Favoring the small and the plenty: Islamic banking for MSMEs

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ARTICLE INFO

ABSTRACT

While MSMEs form the backbone of many countries, most of them suffer from limited access to finance. We extend the literature by examining whether Islamic banks, compared to their conventional peers, favor more the MSMEs credit market segment in Turkey. We do this by considering various aspects of the lending behavior towards MSMEs (total lending, foreign currency lending, loan commitments, loan quality, and revenues) across different MSMEs size categories (micro, small and medium-sized firms). Our results show that once we control for bank-specific characteristics, we find that Islamic banks are more engaged with MSME financing and generate more revenues from servicing MSMEs. Concerning the quality of the MSME lending portfolio, no distinguishable patterns were observed between Islamic and conventional banks.

1. Introduction

Banks are considered prime providers of finance for micro, small and medium-sized enterprises (MSMEs). MSMEs represent a vast portion of businesses in many economies and contribute significantly to employment and growth. Across the OECD area, for instance, MSMEs account for approximately 99% of the total number of firms and two-thirds of employment (OECD, 2019). However, because of their informationally opaque nature, MSMEs face greater obstacles in raising external finance than their larger counterparts. It follows that suitable alternatives should be provided to close further the MSME financing gap.[1] One area that particularly needs further study is the role of Islamic banks in tackling financial exclusion. The last half of a century has witnessed the emergence of Islamic banking and finance from an expression of Muslims' distinct identity to a mature, conspicuously large, and fast-growing industry. Especially since the outbreak of the latest global financial crisis, interest in Islamic banking has gained momentum as a viable alternative to the conventional way of banking. Indeed, the relative performance of Islamic banks to conventional banks proved to perform better in the lead-up to the crisis and exhibited greater resilience during the crisis because of their fundamentals of risk-sharing and the avoidance of leverage and speculative financial products (Čihák and Hesse, 2010; Hasan and Dridi, 2011; Beck et al., 2013). According to the figures of IFSB (2019), between 2008 and 2017, the Islamic banking industry grew by a compound rate of about 10%, reaching more than US$ 1.6 trillion in total assets. Fairness and socio-economic justice are considered the most salient

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[1] The MSME financing gap refers to the obstacle many MSMEs face in raising external finance, even for financially viable investment projects.

Table 1
Importance of SMEs in Turkey and EU.

Class size	Number of enterprises			Number of persons employed			Value added		
	Turkey		*EU28*	Turkey		*EU28*	Turkey		*EU28*
	Number	Share	*Share*	Number	Share	*Share*	Million €	Share	*Share*
Micro	2380,885	96.4%	*92.8%*	5112,500	45.2%	*29.0%*	30,075	15.3%	*20.2%*
Small	57,214	2.3%	*6.0%*	1754,015	12.7%	*20.2%*	24,717	12.6%	*17.7%*
Medium-sized	25,948	1.1%	*1.0%*	2582,542	17.6%	*17.1%*	44,596	22.6%	*18.4%*
SMEs	**2464,047**	**99.8%**	***99.8%***	**9449,147**	**75.5%**	***66.3%***	**99,388**	**50.5%**	***56.3%***
Large	4694	0.2%	*0.2%*	3583,058	24.5%	*33.7%*	97,539	49.5%	*43.7%*
Total	**2468,741**	**100.0%**	***100.0%***	**13,032,205**	**100.0%**	***100.0%***	**196,927**	**100.0%**	***100.0%***

Source: European Commission's, 2018 SBA Fact Sheet Turkey. Figures are related to 2015. According to the Turkish Statistical institute: businesses with fewer than 10 employees or annual sales of less than 1million TL are classified as micro-sized enterprises; businesses with 10–49 employees or annual sales of 1–5 million TL are identified as small businesses; and businesses that have 50–249 employees or annual sales of 5–25 million TL are categorized as medium-sized businesses. Turkey and EU use equal staff headcount ceilings for the definition of different SME categories.

values of the Islamic financial system. Next to social responsibility, by expanding the range of financial products, Islamic finance is believed to be well-positioned to help improve financial access for those deprived of financial services due to their faith. With its emphasis on norms and values, Islamic finance ideals encourage entrepreneurship at the micro-, meso- and macro-level (Gümüsay, 2015).

Compared to other developing countries, the ownership structure of banking systems in Muslim-majority countries has not only experienced a move towards more foreign bank presence but has also become more distinctive with the development of Islamic banking entities. Although the impact of conventional bank ownership on financing decisions has been subject to increasing scrutiny, almost no effort has been made to investigate how Islamic banks influence access to credit as a whole and to MSMEs in particular. This paper aims to empirically test whether Islamic banks are more inclined to service the MSME market by using Turkey as a single-country case study. From Table 1, we can observe that Turkish MSMEs play a vitally important role in the 'non-financial business economy'. They provided most of the jobs (75.5% in 2015), constituted 99.8% of all businesses, and generated 50.5% of the value-added in 2015. Relative to their numbers in the total enterprise population, micro-businesses accounted for a smaller share of the total value-added compared to other size categories. Although they do not generate as much income as larger corporations, they are considered a critical component of the strength of local economies. Since an overwhelming majority of businesses are MSMEs, with large enterprises representing only a tiny fraction of firms, the Turkish corporate sector structurally faces the problem of information asymmetry in obtaining external finance.[2] Therefore, an important policy question is whether alternative financing mechanisms, such as Islamic finance, can further ease MSMEs' financing constraints.

The Turkish banking system is especially suitable for the comparative analysis of conventional and Islamic banks' lending behavior towards MSMEs. Turkey implements a dual banking system, in which Islamic banks operate alongside conventional banks and are subject to the same regulatory standards. Furthermore, Islamic finance holds a sizeable segment within the financial services industry, and its relevance is set to increase even more because of Turkey's large Muslim population.[3] In addition, international organizations recommend studying the MSME financing model of Islamic banks in Turkey as a potential role model to emulate in other dual banking systems (WB-IDB, 2015). Using quarterly bank-level data from 2006Q4 to 2014Q2, we test whether bank orientation – Islamic or conventional – is a critical factor in explaining the financing of MSMEs. In doing so, we contribute to the literature along several dimensions. First, while it has been claimed that Islamic finance is seen as an opportunity for advancing a possible alternative means of financial intermediation, particularly for micro-businesses and SMEs, the empirical literature is surprisingly sparse due to both data limitations and the relatively recent interest in this subject.[4] Secondly, we add to the general literature on banks' MSME exposure as we are able to differentiate between lending to micro, small and medium-sized enterprises. Despite their importance to the economy, the literature has only, to a limited extent, studied whether bank ownership affects credit provisioning to MSMEs.[5] Furthermore, these studies have generally limited their scope to the aggregate category of MSME financing without being able to zoom further into the MSME lending portfolio. However, the distinction between smaller and larger MSMEs is

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[2] According to the Turkish Statistical Institute, businesses with fewer than 10 employees or annual sales of less than 1 million Turkish lira (TL) are classified as micro-sized enterprises; establishments employing between 10 and 49 people, or with annual sales between 1 and 5 million TL are identified as small-sized businesses; and businesses that have 50–249 employees or annual sales of 5–25 million TL are categorized as medium-sized businesses.

[3] The nine core markets – Bahrain, Qatar, Saudi Arabia, Malaysia, United Arab Emirates, Kuwait, Pakistan, and Turkey – are considered to be the pulse of the international Islamic banking industry (Ernst and Young, 2016).

[4] The literature so far has almost entirely focused upon discussing how the *Shariah* way of intermediation differs from the conventional one.

[5] Most of these studies explored why different conventional bank ownerships differ in terms of their total credit portfolio composition. For instance, in comparing the behavior of foreign and domestic banks, it is claimed that the former have a comparative advantage in transaction lending and a disadvantage in relationship lending and therefore tend to "cherry-pick" the largest, most transparent firms they lend to in host countries (Aghion and Tirole, 1997; Berger et al., 2005).

important since evidence suggests that firm size affects financing patterns (Demirgüç-Kunt and Maksimovic, 1999). Further, financial statement lending is likely used less frequently for smaller MSMEs (Uchida et al., 2012). As far as we know, this is the first attempt to distinguish between different MSME categories and their relationship with different types of banks in obtaining funding. Third, by covering the entire banking sector, this is also the first study that relates bank type to various aspects of MSME lending practices. Similar to banks' MSME loan exposure, our data allow us to examine whether bank type has an influence on foreign exchange lending, loan commitments, and loan quality across different MSME classifications.

