Impact of CEO characteristics on bank performance

The case of a cooperative bank

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Abstract

How do CEO characterisitcs effect the performance of a bank? We use data on 106 autonomous banks that are part of one and the same cooperative European bank over the period 2010–2015 to answer that question. The balance between the homogeneity (e.g., one company) and heterogeneity (e.g., decision freedom of CEOs) of the sample provides an unique setting to test whether CEO turnover and the education and gender of the CEO matter for bank performance. We estimate the panel data with a fixed effects model and include bank and time fixed effects. Moreover, we control for balance sheet and income statement characteristics, the member base and market share of a bank, and local GDP.

*Electronic addresses: J.A.C.vanToor@tias.edu (Corresponding author), Kees@duvelhok.com, J.Dornigg@gmail.com, J.M.Groeneveld@tias.edu. Due to confidentiality reasons we do not disclose the name of the bank and the country the bank is located in.

We report evidence that the return on average assets declines after a change of the CEO. This is statistically significant at the 1% level. Economically the effect is also large as the return on average assets declines with 0.126%, which represents 34% of the average return on assets in our sample.

We also find that bank performance is positively related to operating efficiency, mortgages to assets, GDP and market share, and negatively to funds provided by the central institution.

Keywords: Bank Performance, Cooperative Bank, CEO characteristics

JEL Codes: G21, P13

1 Introduction

This paper investigates how the performance of a cooperative bank is influenced by CEO's characteristics. More specifically, we focus on CEO turnover, the level of CEO education and gender. Many papers have been published that analyze determinants of bank performance, notably Demirguc-Kunt and Huizinga (1999), Berger and Bouwman (2013) and Kok, Móré, and Pancaro (2015). Typically, these papers look at a sample of different banks, banks with different ownership structures, among which are commercial and cooperative banks, and often banks from several countries. In these studies many variables need to be controlled for to measure the impact of the variable of interest on the performance of the bank. Due to a partnership with a cooperative bank (hereafter the cooperative bank) we have access to an extensive financial dataset of all their banks. Since all banks are part of one cooperative bank many characteristics that would otherwise be difficult to control for, e.g., corporate culture or internal governance systems, are automatically controlled for. At the same time, banks enjoy a high degree of autonomy in terms of, for example, the acceptance of customers, the strategy of the bank and the spending of the marketing budget. This balance between

homogeneity and heterogeneity provides us with a unique environment to analyze not only financial determinants of performance, but also the influence of a CEO, in particular his or her level of education and gender. We focus on the CEO as it is the most important member of the board and who carries the final responsibility.

When studying the effect of CEO turnover on bank performance we compare bank performance before CEO turnover with bank performance after CEO turnover. In other words, the bundle of characteristics of the CEOs is compared. Hence, we compare CEO fixed effects of a CEO before and after a change. As the bundle of characteristics matters for decisions of firms in general (Bertrand & Schoar, 2003) and of banks in particular (Hagendorff, Saunders, Steffen, & Vallascas, 2015) we focus on the change of the CEO.

Within the field of labor economics many papers analyse the causal relationship between education and performance. Performance is usually proxied with hourly wage, whereas level of education is either measured as the amount of years spent in schooling or the highest finished degree Card (1999). The results suggest a positive relationship. Hartog and Oosterbeek (2007) state that the return of an extra year of education lies between 5 and 15%, depending on the country, demographic group and time period considered. However, alternatively, one could think that people with more ability will opt for more education and thus will also earn more later on. Another study by Van der Sluis, Van Praag, and Vijverberg (2008) measures the impact of education on the performance of entrepeneurs and includes, in addition to income, profitability and size of the company. Since education matters for employees in general, and also for the specific group of entrepreneurs, which in terms of decision freedom are more like CEOs, we are interested in the impact of education on the performance of CEOs.

The third characteristic we consider is the gender of the CEO. From the literature, e.g., Croson and Gneezy (2009), we know that women are less inclined to take risks than man.

An example from the banking industry is Palvia, Vähämaa, and Vähämaa (2015), where banks with women at the helm are better capitalized. Moreover, small banks led by women were more likely to survive the financial crisis.

The data for this paper are from the cooperative bank, LinkedIn and the national statistics bureau. They provided data on the balance sheet, income statement, number of members and market share per bank for the period 2010 to 2015. Additionally we received a file containing who was when where CEO of a bank. This file has been completed by hand by using the LinkedIn user-profiles of current and former bank CEOs. In addition, we collected statistical data from the national statistics bureau in order to control for regional differences. The dataset has been analyzed by a fixed effects regression model.

The results show that after a change in CEO the performance, measured by return on assets, significantly declines at the 1% level. The decline is also economically large with -0.126%, which represents a decline of 34% of the average return on assets. This effect is partly explained by a significant increase of approximately 0.05% in the operating expenses of a bank. Education and gender, on the other hand, do not have an impact on performance.
Furthermore, just focusing on bank-, industry- and region-specific characteristics of the bank, shows that performance is positively related to operating efficiency, mortgages to assets, local GDP and market share. On the other hand, funds provided by the central institution are negatively associated with bank performance.

The remainder of this paper is structured as follows. Section 2 will introduce the structure of the cooperative bank. Section 3 describes the variables. Section 4 discusses the data and presents summary statistics. Section 5 presents the results, while section 6 concludes.

2 The structure of the cooperative bank

In this section we want to discuss characteristics of cooperative banks which distinguishes them from commercial banks. Simultaneously we relate these characteristics to the structure of the cooperative we study.

Ayadi, Llewellyn, Schmidt, Arbak, and de Groen (2010) identify seven characteristics specific to cooperative banks:

Member-influence: The members of cooperative banks can exert their influence and are an integral part of the governance structure of the bank;

Ownership: The shareholders of cooperative banks are its members, who are also customers of the bank. However, it is not necessary for customeres to be members;

Internal organization: Although branches of a cooperative bank largely operate indepedently, some activities, such as IT systems, call centers and capital market transactions, are centralized;

Multiple objectives: Cooperative banks have the objective to focus on the benefit of the members of the bank. Although profit maximization is not the principal objective, it is needed to survive, for example for investing in the bank;

Local presence: Cooperative banks, and especially its branches, maintain a strong relationship with their clients;

Equity funding: Equity funding is largely composed of retained earnings, since many cooperatives do not have access to the stock market;

Share trading: It is not possible for members to sell shares of the bank in a secondary market. Hence a cooperative bank cannot be acquired by a hostile takeover.

We now want to compare to what extent the bank we study has the aforementioned characteristics. Therefore, in Figure 1 we present a stylized overview of the structure of the bank. As can be seen from the graph, the banks at the bottom are the foundation of the organization. Every bank has a local Board of Directors, a Supervisory Board and a Member Council. The management of the bank is in the hands of the directors. They are appointed by the Supervisory Board with the approval of the central institution. Members of the Supervisory Board are nominated by the Supervisory Board itself, in agreement with the Member Council and the central institution. Their task is to monitor and give advice to the Board of Directors and, formally, they are the employers of the directors.

The Member Council consists of 30 to 50 elected members of the corresponding bank. It is involved in decisions on how the cooperative dividend (money reserved for the community) should be spent, in the appointment of the Supervisory Board and in the adoption of the financial statement. Other members of a bank can raise their concerns in the General Meeting of a bank, which assembles only when pivotal decisions have to be made. In this way members are able to exert influence on the bank, which is the first characteristic the list of Ayadi et al. (2010). Furthermore, all members of the banks are the ultimate owners of the bank, which comprises the second characteristic of the list.

Looking at the next higher level, banks are organized in twelve Regional Delegates Assemblies which, according to the statutes, are supposed to provide a platform for dialog in order to strengthen the relation among banks and at the same time, stimulate the discussion about issues that need to be dealt with in the next General Meeting. Every Regional Assembly is represented by its Board in the Central Delegates Assembly, i.e., the "Parliament" of the bank. The Board is composed of the members of the local Supervisory Boards and the local Boards of Directors. The purpose of the Central Delegates Assembly is twofold. On the one hand, it is supposed to provide advice to banks, the Executive Board or the General Meeting of all banks. On the other hand, it adopts rules for all banks and also the budget with which

the central institution supports the banks.

