

# Are SMEs driven by a Manager from a Minority more Financially Constrained? French evidences

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## Abstract:

The paper investigates the financial constraint of French SMEs run by minority CEOs. We use two characteristics to identify minority: gender and ethnicity. Our results suggest that firms run by female CEOs have cash flows sensitivity of cash holdings not significantly different from male CEOs. On the other hand, SMEs with CEOs with a foreign first name, especially a Muslim first name, suffer more from financial constraint than others SMEs. When we cross the results with the type of the main bank (relational versus transactional), the effect is even stronger when the main bank is a “relational bank”. This suggests that inter-personal relations in SME’s bank increase the bias.

Key words: Financial Constraint; Relationship Banking; Cash Holding; SMEs; Cash Flow Sensitivity; Discriminations Bias

JEL Classification: G21; G32

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## Section 1. Introduction

Since the seminal work of Gary Becker on discrimination (1957)<sup>3</sup>, the topic that appeared to be political or sociological had entered the field of the economy and management and started a new stream of academic work. Discrimination can be the unjust or prejudicial treatment of different categories of people, especially on the grounds of race, age, or sex. By definition it affects minorities. Our paper focus on CEOs with minority characteristics, especially two of them, the gender and the ethnic origin. While female are not minority since they represent half of the human population, they still are under-represented in the CEO sub-group. In this paper, we study whether having a CEO with a minority characteristic significantly impact the financial constraint of the firm. We define the financial constraint following Almeida et al (2004) measuring the cash holdings to cash flows sensitivity.

In many countries the Law tries to fight the negative treatments on minorities. In the US, the affirmative action guarantees the access to jobs, universities, and even capital to minorities. A CEO from minority can also apply for the Minority Owned Enterprise status to get a priority access to certain federal contracts and also some funds. In France such a preferential policy doesn't exist because it would contradict the principles of color blindness of the French republic. But in the same time, gender equality is promoted through parity law in the elections and also in the firms' board of directors.

In the US context, the racial variables are available and it allows a direct test of theories and hypothesis. In this paper we focus on two manager characteristics, gender and ethnicity and their impact on the overall financial constraint. Financial constraint is a critical factor because limited access to capital makes the undercapitalized firms more likely to fail (Fairlie and Robb, 2008). Moreover we choose to work on France, because the assimilation ideology of the driving French institutions forbids ethnicity or racial statistics. The idea is that everyone is equal in regards of the Law, the rights and duties. In France, gender discrimination

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<sup>3</sup> The Beckerian "taste based discrimination" (1957) was soon complemented by a "statistical discrimination" documented by Arrow (1973).

is tackled by the law and for instance there is a Ministry for the Defense of Women Rights. But racial or ethnical discrimination are simply ignored. The French setting provides an interesting case where we can test what happens in a context where nothing is officially done to cope with an issue (ethnic minority) while on the other hand there are policies to fight discrimination (female).

Because discriminations target mostly individuals, most of the research focuses on individual interactions such as employment, wages, access to mortgages, and access to consumer loans. There is a growing body of papers looking at the potential discrimination of persons connected to a more complex institution, i.e. managers of funds, entrepreneurs running a business. In our paper, the potentially discriminated persons are managers or CEOs of small and medium firms. We look at a firm status, the financial constraint, which should be related only to rational economic factors. The impact of the CEO is not neutral on the firm, as the rich literature on the CEO characteristics shows. But biological characteristics such as gender and ethnicity should not matter. There is a moral reason in that: people do not choose these characteristics, they cannot be judged based on that.

We postulate that everything else being equal, any manager should perform equally regardless his or her minority characteristics. To test that, we compute the financial constraint measure of Almeida et al. (2004) and regress on several variables including minority characteristics such as, gender, and ethnicity. This measure captures the global constraint not just the credit rationing. Therefore it is not affected by the self-selection bias. Indeed, one could argue that the discrimination might push part of the managers to turn their back on credit anticipating a refusal. The strength of the measure is that it reflects the overall financial constraint. We find no effect of the gender on the financial constraint. The most striking result is the effect of the ethnicity factor. Following studies in sociology, we approach the ethnicity by categorizing the first name of the CEO. We used a database to find the closest cultural or religious family for each first names

and when there was a doubt or when the first name was too “international” we dropped the observation<sup>44</sup>. The factor has a significant impact on the cash to cash flow sensitivity. The effect is driven by the “Muslim” nature of the first name. We do not measure directly the access to credit since we use a global financial constraint. But further tests give evidence that discrimination may work through the credit. The effect of the Muslim first name is even stronger when the bank is known as a relationship bank as opposed to the transactional banks. Because the relationship banking is built on a strong inter-personal link between the loan officers who rely more on “soft information” and the entrepreneur, discriminations can more easily affect the loan decision.

The rest of the paper is organized as follow, in the section 2 we review the related literature and we propose our two hypotheses, the section 3 presents the data and our methodology. Then in section 4 analyze the results. The fifth section concludes.

## **Section 2. Literature and hypotheses**

### **2.1 Financial constraint and discrimination**

Before the seminal work of Becker (1957) economists paid little attention to discrimination in the decision making process. As mentioned in the quote from the Noble prize lecture, self-interest and profit maximization cannot explain why individuals might refuse to work and interact with others based on non-economic factors. It is necessary to broaden the assumption. This is why Becker (1957) proposed a model to explain the “taste based” discrimination. Even if it appears more neutral than the “taste discrimination”, “the statistical discrimination” (Arrow 1973) is also banned as a business practice in many countries.