We find that bank orientation is a significant dimension in explaining lending specialization. In particular, once we control for bank-specific characteristics, we find that Islamic banks are more engaged with MSME financing. The distinction between different types of MSME borrowers yields some interesting insights: Islamic banks fare especially well in the financing of micro and small-sized companies, whereas their credit extension towards medium-sized firms does not differ from privately-owned domestic banks. Nevertheless, Islamic banks still provide more loans to medium-sized businesses than state-owned and foreign-owned banks. These findings survive a battery of robustness tests. In the analyses of other aspects of lending behavior, we find that Islamic banks outperform their conventional peers in terms of issuing letters of credit and generating more revenues from servicing MSMEs. Concerning the quality of the MSME lending portfolio, no distinguishable patterns were observed between Islamic and conventional banks.

The remainder of this paper is structured as follows. In Section 2, we review the literature with a particular focus on Islamic banks' role in access to credit. In Section 3, we describe our data and empirical methodology. In Section 4, along with robustness checks, we present the empirical findings concerning the effects of Islamic banks on MSMEs' financing decisions. In Section 5, we examine the impact of Islamic banks on various aspects of MSME lending: foreign exchange lending, revenues, lines of credit, and non-performing loans. Finally, Section 6 contains the conclusions reached.

2. Literature review

The key difference between Islamic and conventional banks is that the former operate in compliance with the rules of *Shariah*, the legal code of Islam. The most distinguishing feature of the Islamic financial system is the prohibition of *riba*, i.e., the payment of a fixed or determinable interest on funds. As with many aspects of Islamic society, the moral code in Islamic banking and finance is justice. In this respect, justice is achieved through risk-sharing, which corresponds to sharing of profits or losses. From a *Shariah* point of view, the foundational philosophy of Islamic finance also heavily relies on economic and social development, including financial inclusion through servicing the un-banked and under-banked of the society – such as MSMEs and lower-income individuals (Asutay, 2012). Furthermore, it has been claimed that Islamic banks are, through asset-based and equity-based financing instruments, well-equipped to finance enterprises and start-ups (Iqbal and Mirakhor, 2011).[6]

In theory, Islamic finance is well-positioned to promote financial inclusion and economic development as part of its corporate social responsibility. The limited empirical evidence at the macro level suggests that Islamic finance is a promising avenue for promoting economic growth. Applying the stochastic frontier approach at the country level for a sample of 70 countries over the 2000–2005 period, Gheeraert and Weill (2015) find that Islamic banking development fosters macroeconomic efficiency. Again in a cross-country setting, Imam and Kpodar (2016) show that Islamic banking positively contributes to economic growth, even after controlling for the level of financial development.[7] There is, however, no unequivocal empirical evidence on the relationship between Islamic banking and financial inclusion parameters. Naceur et al. (2015) find that although physical access to financial services has grown more rapidly in Muslim-majority countries, the use of these services has not increased as rapidly. After controlling for other individual- and country-level characteristics, Demirguc-Kunt et al. (2014) find that while Muslims are less likely to hold savings accounts in a formal financial institution, they are not less likely to borrow than non-Muslims.

For the most part, the conducive role of Islamic banks on the credit supply has been suggestive because of the paucity of appropriate data. For instance, the International Finance Corporation (IFC) (2014) reports that while Muslim countries exhibit lower levels of financial inclusion, the presence of Islamic banks mitigates religious self-exclusion since a lower share of firms in these countries cite access barriers to finance as a significant obstacle. Although profit-and-loss sharing through equity-based financial instruments (such as *Musharaka*) is accepted as the ideal form of intermediation, Islamic banks' main exposure is through asset-based financing in the form of *Murabaha*. *Murabaha* is a contract of exchange based on purchase-and-sale contracts (*Al-Bay'*) with a pre-determined cost and profit. Through this contract, the financier purchases the assets the client requires and sells them, usually in installments, to the client at a cost that includes a disclosed profit margin. A second major form of financing is lease financing, made possible through the *Ijara*. Since the bank maintains the ownership of the asset until the maturity of the contract, it has been claimed that the *Ijara* contract significantly eases the collateral constraints that small entrepreneurs invariably find difficult to comply with.[8]

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[6] The most commonly used financing option by Islamic banks is asset-based, from which *Ijara* and especially *Murabaha* make up the bulk of the transactions. Under a *Murabaha* contract, a bank agrees to buy assets from a third party at the request of its clients and then re-sells them to its client with a mark-up profit, usually paid back to the bank in installments. The *Ijara* contract or Islamic leasing involves a transaction in which a bank buys and leases out an asset or equipment to its client for a pre-agreed rental fee. The Islamic equity-based financing contracts are based on profit-and-loss sharing arrangements, with *Musharaka* (participation financing) and *Mudaraba* (trust financing) being the most common.

[7] Kumru and Sarntisart (2016) theoretically demonstrate that this finding is driven by an improved allocation of the aggregate level of savings since the presence of Islamic banks mitigates religious self-exclusion.

[8] The WB-IDB (2015) report provides further support for this mechanism by indicating that the collateral requirements are more effectively

Table 2

Islamic versus conventional banking systems – empirical evidence.

Authors	Coverage	Period	Main findings
Macroeconomic performance			
Gheeraert and Weill (2015)	70 countries	2000–2005	Development of Islamic banking has a beneficial impact on macroeconomic efficiency
Imam and Kpodar (2016)	52 countries	1990–2010	Countries with a developed Islamic banking system experience faster economic growth.
Financial inclusion			
Demirguc-Kunt et al. (2014)	64 countries	2011	Muslims are significantly less likely than non-Muslims to own a formal savings account. There is no discernable difference between Muslims and non-Muslims when it comes to borrowing. Muslims are more likely to report religion as a barrier to account ownership, and hence there is demand for Islamic financial products.
Naceur et al. (2015)	150 countries	2004–2013	The use of financial services in Muslim majority countries (both with and without Islamic banking) is lower than in non-Muslim majority countries. Muslim majority countries with Islamic banking exhibit average levels of inclusion surpass those Muslim majority countries without Islamic banking.
Access to credit			
Léon and Weill (2017)	52 countries	2000–2005	Overall, Islamic banking development does not relax credit constraints. Islamic banking development only exerts a positive imact on access to credit when conventional banking development is low.
SME financing			
Aysan et al. (2016)	Turkey	2006–2014	Compared to conventional banks, Islamic banks are more inclined toward financing MSMEs.
Shaban et al. (2014)	Indonesia	2002–2010	Islamic banks in Indonesia are more likely to lend to MSMEs than conventional banks.

This feature may be particularly important for small businesses that usually have few assets or assets that are difficult to value as collateral. We are aware of only two empirical studies that have explored the relationship between bank orientation (Islamic vs. conventional) and SME finance. Shaban et al. (2014) confirm that Islamic banks in Indonesia are more inclined to engage in small business lending than their conventional counterparts. Aysan et al. (2016) report a similar finding in the Turkish context, showing that Turkish Islamic banks allocate a higher share of their assets to small business loans.

The mission of Islamic banks to promote inclusive economic growth, however, may be compromised by divergences between their ideals and their practices. Using cross-country firm-level survey data, Léon and Weill (2017) do not find that Islamic banks alleviate firms' obstacles in obtaining external funds, suggesting the presence of mutually offsetting forces. The difficult financing conditions proposed by Islamic banks may act as one access limiting force. Specifically, Islamic banks may have a lower cost performance because these banks are usually relatively small (diseconomies of scale) and require additional legal obligations stemming from the very nature of their operations (Srairi, 2010; Beck et al., 2013). The *Murabaha* financing mode involves two sales transactions – temporary purchase and sale – instead of one. The partnership financing scheme based on profit-and-loss sharing requires, next to additional screening and monitoring costs, the formation of separate legal entities. Furthermore, Islamic banks need to institute a *Shariah* supervisory board to advise them whether their operations and activities are in line with *Shariah* principles. Another force that can temper Islamic banks' willingness to finance is that these banks potentially have greater market power than their conventional counterparts (Léon and Weill, 2017). In this regard, Islamic banks can benefit from *Shariah* arbitrage, i.e., labeling products as *Shariah*-compliant makes their demand more inelastic since the clientele is driven by religious motives (El-Gamal, 2006). This practice may result in an increase in the intermediation margins and hence lower access to finance.