Finally, the central institution follows a similar structure as the banks. It is again composed of three bodies, an Executive Board, a Supervisory Board, and a General Meeting. The Executive Board is comparable to the Board of the Directors on the level, however this time, it is responsible for the whole group. The task of supervision is again carried out by the Supervisory Board. The General Meeting resembles the Member Council, since all banks together own the whole bank, i.e., the banks are the members. It is responsible for the adoption of the financial statement as well as the discharge of the Executive and Supervisory Board.

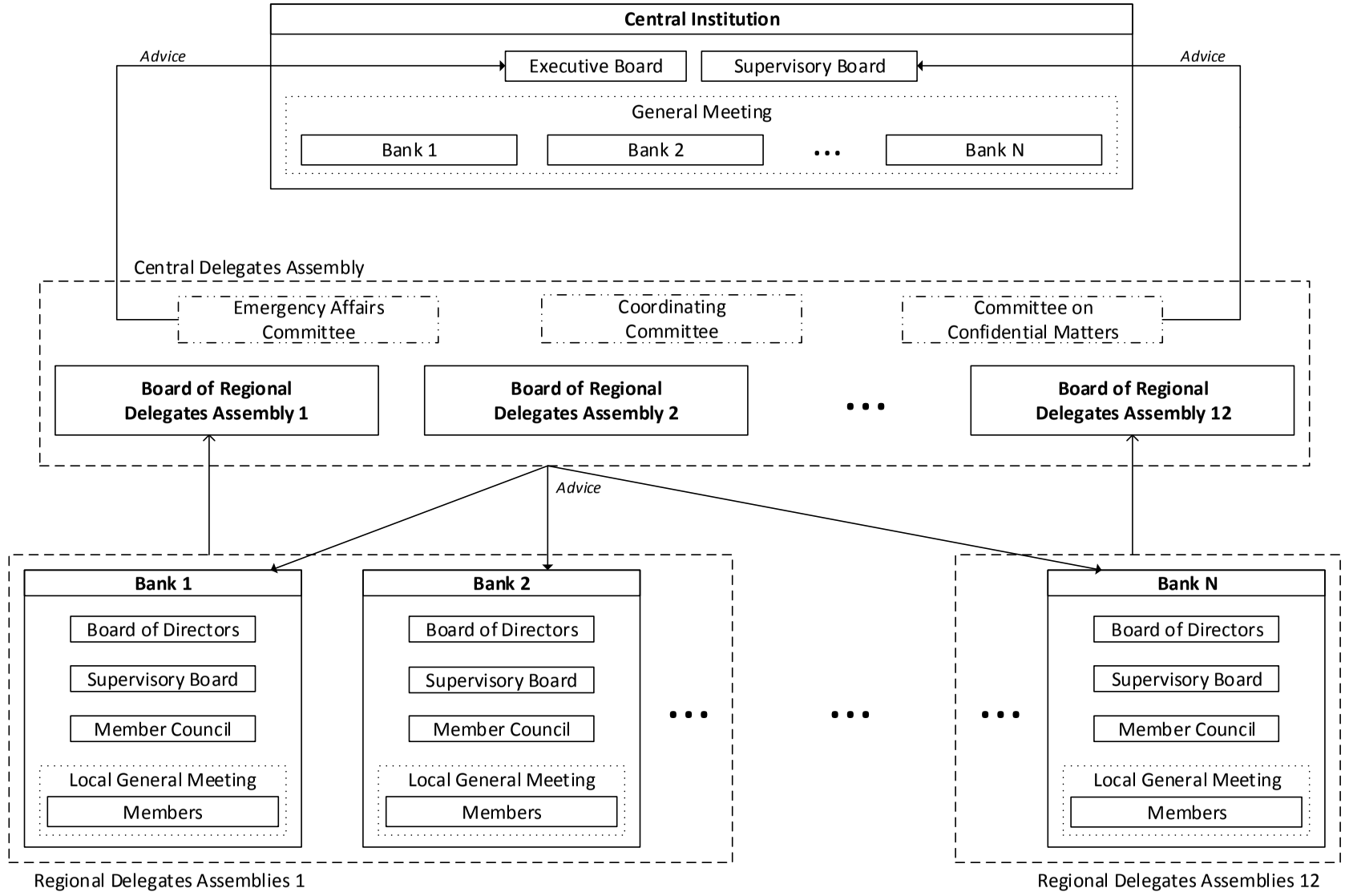

Figure 1. Governance structure of the bank.

With regard to point three on the list of Ayadi et al. (2010), the central institution performs several tasks for the banks. It designs products, develops policies and initiatives in the fields of human resources, security etc. In addition, it acts as holding company for subsidiaries and provides access to the capital markets for banks. Finally, it is responsible for the international banking business.

Although the bank we study aims to generate profits to remain healthy and to grow, it is not the ultimate goal. They also want to support society at large, of which evidence can be found in their spending of the cooperative dividend. Each year, every bank reserves a certain amount of its profits to sponsor projects and initiatives in the local community such as events and sports clubs. Sometimes it even contributes manpower. Therefore, we conclude that the bank pursues more than profit maximization (point 4). In its support of the local community it, moreover, tries to build and maintain a strong relationship (point 5).

At the end of last year the bank's equity base is composed of 62% of retained earnings and reserves, 15% certificates, 22% hybrid capital and subordinated capital instruments and 1% other non-controlling interests. Therefore, we conclude that the majority of the equity is indeed retained earnings (see point six). The bank has issued certificates and capital securities in the past since it expanded faster than it could retain earnings. Although neither of the two has a fixed term, the difference is that capital securities are more like bonds, whereas certificates have more an equity character. Moreover, while the certificates are being traded on the stock exchange its holders can not vote on major company decisions. Finally, with regard to the last point, it is not possible to sell shares of the bank. Although the certificates mentioned before are listed on the stock exchange and have a form of voting rights, they are not comparable to shares of other *listed* commercial banks.

3 Dependent and independent variables

In this section we will first discuss the variables we want to explain, i.e., the dependent variables. Second we motivate which independent variables we use.

At this point we would like to point to the difference between a stock and flow variable as discussed by Fisher (1896). The value of a stock variable can be observed at one point in time, while the value of a flow variable is the result of an accumulation over a period of time. In addition it is possible to combine these types by multiplying or dividing stock and flow variables.

Throughout the paper stock variables with subscript t are the average of the stock value at time $t-1$ and t. This ensures we capture the change in the stock that occurred during year t. Since flow variables materialise during year t no averaging is needed. For combinations of stock and flow variables we average the former, but not the latter. As a consequence of the averaging one year of data will be lost in the analysis.

3.1 Dependent variables

Return on assets: Net income earned by the bank divided by average total assets. Due to an internal balancing mechanism it is impossible for a bank to report a bottom line loss. Therefore, we do not use the bottom line profit, but the profit before the balancing mechanism is activated. Assets are averaged to account for changes in size occuring during the year.

Operating expenses over assets: Operating expenses is the overhead of the bank and is primarily composed of labour, administration and maintenance costs. We will use this variable as dependent and independent variable. As a dependent variable it is interesting because the CEO – our focus – can more directly influence operating costs

than net income, e.g., by firing people or closing a branch of a bank.[1]

3.2 Independent variables

The independent variables are subdivided in bank-, industry-, region- and CEO-specific variables.

3.2.1 Bank-specific

Size: Size is accounted for by including the log of average assets. The rationale to include size is usually twofold. On the one hand, large banks might suffer from inefficiencies due to bureaucratic overhead. On the other hand, as pointed out by McAllister and McManus (1993), large institutions can reap financial returns to scale as they have the possibility to diversify across geographic regions or borrowers. However, in our setting, only the first channel should be of importance since for example the geographic area a bank can be active in is predetermined. A company seeking a loan from another bank will usually be referred back to the bank of its region. Any other behavior would counter the idea of cooperative banking which stresses the attachment to the local community. Thus, we expect a negative sign, i.e., the larger the bank, the lower its performance.