The literature on gender is also rich and counts many papers. Some papers might help explaining the differences in treatment of women and men as rational answers to “real differences”, for example, some

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<sup>44</sup> Very few observations are dropped due to that reason.

studies shows that women are more risk adverse (Powell and Ansic, 1997). Belluci et al. (2010) uses a unique proprietary database to study the impact of the gender of entrepreneurs and the loan officer in the credit decision. They find that female loan officers are more risk adverse (or less self-confident) and therefore restrict credit to borrower with less information available. This shows that loan officer's preferences does matter in a credit decision. They also find that female entrepreneurs are more credit constrained but when they get a loan, they are charged the same amount of interest as the male entrepreneurs. Alesina et al. (2013) found that female entrepreneurs pay higher interests than males *ceteris paribus*, but they do not take into account the loan officer gender. Niessen-Ruenzi and Ruenzi (2017) run several test using regressions as well as experimental tests to show that female fund managers are worse treated and their performance are affected by the discrimination bias rather than "biological" explanation. In Kumar et al. (2015) the authors show the impact of the first name in fund flows. Both regressions and experiments converge to show that "foreign first name", from the view point of US investors are associated with prejudice that bias the investor decision in money allocation among fund managers. So, female and foreigner minority suffer from discriminative treatment based of taste preferences rather than rational choice.

The U.S Small Business Administration issued a survey conducted by Robb Alicia (April 2013) assessing the issues faced by women and minorities when running their business. The survey uses the Kaufmann Firm Survey and shows that minorities and women have a difficult access to external capital and therefore rely more on owner's capital. Fairlie and Robb (2008) found that undercapitalized firms had lower sales, profit and employment which could explain the high failure rate. The human capital factor is also a significant explanatory factor for the failure rate. In the United States and the U.K ethnicity statistics are available and many researchers have used this variable to study social issues such as education, crime, health, and wages. Cavalluzzo et al (1999) have worked on searching the sources of differentials across the firms and their owners. After taking into account several factor and minimizing the risk of missing factors, they

analyze the credit application and denial but the authors also have access to data on owners who didn't ask because they expected a denial. They find that Hispanics and African Americans report a statistically higher credit rationing (they receive less than what they declare they need or credit are denied), and also a statistical significant difference in avoiding an application. Cavalluzzo and Wolken (2005) find results in the same line using a newer survey. They have the possibility to control for personal wealth and despite this factor, discrimination remains and is stronger in area where the lender concentration is higher, suggesting a Beckerian preference taste. In our paper, the global financial constraint allows us to endogenize the personal wealth which is an alternate external finance available.

In France such categorization is prohibited. Boyez and Blazy (2013) investigate the survival rate of start-up looking at characteristics concerning the founder and among them the gender and the nationality. They found that non-French and non-European founders have a significant lower rate of survival. They interpret it as a form of discrimination because the result hold after controlling for typical risk factors. Our paper furthers this analysis by looking at the financial constraint faced by firms run by potentially discriminated CEOs. We also differ from the Boyez and Blazy (2013) in the choice of the ethnicity factor because following the practice in sociology and the proxy from Kumar et al (2015), we use the first name to identify minorities instead of the nationality. Our proxy captures both the non-French managers and the French managers with immigrant heritage. Sociological works as well as terminology shows that stigmatization doesn't stop with the citizenship. Children and grandchildren of non-European immigrants are still considered as "outsiders" and subject to discriminations and prejudices. Another major difference with Boyez and Blazy (2013) is our focus on SMEs while they work on start-ups. Our sample covers firms from all industries matching the European Union SMEs' criteria. Our sample firms have on average more tangible assets, are larger (but not too large) therefore they are not the natural ground for venture capital.

To be the best of our knowledge our paper is the first to test discrimination's impact on the financial constraint. Bertrand J (2016) also explore the discrimination bias in relationship lending using a sample of SMEs from the Survey of Small Business Finances 2003 in the US context. Our paper differs in the fact that while he's using a survey that points out credit rationing, we highlight the overall financial constraint. If there is no discrimination bias (our null hypothesis), everything else equal, the manager characteristics such as gender and ethnicity should not matter when it comes to accessing the capital. Therefore the financial constraint defined as the sensitivity of the cash to the cash flow should not be affected by factors such as gender, age and ethnicity.

Hypothesis 1: SMEs with a potentially discriminated manager are more financially constrained than those without such manager.

## **2.1 Financial constraint and main bank organizational structure**

There are two facts that can be stated about the SMEs: most, but not all, SMEs can get their external finance through bank loan (Berger and Udell, 1998) and their relative opacity would make them connect to decentralized banks (Stein, 2000). The following points are explained below. This offers an interesting setting to test the impact of financial constraint when interacting with a decentralized versus a centralized bank.

Discrimination bias is based on how much a person deviates from a rational choice due to personal preferences. Therefore the impact of this bias is related to the intensity of interpersonal relations. Because relational financing implies soft information collected through interpersonal relation between the loan officer and the manager or the CEO<sup>5</sup> as opposed to transactional financing based on hard information

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<sup>5</sup> We are studying SMEs so, the CEO is more often involved in loan negotiation.

(more quantitative), we can assume that CEOs dealing with relational banks are more exposed to the discrimination risk. The characteristics of these firms also deny them access to capital markets (Berger and Udell, 1998). Therefore, most of the financial constraint can be explained by the access to bank credit. The CEOs then faces a choice between: developing a link with a relationship bank's loan officer or trying the arm's length financing.

To proxy the relationship lending, we consider the organizational structure of the firm's main bank following the propositions of the model from Stein (2002). Stein (2002) shows that decentralized banks are more efficient than centralized ones in supplying relationship credit. In the decentralized banks the lending decision is delegated to the loan officer, while in centralized banks, the loan officer follows standardized rules set up by a hierarchy. The key element for credit decision is the information that the bank's loan officer collects through the interaction with the firm manager. The information can be either "hard" or "soft". The hard information is quantitative and easily ascertainable such as certified accounts or track records or credit scoring. The soft information is qualitative. It's the result of a personal processing of tangible facts, but combined to opinions, tacit knowledge and other elements not formally defined (Petersen, 2004). The transmission of hard information to upper levels in the hierarchy is cheap while the transmission of soft information to a player who did not take part to the construction of the soft information is very costly. Stein (2002) model's shows that it is optimal form centralized banks to process hard information while decentralized bank will process/produce soft information. This soft information is the basis of relationship lending. It is more frequently supplied by decentralized banks. Empirical studies provide evidence in line with these theoretical assertions. Cole et al (2004) reports that big banks use more standardized process to analyses SMEs credit request whereas small banks use more subjective component in their decision process. Scott and Dunkelberg (2005), Scott (2006) and Uchida et al (2006) notice that bank loan officer rotation reduce credit availability for opaque firms because when a loan officer leaves the stock of soft information about the firm disappear. Berger et al. (2001) in Argentina, and



Hajj Chehade and Vigneron (2008), in French context, provide evidence that centralized banks ration more frequently opaque firms than decentralized ones.