Given these considerations, whether the net effects of Islamic finance on access to credit are positive or negative is, ultimately, an empirical question. Table 2 summarizes the main findings of the above-mentioned empirical studies.[9] Closest to this study are Shaban et al. (2014) and Aysan et al. (2016). Our work, however, extends and complements both of these studies in important ways. Rather than examining only the relationship between bank orientation and the aggregate MSME lending portfolio, we further disaggregate this portfolio into three size categories (micro, small and medium-sized firms). Hence, we add to the literature by verifying whether Islamic banks cater differently to MSMEs of different sizes. Furthermore, next to lending behavior, by incorporating various aspects of MSME lending into our analyses (such as foreign exchange lending, revenues, loan commitments, and loan quality), we offer a more complete perspective on the comparative performance of Islamic banks vis-a-

vis conventional banks.

3. Data and empirical methodology

3.1. Background and data sources

Islamic banking in Turkey has taken off since the 1980 s with the introduction of 'Special Finance Houses'. Despite being *Shariah*-compliant, such a euphemism was adopted to soothe their Islamic image and resonate with the ideological sensitivity of the secular establishment (Aysan and Disli, 2019). However, shifts in subsequent governments' priorities have allowed Islamic banking to gradually acquire legitimacy as financial intermediaries. Especially the enactment of the Banking Law No. 5411 in 2005 meant a breakthrough in this respect, enabling Islamic banks to have the same privileges and status as conventional banks. Before this reform, Islamic banks in Turkey did not enjoy the same regulatory status as conventional banks, and the government-provided insurance did not cover Islamic deposits.[10] This legislation transformed 'Special Finance Houses' into 'Participation Banks' and brought their regulation and supervision on par with conventional banks.[11] Since then, the Turkish Islamic banking segment has witnessed remarkable growth but, as of 2020, still only accounts for 7.2% of the Turkish banking system assets (FitchRatings, 2021). However, it appears that Turkish Islamic banks are better able to mitigate the information asymmetries in small business lending, thereby improving the capital allocation process.[12] In fact, the country's efforts in tackling the unmet demand of MSMEs have been praised by international bodies, and its financing model has been suggested to be replicated in other emerging countries (WB-IDB, 2015).

We test our hypotheses about Islamic banks' attitudes towards MSME lending using a novel dataset provided by the Central Bank of the Republic of Turkey (CBRT). The data contain information on the amount of granted loans, revenues from these loans, lines of credit, and non-performing loans for three borrower types: micro-sized, small-sized, and medium-sized enterprises. To examine whether Islamic banks' lending behavior differs from their conventional counterparts, irrespective of individual bank characteristics, we accompany this small business lending data with standard information from balance sheets and income statements. The standard information for conventional banks is derived from the Banks Association of Turkey, and that of Islamic banks is from the Participation Banks Association of Turkey. Our quarterly dataset comprises 36 conventional and 4 privately-owned Islamic banks over the period 2006Q4–2014Q2. The four Islamic banks are *Bank Asya, Turkiye Finans, Albaraka Turk*, and *Kuveyt Turk*.[13]

3.2. Empirical methodology

Once we control for bank characteristics, do banks having a different orientation (i.e., Islamic versus conventional) generate different behavior towards MSME finance? In particular, is it the case that Islamic banks have more favorable attitudes towards SME financing? We first study the impact of bank orientation on the allocation of loans towards three borrower types: micro-sized, small-sized, and medium-sized enterprises. For each type of borrower, the share of MSME financing is modeled as a function of bank orientation and controls for bank characteristics and time-fixed effects. In particular, we estimate the following equation:

$$MSME_{i,j,t} = \alpha_0 + \alpha_1 Islamic_i + \alpha_2 X_{i,t-1} + \alpha_3 Y_t + \varepsilon_{i,t} \tag{1}$$

where *MSME* is bank *i*'s share of MSME lending to borrower type *j* at quarter *t*. The variable we are primarily interested in is *Islamic*, which is a dichotomous variable that equals to 1 for banks whose operations are based on *Shariah* principles. In particular, this variable captures the comparative behavior of banks with different orientations in the MSME segment of the credit market in Turkey. *X* and *Y* stand for bank-level and macro-level control variables, respectively. Our baseline estimates are based on the random-effects model in accordance with existing literature on Islamic banking (Abedifar et al., 2013, 2016; Bilgin et al., 2021; Hoque and Liu, 2021; Mollah and Zaman, 2015). We proceed with the random-effects model for two key reasons: First, methods such as ordinary least squares (OLS) do not consider the data's panel dimension. Second, the primary variable of interest, the *Islamic* bank dummy variable, is time-invariant and therefore omitted from fixed-effect models. All bank-level control variables are lagged by one year in the regressions to mitigate the possibility of reverse causality. Reported standard errors are robust to the presence of heteroscedasticity and serial correlation (Huber, 1967; White, 1980). We will perform various robustness tests by employing alternative model specifications and estimation methods.

Table 3 lists the names and definitions of all the variables used in this paper, while Table 4 reports their summary statistics. The last column of Table 4 presents the difference in means between Islamic and conventional banks for the variables used in the models, along with asterisks denoting their significance. The dependent variables capture various aspects of MSME financing for the entire

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[10] For example, the regulatory framework in which Islamic banks' operated was inadequate in the sense that the Decree No. 83/7506 that allowed Islamic banks to operate in Turkey could just as easily be revoked (Brown, 2014).

[11] Islamic banks in Turkey are referred to as Participation banks since, in keeping with Islamic tenets, depositors and borrowers participate in the risk of financial transactions with their intermediaries.

[12] We refer to Aysan et al. (2017) for a detailed discussion of the developments in the Turkish dual banking system.

[13] Since 2015, to further stimulate the Islamic banking segment, two more banks, Ziraat Participation and Vakif Participation, have been authorized by the country's banking regulator (BRSA) to operate as the first state-owned Islamic banks. In February 2015, however, the BRSA handed over Bank Asya's management to the deposit insurance fund because of irregular monetary transactions to Gülen-linked companies and lack of transparency. Bank Asya's banking license was eventually canceled in July 2016.

Table 3
Definition of the variables.