Mortgages to assets: Roughly speaking, the asset side of a bank is composed of three components: loans to retail customers which are almost entirely composed of mortgages (99.46%), loans to companies, and an internal account with the central institution. The first two components added up account for almost the entire asset side of which 59% is retail loans. Since the national mortgage market has a very low incidence of default

[1]Banks often have several branches. These are located within the working area of the bank and can be viewed as a way to service people living nearby.

(when compared internationally) it provides a steady income for a bank. Therefore, we expect a positive impact on performance.

Equity to assets: Since a bank is insured by a cross-subsidy of the other banks and the banks do not have direct access to the capital market, the argument that a low capital ratio would lead to higher funding costs is not applicable here. However, as pointed out by Iannotta, Nocera, and Sironi (2007) a higher capital ratio could be a result of high quality management. Hence, we expect a positive impact on performance.

Debt to central institution to assets: The liability side of a bank is composed of three components. Deposits of retail customers and companies, an internal account with the central institution and equity. In case the bank's equity level falls below a certain threshold, the other banks will prop it up by means of the internal balancing mechanism. Hence, controlling for other factors as the state of the local economy, assistance from other banks could mirror poor management. As a result, we expect a negative sign, i.e., the more assistance required, the lower performance. In addition, for money from the central institution banks have to pay interest, which is usually higher than what the bank has to pay for alternative ways of funding, e.g., deposits.

Total deposits to assets: As deposits are a cheaper way of funding the balance sheet compared to debt, (i.e., debt to central institution) deposits are expected to have a positive impact on performance.

Operating expenses to assets: Operating expenses is the overhead of the bank and is primarily composed of labour, administration and maintenance costs. We will use this variable as dependent and independent variable.

It is a measure of how efficiently the bank is run. Since net income is composed of net interest and commissions on the one hand and operating costs on the other there is

a mechanical negative relation between the operating expenses and net income. This would induce a direct negative relation between these variables.

Moreover, Berger and DeYoung (1997) point to an indirect relation between efficiency and performance in the form of bad loans. They find support for their bad management hypothesis that bad loans and efficieny are simulatneously influenced by the quality of mangement. They concluded that bad management is associated with both lower efficiency and more bad loans.

The previous two arguments would yield a negative relation. However, increasing operating costs happens with the goal of generating (additional) income. This would imply an indirect positive relation.

Despite this argument, we would nonetheless, expect there to be a negative relation.

Impaired loans to total loans: This variable proxies for loan quality. Typically, the riskier the loan, the more interest income it should generate in order to compensate for a higher default probability (Iannotta et al., 2007). In addition, higher loan quality, i.e., less provisions, are a result of more monitoring, which is more costly (Iannotta et al., 2007). On the other hand, in case loans become impaired the extra monitoring result in more costs. Since it is not obvious that either effect dominates, the impact is unpredictable.

Member ratio: Customers of a bank can become a member of their bank. Although this is not mandatory more than 20% of the customers is a member. As discussed in section 2 membership is a key aspect of cooperative banking and, therefore, the member ratio can be interpreted as proxy for the strength of how deeply the bank is rooted in the local community. One can imagine that the stronger this bond, the more loyal the customers will be. As a result, we would expect a positive impact on performance.

3.2.2 Industry-specific variables

Market share: Basically, there are two main theories that potentially explain the impact of market share or market concentration on performance. The structure-conduct-performance (SCP) hypothesis says that in highly concentrated markets, banks tend to collude and thus are able to extract monopolistic rents which translates into high rates on loans and low interest on deposits. In contrast, the efficiency-structure (EFS) hypothesis states that high market shares did not occur on accident, but are rather a reflection of superior management. Therefore, one would expect a positive impact of market share on performance (Molyneux & Thornton, 1992).

3.2.3 Region-specific variables

Local GDP: Each bank has its own working area which are in principle non-overlappping and cover the country. In a meeting with a bank director, he assured us that in general banks respect these boundaries. Exceptions to this rule are when someone moves to another part of the country and keeps a deposit account at its previous bank or when a company with retail stores throughout the country takes out a loan for the holding company in a region where one of the stores is located, while the holding company is situated in a different region.

Despite these exceptions, the location of a bank determines to a large extent its earnings potential. Since urban and rural areas differ in many respects it is not immediately clear whether the one is always more profitable than the other. In an urban area the potential number of companies and households that can be serviced is larger than in a rural area. However, the banks' large market share in the food and agri sectors might lead to better earnings prospects in rural areas.

Since the national statistics bureau does not report a local gross domestic product on neighborhood level, i.e., the level at which the cooperative defined the working areas

of the banks, we devised our own proxy for the strength of the community serviced by a bank.

The basic idea is shown in figure 2.

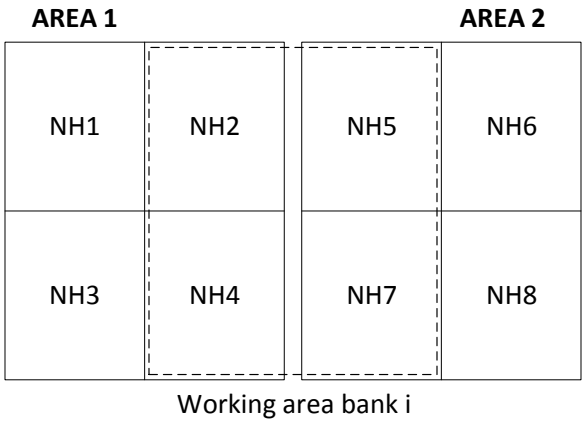

Figure 2. Stylized example of the approximation of the local GDP of the working area of bank i.

Assuming there are two areas , A1 and A2, and each of them is divided in four neighborhoods, NH1 to NH4 and NH5 to NH8. The working area of a particular bank contains neighborhood two and four of A1 and five and seven of A2. From the national statistics bureau we download GDP information on the highest level available and number of inhabitants on neighborhood level. In order to get a proxy for the economic strength of the working area, we summed up the weighted GDPs of A1 and A2, where the weighting factor is the share of inhabitants of an area that fall in the working area. In this particular case the local GDP of the working area of the bank would be equal

to:

$$local - GDP_i = GDP_{A1} \cdot \frac{NH2 + NH4}{NH1 + NH2 + NH3 + NH4} + \tag{1}$$

$$GDP_{A2} \cdot \frac{NH5 + NH7}{NH5 + NH6 + NH7 + NH8} \tag{2}$$

where for instance GDP_{A1} is equal to the gross domestic product of A1 and $NH2$ is the number of people that live in neighborhood two.

The generalization of (1) for bank i at time t would be:

$$local - GDP_i^t = \sum_{j=1}^{N} \left(GDP_j^t \cdot \frac{NH_i \wedge NH_j}{NH_j} \right), \tag{3}$$

where N is the number of different areas in the working area of bank i. GDP_j^t is the GDP of area j at time t. NH_j is the number of inhabitants in area j and NH_i is the number of inhabitants in the working area of bank i. Hence, $NH_i \wedge NH_j$ is the number of inhabitants living in the neighborhoods of area j, which are also situated in the working area of bank i.

Since the assignment of neighborhoods to areas changes throughout the years, we base the weights on population data from 2014. In addition, since GDP data for 2015 is not available yet, we linearly extrapolated it.

Overall, we would expect a positive effect of GDP on performance since the more economic activity in a working area, the more potential business for a bank.

3.2.4 CEO-specific variables

The final set of variables are characteristics of the CEO. We focus on three different variables: the change, gender and education of the CEO.

