (-0.602 and -0.392, respectively).

Table 2
Descriptive statistics of CMAC growth

	Financial Income			
Year	Average	Minimum	Maximum	Standard Deviation
2005	0.252218	0.123679	0.452736	0.105655
2006	0.183051	0.028941	0.331546	0.094929
2007	0.179160	-0.085500	0.283897	0.090693
2008	0.251942	0.133250	0.425643	0.072778
2009	0.240258	0.120492	0.395850	0.071566
2010	0.114527	-0.000825	0.182105	0.061136
2011	0.119438	-0.030169	0.221427	0.083541
2012	0.106077	-0.043049	0.230635	0.080978
2013	0.060380	-0.086009	0.172985	0.082280
2014	0.052399	-0.091422	0.206238	0.087291

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Number of Workers				
Year	Average	Minimum	Maximum	Standard Deviation
2005	0.185386	-0.006410	0.536036	0.154208
2006	0.189993	-0.032394	0.492537	0.158115
2007	0.239625	0.034483	0.497110	0.144774
2008	0.294469	0.088803	0.814016	0.189737
2009	0.233943	0.058692	0.430412	0.083731
2010	0.196775	-0.197222	0.500818	0.199199
2011	0.115158	0.020761	0.245365	0.076889
2012	0.109169	-0.050562	0.462355	0.133201
2013	0.059393	-0.091603	0.222316	0.089325
2014	0.052152	-0.029212	0.190027	0.063371

Source: Financial statements of the CMAC, SBS

The negative relationship between financial revenues and delinquency indicates that with higher delinquency, the financial revenues that CMACs will obtain as a result of default on customer payments will be lower. In terms of age, this relationship shows that the CMACs that have few years of operation are the ones that are generating the least financial income. This is understandable because in a competitive market such as the financial sector, the less time you have been operating, the placements and deposits tend to be smaller compared to larger financial institutions with more time on the market.

Table 3
Descriptive statistics of the explanatory variables

	Average	Minimum	Maximum	Standard Deviation
$COLOC_{it}$	0.192896	-0.093607	0.722226	0.142319
$DEPOS_{it}$	0.221995	-0.145587	0.568028	0.152317
$TASA_{it}$	0.244430	0.176453	0.381370	0.039540
$MOROS_{it}$	0.055035	0.018435	0.170504	0.027024
CE_t	0.060415	0.010492	0.091431	0.026470
$EDAD_{it}$	22.1	13.0	32.0	4.0

Source: Author´s own

The other dependent variable—number of workers—has a positive and significant relationship with placements (0.440), deposits (0.413), and economic growth (0.194). With respect to placements, it is clear that when microfinance companies increase their portfolio of placements, they will need more staff, given the nature of the microfinance business. The same may occur with deposits; as they increase, they would also need more administrative staff to be able to efficiently manage the resources that are captured through the savings of the public. Economic growth is an indicator of well-being in economic agents and given that the financial sector is dynamized according to the behavior of the economy of a country, it is to be expected that when the economy grows companies do the same, which causes companies to hire more staff. On the other hand, delinquency is negatively and significantly related to the number of staff members (-0.435) and to the age (-0.211) of the CMACs. As with financial income, delinquency is an evil that generates problems in the management of financial institutions, which means that if delinquency increases, CMACs tend to reduce staff. While age is also a variable that indirectly explains the number of staff members, CMACs with younger ages tend to reduce the staff because their income is not high enough to cover too many staff costs.

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Table 4
Pearson Correlations of the model variables

	IF_{it}	$NTRAB_{it}$	$COLOC_{it}$	$DEPOS_{it}$	$TASA_{it}$	$MOROS_{it}$	CE_{t}	$EDAD_{it}$
IF_{it}	1.000							
$NTRAB_{it}$	.477**	1.000						
$COLOC_{it}$	.739**	.440**	1.000					
$DEPOS_{it}$	.621**	.413**	.612**	1.000				
$TASA_{it}$	-.008	-.075	-.103	.000	1.000			
$MOROS_{it}$	-.602**	-.435**	-.576**	-.433**	.354**	1.000		
CE_{t}	.096	.194*	.336**	.280**	.097	-.165	1.000	
$EDAD_{it}$	-.392**	-.211*	-.394**	-.313**	-.457**	.150	-.294**	1.000

** The correlation is significant at the 0.01 level (bilateral)
* The correlation is significant at the 0.05 level (bilateral)
Source: Author´s own

Description of the sample

The study of the determinants of the growth of the CMACs of Peru was carried out taking as a sample the twelve CMACs that, as of December 31, 2014, were authorized by the SBS, which is the supervisory organ of the Peruvian financial system. It should be noted that in 2005 there were thirteen CMACs in operation and that as of 2007 there were only twelve companies, due to the fact that in 2006 the CMAC Chincha was absorbed by CMAC Ica. Table 05 shows the CMACs that have intervened in the study and the year of operation. The first CMAC to operate in the Peruvian financial system was the CMAC Piura in 1982, and the CMACs of Tacna and Pisco were the last to start operating in 1992. It should also be noted that in 2014 CMAC Pisco was intervened by the SBS so it entered into a liquidation process.