Dependent variables	
MSME Lending: Share	The ratio of the total MSME lending portfolio to total assets
MSME Lending: Growth	The quarterly first difference of the log of MSME loans
Micro Lending: Share	The ratio of lending to micro-sized firms to total assets
Micro Lending: Growth	The quarterly first difference of the log of lending to micro-sized firms
Small Lending: Share	The ratio of lending to small-sized firms to total assets
Small Lending: Growth	The quarterly first difference of the log of lending to small-sized firms
Medium Lending: Share	The ratio of lending to medium-sized firms to total assets
Medium Lending: Growth	The quarterly first difference of the log of lending to medium-sized firms
FX MSME Lending: Share	The ratio of MSME loans in foreign currency to total assets
FX Micro Lending: Share	The ratio of lending to micro-sized firms in foreign currency to total assets
FX Small Lending: Share	The ratio of lending to small-sized firms in foreign currency to total assets
FX Medium Lending: Share	The ratio of lending to medium-sized firms in foreign currency to total assets
MSME Lending rate	The ratio of interest income to MSME loans. Calculated on quarterly basis.
Micro Lending rate	The ratio of interest income to lending to micro-sized firms. Calculated on quarterly basis.
Small Lending rate	The ratio of interest income to lending to small-sized firms. Calculated on a quarterly basis.
Medium Lending rate	The ratio of interest income to lending to medium-sized firms. Calculated on a quarterly basis.
MSME Lines of Credit	The ratio of lines of credit to MSMEs to total assets
Micro Lines of Credit	The ratio of lines of credit to micro-sized firms to total assets
Small Lines of Credit	The ratio of lines of credit to small-sized firms to total assets
Medium Lines of Credit	The ratio of lines of credit to medium-sized firms to total assets
NPL: MSME Lending portfolio	The ratio of nonperforming loans to MSME loans
NPL: Micro Lending portfolio	The ratio of micro-sized nonperforming loans to lending to micro-sized firms
NPL: Small Lending portfolio	The ratio of small-sized nonperforming loans to lending to small-sized firms
NPL: Medium Lending portfolio	The ratio of medium-sized nonperforming loans to lending to medium-sized firms
Bank-level variables	
Islamic	A dummy variable which takes the value of one for Islamic banks, zero otherwise
Foreign	A dummy variable which takes the value of one if more than 50% of the bank is owned by non-residents, zero otherwise
State	A dummy variable which takes the value of one if more than 50% of the bank is owned by the government, zero otherwise
Equity ratio	The ratio of the book value of equity to total assets
Liquidity ratio	The ratio of liquid assets (cash and central bank reserves) to total assets
Deposits ratio	The ratio of deposits to total assets
Profits ratio	The ratio of after tax profits to total assets
Bank age	The natural logarithm of quarter-years the bank exists
Bank size	The natural logarithm of total assets
Macro-level variables	
Inflation	Quarterly inflation rate
GDP growth	Real quarterly growth rate of GDP

segment and its disaggregation into borrower types (micro, small and medium-sized firms). On average, Islamic banks allocate a higher proportion of their assets to MSME loans (full and across borrower types) than conventional banks, and this difference was persistent during the sample period (growth rates do not significantly differ between bank types). Similarly, we observe that Islamic banks extend proportionally more lines of credit to the MSME segment of the market. Differences between Islamic and conventional banks in both of these indicators may reflect the use of *Murabaha* contracts for credit transactions by Islamic banks, which is believed to operate as a tool to reduce informational asymmetries. On the other hand, Islamic banks are less engaged with foreign exchange MSME financing than their conventional counterparts. Especially foreign exchange lending to small-sized enterprises seems to drive this observation. Further, compared to conventional banks, Islamic banks generate more income from their MSME borrowers, while they are not differently exposed to non-performing loans. In fact, compared to their conventional peers, Islamic banks more effectively manage the credit risk of their investments in medium-sized enterprises. Based on the results in Table 4, this study seeks to determine if these unconditional differences still hold once we account for bank-specific characteristics.

To control for the possible sensitivity of MSME financing to bank health, we include the following bank fundamental ratios (Cull and Martínez Pería, 2013): solvability, liquidity, deposit-funding, and profitability. The impact of some of these fundamentals on the banks' MSME loan portfolio is, however, a priori unknown. For example, more profitable and better-capitalized banks might be better positioned than low-capitalized banks to advance know-how in specific areas such as MSME financing. On the other hand, under-capitalized banks may take more risks to boost profits by venturing more aggressively into high-risk segments such as MSME financing (Clarke et al., 2005). Liquid banks might try offset the opportunity costs of higher cash holdings through two opposing strategies (Aysan et al., 2016): charging higher lending rates to MSME borrowers (price effect) or rebalancing their loan portfolio exposures by focusing more on MSME financing (quantity effect). Although deposit liabilities are a stable source of bank funding, their influence on small business lending is also difficult to determine. With regressions, we hope to find patterns for the balance sheet variables that make it easier for us to interpret why some banks are more engaged with MSME financing.

The figures reveal that Turkish Islamic banks are less-capitalized, more liquid, and rely more heavily on deposit funding. The

Table 4

Summary statistics.

	Conventional Banks			Islamic Banks			Difference
	Obs.	Mean	SD	Obs.	Mean	SD	
MSME Lending: Share	1036	0.1389	0.110	122	0.2489	0.082	0.1101***
MSME Lending: Growth	963	0.0542	0.398	118	0.0799	0.262	0.0257
Micro Lending: Share	1036	0.0293	0.037	122	0.0407	0.027	0.0114***
Micro Lending: Growth	808	0.0647	0.643	115	0.0665	0.340	0.0018
Small Lending: Share	1036	0.0383	0.041	122	0.0746	0.026	0.0363***
Small Lending: Growth	900	0.0597	0.545	118	0.0806	0.255	0.0209
Medium Lending: Share	1036	0.0713	0.061	122	0.1336	0.049	0.0623***
Medium Lending: Growth	931	0.0657	0.386	115	0.0793	0.555	0.0137
FX MSME Lending: Share	1036	0.0319	0.056	122	0.0138	0.011	-0.0181***
FX Micro Lending: Share	1036	0.0049	0.016	122	0.0035	0.005	-0.0014
FX Small Lending: Share	1036	0.0082	0.022	122	0.0033	0.005	-0.0049**
FX Medium Lending: Share	1036	0.0188	0.026	122	0.0069	0.005	-0.0118
MSME Lending rate	1003	0.0174	0.021	122	0.0299	0.032	0.0126***
Micro Lending rate	852	0.0207	0.031	119	0.0378	0.052	0.0171***
Small Lending rate	942	0.0171	0.025	122	0.0244	0.023	0.0074***
Medium Lending rate	972	0.0169	0.027	119	0.0370	0.101	0.0201***
MSME Lines of Credit	1036	0.0494	0.058	122	0.1821	0.084	0.1327***
Micro Lines of Credit	1036	0.0082	0.023	122	0.0303	0.023	0.0221***
Small Lines of Credit	1036	0.0166	0.031	122	0.0542	0.025	0.0375***
Medium Lines of Credit	1036	0.0246	0.030	122	0.0976	0.053	0.0731***
NPL: MSME Lending portfolio	1003	0.4489	5.510	122	0.0412	0.026	-0.4077
NPL: Micro Lending portfolio	852	0.2724	4.294	119	0.0739	0.081	-0.1985
NPL: Small Lending portfolio	942	0.2797	2.191	122	0.0429	0.031	-0.2367
NPL: Medium Lending portfolio	972	0.0535	0.157	119	0.0318	0.021	-0.0217***
Equity ratio	1036	0.2247	0.205	122	0.1165	0.022	-0.1081***
Liquidity ratio	1036	0.0673	0.041	122	0.1219	0.041	0.0547***
Deposits ratio	1036	0.4494	0.283	122	0.7459	0.060	0.2965***
Profits ratio	1000	0.0052	0.006	118	0.0039	0.008	-0.0014**
Bank age	1036	4.8144	0.744	122	4.3521	0.273	-0.4623***
Bank size	1036	15.5608	2.136	122	16.0726	0.621	0.5118***

See Table 3 for the definition of the variables. The last column refers to the difference between Islamic and conventional banks.

* Significance level at 10%.

*** Significance level at 1%,

** Significance level at 5%,

lower capitalization ratio may reflect the different nature of Islamic banks since these banks operate like equity-based companies in which depositors are treated as quasi-shareholders (Grais and Pellegrini, 2006; Aysan et al., 2017). Higher liquidity and deposits ratios might be a reflection of reduced access to *Shariah*-compliant investments and non-deposit funding sources, respectively. As for the other bank-control variables, we observe that Islamic banks are, on average, younger but bigger than conventional banks.

4. Estimation results

Below, we present our results as follows. First, we discuss whether Islamic banks differ from their conventional counterparts with respect to lending towards the MSME segment and its size breakdown. Second, we repeat the previous exercise but with the difference that we take into account the heterogeneity in terms of ownership in the conventional banking group. Third, we verify whether lending growth is influenced by bank orientation (Islamic versus conventional) or bank ownership (Islamic vs. different bank ownership forms). Fourth, we present a series of robustness tests to check the validity of our findings.