Change: In our sample we encounter many instances where the CEO changed. It is peculiar to call this change a characteristic of the CEO, since actually the difference between

the collection of all characteristics of the leaving and coming CEO are compared. In other words this variable measures managerial fixed effects, which have been shown to impact corporate decisions of firms in general (Bertrand & Schoar, 2003) and of banks in particular (Hagendorff et al., 2015). Furthermore, the latter paper posits that education, life and work experience only explain 4% of the variation in banks' business models, whereas including manager fixed effects explains 72%. Although we expect these fixed effects to matter for performance in general we do not know by which this is driven. Therefore we do not expect beforehand a positive or negative impact.

Gender: The impact of gender on economic and financial decisions has attracted much attention in the literature. Women are less inclined to take risks. An example of the manifestation of this character trait from the banking literature is Palvia, Vähämaa, and Vähämaa (2015). The authors find that female CEOs have more conservative levels of equity. Moreover, small banks with women at the helm were more likely to survive the financial crisis. In case women take less we would expect their banks on average to perform worse in terms of return on assets.

Education: A stream in the labor economics literature deals with the returns on education. The consensus is that there exists a positive link between education and performance (Card, 1999; Hartog & Oosterbeek, 2007). These studies, however, are often focused on the rewards of employees, i.e., hourly wage. Directors of banks are not 'standard' employees but have more freedom in decision making and can therefore be seen more as entrepeneurs. Also for this group a positive relation has been documented between education and performance (Van der Sluis et al., 2008).

Restricting our attention to CEOs of banks, King, Srivastav, and Williams (2016) document that there is a positive relation between having an MBA and performance of the bank. The corresponding channel is the riskiness of the business model. Bertrand

and Schoar (2003) show a similar relation between MBA degree and riskiness of the 800 largest U.S. companies. Although there are many people with an MBA degree in our sample we do not expect this reasoning to apply to our sample, because the MBA degrees are incomparable. The degrees obtained by our directors are often part-time post-graduate program, whereas the one or two year full-time U.S. degrees are much more elaborate and intensive.

Based on the labor economics literature we nonetheless expect there to be a positive link between education of the CEO and bank performance.

4 Data

For this paper we relied on three main data sources: the cooperative bank, the national statistics bureau and LinkedIn. In this section we discuss the data and provide summary statistics.

4.1 Bank data

The bank provided annual data on the balance sheet, the income statement, the number of members, the working areas and market shares in three different sectors (residential mortgages, company loans and food- and agriculture) per bank for the period of 2010 to 2015.[2] In addition, we also received information about who was when the CEO of the board of the bank. However, in contrast to the financial data, this part was incomplete and required

[2]Note that the market share data provided for the three sectors is not measured in the same way. The market share in company loans is defined as the number of companies in the working area that perceive the bank as their house bank divided by the total number of companies in the working area. In contrast, the number for the food and agrisector is based on an annual survey on the companies in the working area of the bank. It is defined as the number of surveyed companies in the agri business that perceive the bank as their house bank divided by the total number of surveyed companies in the agri business. The market share in mortgages is based on bank data and data from the cadastre. The market share is then computed as the amount of mortgages issued by a bank divided by the total number of mortgages in the working area of the bank.

further work.

In the period we consider, 41 banks merged. Typically, one bank is the *leading* bank and the other the *liquidated* bank. Figure 3 gives an example.

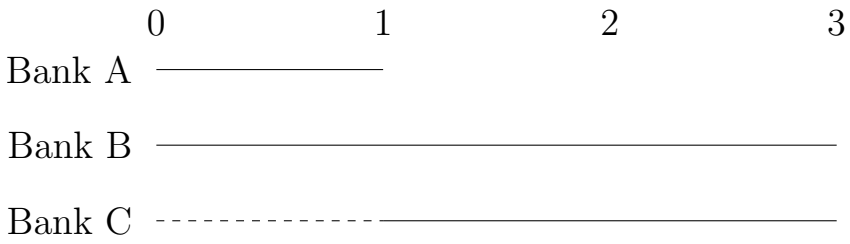

Figure 3. Bank A and bank B merge at time period 1. Bank B is the leading bank and bank A is the liquidated bank. Bank C is equal to the merged entity as of time 1. Before the merger (from period 0 to 1) bank C is equal to the combination of the individual banks A and B.

Suppose bank A is the liquidated bank and bank B the leading bank and the merger takes place at time period 1. Hence, after time period 1 bank A no longer exists and is incorporated in bank B. To assure comparability before and after the merger we define bank C which is equal to bank B from period 1 to period 3. In the pre-merger period, i.e., from period 0 to 1, we artificially 'merged' bank A with bank B to form bank C. Hence, for this period we combine the financial data of bank A and bank B.

For the assignment of a CEO to a bank we applied the rule that the CEO of the leading bank becomes the CEO of the 'combined' bank. Hence, in the above example, the CEO of bank B becomes the CEO of bank C for period 0 to 3.

This procedure results in 106 banks for the period 2010 to 2015. We also requested financial data for the time before 2010, but this data was either not consistent with the data after 2010 or not available.

4.2 National statistics bureau data

As described in section 3.2.3, we proxy for economic activity of a particular working area of a bank. In order to do so, we relied on data from the national statistics bureau. To be precise, we downloaded GDP data on the highest possible level of detail and information about number on inhabitants on neighborhood level.

In 1970, the country was divided in 40 areas by applying a nodal classification system based on commuter flows. That is, each area has a central node (a city) and an area that depends on it. We downloaded the GDP data on this level: the highest level of detail for which the national statistics bureau has data.

Independent of this structure, the country is split up into twelve provinces, where each province consists of several municipalities. For administrative and statistical purposes, each municipality is further subdivided into districts and neighborhoods. On the neighborhood level we collected data for the number of inhabitants.

4.3 LinkedIn data

The previous two data sources cover the bank-, industry- and region-specific variables. However, for bank-specific variables we had to use LinkedIn profiles of the CEOs.

Although the bank provided us with data on who worked when at which bank this information turned out to be incomplete. Therefore, we checked information with the LinkedIn profiles of the CEOs. When the dates did not correspond we relied on the dates provided by the CEOs on their LinkedIn profiles. This cleaned file has then been used to assign the CEOs to banks. When a CEO change took place during the year we assign the CEO who was at the helm for the largest period of the year to the bank. In case a CEO started at the middle of the year, i.e., June 30 / July 1, its predecessor is assigned to the bank-year. Although it is a bit arbitrary we choose this option since we think the new CEO cannot immediately

exercise his influence and therefore the bank actually operates a bit longer according to the predecessor's policies.

For the gender variable we were able to use the data the bank provided us.

Finally, we collect educational information from the LinkedIn profiles of the CEOs. We categorized the CEOs along the following lines:

1. *Education level started with after high school:* Lower vocational education (MBO), higher vocational education (HBO), university degree;

2. *Highest degree directly after high school:* Finishing lower vocational education one receives a MBO-degree. Completing the higher vocational education yields a bachelor's degree. A master's and Phd degree are obtained from the university;

3. *Postgraduate education:* These are part-time degrees obtained during the careers, e.g., an MBA;

4. *Main field of study after high school:*[3]

   i) Accounting, Business, Economics, Finance;

   ii) Engineering;

   iii) Sociology, psychology;

   iv) Law;

   v) Others.

4.4 Summary Statistics

In this section we first discuss the financial variables, i.e., bank-, industry- and region-specific variables. Second, we discuss the CEO-specific variables.

[3]In case somebody did two programs or a combinational program such as Law and Economics, we indicated the person in both categories.

4.4.1 Financial variables

In Table 1 summary statistics of the main financial variables of interest for all 106 banks are presented. The average bank has a RoA of 0.37 percent. Figure 4 shows the number of banks that had a negative average RoA over the five year period. This clearly identifies 2013 as the worst year with 27 banks making a loss.

Table 1. Financial summary statistics of all 106 banks. Total assets are measured in thousand, GDP in million Euro. The other variables are expressed as percentage.