It should be noted that the CMACs were created by the provincial municipalities of each of the provinces of origin. Currently, CMACs are corporations whose only shareholder are the provincial municipalities. Since their inception, CMACs have become the largest financial support for the micro and small enterprise sector in Peru and are also important in attracting savings from small investors. Table 5 shows that the years of operation of the CMACs in Peru have allowed them to position and consolidate themselves in the microfinance market.

Table 5
Sample decomposition and year of operation

Company	Year of operation
CMAC Arequipa	1986
CMAC Cusco	1988
CMAC del Santa	1986
CMAC Huancayo	1988
CMAC Ica	1989
CMAC Maynas	1987
CMAC Paita	1989
CMAC Pisco	1992
CMAC Piura	1982
CAMC Sullana	1986
CMAC Tacna	1992
CMAC Trujillo	1984

Source: CMAC website

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Hypotheses and model estimation

In accordance with what has been stated in the determinants of business growth, the following hypotheses have been put forward:

First hypothesis: There is a positive relationship between the growth of the CMACs and the placements.

The placements represent the loans that CMACs make mainly to micro and small entrepreneurs and are the main activity to achieve profitability and growth in the medium and long term. In general, the increase in placements tends to increase financial income, which leads to financial institutions tending to grow in the medium and long term, with this a positive relationship between growth and placements is expected.

Second hypothesis: There is a positive relationship between the growth of CMACs and deposits.

Savings deposits are the source of the economic resources available to CMACs to place with customers. The business of financial institutions depends on the deposits they can capture from savers in order to channel them to borrowers. As the deposits of savers increase, CMACs will have more resources to raise their level of placements and thus try to make profitable and grow as a company. Therefore, it is expected that there will be a direct relationship between growth and deposits.

Third hypothesis: There is a direct relationship between the growth of the CMACs and the interest rate.

The interest rate in microfinance tends to be higher than for banking. This is because microfinance institutions have higher operating costs in the process of taking deposits and placing them with clients. As is known, the interest rate represents the cash flow that is obtained as profit if the placements are recovered under the conditions agreed upon by the CMAC and the client. Although it is true that the increase in interest rates can contract placements, in the microfinance field and given the favorable economic conditions of the country, the opposite may occur, that is, the increase in interest rates has helped to increase the levels of profitability and growth of the CMACs. Therefore, a positive relationship between growth and interest rate is expected.

Fourth hypothesis: There is a negative relationship between the growth of CMACs and delinquency.

Delinquencies are a higher risk factor in the business of financial institutions and even more so in the microfinance sector, where smaller loans are granted without collateral. If delinquency levels increase, financial income will be reduced, and profitability will decrease. The business growth will also be affected in the sense that if the loans are not recovered within the established terms the CMACs would reduce their liquidity levels and this would not be able to increase the level of placements. Therefore, an indirect relationship is expected between growth and delinquency.

Fifth hypothesis: There is a positive relationship between CMAC growth and economic growth.

The growth of the economy is an indicator of the well-being of the population. It is a variable that affects companies externally. If the economy of a country tends to grow, then companies will also grow because the economic dynamics reflected in consumption and investment have a direct impact on the business sector. For the financial sector the trend is the same, economic growth makes both deposits and placements to be dynamic and thus financial institutions can increase their profitability and growth. Therefore, a direct relationship between growth and

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economic growth is expected.

Sixth hypothesis: There is a direct relationship between the growth and age of the CMACs.

Business growth is generated in the long term. As companies begin to develop their operations in the market, they acquire the experience that will allow them to make decisions such as expanding into new markets. For this, the business needs to generate economic benefits that allow them to move on to the growth stage. The knowledge of the market, its customers and competition make financial institutions decide to enter new markets both nationally and internationally. This has not been the exception of the CMACs in Peru, which, over the years, have begun to expand throughout the Peruvian territory. Therefore, a positive relationship is expected between growth and age.

Table 6 shows the results of the estimation of model 1 posed in equation (3) taking Financial Income (IF for its acronym in Spanish) as the dependent variable, both for fixed effects and for random effects. Hausman test shows whether fixed-effects and random-effects estimators differ substantially or not. The results of this test show that the difference between random and fixed-effects coefficients is systematic, so it is best to use the fixed-effects model. On the other hand, the modified Wald test indicates that the variance of the errors of each cross-sectional unit is not constant, so there are heteroscedasticity problems. In order to correct this problem, robust standard errors have been used that allow estimates to be made considering the heteroscedasticity presence in the model.