4.1. Banks' MSME financing – Islamic versus conventional banks

For the full sample of MSME borrowers as well as for different borrower types, we initially investigate whether bank orientation (Islamic versus conventional) affects the share of lending. In Table 5, the first column reports the regression estimates for the full MSME segment, while the following columns show the separate estimation results for the three size categories of MSMEs. Differences in lending behavior towards MSMEs between Islamic and conventional banks are derived from the coefficient estimate on the *Islamic* variable. In the share regression for the entire MSME segment, the coefficient estimate for *Islamic* is positive and significant at the 1% level (Column 1). These results suggest that, after controlling for other factors that might affect lending, Islamic banks hold, on average, a 10.46% larger share of MSME loans in the assets portfolio than conventional banks do. Similar conclusions are reached for share regressions involving different size (micro, small, or medium-sized) categories and, in fact, the difference in shares between Islamic and conventional banks increases with the MSME size category: average difference in the share of lending to micro-sized firm segment is 1.51%, whereas this difference is 3.56% and 4.78% to small-sized and medium-sized categories, respectively. Hence, the

Table 5

Banks' MSME financing – Islamic versus conventional banks.

	MSMEs	Micro SMEs	Small SMEs	Medium SMEs
	Share	Share	Share	Share
	(1)	(2)	(3)	(4)
Bank ownership				
Islamic	0.1046***	0.0151***	0.0356***	0.0478**
	(0.037)	(0.005)	(0.009)	(0.024)
Bank fundamentals				
Equity ratio[a]	-0.0445	-0.0286	-0.0291	0.0131
	(0.093)	(0.031)	(0.041)	(0.056)
Liquidity ratio[a]	0.1687	-0.0396	0.0648	0.1510**
	(0.125)	(0.037)	(0.054)	(0.069)
Deposits ratio[a]	-0.0368	-0.0078	-0.0258	-0.0019
	(0.039)	(0.016)	(0.020)	(0.022)
Profits ratio[a]	-0.4026	-0.2280	-0.1096	-0.1113
	(0.337)	(0.154)	(0.132)	(0.210)
Bank controls				
Bank age[a]	0.0147	0.0084	0.0051	-0.0091
	(0.030)	(0.007)	(0.008)	(0.016)
Bank size[a]	0.0135	0.0015	0.0065	0.0063
	(0.010)	(0.003)	(0.004)	(0.006)
Macro controls				
Inflation	0.1070	0.0053	0.1034***	-0.0034
	(0.087)	(0.044)	(0.037)	(0.059)
GDP growth	0.0233**	0.0023	0.0135**	0.0078
	(0.011)	(0.005)	(0.006)	(0.007)
Observations	1070	1070	1070	1070
R-squared	0.0725	0.147	0.0868	0.0496

See Table 3 for the definition of the variables. The models are estimated using random effects. a Indicates that the variable is lagged with one quarter. Cluster-robust standard errors (to account for both heteroskedasticity and autocorrelation) are in parentheses.

* Significance level at 10%.
*** Significance level at 1%,
** Significance level at 5%,

larger magnitude of coefficients in the regressions for larger MSME classifications suggests that larger MSMEs are relatively more serviced by Islamic banks. This observation is also the first evidence that Islamic banks follow heterogeneous lending policies according to the size of the MSME borrower.

Since bank lending to MSMEs constitutes only a portion of the total investment activities, we lack strong priors about how balance sheet characteristics and other bank-specific information would affect the lending behavior towards MSMEs.[14] The results show that most bank-level control variables do not significantly influence banks' MSME lending. The only exception is the finding that the Liquidity ratio positively influences the supply of credit for medium-sized SMEs. Concerning macro controls, we find that a macroeconomic environment with higher GDP leads to higher lending towards MSME lending and that this finding is mainly driven by lending to the small-sized sub-segment. On the other hand, inflation seems to only affect lending to small-sized SMEs without influencing banks' overall MSME portfolio.

4.2. Banks' MSME financing – Islamic versus different forms of bank ownership

The aforementioned results show that, compared with conventional banks, Islamic banks exhibit larger credit exposures not only to the main MSME category but also for all sub-categories. Previous literature shows that the heterogeneity in the ownership structure of conventional banks produces different lending outcomes for small businesses. Historically, foreign banks were recognized for their efficiency in financial intermediation (Bonin et al., 2005; Fries and Taci, 2005). However, evidence from emerging economies suggests that foreign banks are risk-averse and therefore are less likely to lend to small and opaque companies for which most of the information on them is soft. This soft information impedes the effective flow of information at foreign banks, which typically have more hierarchical decision-making structures (Mian, 2003; Gormley, 2010; Sengupta, 2007).[15] On the other hand, the literature on

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[14] In addition, the literature is particularly silent on how these bank characteristics affect the allocative decisions within and between the various groups of investment activities.

[15] In comparing the lending behavior of small and large banks, the argument is that the latter has a comparative advantage in transaction lending and a disadvantage in relationship lending. On the other hand, some recent studies (Berger and Udell, 2006; de la Torre et al., 2010) underline the

Table 6

Banks' MSME financing – Islamic banks versus different forms of bank ownership.

	MSMEs	Micro SMEs	Small SMEs	Medium SMEs
	Share	Share	Share	Share
	(1)	(2)	(3)	(4)
Bank ownership				
Islamic	0.0882**	0.0204***	0.0361***	0.0244
	(0.037)	(0.006)	(0.010)	(0.025)
Foreign	-0.0176	0.0072	0.0076	-0.0379***
	(0.014)	(0.008)	(0.010)	(0.013)
State	-0.0839	0.0332	-0.0346**	-0.0769***
	(0.066)	(0.033)	(0.017)	(0.023)
Bank fundamentals				
Equity ratio[a]	-0.0466	-0.0278	-0.0268	0.0046
	(0.093)	(0.032)	(0.041)	(0.057)
Liquidity ratio[a]	0.1754	-0.0404	0.0592	0.1678**
	(0.125)	(0.038)	(0.054)	(0.072)
Deposits ratio[a]	-0.0326	-0.0100	-0.0244	0.0043
	(0.040)	(0.015)	(0.020)	(0.021)
Profits ratio[a]	-0.4309	-0.2290	-0.0965	-0.1574
	(0.338)	(0.155)	(0.129)	(0.207)
Bank controls				
Bank age[a]	0.0129	0.0065	0.0057	-0.0075
	(0.028)	(0.006)	(0.007)	(0.016)
Bank size[a]	0.0134	0.0016	0.0072*	0.0044
	(0.010)	(0.003)	(0.004)	(0.006)
Macro controls				
Inflation	0.1057	0.0055	0.1046***	-0.0074
	(0.086)	(0.044)	(0.037)	(0.058)
GDP growth	0.0233**	0.0023	0.0137**	0.0075
	(0.011)	(0.005)	(0.006)	(0.007)
Observations	1070	1070	1070	1070
R-squared	0.113	0.150	0.0975	0.163

See Table 3 for the definition of the variables. The models are estimated using random effects. a Indicates that the variable is lagged with one quarter. Cluster-robust standard errors (to account for both heteroskedasticity and autocorrelation) are in parentheses.

*** Significance level at 1%,

** Significance level at 5%,

* Significance level at 10%.

state-owned banks indicates that the presence of these banks is correlated with poor financial development and inefficiencies in financial intermediation (Barth et al., 2001; La Porta et al., 2002). Further evidence suggests that these banks are more subject to credit misallocation due to politically motivated lending practices (Sapienza, 2004; Dinç, 2005; Claessens et al., 2008).

Hence, in this section, we compare Islamic banks' MSME lending behavior with the behavior of different conventional bank ownership forms. Out of the 36 *conventional banks* that operate in Turkey, 15 banks are classified as domestically owned commercial banks (more than 50% of their shares are owned by Turkish citizens), 18 banks are classified as foreign (more than 50% of their shares are owned by non-residents), and 3 of them are state-owned banks. We extend Eq. (1) by including bank ownership dummy variables in which domestically owned commercial banks serve as the control group.

Results of the extended model are presented in Table 6. The share regression for the aggregated MSME category confirms our previous finding that Islamic banks are allocating relatively more resources to MSME lending. More specifically, the weight they assign to MSME lending is more than all the different groups of conventional banks: the coefficient on Islamic is 0.0882, which implies that the average Islamic bank devotes 8.82% more MSME financing than domestically owned commercial banks. On the other hand, in the aggregate, we do not find that foreign and state-owned banks lend less than domestically-owned commercial banks to small businesses.