	Mean	Standard deviation	Min	Max
RoA	0.37	0.34	-1.28	1.54
Operating expenses to assets	1.58	0.27	0.81	2.57
Assets	2,714,117	1,340,701	242,596	10,800,000
Mortgages to assets	59.02	8.15	31.86	78.41
Mortgages to loans	99.46	0.31	93.61	99.78
Equity to assets	8.86	2.58	0.47	16.74
Deposits to assets	72.55	9.61	35.99	90.14
Debt to central institution to assets	16.41	10.62	0	61.36
Impaired loans to loans	1.50	0.64	0.15	4.39
Member ratio	26.55	7.55	9.48	56.1
Market share in mortgages	23.49	7.51	8.96	50.52
Market share in food/agri	82.80	7.19	55.56	95.81
Local GDP	6,088	6,957	217	59,766
Number of observations	530			

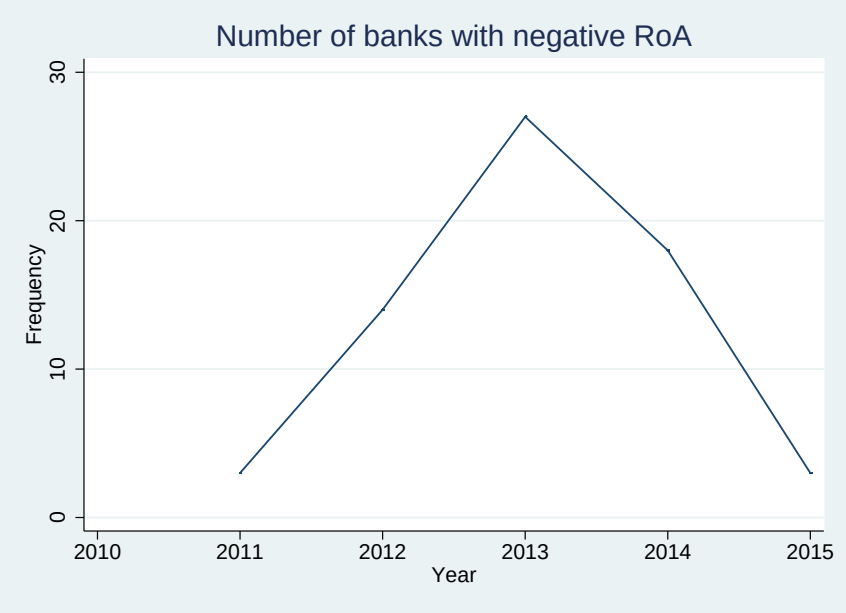

Figure 4. The number of banks with a negative RoA per year.

The operating expense to assets ratio equals on average 1.58%, while the size as measured in assets is 2.7 billion Euro.

As one can see in the fourth row of the table mortgages account for almost 60% of total assets. When mortgages are compared to retail loans instead of total assets they account for 99.4 % (fifth row). Hence, retail loans / mortgages, are the single largest component on the asset side of the banks. On the liability side, equity accounts for almost 9% of the balance sheet. The minimum and maximum values of 0.47% and 16.74% show the large variability between the banks. Deposits (retail and company deposits) account for 73% and the debt to the central institution for 16% of the funding. When looking at the minimum and maximum values, some banks need no funding from the central intitution at all, while others require up to 61%. The number of impaired loans to the total portfolio is 1.5% on average with a minimum of 0.15% and a maximum of 4.39%. What also stands out is the enormous market share of 82% in food and agriculture. Finally, there seems to be large variability in terms of economic activity, that is, some banks clearly have a location disadvantage.

4.4.2 CEO specific variables

In 75 of the 106 banks one succession took place in the period from 2010 to 2015. For six banks the CEOs changed twice.

Eight women were at the helm of a bank at one point in our sample, which amounts to 5.3% of the 152 unique CEOs.

In Table 2 we present summary statistics of the education variables. We focus on the period after high school. Depending on the level of high school education, one can start at one of three levels: lower vocational education (LVE), higher vocational education (HVE) or university.

In addition to the starting level, we distinguish four degree categories obtained directly after high school: LVE-, bachelor-, master- and PhD-degree. The first one can be obtained exclusively from an LVE institution and the third and fourth only from a university. The bachelor-degree can be earned in four years from a HVE and in three years from a university. It is possible to continue with studying at a HVE when one has a LVE-degree. Moreover, a bachelor degree provides access to a master's education at the university. With a bachelor degree from the university one can immediately continue with a master education at the university. By contrast the bachelor degree from the HVE requires an additional (half-)year of pre-master education at the university before being able to continue with a master.

After graduating it is possible to study for a postgraduate degree, e.g., an MBA or the highest accounting degree. These are usually obtained during the working career.

Table 2. Information about the education of bank CEOs gathered from LinkedIn. For numbers on the left side we have educational information, while numbers on the right represent the people for which we do not have information. Hence, from the first block we see that for 129 CEOs there is some educational information available, while no information is available for 23 CEOs. The second block specifies the highest degree CEOs obtained directly after high school and the third block the level with which the CEOs started their education after high school. LVE stands for lower vocational education and HVE for higher vocational education. The fourth block shows whether a CEO obtained a postgraduate degree. Block five denotes the fields CEOs studied in.

	Number of observations	Missing values
Number of CEOs	**129**	**23**
Highest degree after high school	**108**	**44**
LVE-degree	0	
bachelor	48	
master	60	
Phd	0	
After high school started with...	**106**	**46**
LVE	1	
HVE	56	
university	49	
Postgraduate degree	**117**	**35**
CEO with degree	78	
CEO without degree	39	
Field	**99**	**53**
Accounting, Business, Economics, Finance	74	
Engineering	4	
Law	16	
Sociology, Psychology	4	
Others	13	

In the period of 2010 to 2015 there were 129 unique CEOs for which there is some education information. For 23 we do not have *any* information regarding their education, i.e., they do not have profile on Linkedin.

For 108 of the 152 CEOs we know the highest degree they obtained after high school: 48

received a bachelor degree and 60 a master degree. There are no CEOs in our sample for whom the highest degree is either a LVE- or PhD-degree.

For 106 out of the 152 CEOs we have information whether they started with lower vocational education (LVE), higher vocational education (HVE) or university. There was one person that started with LVE and finished HVE, i.e., obtained a bachelor degree. There were nine other people that started with a HVE and obtained a master degree. Finally, one person started with university and obtained a bachelor degree. Hence, the majority, followed the predetermined path, that is, starting with HVE and finishing with a bachelor, or starting with university and finishing with a master.

For 117 CEOs we have information whether they obtained a postgraduate *degree*. Almost all CEOs received education of some kind, ranging from a few courses to a complete MBA. We choose to split these in two groups: CEOs who obtained a postgraduate *degree*, e.g., an MBA, and the rest, e.g., CEOs completing a few courses. This results in 78 CEOs with a postgraduate *degree* and 39 without a degree.

Finally, we categorized the main education after high school in five fields. The majoriy, 74 of the 99, of CEOs have an Accounting, Business, Economics or Finance background. The second largest group consists of sixteen CEOs with a law degree.

5 Results

In this section we present our results. In section 5.1 we start with focusing on the relation between bank performance and financial characteristics. Subsequently, we add CEO-specific variables to our model in section 5.2.

5.1 Financial performance

In order to get an idea about the financial determinants of bank performance we first estimate the following fixed-effects model:

$$RoA_{it} = \alpha + \kappa_t + \sigma_i + \beta X_{it} + \epsilon_{it} \tag{4}$$

The dependent variable is the return on average assets for bank i at time $t \in \{2011, 2012, 2013, 2014, 2015\}$, where the cross-subsidy from stronger to weaker banks is excluded. κ_t and σ_i are time and bank fixed effects, respectively, and α is the constant. X_{it} is the vector of control variables for bank i at time t. We cluster error terms on bank level.