For a CEO of an SME, the relationship banking is the best choice on the long run. But for a potentially discriminated CEO, there is a chance to face a refusal based on discrimination, while going for a transactional bank with standardized procedure processing hard information reduces that risk. The issue with the transactional banks is that without sufficient hard information, the credit conditions might be tougher than with a relationship banks. The choice between the two banks is a tradeoff.

If there is no discrimination bias, there should not be any difference related to the type of bank the firm is dealing with. But if there is a discrimination bias, it should appear more frequently in decentralized banks where the discrimination bias loan officer can be diluted with the soft information. We note that in a Beckerian definition of discrimination, the taste does not need to be related to the loan officer. The loan officer's might try to anticipate the taste preference of his or her hierarchy or even the taste preference of consumers and therefore infers that the business might fail because the customers will shy away from the firm. Discriminations is the product of an interpersonal relation between two individuals. In our case, even if we have a bank and a firm, the link is built through the interaction between two individuals (the loan officer and the CEO. Because of the regulation prohibiting the use of ethics statistics or gender statistic in scoring models, we assume that the room for personal taste will be lower with centralized banks than in the context of decentralized banks.

This leads us to propose the hypothesis 2.

Hypothesis 2: SMEs with a potentially discriminated manager connected to decentralize/relational banks are more financially constrained.

## **Section 3. Data and methodology**

### **3.1 Sample selection**

In order to conduct our investigations, we use the DIANE database<sup>6</sup>. First, we download all the firms meeting the European Commission's criteria to identify SMEs in 2011. We obtain a sample of about 45 000 firms with 10 to 250 employees, and realizing a turnover of 2 to 50 million Euros or with a total assets of 2 to 43 million Euros. Then, we filter the firms for which we are not able to identify the main bank and manager's gender, age and origin. Finally, we drop the firms missing two consecutive 12 month accounting periods. After applying these filters, we get a panel of 27 620 SMEs observed over the 2003-2012 period (details about our sampling procedure are in ANNEXE 1).

Table 1 reports the summary statistics about these firms. Our minority variables are gender and foreign origin of the first name, but we will also take into account age because it is an important control variable. 57% of them are engaged with a decentralized main bank. They are generally smaller, younger, perform better and have a more important financial debt ratio than those working with a centralized main bank but they are not different from them in term of risk (see Panel A). On the total sample, we can notice only a small proportion of firms that are run by a manager belonging to a potentially discriminated group. 8.7% are run by a female managers. 5% are run by an under 30 years old manager. 11% are run by a manager identified as with foreign origin. In this group, the majority are from a Western European country. Only 1.55% of the total sample is identified as with a no Western origin. Nearly 1% of the managers are classified as Muslim. These last two categories are considered as the most potentially discriminated because of

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<sup>6</sup> Edited by Bureau Van Dick (92, rue de Richelieu 75002 PARIS).

negative ethnic prejudice or racism. A quick analysis of firms' characteristic for these groups provides evidences in line with this statement. They are smaller, younger, they perform better and they are as risky as the rest of the sample, but they have a less important financial debt ratio. This independent difference does not appear to be related to the organizational structure of their main bank. Panel B displays information about sectorial repartition of potentially discriminated firms because of manager gender, age or ethnicity. It does not seem that they are concentrated in a particular type of activity.

Table 2 describes the proportion of firm working with a decentralized bank versus a centralized bank considering different types of manager characteristics (potentially discriminated or not). We do not notice a significant difference in main bank choice between firms run by a male or a female manager. However, we report a more frequent relationship for firms run by young manager with decentralized main banks and for firms run by foreign origin manager with centralized ones. It appears that young manager can more easily benefit from relationship banking than foreign ones. Those last have less possibility to use this mechanism to deal with asymmetric information problems. As a result, they may have more difficulty to access credit and may be more financially constraint.

### **3.2 Variable definition and econometric specification**

To measure financial constraint, we adapt Almeida et al. (2004) seminal work to SMEs' context. This methodology is based on cash-flows sensitivity of cash. The rationale is that saving cash is costly for firms but has the benefit to allow funding future projects in a context of anticipated financial constraint. The cost of cash saving lies in the reduction of the amount of resources that firms can today dedicate to positive NPV projects. For financially constrained firms, it allows to catch future opportunities. Their optimal cash policy is designed as a balance between values of current investment opportunities and anticipated values of future ones. As a result, financially constrained firms regularly need to adjust their cash holding level in order to fulfill future lack of resources. These adjustments depend on their ability to generate cash. In this

context, the cash-flows sensitivity of cash, i.e. the link between cash holding variation and cash flow, is positive. For unconstrained firms cash saving policy is undetermined. It does not depend on the balance between current and future investment opportunities. The link between cash holding and cash flow is neutral.

To test the hypothesis 1 and its different variations, we estimate the following model.

$$\Delta Cash. hold_{i,t} = \alpha + \beta_1 C F_{i,t} + \beta_2 Man. Charac._i + \beta_3 C F_{i,t} \times Man. Charac._i + \beta_4 Inv. Op._{i,t} + \beta_5 Size_{i,t} + \beta_6 \Delta S.T. Debt_{i,t} + \beta_7 \Delta W.C._{i,t} + \beta_8 Inv._{i,t} + \varepsilon_{i,t}$$

Manager characteristics are fixed along the entire study period. As a result, we use random effect panel regression models estimated by GLS in order to fully exploit the panel structure of our data. Coefficients' standard deviations are obtained through Hubert-White robust variance-covariance matrix estimation method considering firms' level clusters.