As for the MSME sub-segments, the positive coefficient on Islamic in the aggregated MSME regression seems to be driven by

(*footnote continued*)

possibility that large banks can be as effective in MSME lending by increasing the effectiveness of arms-length lending technologies (credit scoring, factoring, asset-based lending, etc.). However, these lending technologies are less applied in Turkey. According to the Turkish Commercial Code, the majority of enterprises are not legally required to audit their financial statements. Moreover, credit scoring to determine customers' history of creditworthiness is still not common practice, mainly because of the low quality of the credit registry (which contains primarily negative information regarding delinquencies).

Table 7
Growth in banks' MSME financing.

	MSMEs		Micro SMEs		Small SMEs		Medium SMEs	
	Growth		Growth		Growth		Growth	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank ownership								
Islamic	0.0519	0.0553	-0.0367	-0.0411	-0.0452	-0.0186	0.0161	0.0268
	(0.033)	(0.035)	(0.046)	(0.060)	(0.071)	(0.083)	(0.021)	(0.028)
Foreign		0.0002		-0.0115		0.0466		0.0093
		(0.023)		(0.047)		(0.104)		(0.035)
State		0.0377		0.0372		0.0326		0.0580[**]
		(0.026)		(0.034)		(0.096)		(0.028)
Bank fundamentals								
Equity ratio[a]	0.0242	0.0119	0.7106[**]	0.6955[**]	-0.0306	-0.0184	0.0736	0.0617
	(0.116)	(0.115)	(0.277)	(0.271)	(0.208)	(0.212)	(0.163)	(0.163)
Liquidity ratio[a]	-0.0286	-0.0201	0.3811	0.3938	0.2305	0.2119	0.0659	0.0773
	(0.287)	(0.293)	(0.453)	(0.452)	(0.619)	(0.611)	(0.523)	(0.518)
Deposits ratio[a]	-0.0660	-0.0755	0.2343[**]	0.2318[**]	0.1051	0.0936	0.0232	0.0053
	(0.103)	(0.108)	(0.102)	(0.110)	(0.177)	(0.191)	(0.083)	(0.091)
Profits ratio[a]	-1.0958	-1.1760	-1.4667	-1.6371	-2.2752	-2.1877	2.7897	2.7041
	(3.117)	(3.117)	(3.715)	(3.795)	(2.893)	(2.873)	(5.773)	(5.803)
Bank controls								
Bank age[a]	-0.0151	-0.0193	-0.0566	-0.0641	0.0307	0.0317	-0.0075	-0.0122
	(0.022)	(0.024)	(0.038)	(0.045)	(0.079)	(0.080)	(0.031)	(0.035)
Bank size[a]	0.0084	0.0070	0.0032	0.0016	-0.0454	-0.0438	0.0041	0.0028
	(0.011)	(0.010)	(0.014)	(0.014)	(0.057)	(0.055)	(0.014)	(0.012)
Macro controls								
Inflation	1.7909[*]	1.7896[*]	2.8256[**]	2.8225[**]	0.9702	0.9790	0.3252	0.3219
	(0.917)	(0.913)	(1.415)	(1.417)	(1.744)	(1.747)	(1.094)	(1.087)
GDP growth	0.2811	0.2819	0.3410	0.3425	0.2459	0.2458	0.1871	0.1874
	(0.175)	(0.175)	(0.263)	(0.264)	(0.261)	(0.261)	(0.211)	(0.210)
Observations	1038	1038	892	892	979	979	1007	1007
R-squared	0.005	0.006	0.017	0.018	0.001	0.001	0.003	0.004

See Table 3 for the definition of the variables. The models are estimated using random effects. a Indicates that the variable is lagged with one quarter. Cluster-robust standard errors (to account for both heteroskedasticity and autocorrelation) are in parentheses.
* ** Significance level at 1%,
  ** Significance level at 5%,
  * Significance level at 10%.

Islamic banks' lending to micro and small-sized firms. In terms of lending to the medium-sized industry segment, Islamic banks are not distinguishing themselves from privately-owned Turkish banks. Compared with privately-owned domestic banks, foreign banks are less likely to lend to the medium-sized segment of the industry. On the other hand, state-owned banks lend less to small and medium-sized firms. Hence, our findings only support the argument that foreign and state-owned banks are less exposed to SMEs in respect of lending to small and midsized firms.

In the share regressions, for the variables capturing bank- and macro-level factors, the coefficients and significance levels remain similar to those observed in Table 5.

4.3. Growth regressions

This section presents the regression results for the influence of bank orientation (Islamic versus conventional) or bank ownership (Islamic vs. different bank ownership forms) on lending growth. Table 7 includes regressions based on Eq. (1), with quarterly growth of small business lending as the dependent variable. Specifically, uneven columns in Table 7 report the results for bank orientation, while the even columns report the results, including different *conventional* bank ownership forms. Considering both the share and growth of lending is important since lending growth reveals the dynamics of convergence (or divergence) in the MSME lending shares (Clarke et al., 2005; Aysan et al., 2016). The coefficients on the dummy variable for Islamic banks for the growth regressions involving total MSME lending and different size (micro, small, or medium-sized) categories are statistically insignificant across all regressions. These findings indicate that the difference between Islamic and conventional banks in credit allocation towards the entire MSME segment and its sub-segments is persistent, i.e., the wedge does not dissipate.

4.4. Robustness checks

The sensitivity of our empirical results is examined through a number of additional tests. Although our primary regressions

Table 8
Fixed effects regressions—second stage.

	MSMEs		Micro SMEs		Small SMEs		Medium SMEs	
	Share		Share		Share		Share	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank ownership								
Islamic	0.1312***	0.1090***	0.0292***	0.0268***	0.0520***	0.0452***	0.0501**	0.0375*
	(0.029)	(0.036)	(0.006)	(0.006)	(0.010)	(0.013)	(0.020)	(0.022)
Foreign		-0.0297		-0.0096		-0.0052		-0.0144
		(0.041)		(0.013)		(0.016)		(0.021)
State		-0.1278*		0.0193		-0.0609***		-0.0857***
		(0.065)		(0.035)		(0.019)		(0.017)
Observations	40	40	40	40	40	40	40	40
R-squared	0.096	0.163	0.054	0.095	0.094	0.187	0.055	0.171

The coefficients presented are those from the second stage of a two-stage estimation to account for fixed effects in the share of lending to small businesses (MSMEs) and its sub-segments (micro, small or medium-sized SMEs). In the first stage, we regress the share of MSME lending on lagged bank variables, macro controls and individual bank dummy variables (i.e., bank fixed effects). In the second stage, the retrieved fixed effects are regressed on either bank orientation (Islamic vs. conventional) or bank ownership (Islamic vs. different bank ownership forms). Cluster-robust standard errors (to account for both heteroskedasticity and auto-correlation) are in parentheses.
*** Significance level at 1%,
** Significance level at 5%,
* Significance level at 10%.

include a variety of bank-specific variables to control for inherent differences between Islamic and conventional banks, the estimation results may still suffer from an omitted-variable bias. In other contexts, the inclusion of bank-fixed effects would mitigate this omitted variables problem. In our case, however, the primary variable of interest, i.e., the bank orientation variable *Islamic*, does not change during the sample period. Therefore, it is not possible to disentangle the effect of the *Islamic* variable from the individual bank-fixed effects. In fact, we observe a similar invariance for state-owned banks. Hence, the time-invariant nature of the bank orientation variable prevents us from including bank-fixed effects.