Table 6 shows that the COLOCit coefficient is significant and positive. This means that the loan placements granted by the CMACs influence the growth of these microfinance organizations. The estimated DEPOSit coefficient is also significant and positive, confirming that deposits captured from the public influence the growth of CMACs in Peru. The estimation of the TASAit coefficient is significant and positive. This means that the interest rate charged by CMACs in Peru influences business growth. On the other hand, the estimated MOROSit coefficient is also significant and negative. This result confirms that delinquency negatively influences the economic growth of the Peruvian municipal savings banks. The estimated ECt coefficient is significant and negative. This result rejects the hypothesis. In other words, these results show that, if the economy of the country does not grow, microfinance institutions would grow. In the analysis period the Peruvian economy has had upward and downward variations and, in spite of this, the growth of financial institutions has continued to grow.

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Table 6
Estimation of Panel Data Model 1

Dependent variable: IF								
FIXED EFFECTS					RANDOM EFFECTS			
Variables Explicativas	Coeficiente (β)	Robust Desv. Std.	t-ratio	P-valor	Coeficiente (β)	Desviación Estándar	z-ratio	P-valor
$COLOC_{it}$	0.3826303	0.1028587	3.720	0.003	0.3670361	0.0632535	5.80	-
$DEPOS_{it}$	0.1589147	0.0581871	2.730	0.020	0.1897761	0.0535973	3.54	-
$TASA_{it}$	1.2919600	0.5075543	2.550	0.027	0.3360904	0.1954490	1.72	0.086
$MOROS_{it}$	-0.9237433	0.2601465	-3.550	0.005	-1.1293550	0.2960951	-3.81	-
CE_t	-0.9281172	0.2914703	-3.180	0.009	-0.9915659	0.2614676	-3.79	-
$EDAD_{it}$	0.0035300	0.1295700	0.030	0.979	-0.0503996	0.0415953	-1.21	0.226
Constante	-0.1727351	0.5450475	-0.320	0.757	0.2388655	0.1627210	1.47	0.142
R^2			0.5769			0.6895		
No. of Observations			113			113		
No. of Groups			12			12		
Hausman Test					125.87 (0.0000)			
Modified Wald Test					485.45 (0.000)			

Source: Author´s own

Table 7 shows the results of the estimation of model 2 set out in equation (3) using the NTRAB as a dependent variable, both for fixed effects and for random effects. The results of the Hausman test show that the difference between random and fixed effect coefficients is not systematic, so it is better to use the random effects model. The results of the random-effects coefficients are presented corrected to avoid the heteroscedasticity of the model.

Table 7 shows that the calculated DEPOSit coefficient is significant and has a direct relationship with business growth. This result confirms that deposits represent a determining factor in the economic growth of municipal savings banks in Peru, since in both models it is significant and positive. The funding that municipal savings banks obtain through public deposits represents the source of economic resources available to place them to customers and thereby generate economic growth. On the other hand, the calculated MOROSit coefficient is significant and indirectly related to the growth of Peruvian microfinance institutions. These results demonstrate, like model 1, that delinquency has a decisive influence on the growth of Peruvian municipal savings banks. Delinquency destroys profitability and allows companies to neither grow nor develop in the medium and long term, the quality of loans is vital so that delinquency does not influence the business growth of the Peruvian municipal savings banks.

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Table 7
Estimation of Panel Data Model 2

Dependent variable: NTRAB								
FIXED EFFECTS					RANDOM EFFECTS			
Explicative Variables	Coefficient (β)	Standard Deviation	t-ratio	P-value	Coefficient (β)	Robust Standard Deviation	z-ratio	P-value
$COLOC_{it}$	0.0328677	0.1906045	0.170	0.863	0.1561755	0.1642303	0.95	0.342
$DEPOS_{it}$	0.1882902	0.1224699	1.540	0.128	0.1951777	0.1147136	1.70	0.089
$TASA_{it}$	-0.9320499	1.1584830	-0.800	0.423	-0.0130160	0.4195313	-0.03	0.975
$MOROS_{it}$	-1.3221380	0.7483384	-1.770	0.080	-1.4522770	0.6831681	-2.13	0.034
CE_t	0.0331894	0.6080471	0.050	0.957	0.1921334	0.5764476	0.33	0.739
$EDAD_{it}$	-0.3640092	0.2457837	-1.480	0.142	-0.0419372	0.0938657	-0.45	0.655
Constante	1.5494280	1.0470940	1.480	0.142	0.2865520	0.3713708	0.77	0.440
R^2			0.1967			0.6895		
No. of Observations			113			113		
No. of Groups			12			12		
Test de Hausman					3.46 (0.7497)			

Source: Author´s own

With these results, it can be concluded that the factors that influence the growth of municipal savings banks in Peru are the deposits captured by the public and the delinquency generated by the poor quality of customer placements, accepting the second and fourth hypotheses.