The cash holding variation ( $\Delta Cash. hold_{i,t}$ ) is the difference between the ratio of the sum of cash and marketable securities over total asset in t and the same ratio in t-1. The cash flow ( $C F_{i,t}$ ) is the earnings before interest and depreciation minus the dividends normed by the total asset.

We study two different sources of discriminations related to manager characteristics ( $Man. Charac._i$ ): gender and ethnicity, but we give a peculiar care to "age" as it is an important control variable. For age, we consider only one groups of potentially discriminated manager the younger ones (less than 30 years old). We do not consider the older ones (more than 60 years old) as a potentially more financially constrained group because on average they have a higher level of personal assets. For gender, we build a dummy variable taking the value one if the firm manager is a woman. For ethnicity, because ethnic statistics are not allowed in France, we do not have a direct observation of the manager's membership of

a potentially discriminated group based on such criteria. In order to approximate it, we use the manager's first names origin. We identify the managers which have no French first names as potentially discriminated that we qualified as with "foreign" origin<sup>7</sup>. We used a name database to identify the origin of the first name. When the first name was used in many countries with different cultural and religious background, we just ignored those observations. To be more precise in our investigation, we split this group in different categories of foreign origins. We consider three subgroups of foreign origin managers: those which have only European first names (Anglo-Saxons, German, Nordic, south of European or from Belgium, Netherlands or Suisse land); those which have only Oriental first names (Asian, Russian, East European, African, or Muslim); because of the important negative stereotypes from which Muslim suffer in France, we specifically consider a sub-group for them. Each group or sub-group is coded by a dummy variable. In order to identify the specific effect of manager characteristics on SME's cash-flows sensitivity of cash, we use interaction variables between cash flow and manager characteristics dummies.

Investment opportunities ( $Inv.Op_{i,t}$ ) are estimated the growth rate of the total sales in firm's sector identified by the NAF2 revised classification in t+1. In SMEs' context, we cannot use Tobin's Q as in original Almeida et al (2004)'s specification because of the lack of market data.

We use the typical control variables of the cash holding studies. The first one, firm's size ( $Size_{i,t}$ ) is included to take account of economies of scale in cash management. We measure it by the natural logarithm of the firm's total asset. Other variables are included to consider alternatives sources and uses of funds. So we add to the specification three elements: the variation between t and t-1 of the firm's short term debt over total asset ratio ( $\Delta S.T. Debt_{i,t}$ ); the variation over the same period of its non-cash working capital over total asset ratio; its capital expenditures over total assets the ratio.

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<sup>7</sup> Choosing the first name instead of the nationality has a benefit since it allows capturing the French with foreign heritages. The drawback is that we miss the ones using a French name for a better assimilation in the French culture. Whether this category is discriminated or not is a rich question we won't be able to explore in our research design.

To test hypothesis 2 and its different variations, we run the same regression over two different subsamples: the firms working with a decentralized main bank (local banks, mutual banks, saving and loans) and those working with a centralized one (big banks, foreign banks).

#### **Section 4 Results**

Table 3 presents the summary statistics about the level of cash-holding in our sample after we classified them into categories of potentially discriminated CEOs based on their manager characteristics: gender, age and ethnicity. Those statistics are provided for the total sample and for subgroups defined according main bank type. It shows that SMEs hold around 15% of their total assets in form of cash or marketable securities. Almieda et al. (2004) have reported the same kind of values for constrained firms in US context. The level of cash-holding appears to be more important for most of potentially discriminated firms: those run by female and young manager. For firms run by foreigners, things are more complex. Considered as a single group, they have a lower cash-holding level, but this result hides some important differences related to the manager's origin. Firms run by Europeans foreigners (largest category of foreigners) drives this result. For firms run by a manager with an oriental first name and more specifically those run by a Muslim, we report the opposite. These results are in line with the hypothesis of a more pronounced financial constraint problem for potentially discriminated firms. To prevent future loses and difficulties associated with the lack of external funds, they accumulate more cash and marketable securities than the others. European foreigners do not appear to behave like people who are discriminated in this context.

Table 4 presents the results obtained from the estimations of our baseline regressions for each group of potentially discriminated firms because of their CEO's gender, youth or foreign origins. In the three cases we report positive sensitivities of cash to cash-flow. The estimates vary between 0.0683 and 0.0790 and are all statistically significant at a better level than 1%. SMEs appear to be financially constraints.

Interaction variables are only significant for young CEO and for foreign origin ones. SMEs run by female do not appear to be treated differently in term to access to external funds. Cash-flow sensitivity of cash for firms ran by a less than 30 years old manager is 0.1412 (0.0683+0.0729) against 0.0683 for the other SMEs. Financial constraint is two time higher for this firms. This report is clearly in line with our first hypothesis. Young are negatively treated. For firms ran by foreign origin CEO things are to be different. They have a less important of sensitivity of cash to cash-flow 0.0482 (0.0790-0.0308) against 0.0790 for other SMEs. They appear to be positively treated or have larger access to funds. This report does not fit with a discrimination based on ethnicity. However as we previously discussed in summary statistics comments, this group is not homogenous. The biggest part of its members is composed of Western European people who are not the more probably discriminated ones.

Growth opportunities coefficients are positive and significant with a value of 0.045 in the three estimated models. This result is consistent with the presence of financial constraint in SMEs context. Other control variables also have the expected signs. We notice the relative importance of the variation of working capital which is significantly and negatively correlated with the cash-holding variation.

Table 5 reports results we obtain splitting foreign origin CEOs category into three groups of origins: Western European people, Oriental and Muslims ones. Interaction variables analysis shows that it's clearly the first category which drives the less important financial constraint problems for foreigner report in table 4. Cash-flow sensitivity of cash for SMEs with foreign Western European is lower than for other SMEs. Estimate coefficient is 0.0461 (0.0789-0.0328) against 0.0789 for other firms. This category of foreigners does not seem to suffer from a particular form of discrimination to access external funds. For firms ran by CEOs with Oriental or Muslim first name, the situation is very different. The estimate of cash-flow sensitivity of cash is higher than for other SMEs: 0.1396 (0.0684 + 0.0712) against 0.0684 for not western European (oriental) and 0.1517 (0.0686+0.0831) against 0.0686 for Muslim. These last reports are clearly

in line with discrimination in external funds access based on ethnicity. SMEs ran by CEO have to keep a more important cash-holding level and more regularly adapt it to cash-flow in order to avoid future loses of investment opportunities.