To circumvent this limitation, it is necessary to divide the estimation procedure into two stages (Hsiao, 2014). Clarke et al. (2005) follow a similar estimation strategy to evaluate the sensitivity of their findings with respect to MSME lending in a sample of Latin American countries. In the first stage, we regress the share of MSME lending on bank fundamentals, other controls, and individual bank dummy variables (i.e., bank-fixed effects). The estimated fixed effects from the first stage are used as dependent variables in the second stage. To conserve space, Table 8 only reports the estimated coefficients of the second stage. The share regressions for the total MSME segment and its sub-segments are estimated under two model specifications. The first one includes the *Islamic* variable (vs. conventional banks), and the second one controls, next to the *Islamic* variable, for the heterogeneity in conventional banks' ownership structure. Although the number of observations dropped substantially commensurate with the number of banks, the results are consistent with our earlier analyses. For the two model specifications under share regressions, Islamic banks are more willing to allocate credits to the entire spectrum of MSMEs. In addition, compared to their private counterparts, we again find that state-owned banks devote less to the total MSME loans and different size categories. The only exception is the financing approach towards the micro-sized sub-segment, where we do not find that state-owned banks differ from private domestic banks. On the other hand, we do not observe a significant difference in lending behavior between foreign and domestically-owned private banks.[16]

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[16] One may be concerned that our results could be driven by the Islamist-rooted government party, Justice and Development Party, or AKP, such that Islamic banks' favorable attitude towards MSME financing might be a reflection of clientelistic practices. There are, however, a number of arguments against this possibility. First, although the AKP has its Islamist roots, the driving force behind the party's consecutive election wins is the growing but heterogeneous urban lower middle class. From this point of view, explicitly favoring one segment at the expense of another would damage the mainstream image of the AKP. However, the government has indeed been following an active policy in correcting the historically-rooted institutionalized biases against the religious identity in various contexts, including the banking sector. In December 2005, upon enactment of the Banking Act No. 5411, the government created an even level playing field for Islamic banks vis-a-vis conventional banks. Since then, Islamic banks have been subject to the same regulatory rules and oversight, and Islamic depositors have benefited from the same deposit insurance coverage compared to their conventional peers. Hence, from a regulatory point of view, Islamic banks do not enjoy any preferential treatment. Concerning the lending towards MSMEs, Islamic banks have to meet the same minimum capital standards as conventional banks. If there had been any preferential treatment from the government towards MSMEs, this would have been materialized through state-owned banks and not privately-owned Islamic banks (Dinç, 2005; Cole, 2009). Secondly, Table 7 shows that the growth rate in the volume of MSME lending between Islamic and conventional banks is, on average, not different from each other, indicating that the wedge in lending behavior between both bank types has not increased but remained unchanged. Thirdly, taking into account AKP's lengthy tenure in power, one can argue that the market share of Islamic banks has not matched the expectations. Finally, although these findings need further substantiation, province-level regressions reveal that Islamic banks' total credit growth in the provinces (we have no data specifically on MSME lending on the level of provinces) which the AKP lost is larger than in provinces were the AKP was the largest, giving us an indication that there is no rent redistribution towards supporters through Islamic banks.

Table 9

Banks' MSME financing – Hausman and Taylor (1981) regressions.

	MSMEs		Micro SMEs		Small SMEs		Medium SMEs	
	Share		Share		Share		Share	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank ownership								
Islamic	0.1168***	0.1052**	0.0240***	0.0310***	0.0430***	0.0456***	0.0451	0.0243
	(0.045)	(0.045)	(0.007)	(0.008)	(0.012)	(0.013)	(0.030)	(0.029)
Foreign		-0.0130		0.0126*		0.0135		-0.0400***
		(0.013)		(0.007)		(0.011)		(0.012)
State		-0.0990		0.0357		-0.0406*		-0.0877***
		(0.075)		(0.034)		(0.023)		(0.032)
Bank fundamentals								
Equity ratio[a]	-0.0446	-0.0441	-0.0378	-0.0346	-0.0296	-0.0266	0.0260	0.0210
	(0.094)	(0.094)	(0.035)	(0.036)	(0.044)	(0.044)	(0.056)	(0.057)
Liquidity ratio[a]	0.1559	0.1551	-0.0321	-0.0374	0.0550	0.0476	0.1352*	0.1463**
	(0.123)	(0.122)	(0.036)	(0.038)	(0.053)	(0.055)	(0.070)	(0.071)
Deposits ratio[a]	-0.0384	-0.0391	-0.0146	-0.0159	-0.0273	-0.0278	0.0023	0.0026
	(0.039)	(0.039)	(0.015)	(0.015)	(0.019)	(0.019)	(0.022)	(0.021)
Profits ratio[a]	-0.3241	-0.3302	-0.2112	-0.2036	-0.0564	-0.0377	-0.0831	-0.1168
	(0.331)	(0.331)	(0.150)	(0.150)	(0.127)	(0.126)	(0.208)	(0.205)
Bank controls								
Bank age[a]	0.0339	0.0358	0.0198	0.0167	0.0172	0.0167	-0.0123	-0.0070
	(0.047)	(0.046)	(0.012)	(0.011)	(0.013)	(0.013)	(0.027)	(0.026)
Bank size[a]	0.0120	0.0118	-0.0026	-0.0016	0.0056	0.0065	0.0103	0.0083
	(0.013)	(0.013)	(0.005)	(0.005)	(0.006)	(0.006)	(0.007)	(0.007)
Macro controls								
Inflation	0.1104	0.1120	0.0027	0.0040	0.1055***	0.1070***	0.0024	0.0020
	(0.088)	(0.088)	(0.046)	(0.046)	(0.037)	(0.037)	(0.058)	(0.057)
GDP growth	0.0229**	0.0231**	0.0015	0.0017	0.0134**	0.0136**	0.0083	0.0082
	(0.011)	(0.011)	(0.005)	(0.005)	(0.006)	(0.006)	(0.007)	(0.007)
Observations	1070	1070	1070	1070	1070	1070	1070	1070
Sargan-Hansen (p-value)	0.439	0.403	0.588	0.150	0.367	0.431	0.699	0.809

See Table 3 for the definition of the variables. The models are estimated using Hausman and Taylor (1981) estimator. a Indicates that the variable is lagged with one quarter. The foreign bank dummy (in regressions with different forms of bank ownership) and bank bank-level control variables are treated as time-variant and endogenous, state-owned (in regressions with different forms of bank ownership) and Islamic bank dummies as time-invariant and exogenous, while macroeconomic variables are assumed to be time-variant and exogenous. Cluster-robust standard errors (to account for both heteroskedasticity and autocorrelation) are in parentheses.

*** Significance level at 1%,
** Significance level at 5%,
* Significance level at 10%.

As a second robustness test, following de Haas and Van Lelyveld (2006) and Degryse et al. (2012), we employ the Hausman and Taylor (1981) instrumental variable estimator. Unlike the random effects models, the Hausman and Taylor estimator permits some of the independent variables to be correlated with the unobserved bank-level random effect (hence, taking into account the endogeneity of explanatory variables), but also allows the estimation of coefficients for exogenous time-invariant covariates. In this regard, the foreign bank dummy (in regressions with different forms of bank ownership) and bank bank-level control variables are treated as time-variant and endogenous, state-owned (in regressions with different forms of *conventional* bank ownership) and Islamic bank dummies as time-invariant and exogenous, while macroeconomic variables are assumed to be time-variant and exogenous.

Table 9 indicates that Islamic banks are providing more total MSME loans (Column 1) as well as loans to micro-sized (Column 3) and small-sized (Column 5) companies than their conventional counterparts. The regression results using conventional bank ownership dummies confirm those reported in Table 6. Compared to their private domestic counterparts, Islamic banks provide more funding to MSMEs, especially to micro and small-sized businesses, while their share of loans to medium-sized businesses is similar. While our findings do not indicate disparities in aggregate lending, we do discover that state and foreign banks service small and medium-sized businesses less than their private counterparts. Table 9 also reports the Sargan-Hansen test of overidentifying restrictions to evaluate the validity of the instruments used. The null hypothesis is rejected in all regressions, pointing out that the excluded instruments are uncorrelated with the error term and hence correctly excluded from the estimations.

As a final series of robustness tests, to cope with potential endogeneity problems, instead of lagged explanatory variables, we use their initial values as in Clarke et al. (2005).[17] Bellemare et al. (2015) show that the introduction of lagged values as explanatory variables does not solve the endogeneity problem but merely moves it one period back in time. Table A1 shows that this alternative

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[17] The majority of initial values are taken from 2006Q4, when our data starts. However, for those banks that enter subsequently, their first observation is taken as the initial value.