Additionally we use operating expenses to assets as dependent variable, as it is under the direct influence of the CEO:

$$Operating\ expenses_{it} = \alpha + \kappa_t + \sigma_i + \beta X_{it} + \epsilon_{it}. \tag{5}$$

Table 3. We estimate a fixed effects model with the return on assets and operating expenses to assets as dependent variable. Balance sheet and income statement characteristics, local GDP, market shares and member ratio are the independent variables. Time and bank fixed effects are included and the error terms are clustered per bank. We report p-values in brackets under the parameter estimates.

	(1) RoA	(2) RoA	(3) Operating Exp.	(4) Operating Exp.
Log(assets)	0.227	0.228	0.269	0.273
	(0.584)	(0.582)	(0.371)	(0.365)
Mortgages to assets	0.0276***	0.0280***	0.0143***	0.0145***
	(0.002)	(0.001)	(0.001)	(0.001)
Equity to assets	-0.0283	-0.0141	0.0350	0.0439**
	(0.477)	(0.732)	(0.116)	(0.043)
Operating expenses to assets	-0.732***	-0.731***		
	(0.000)	(0.000)		
Impaired loans to total loans	-0.0670	-0.0543	0.0356	0.0437
	(0.249)	(0.358)	(0.181)	(0.103)
Debt to central institution to assets	-0.0148*		-0.00917**	
	(0.100)		(0.023)	
GDP	0.0000634**	0.0000638**	-0.00000139	-0.00000123
	(0.049)	(0.046)	(0.931)	(0.939)
Market share in mortgages	0.160	0.152	-1.216***	-1.220***
	(0.775)	(0.785)	(0.000)	(0.000)
Market share in food/agri	1.198**	1.214**	0.0753	0.0804
	(0.050)	(0.047)	(0.859)	(0.849)
Member ratio	0.437	0.427	0.543**	0.543**
	(0.460)	(0.472)	(0.015)	(0.015)
Total deposits to assets		0.0143		0.00912**
		(0.106)		(0.023)
Observations	530	530	530	530
Bank fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Clustering level	Bank	Bank	Bank	Bank

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Column one and two of Table 3 show the results of equation 4. The only difference between the two versions is the way the liability side is represented in the equation. Column 1 uses the debt to the central institution, whereas column 2 includes deposits.[4]

We conclude that the results do not differ much between specification (1) and (2). In both cases, mortgages have a positive contribution at the 1% level to return on assets, which is what we expected. Most likely this is due to the low default rate of mortgages, which means they provide a steady income for a bank. Similarly, operating expenses are also significant at the 1% level and have the expected negative sign: the higher the costs, the lower RoA. Therefore, we conclude that more efficiently run banks perform better, and the direct negative relation between RoA and efficiency seems to dominate the indirect positive relation between efficiency and additional income. As discussed in section 3.2 this could be a reflection of bad management.

The coefficient of the debt to the central institution variable is negative and significant at the 10% level. This could either be due to a reflection of bad management or higher funding costs. In contrast, equity to assets and deposits to assets do not matter. The size of the local economy influences performance positively, i.e., the more economic activity a bank can tap into the higher RoA. Finally, unlike the market share in residential mortgages, the market share of a bank in the food/agri sector influences performance positively. An explanation could be that loans to food and agri companies are more risky than mortgages, which means that also the return will be higher. To my surprise, impaired loans are insignificant in explaining performance. The sign of the coefficient is in line with the explanation put forward in 3.2 that more impaired loans are costly to monitor.

Column three and four of Table 3 shows the results when we change the dependent variable

[4]One cannot include both since that would result in a situation of multicollinearity as the sum of both variables and equity to assets is equal to one. Nonetheless, as described in section 3.2, we expect that the financing of the liability side matters for performance. In order to check that, we ran both variants.

from return on assets to operating expenses to average assets. We find more puzzling results here than in the RoA regressions.

Mortgages have a positive and significant impact on costs. It is an open question how we can explain this, but it might be more labor intenstive for a bank to give out a mortgage than a company loan. Although the number of meetings with a loan officer could be equal the size of company loans is most likely larger. Hence the cost per euro of loans (company or mortgage) is then larger for a mortgage.
We find interesting results on the liability side. From regression (3) we see that more debt to the central institution implies lower costs. Moroever, regression (4) shows that equity and deposits to assets are positively related to operating expenses.
The market share in mortgages is negatively related to costs, while the member ratio is positively related. Finally, impaired loans and local GDP are insignificant.

5.2 The impact of CEO-specific variables

In this section we use the specification of the previous paragraph and add to these regressions CEO-specific characteristics.

5.2.1 The impact of CEO turnover

In this section we specify an event time model that estimates the effect of CEO succession on financial performance of banks (return on average assets) and efficiency (operating expenses to average assets). We estimate the following two equations for banks with one change in

CEO in our sample period:

$$RoA_{it} = \alpha_0 + \kappa_t + \sigma_i + \sum_{\tau=-4}^{3} \lambda_\tau E_\tau + \beta X_{it} + \epsilon_{it}, \tag{6}$$

$$Operating\ expenses_{it} = \alpha_0 + \kappa_t + \sigma_i + \sum_{\tau=-4}^{3} \lambda_\tau E_\tau + \beta X_{it} + \epsilon_{it}. \tag{7}$$

Adding eventtime dummies, E_τ, to equations 4 and 5, yield equations 6 and 7. The eventtime dummy, E_0, is equal to one in the first year of the new CEO. Similarly, E_{-1} equals one in the last year of the previous CEO. In Table 4 we show a stylized example for a change in CEO at bank A.

Table 4. Variable structure in event time model for a stylized bank A over the full period of six years. Variable 'Eventtime' is zero when the succession from one chairman to the next occurred. The ChangeCEO variable equals zero before the change and one as of the change. Indicator variables E_τ track the years.

Bank	Year	CEO	Eventtime	ChangeCEO	E_{-4}	E_{-3}	E_{-2}	E_{-1}	E_0	E_1	E_2	E_3
A	2011	Mr. X	-1	0	0	0	0	1	0	0	0	0
A	2012	Ms. Y	0	1	0	0	0	0	1	0	0	0
A	2013	Ms. Y	1	1	0	0	0	0	0	1	0	0
A	2014	Ms. Y	2	1	0	0	0	0	0	0	1	0
A	2015	Ms. Y	3	1	0	0	0	0	0	0	0	1

In 2012 a change occurs where CEO Mr. X is replaced by CEO Ms. Y. In the year of the switch, the Eventtime is set to zero. Hence, the Eventtime variable enables to align successions at different banks at (possibly) different times. The ChangeCEO variable is equal to zero before the change and equal to one as of the change. Finally, the eventtime dummies are depicted in the last eight columns and are equal to one at the eventtime corresponding to the eventtime dummy.

In order to illustrate why the eventtime dummies range from –4 to 3 we consider the two

most extreme cases. When a change takes place in the last year of the sample, i.e., 2015, the eventtime for that change ranges from –4 in 2011 to 0 in 2015. Hence for this change the eventtime dummies E_{-4} until E_0 are used. The other extreme occurs when the CEO changes in the second year of our sample, i.e., 2012. The eventtime dummies used for that change then range from –1 to 3.

It is not possible in this analysis to include cases where a 'change' occured in 2011. In order to estimate equations (6) and (7) one of the event time dummies has to be left out. In our case this is the dummy in the last year of the leaving CEO, i.e., E_{-1}. However, in this example this, when a CEO changes in 2011, the event time dummy E_{-1} is zero over the whole period. As a consequence the other dummies are perfectly colinear. Hence there are eight event time dummies being estimated in the regression, ranging from –4 to 3.

The solid line in Figure 5 and 6 plots the event time indicator coefficients λ_τ from equation 6 and 7.