In table 6 and 7, we replicate the analysis considering subgroups of firms engaged with a decentralized or centralized main bank. This allows us to evaluate our second hypothesis. As for general case, we do not report evidences of significant differences in financial constraint level between firms ran by male or female CEO whatever the type of main bank they work with. For SME ran by young CEO working with a centralized main bank increase cash-flow sensitivity of cash. We report a positive and significant interaction coefficient in this context and not for those working with a centralized main bank. Estimate of cash sensitivity to cash-flow is 0.1534 (0.0451+0.1083) for young CEO with centralized main bank against about 0.1097 for those with decentralized ones. For foreign CEO, main bank choice appears to be as important as for young ones. Foreign ran SMEs working with a decentralized bank are more financially constraint. Interaction variable is positive and significant in this context. Cash-flow sensitivity is 0.1144 (0.1122+0.0022). This report has to be compared with the estimate of 0.0521 obtain on the subsample of firms working with a centralized main bank for which interaction variable is not significant. These reports are clearly in line with our second hypothesis. There are clear differences for potentially discriminated groups in terms financial constraint between those engaged with main banks depending on their organizational structure.

Those preferences are even more important if we consider ethnicity as in table 7. SMEs ran by Western Europe origin managers are not treated differently from other SMEs (the interaction variable is not significant) if they work with decentralized main bank but are clearly better treated if they work with a centralized one. Cash sensitivity to cash-flow is very low 0.0359 (0.0518-0.0159). We can in particular link this effect to the classification of foreign banks as decentralized ones. For SMEs ran by CEOs with oriental or Muslim first names, cash-flow sensibility of cash, i.e. our measure of financial constraint, is clearly more



important for those working with decentralized main bank. The estimate is 0.194 (0.1087+0.0853) for the first ones and 0.2086 (0.1090+0.0996) for the second ones. For those working with a centralized main bank interaction variable is not significant and cash-flow sensitivity of cash is relatively low around 0.045. Discrimination in term of access to external funding appear to be more important for firms engaged with a decentralized main bank which allow more flexibility to their loan officers to select clients. This is in line with our hypothesis 2.

We ran several robustness checks. First, since the information about the CEO is given at the time of the data was downloaded without access to previous history, one can argue that the CEO might be a new one. Anecdotal evidence shows a very low turnover in medium sized CEOs. But to control for that we ran regressions with only three (four) years of historical, minimizing the risk of mismatching a new CEO. The unreported results show no qualitative differences. We also run regressions with zip-code fixed effect. Interestingly women are not more financially constrained when their business is headquartered in Greater Paris, and we observe a significant sensitivity of cash to cash flow in the rest of France.

## **Section 5 Concluding remarks and extensions**

The paper explores the impact of biological characteristics of CEOs on the overall financial constraint of SMEs they run. We consider as potential source of constraint gender, age and foreign origin first name. This last point is particularly relevant in France because officially there is no way to identify discriminated people when it comes to the ethnic background. Our results indicate that the global financial constraint is higher for firms run by either young managers or a CEOs with a non-Western first name especially for the group with a Muslim first name. We further the investigation by measuring the impact of the type of the firm's main bank on the results. Despite the fact that decentralized banks are theoretically more efficient in dealing with soft information, our results show a stronger financial constraint when the firm's main bank is decentralized and when the CEO has a Muslim first name. We find also evidence that young managers

are more constrained. It appears that working with a decentralized main bank which allows to process non-economic information associated to gender, age and ethnic backgrounds (not allowed in scoring system or official approval mechanism), disadvantages firms which are run by CEOs with potentially discriminative characteristics (women, under 30 year-old, non-Western first name).

We believe this work could lead to further research and we pinpoint two possible avenues. Firstly, our results suggests that certain groups SMEs run by COEs with characteristics associated with prejudices suffer from more important difficulties accessing to external fund. This can be related to discrimination in financial markets (even from banks) but we do not identify clearly which economic actor actually discriminate. It could be the loan officer himself, the bank, or other stakeholders etc... Even the misleading anticipation of the financiers that the firm's customers will shy away could generate such kind of correlation. This fact is very hard to disentangle. We hope future research would find strategies to address this issue.

Secondly, one could easily argue that the firm – bank matching process is not random. We are aware of this potential selection bias. Firms working with decentralized banks are all suffering from more significant financial constraint. But this effect is more important for SMEs run by a CEO with a non-Western first name. At this point we are still unable to distinguish if the centralized banks systematically reject those firms and the decentralized banks finance them although including prejudice driven credit decisions, or if only decentralized banks apply such discrimination.

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Table 1: Sample description

Panel A: Firms characteristics

This table displays means and standard deviations (reported in brackets) for total sample and different groups of potentially discriminated firms considering subgroups of those working with a decentralized and those working with a centralized one.