Discussion of results

This work represents the first approximation in the understanding of the factors that influence the growth of municipal savings banks in Peru. A population of 12 Peruvian municipal savings banks supervised by the SBS has been studied. The variables that explain business growth have been obtained from the public information disseminated by the SBS. The explanatory variables have been designed based on the existing literature for these studies. The panel data methodology was applied in order to be able to contrast the model and explain which factors influence business growth.

Both the financial income and the number of staff members of the Peruvian municipal savings banks have had two stages in their growth in the 2005-2014 period. In a first stage, which covers the 2005-2009 period, financial income grew annually on a cyclical basis, from 25.22% in 2005 to 24.03% in 2009. From then on, the financial income began to decrease, in 2010 the growth was of 11.45% and by 2014 the financial income of the Peruvian municipal savings banks grew by an average of 5.24%. On the other hand, the number of workers in these institutions also had cyclical and periodic variations. For the 2005-2009 period, staff growth was cyclical, rising from 18.54% in 2005 to 23.39% in 2009. For the period 2010-2014 the variation in the number of workers decreased, going from an increase of 19.68 % of the staff in

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the year 2010, to an increase of the number of workers of 5.22% in the year 2014.

Estimated models show that the factors influencing the growth of Peruvian CMACs are deposits (DEPOSit) and delinquencies (MOROSit). Deposits have a positive influence on the growth of municipal savings banks. This result confirms that deposits in an MFI are the main factor in obtaining economic resources in order to place them in the hands of loss-making agents. In other words, CMACs in Peru need to capture savings from the public in order to place them in the market and thus ensure their growth.

On the other hand, delinquency has a negative impact on the growth of Peruvian CMACs. This result confirms that nonpayment by clients generates a setback in the growth objectives of these financial institutions, due to liquidity problems and equity deterioration, since these MFIs generally do not request collateral for the placement of microcredits. This work confirms that CMACs in Peru must be extremely careful when evaluating clients so that delinquency levels do not generate a high credit risk.

Conclusions

In order to determine the factors influencing business growth, two models were considered because the determinants were analyzed on the basis of financial income (IF_{it}) and the number of workers ($NTRAB_{it}$) as dependent variables. Panel data model 1 with fixed effects showed that placements ($COLOC_{it}$), deposits ($DEPOS_{it}$), and interest rate ($TASA_{it}$) positively influence business growth, while delinquencies ($MOROS_{it}$) and economic growth (CE_t) negatively influence the growth of Peruvian municipal savings banks. Panel data model 2 with random effects showed that deposits ($DEPOS_{it}$) directly influence the growth of municipal savings banks in Peru, while delinquencies (MOROSit) indirectly influence business growth.

These results demonstrate that deposits and delinquencies are the determining factors in the growth of municipal savings banks in Peru due to the fact that for model 1 and model 2 these factors are significant. The municipal savings banks, having as their only shareholder the provincial municipality that created them, have the savings that they capture from the public as their main source of financing; these savings are the base of the growth of the municipal savings banks, since with these resources they guide their clients in the form of placements obtaining financial income that have their origin in the deposits. On the other hand, delinquency represents, for a financial institution, a point of focus in order to know if it is properly managing the loans or placements; the increase in delinquency generates liquidity problems in financial institutions and this leads to increased transaction costs incurring economic losses if the client does not pay its debt. All this is more detrimental in municipal savings banks because it does not require collateral for the placements it makes that are mostly oriented to the micro and small business sector. This study shows that business growth will depend on the control of default by clients.

Since delinquency has been shown to be a factor that negatively influences the growth of Peruvian CMACs, future research can address work aimed at analyzing the type of clients who apply for credit from these MFIs, such as their educational level and gender. This is because it is understood that people with higher education tend to comply with the payment of their obligations; in addition, it could also be confirmed that women are more responsible for fulfilling their financial commitments, given that the origin of microcredit is generated by loans to women entrepreneurs with low economic conditions.

Finally, given that it is the first approach to the study of the determinants of the growth of municipal savings banks in Peru and that there is little literature related to the business growth of the financial sector, it is possible to recommend that for future research comparative studies be analyzed among microfinance institutions at an international level, since the microfinance sector has become a financial phenomenon in Latin America and individual studies oriented to banking companies. Future studies can also be conducted considering some delays in the independent variables.

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