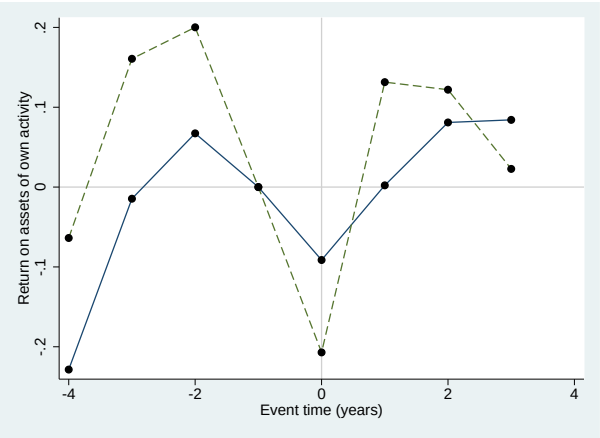

Figure 5. Average rate of return on assets pre and post CEO succession. Succession takes place at event time 0. Event time dummy E_{-1} is left out of the analysis.

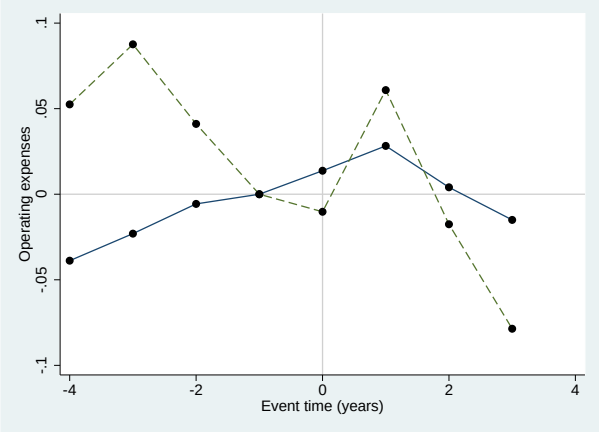

Figure 6. Average rate of operating expenses to assets pre and post CEO succession. Succession takes place at event time 0. Event time dummy E_{-1} is left out of the analysis.

As discussed above the event time dummy in the last year of the leaving CEO, E_{-1}, is left

out and is thus equal to zero. The values depicted in the graphs represent the average return on average assets (or operating expense to assets) in eventtime year τ relative to the average return on average assets (or operating expense to assets) in the year prior to the change.

In Figure 5 we that in the year a new CEO takes over return on assets declines. A possible explanation is that she first needs some time to adjust to the new bank and its environment. On the other hand, she could also use her first years to restructure the bank. This latter conjecture is supported by Figure 6, which shows a jump in costs in the first and second year (event times 0 and 1) of the new CEO.
After the first year the RoA increases and in the third year it is above the level before the change. Similarly the costs start to decrease after the second year.

A possible explanation for these results could be that due to bad results in previous years a CEO is replaced. In case the results bounce back at the time of the new CEO due to good luck, attributing this to the performance of the new CEO is incorrect. In order to mitigate this problem, we redo the analysis for those CEOs that retired in the period of 2010 to 2015. Since an employee of the bank assured us that CEOs at the bank retire at 65 we can use retirement as exogenous variation. In total we identified 14 retiring CEOs. With this subsample we repeated the estimation. The results are represented by the dashed green line in Figure 5 and 6. Comparing the dashed with the solid lines of the previous analysis for the return on assets, we conclude that the overall pattern is similar, but more pronounced for the retirees. However, for the operating expenses the pattern is similar as of the change, but the costs are much higher before the change. This implies that retiring CEOs reduce costs much more in the years before leaving than non-retiring CEOs.

In order to quantify an overall effect of the change of the CEO, i.e., to compare the per-

formance of a bank before and after a change, we estimate the following two regression models:

$$RoA_{it} = \alpha_0 + \kappa_t + \sigma_i + \gamma_1 ChangeCEO_{it} + \beta X_{it} + \epsilon_{it}, \tag{8}$$

$$Operating\ expenses_{it} = \alpha_0 + \kappa_t + \sigma_i + \gamma_1 ChangeCEO_{it} + \beta X_{it} + \epsilon_{it}. \tag{9}$$

These are similar to equations 6 and 7 where the eventtime dummies have been replaced by the ChangeCEO variable (see Table 4).

In Table 5 we report regression output for these regressions. In the estimation we control for the same factors as in specification (1) and (3) of Table 3. These are, however, not reported in the output table.

Table 5. We estimate two fixed-effects regression models where we assess the impact of the change of the CEO on the return on assets and on operating expenses to assets. We control for balance sheet and income statement characteristics, local GDP, market shares, member ratio, and time and bank fixed effects. Error terms are clustered per bank. We report p-values in brackets under the parameter estimates.

	(1) RoA	(2) Operating Exp.
Log(assets)	0.190	0.310
	(0.653)	(0.331)
Mortgages to assets	0.0249***	0.0161***
	(0.006)	(0.000)
Equity to assets	-0.0200	0.0332
	(0.616)	(0.150)
Operating expenses to assets	-0.688***	
	(0.000)	
Impaired loans to total loans	-0.0546	0.0406
	(0.383)	(0.134)
Debt to central institution	-0.0185*	-0.00832**
to assets	(0.074)	(0.046)
GDP	0.0000715*	0.00000187
	(0.080)	(0.909)
Market share in mortgages	0.198	-1.141***
	(0.731)	(0.000)
Market share in food/agri	1.266**	-0.0137
	(0.046)	(0.974)
Member ratio	0.403	0.607**
	(0.524)	(0.015)
ChangeCEO	-0.126***	0.0429**
	(0.002)	(0.038)
Observations	500	500
Bank fixed effects	Yes	Yes
Time fixed effects	Yes	Yes
Clustering level	Bank	Bank

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In the first regression we see that when a CEO takes over the results drop significantly at the 1% level. In economic terms this means that changing a CEO reduces the return on average assets with 0.126%. This represents 34% of the average RoA of 0.37% as reported in Table 1. In the second regression, where the dependent variable changes to operating expenses to assets, we report a significant increase of 0.043% in costs after a CEO takes over. Hence the decrease of the return on assets is for $\frac{0.043}{0.126} = 34\%$ explained by an increase in the operating costs.

Although the results improve and costs decrease as of the third year after a CEO takes over (see figures 5 and 6), overall the new CEO performs worse and has higher costs than his predecessor. Possible explanations for this decrease in performance is that the new CEO has to adjust to the bank, its people and the local community. Alternatively, the new CEO restructures the bank and 'clean-up' the heritage of the leaving CEO.

Moreover, we note that for both specifications the signs and signficance of the remaining variables is almost exactly the same as reported in Table 3. Only the GDP variable in the RoA regression is no longer significant at the 5% level, but at the 10% level.

5.3 Impact of education and gender on performance

In this section we assess the impact of education and gender on the performance of a bank. Based on the data we gathered from LinkedIn the following four education variables are defined:

Graduate degree Dummy variable that is one in case a person has a master's degree. A person with a bachelor's degree has a value equal to zero;

Started with HBO Variable that is equal to zero when somebody started with lower vocational education (MBO) after high school, equal to one when started with higher vocational education (HBO) or equal to two when started with university;

Postgraduate Education Dummy variable that is one in case somebody holds a postgraduate degree. The variable is zero for someone without a postgraduate degree;

Economics degree Dummy variable that is one in case somebody studied either Accounting, Business administration, Economics or Finance. For other studie the dummy equals zero.

In addition to the education variables we also define a dummy variable, *Female*, for gender: female CEOs are denoted with 1 and male CEOs with 0.

In Table 6 we report the results of the fixed effects regression with RoA as dependent variable when we add the education variables, specifications (1) to (4), and the gender variable, specification (5). Furthemore in Table 7 we repeat the analysis for the operating expenses to assets as dependent variable.

In all eight regressions none of the education variables is statistically significant. Hence, apparently, education is not a determinant of financial bank performance for a bank. Moreover, the estimate of the gender variable is not significant either.

Table 6. Estimation results when adding educational variables and gender to equation 4 with return over average assets as dependent variable.