	Total sample	Female manager	Less than 30 years old manager	Foreign origins manager	Oriental origins manager	Muslim origins manager
<b>Total asset(in thousand Euros)</b>						
Decent.	8 153 (147 181)	11 114 (294 658)	3 552 (6 712)	12 611 (296 860)	6 530 (24 725)	4 107 (5 941)
Cent.	16 222 (242 921)	10 500 (82 900)	6 380 (18 989)	13 721 (69 299)	11 428 (30 216)	8 620 (23 495)
<b>Firm age</b>						
Decent.	22.76 (15.26)	22.99 (15.21)	19.22 (13.55)	20.22 (14.12)	16.99 (14.24)	14.86 (12.04)
Cent.	24.38 (16.98)	24.81 (17.06)	20.93 (17.68)	22.17 (15.84)	19.64 (17.18)	17 (15.5)
<b>Operational earnings over total assets</b>						
Decent.	0.071 (0.14)	0.072 (0.13)	0.082 (0.12)	0.068 (0.15)	0.081 (0.16)	0.081 (0.15)
Cent.	0.059 (0.21)	0.065 (0.31)	0.073 (0.14)	0.043 (0.28)	0.061 (0.15)	0.079 (0.13)
<b>Financial debt over total assets</b>						
Decent.	0.164 (1.17)	0.182 (0.79)	0.177 (0.183)	0.15 (0.23)	0.118 (0.16)	0.104 (0.15)
Cent.	0.148 (0.70)	0.176 (1.28)	0.151 (0.22)	0.147 (0.36)	0.101 (0.15)	0.105 (0.16)
<b>AFDCC credit score</b>						
Decent.	10.24 (3.99)	10.43 (3.97)	10.22 (3.89)	9.93 (4.10)	10.26 (4.31)	10.22 (4.17)
Cent.	10.22 (4.08)	10.28 (4.18)	10.15 (4.18)	9.82 (4.18)	10.1 (4.02)	10.22 (3.95)

Panel B: Industry sectors repartition

This table displays the proportions and number (reported under brackets) of firms belonging to an industry sector for the total sample and for different groups of potentially discriminated managers.

	Total	Bank type	Gender	Age	Origins		
	sample	Decent.	Female	Young	Foreign	Oriental	Muslim
Trade	31.18 (8 613)	60.68 (5 227)	9.73 (838)	5.22 (450)	11.63 (1 002)	1.38 (119)	0.73 (63)
Manufacturing	23.16 (6 397)	58.48 (3 741)	7.00 (448)	4.14 (265)	11.53 (738)	1.03 (66)	0.57 (37)
Building	15.17 (4 190)	61.78 (2 589)	5.58 (234)	7.63 (320)	9.68 (406)	1.74 (73)	1.47 (62)
Engineering Services	6.91 (1 908)	46.64 (890)	7.65 (146)	4.08 (78)	10.42 (199)	1.72 (33)	0.99 (19)
Transport	6.25 (1 725)	54.66 (943)	8.63 (149)	4.46 (77)	9.10 (149)	1.91 (33)	1.1 (19)
Management services	3.19 (881)	53.23 (469)	10.44 (92)	4.99 (44)	13.16 (116)	2.15 (19)	1.36 (12)
I.T. and telecom	2.97 (821)	38.97 (320)	9.62 (79)	4.26 (35)	15.22 (125)	3.41 (28)	1.7 (14)
Eating and resting places	2.37 (655)	49.61 (325)	19.69 (129)	5.34 (35)	15.41 (101)	2.29 (15)	1.83 (12)
Others	8.80 (2 431)	48.58 (1 181)	11.72 (285)	2.82 (93)	8.3 (202)	1.76 (43)	0.94 (23)
	100 (27 621)	56.78 (15 685)	8.69 (2 400)	5.06 (1 397)	11.03 (3 046)	1.55 (429)	0.94 (261)

**Table 2:** Managers characteristics categories split among firm's main bank types

This table displays the proportion and number (reported under brackets) of firms ran by different categories of managers (potentially discriminated ones and not) for the total sample and subsamples of those working with a decentralized or a centralized main bank. We report Chi2 statistics associated with differences in proportion between those last subsamples for the managers' categories.

	Total sample	Decentralized main bank	Centralized main bank
Woman	8.69 (2 400)	8.75 (1 372)	8.61 (1 028)
Man	91.31 (25 220)	91.25 (14 313)	91.39 (10 907)
Chi2	0.153		
Young	5.06 (1 397)	5.71 (895)	4.21 (502)
old or middle aged	94.94 (26 223)	94.29 (14 790)	95.79 (11 433)
Chi2	32.28***		
Foreign origin	11.03 (3 046)	8.82 (1 383)	13.93 (1 663)
French origin	88.97 (24 574)	91.18 (14 302)	86.07 (10 272)
Chi2	178.9***		
European (not French)	8.79 (2 427)	7.12 (1 116)	10.98 (1 311)
Other origin	91.21 (25 193)	92.88 (14 569)	89.02 (10 624)
Chi2	125.2***		
Oriental	1.55 (429)	1.18 (185)	2.04 (244)
Other origin	98.45 (27 191)	98.82 (15 500)	97.96 (11 691)
Chi2	32.75***		
Muslim	0.94 (261)	0.77 (121)	1.17 (140)
Other origin	99.06 (27 359)	99.23 (15 564)	98.83 (11 795)
Chi2	11.54***		

\* indicates significance at the 0.1 level, \*\* indicates significance at the 0.05 level and \*\*\* indicates significance at the 0.01 level.

Table 3: Cash-holding bivariate analysis

This table displays summary statistics about firms' cash-holdings, the cash and cash equivalents over total assets ratio, across different manager characteristics groups. We assign the letter (A) for firms run by a not considered potentially discriminated manager following this characteristic and (B) for those run by a potentially discriminated one. The statistical tests performed here are respectively Student's test on difference in mean and Mann Whitney's test on difference in median.