	(1) RoA	(2) RoA	(3) RoA	(4) RoA	(5) RoA
log(Assets)	-0.0956	-0.273	0.627	-0.134	0.225
	(0.895)	(0.712)	(0.139)	(0.863)	(0.596)
Mortgages to assets	0.0242**	0.0219**	0.0383***	0.0265***	0.0276***
	(0.011)	(0.029)	(0.000)	(0.007)	(0.002)
Equity to assets	-0.0623	-0.0687	-0.00822	-0.0792	-0.0283
	(0.227)	(0.183)	(0.864)	(0.175)	(0.478)
Operating Expenses	-0.735***	-0.736***	-0.729***	-0.765***	-0.732***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Impaired loans to total loans	0.0379	0.0409	-0.0413	0.00790	-0.0670
	(0.699)	(0.663)	(0.522)	(0.935)	(0.250)
Debt to central institution to assets	-0.0210**	-0.0213**	-0.0194*	-0.0205**	-0.0148
	(0.029)	(0.035)	(0.072)	(0.047)	(0.106)
GDP	0.000109**	0.000110**	0.0000986**	0.0000983**	0.0000634**
	(0.012)	(0.015)	(0.017)	(0.035)	(0.049)
Market share in mortgages	1.160*	1.147	0.371	0.768	0.162
	(0.087)	(0.103)	(0.615)	(0.308)	(0.776)
Market share in agriculture	1.111*	1.166*	1.145*	1.104*	1.200*
	(0.068)	(0.054)	(0.060)	(0.097)	(0.052)
Member ratio	0.269	-0.212	0.551	0.218	0.436
	(0.708)	(0.784)	(0.415)	(0.772)	(0.461)
Graduate Degree	0.00193				
	(0.975)				
Start Position HBO		0.00423			
		(0.949)			
Postgraduate Education			-0.0342		
			(0.592)		
Economics degree				0.0459	
				(0.337)	
Female					0.00276
					(0.946)
Observations	395	388	421	362	530

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7. Estimation results when adding educational variables and gender to equation 4 with operating expenses over average assets as dependent variable.

	(1) Op. Exp.	(2) Op. Exp.	(3) Op. Exp.	(4) Op. Exp.	(5) Op. Exp.
log(Assets)	0.166	0.267	0.174	0.157	0.271
	(0.639)	(0.422)	(0.554)	(0.640)	(0.357)
Mortgages to assets	0.00984**	0.0107**	0.0135***	0.00943**	0.0143***
	(0.043)	(0.024)	(0.001)	(0.035)	(0.001)
Equity to assets	0.0511*	0.0570**	0.0525**	0.0565**	0.0350
	(0.068)	(0.030)	(0.032)	(0.042)	(0.117)
Impaired loans to total loans	0.0508	0.0359	0.0296	0.0561**	0.0356
	(0.109)	(0.252)	(0.317)	(0.048)	(0.182)
Debt to central institution to assets	-0.00597	-0.00429	-0.00427	-0.00299	-0.00921**
	(0.182)	(0.323)	(0.300)	(0.480)	(0.020)
GDP	0.00000219	0.00000596	-0.00000683	0.0000148	-0.00000139
	(0.932)	(0.782)	(0.790)	(0.466)	(0.931)
Market share in mortgages	-1.086***	-1.130***	-1.309***	-1.097***	-1.218***
	(0.004)	(0.003)	(0.000)	(0.004)	(0.000)
Market share in agriculture	0.122	0.141	0.200	0.156	0.0726
	(0.774)	(0.733)	(0.610)	(0.708)	(0.862)
Member ratio	0.652*	0.682***	0.822***	0.652**	0.543**
	(0.068)	(0.007)	(0.005)	(0.016)	(0.015)
Graduate Degree	-0.00153				
	(0.965)				
Start Position		0.00879			
		(0.807)			
Postgraduate Education			-0.0306		
			(0.331)		
Economics				-0.000193	
				(0.995)	
Female					-0.00282
					(0.951)
Observations	395	388	421	362	530

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

At this point we first want to discuss the two endogeneity issues we have with the education regression. Subsequently, we discuss how big the problem would be for our sample of bank CEOs.

The two issues that apply to our set-up are:

Omitted variable bias (OVB) One can think of variables that affect both performance and education and are, in addition, unobserved. Ability for instance is an example. It affects not only the amount and type of education one acquires, but also the performance as bank manager later on. Furthermore, the more able I am, the more easily will I grasp complex relations which most likely translates into smarter decisions when it comes to, for example, granting loans.

Reverse causality In the context of this study, reverse causality could also be an issue. Assume CEO X who currently runs bank A has only a lower vocational degree. Due to an external shock, some companies in his working area run into problems, which puts bank A in distress. Since 'bad luck' is difficult to prove, an internal evaluation might come to the conclusion that the weak performance is due to mismanagement, which in turn could be attributed to his low level of education. As a result, the supervisory board of bank A decides to replace CEO X with another, but this time better qualified (at least in terms of education) CEO. When the performance of these companies improves due to good luck in the next years, the pressure on bank A alleviates as well. Without knowing the exact reasons that caused the slump in performance, the improvement would be attributed to the new CEO and his higher level of education.

The question is how big these two endogeneity problems are. We argue that the OVB problem is limited as the people that are currently CEO or in the pool of potential CEO candidates are similar in many respects. The pool of candidates comprises:

1. **Idle CEO:** Since a lot of mergers took place over the last years, there is an abundance of 'idle' CEOs

2. **Promotion:** It could be that a director of the bank's board gets promoted;

3. **Fresh blood:** A bank appoints a CEO from outside the company. However, an employee of the central institution assured us that this (almost) never happens.

Therefore, this pool of potential CEOs, i.e., groups 1 and 2, essentially consists of people already working for the bank for a long time. As this probably also holds for current CEOs these groups would to a large extent be similar. One can think along the following lines:

1. **Past performance:** One would expect that CEOs excelled in their previous jobs;

2. **Experience:** A person who recently graduated from a university will probably not be considered for the CEO job. Years of experience in banking are necessary;

3. **Agreeableness:** The person has to be socially skillfull in order to lead the bank and network with people in- and outside the bank. This especially holds for a cooperative bank with its emphasizes on the local community;

4. **Ambition / motivation** It will not be easy to reach the CEO position without ambition and motivation;

5. **Ability / Education:** People that climb the hierarchy will continuously receive on the job training, or, at some point, even do a full postgraduate degree. In case they would not excel on these tests, then they would not be promoted any further. Moreover, as the LinkedIn research has shown, the bank sends its employees only to a handful of postgraduate institutions, which means, they all run through the same programs, which makes them even more uniform.

Therefore, we argue that the CEOs are likely to be a homogeneous group, which alleviates concerns of OVB.

The problem of reverse causality, however, remains on the table. Firstly, we could use a dynamic panel set up where the lagged dependent variable is added as independent variable (Arellano & Bond, 1991). This would, however, further reduce the number of observations as we would lose another year.

Alternatively, we could try to find instrumental variables (IV). We then need to find a variable that is (strongly) correlated with the endogenous variable, i.e., education, and on the other hand, influences performance only through education. A potential IV candidate could be birth order. Black, Devereux, and Salvanes (2005) investigate the effect of birth order on educational outcome of children. They find that the higher the birth order the lower the educational attainment. Hence birth order would qualify as IV, since it is strongly related to education, but does not directly influence performance of a bank.
In a survey, which is currently being carried out, birth order is one of the questions.

6 Conclusion

In this paper we assess whether CEO turnover, his or her education and gender impact the performance of a cooperative bank. By controlling for bank-, industry- and region-specific characteristics and moreover including time- and year-fixed effects, we find that a chanage in CEO has a negative impact on performance of the bank. The return on assets declines on average with 0.126%, which represents 34% of the average return on assets. Education and gender do not have an impact on bank performance.
When we relate bank performance to bank-, industry- and region-specific characteristics we find that performance is positively related to operating efficiency, mortgages to assets, local GDP and market share. However, funds provided by the central institution are negatively associated with bank performance.

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