Cash Holdings	Total sample				Decentralized main bank				Centralized main bank				
	Mean	Median	St. D.	N. Ob.	Mean	Median	St. D.	N. Ob.	Mean	Median	St. D.	N. Ob.	
Manager characteristics													
1.													
	(A) male	0.151	0.091	0.167	208 758	0.156	0.101	0.164	118 302	0.145	0.077	0.172	90 456
	(B) female	0.168	0.108	0.178	19 979	0.174	0.122	0.172	11 421	0.160	0.089	0.185	8 558
	p-value (A-B≠0)	0.000	0.000			0.000	0.000			0.000	0.000		
2.													
	(A) old or middle aged	0.152	0.091	0.169	223 527	0.157	0.102	0.165	126 309	0.146	0.078	0.173	97 218
	(B) young	0.162	0.113	0.163	5 210	0.162	0.116	0.159	3 414	0.160	0.107	0.169	1 796
	p-value (A-B≠0)	0.000	0.000			0.065	0.000			0.000	0.000		
3.													
	(A) French origin r	0.154	0.093	0.169	204 089	0.158	0.103	0.165	118 475	0.148	0.080	0.175	85 614
	(B) foreign origin r	0.142	0.081	0.163	24 648	0.150	0.094	0.161	11 248	0.135	0.069	0.164	13 400
	p-value (A-B≠0)	0.000	0.000			0.000	0.000			0.000	0.000		
4.													
	(A) European (not French)	0.135	0.076	0.159	19 789	0.145	0.090	0.158	9 142	0.127	0.063	0.159	10 647
	(B) Other origin	0.154	0.094	0.169	208 948	0.158	0.103	0.165	120 581	0.149	0.080	0.175	88 367
	p-value (A-B≠0)	0.000	0.000			0.000	0.000			0.000	0.000		
5.													
	(A) Other origin	0.152	0.092	0.168	225 342	0.157	0.102	0.164	128 254	0.146	0.078	0.173	97 088
	(B) Oriental	0.166	0.105	0.172	3 395	0.175	0.114	0.178	1 469	0.159	0.099	0.167	1 926
	p-value (A-B≠0)	0.000	0.000			0.000	0.000			0.000	0.000		
6.													
	(A) Other origin	0.152	0.092	0.168	226 723	0.157	0.102	0.164	128 782	0.146	0.078	0.173	97 941
	(B) Muslim	0.177	0.112	0.183	2014	0.198	0.125	0.196	941	0.158	0.096	0.168	1 073
	p-value (A-B≠0)	0.000	0.000			0.000	0.000			0.028	0.000		



Table 4: Base line regression

This table displays estimation by GLS of random effects models. The dependent variable is the variation of cash-holding ratio. The independent variables are firm's Cash-flow, i.e. the ratio of the earnings before interest and depreciation minus dividends over total assets, Growth opportunities, i.e. the growth rate of firm's industry sector defined by is NAF2 rev. code in year t+1, Size, i.e. the natural logarithm of firm's total asset, the Variations of working capital over total assets ratio and the Variations of short term debts over total assets ratio. We add a dummy variable taking the value 1 if the firm's manager belongs to a potentially discriminated category and an interaction variable with the Cash-flow in order to identify the link between the considered manager characteristic and the cash-flow sensitivity of cash. We consider her female, young (less than 30 years old) and foreign origin manager. We report regression coefficient and Hubert-White robust standard deviation estimation with firms clusters here after in brackets.

	(1)	(2)	(3)
Constant	-0.0002 (0.0018)	-1.0004 (0.0018)	-0.0010 (0.0018)
Cash-flow	0.0682*** (0.0070)	0.0683*** (0.0070)	0.0790*** (0.0066)
Growth opportunities	0.0045*** (0.0010)	0.0045*** (0.0010)	0.0045*** (0.0010)
Size	-0.0001 (0.0002)	-0.0001 (0.0002)	-0.0001 (0.0002)
Δ working capital	-0.2895*** (0.0188)	-0.2894*** (0.0188)	-0.2902*** (0.0187)
Δ short term debt	0.0034 (0.0093)	0.0033 (0.0093)	0.0043 (0.0093)
Investment	-0.0007 (0.0006)	-0.0007 (0.0006)	-0.0007 (0.0005)
Female	-0.0013 (0.0009)		
Young		-0.0049** (0.0024)	
Foreign			0.0018** (0.0008)
Female × Cash-flow	0.0172 (0.0127)		
Young × Cash-flow		0.0729** (0.0295)	
Foreign × Cash-flow			-0.0308*** (0.0113)
Nb. obs.	141 562	141 562	141 562
Nb. firms	26 782	26 782	26 782
Chi2	631.8***	641.2***	664***
R2 overall	0.2207	0.2209	0.2213

\* indicates significance at the 0.1 level, \*\* indicates significance at the 0.05 level and \*\*\* indicates significance at the 0.01 level.

Table 5: Impact of ethnicity on financial constraint problems

This table displays estimations of the baseline model for different categories of manager's origin (Europe but not France; Oriental, i.e. with no occidental first names, and Muslim). Estimation methods, dependent and independent variables are the same than those used in table 4.

	(1)	(2)	(3)
Constant	-0.0010 (0.0018)	-0.0004 (0.0018)	-0.0003 (0.0018)
Cash-flow	0.0789*** (0.0065)	0.0684*** (0.0070)	0.0686*** (0.0070)
Growth opportunities	0.0045*** (0.0010)	0.0045*** (0.0010)	0.0045*** (0.0010)
Size	-0.0001 (0.0002)	-0.0001 (0.0002)	-0.0001 (0.0002)
Δ working capital	-0.2902*** (0.0187)	-0.2895*** (0.0188)	-0.2895*** (0.0188)
Δ short term debt	0.0044 (0.0093)	0.0035 (0.0093)	0.0033 (0.0093)
Investment	-0.0007 (0.0005)	-0.0007 (0.0006)	-0.0007 (0.0006)
Europe without France	0.0025*** (0.0008)		
Oriental		-0.0064*** (0.0019)	
Muslim			-0.0088*** (0.0023)
Europe without France × Cash-flow	-0.0328*** (0.0111)		
Oriental × Cash-flow		0.0712*** (0.0234)	
Muslim × Cash-flow			0.0831*** (0.0281)
Nb. obs.	141 562	141 562	141 562
Nb. firms	26 782	26 782	26 782
Chi2	666.5***	634.7***	653.2***
R2 overall	0.2214	0.2208	0.2208

\* indicates significance at the 0.1 level, \*\* indicates significance at the 0.05 level and \*\*\* indicates significance at the 0.01 level.

**Table 6:** Baseline regression on subsamples of firms with a decentralized or centralized main bank

This table displays estimations of the baseline model for two subsamples of firms: those working with a decentralized main bank and those working with a centralized one. Estimation methods, dependent and independent variables are the same than those used in table 4.

	(1)		(2)		(3)	
	Decentralize d main bank	Centralize d main bank	Decentralize d main bank	Centralize d main bank	Decentralize d main bank	Centralize d main bank
Constant	-0.0007 (0.0024)	0.0027 (0.0022)	-0.0010 (0.0024)	0.0028 (0.0022)	-0.0011 (0.0024)	0.0023 (0.0022)
Cash-flow	0.1096*** (0.0067)	0.0450*** (0.0063)	0.1097*** (0.0065)	0.0451*** (0.0061)	0.1122*** (0.0068)	0.0521*** (0.0074)
Growth opportunities	0.0041*** (0.0012)	0.0046** (0.0018)	0.0041*** (0.0012)	0.0046** (0.0018)	0.0041*** (0.0012)	0.0046** (0.0018)
Size	-0.0003 (0.0002)	-0.0004 (0.0002)	-0.0003 (0.0002)	-0.0004* (0.0002)	-0.0003 (0.0002)	-0.0003 (0.0002)
Δ working capital	-0.3605*** (0.0197)	- 0.2409*** (0.0244)	-0.3605*** (0.0197)	- 0.2408*** (0.0244)	-0.3606*** (0.0197)	- 0.2413*** (0.0245)
Δ short term debt	0.0254** 0.0123	-0.0010 (0.0119)	0.0254** (0.0123)	-0.0010 (0.0119)	0.0255** (0.0123)	-0.0006 (0.0120)
Investment	-0.0002 (0.0001)	- 0.0067*** (0.0012)	-0.0002 (0.0001)	- 0.0067*** (0.0012)	-0.0002 (0.0001)	- 0.0066*** (0.0012)
Female	-0.0015 (0.0014)	-0.0005 (0.0012)				
Young			-0.0010 (0.0024)	-0.0073* (0.0040)		
Foreign					0.0022* (0.0012)	0.0002 (0.0009)
Female × Cash-flow	0.0065 (0.0187)	0.0192 (0.0133)				
Young × Cash-flow			0.0211 (0.0256)	0.1083** (0.0533)		
Foreign × Cash-flow					-0.0177 (0.0170)	-0.0157* (0.0097)
Nb. obs.	80 062	61 500	80 062	61 500	80 062	61 500
Nb. firms	15 213	11 569	15 213	11 569	15 213	11 569
Chi2	825.6***	202.8***	832.7***	209.6***	822.1***	207.3***
R2 overall	0.2722	0.1870	0.2722	0.1873	0.2722	0.1872

\* indicates significance at the 0.1 level, \*\* indicates significance at the 0.05 level and \*\*\* indicates significance at the 0.01 level.

**Table 7:** Ethnicity effect analysis on subsamples of firms with a decentralized or centralized main bank

This table displays estimations of the baseline model for different categories of manager's origin (Europe but not France; Oriental, i.e. with no occidental first names, and Muslim) for two subsamples of firms: those working with a decentralized main bank and those working with a centralized ones. Estimation methods, dependent and independent variables are the same than those used in table 4.

	(1)		(2)		(3)	
	Decentralize d main bank	Centralized main bank	Decentralize d main bank	Centralized main bank	Decentralized main bank	Centralized main bank
Constant	-0.0012 (0.0024)	0.0022 (0.0022)	-0.0009 (0.0024)	0.0026 (0.0022)	0.0996 (0.0297)	0.0028 (0.0022)
Cash-flow	0.1129*** (0.0067)	0.0518*** (0.0072)	0.1087*** (0.0064)	0.0455*** (0.0062)	0.1090*** (0.0064)	0.0457*** (0.0062)
Growth opportunities	0.0041*** (0.0012)	0.0046** (0.0018)	0.0041*** (0.0012)	0.0046** (0.0018)	0.0041*** (0.0012)	0.0045** (0.0018)
Size	-0.0003 (0.0002)	-0.0004 (0.0002)	-0.0003 (0.0002)	-0.0003 (0.0002)	-0.0003 (0.0002)	-0.0004* (0.0002)
Δ working capital	-0.3606*** (0.0197)	-0.2413*** (0.0245)	-0.3606*** (0.0197)	-0.2409*** (0.0244)	-0.3605*** (0.0197)	-0.2408*** (0.0244)
Δ short term debt	0.0256** (0.0123)	-0.0006 (0.0120)	0.0259** (0.0122)	-0.0011 (0.0119)	0.0255** (0.0123)	-0.0012 (0.0119)
Investment	-0.0002 (0.0001)	-0.0066 (0.0012)	-0.0002 (0.0001)	-0.0067*** (0.0012)	-0.0002 (0.0001)	-0.0067*** (0.0012)
Europe without France	0.0035*** (0.0013)	0.0007 (0.0009)				
Oriental			-0.0086*** (0.0033)	-0.0034 (0.0023)		
Muslim					-0.0085** (0.0033)	-0.0061* (0.0033)
Europe without France × Cash- flow	-0.0298 (0.0197)	-0.0159* (0.0096)				
Oriental × Cash-flow			0.0853** (0.0368)	0.0388 (0.0303)		
Muslim × Cash- flow					0.0996*** (0.0297)	0.0359 (0.0450)
Nb. obs.	80 062	61 500	80 062	61 500	80 062	61 500
Nb. firms	15 213	11 569	15 213	11 569	15 213	11 569
Chi2	825.8***	207.4***	835***	200***	852.5***	202.8***
R2 overall	0.2723	0.1872	0.2724	0.1870	0.2723	0.1870

\* indicates significance at the 0.1 level, \*\* indicates significance at the 0.05 level and \*\*\* indicates significance at the 0.01 level.

Appendix 1: Sample Selection Process

Stage	Selection Criteria	Number of Dropped Firms	Total Number of Firms in the Sample
1	European Union Commission Criteria for SMEs identification in year 2011: 10-250 employees and 2-50 Million Euros in total sales or 2-43 Million Euros in total assets	–	45 923
2	Identified main bank	11 916	34 007
3	Identified Manager (First Name Origin, Gender, Age)	6 353	27 654
4	At least two consecutive 12 month accounting periods completed	34	27 620