Table 10
Foreign exchange lending.

	MSMEs		Micro SMEs		Small SMEs		Medium SMEs	
	RE	HT	RE	HT	RE	HT	RE	HT
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank ownership								
Islamic	-0.0141	-0.0065	0.0003	0.0021	-0.0017	0.0020	-0.0161***	-0.0145*
	(0.013)	(0.016)	(0.003)	(0.003)	(0.004)	(0.006)	(0.006)	(0.008)
Foreign	-0.0085	-0.0073	-0.0017	0.0000	-0.0007	0.0021	-0.0104***	-0.0110***
	(0.007)	(0.006)	(0.003)	(0.003)	(0.004)	(0.004)	(0.002)	(0.001)
State	-0.0382*	-0.0497*	-0.0035	-0.0053	-0.0101	-0.0165	-0.0199**	-0.0236*
	(0.023)	(0.030)	(0.003)	(0.005)	(0.008)	(0.013)	(0.010)	(0.013)
Bank fundamentals								
Equity ratio[a]	-0.1114	-0.1209	-0.0306	-0.0356	-0.0481	-0.0541	-0.0268*	-0.0277*
	(0.076)	(0.080)	(0.025)	(0.028)	(0.037)	(0.040)	(0.015)	(0.016)
Liquidity ratio[a]	-0.0345	-0.0256	-0.0244	-0.0163	-0.0226	-0.0172	0.0048	0.0082
	(0.053)	(0.050)	(0.015)	(0.013)	(0.030)	(0.028)	(0.020)	(0.020)
Deposits ratio[a]	-0.0342*	-0.0287**	-0.0099	-0.0070	-0.0168	-0.0119*	-0.0131**	-0.0113**
	(0.018)	(0.013)	(0.008)	(0.005)	(0.012)	(0.007)	(0.006)	(0.005)
Profits ratio[a]	-0.2563	-0.2019	-0.1508	-0.1362	-0.0863	-0.0519	-0.0498	-0.0344
	(0.235)	(0.215)	(0.122)	(0.115)	(0.101)	(0.088)	(0.047)	(0.042)
Bank controls								
Bank age[a]	0.0182	0.0369	0.0024	0.0070*	0.0053	0.0147*	0.0026	0.0077
	(0.018)	(0.024)	(0.002)	(0.004)	(0.005)	(0.008)	(0.009)	(0.014)
Bank size[a]	-0.0027	-0.0064	-0.0009	-0.0023	-0.0006	-0.0022	0.0003	-0.0006
	(0.004)	(0.005)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.003)
Macro controls								
Inflation	0.0066	0.0013	-0.0062	-0.0101	0.0242	0.0202	-0.0065	-0.0078
	(0.033)	(0.035)	(0.028)	(0.031)	(0.019)	(0.017)	(0.017)	(0.017)
GDP growth	0.0007	-0.0004	0.0014	0.0009	0.0024	0.0018	-0.0024	-0.0028
	(0.005)	(0.005)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Observations	1070	1070	1070	1070	1070	1070	1070	1070
R-squared	0.138		0.0749		0.0840		0.192	
Sargan-Hansen (p-value)		0.607		0.468		0.346		0.474

See Table 3 for the definition of the variables. RE refers to random effects model, while HT refers to Hausman and Taylor (1981) estimator. a Indicates that the variable is lagged with one quarter. In HT estimations: the foreign bank dummy and bank bank-level control variables are treated as time-variant and endogenous, state-owned and Islamic bank dummies as time-invariant and exogenous, while macroeconomic variables are assumed to be time-variant and exogenous. Cluster-robust standard errors (to account for both heteroskedasticity and autocorrelation) are in parentheses.
* Significance level at 10%.
** Significance level at 5%,
*** Significance level at 1%,

estimation procedure, hence the *random-effects* model with initial values of explanatory variables, produces similar results. When we re-estimate Eq. (1) using time-fixed effects instead of macroeconomic variables, Table A2 shows that Islamic banks extend more loans to MSMEs in aggregate and across the size categories, regardless of bank orientation (Islamic vs. conventional) or bank ownership (Islamic vs. different bank ownership forms). In addition, when we re-estimate Eq. (1) using pooled OLS instead of random effects, we find that Islamic banks serve the aggregate pool of MSMEs and its sub-segments better, regardless of whether we account for bank orientation or bank ownership in models with macro variables (Table A3) or time fixed effects (Table A4).

5. Other aspects of MSME lending policies

In the previous section, we examined whether bank orientation explains the lending behavior towards MSMEs. In this section, we expand into other aspects of MSME lending policies. Since almost all variables were found to be insignificant in the growth regressions, we will proceed with the share regressions from now on. Furthermore, we will only report the results of our estimations, alternatively using random-effects (RE) and Hausman-Taylor (HT) estimators, in which Islamic bank and conventional bank ownership dummies are incorporated. First, we verify the attitude of Islamic banks towards foreign exchange lending. Second, we examine whether bank orientation matters for lending rates. Third, we check whether our findings for bank lending corroborate with letters of credit issued to MSMEs. Finally, we reveal the impact of bank orientation on MSME loan quality.

5.1. Foreign exchange lending to MSMEs

The liberalization policies instituted by the late President Turgut Özal from the early 1980s redirected the economy towards export-oriented and labor-intensive industrialization. It was also under his impetus that Islamic banks were founded. Moreover, one of the most

important outcomes of Özal's export-oriented policies was the creation of Islamic business groups, mainly organized under the umbrella of MÜSIAD, the association of Islamic-inclined businessmen. Over the years, and especially after the conservative Justice and Development Party (AKP) came into power in 2002, MÜSIAD has built an enormous outreach of representatives within and beyond Turkey. MÜSIAD's members are pious entrepreneurs from Anatolia, primarily in cities such as Gaziantep, Kayseri, and Konya. The region is home to a strengthening conservative business class, often called 'Anatolian Tigers', and has fueled economic growth, industrial diffusion, and export capacity.

Numerous studies indicate that Islamic banks have played a pivotal role in the formation of the export potential of Anatolian MSMEs (Özcan and Çokgezen, 2003; Demiralp, 2009; Gümüscü 2010; Hosgör, 2011). Table 10 provides the empirical verification of this assertion and reports the results of the share regressions for extended loans in foreign currency. Our results do not confirm the suggestion that Islamic banks extend more loans in foreign currency to MSMEs. In fact, the Islamic banking dummy variable enters the regressions with an insignificant coefficient. Compared to domestic-owned private banks, Islamic banks even provide less loans in foreign currency to mid-sized firms. Although previous studies suggested that Islamic banks were crucial in enabling Anatolian MSMEs to develop their export potential, our findings indicate that this did not necessarily materialize with foreign exchange lending. State and foreign banks exhibit a similar foreign exchange lending behavior as their Islamic counterparts.

5.2. Loan rates to MSMEs

In this sub-section, we will proceed with the comparative evaluation of the rates charged on MSMEs by Islamic and conventional banks. As indicated before, Islamic rates refer to the revenues generated from their lending activities, mainly through *Murabaha* finance. Since in most countries, including Turkey, only a few Islamic banks operate alongside conventional banks, it has been argued that they have a more captive clientele (Kuran, 2004). This has led to what El-Gamal (2006) dubs as '*Shariah* arbitrage', i.e., participants in a captive market are willing to pay a higher premium for *Shariah*-approved financial products (but mimicking their conventional counterparts). We will examine whether Islamic banks indeed charge higher premiums to MSMEs than conventional banks.

Table 11
Loan rates to MSMEs.

	MSMEs		Micro SMEs		Small SMEs		Medium SMEs	
	RE	HT	RE	HT	RE	HT	RE	HT
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank ownership								
Islamic	0.0176**	0.0206*	0.0334**	0.0527**	0.0175**	0.0288*	0.0250	0.0247
	(0.008)	(0.011)	(0.016)	(0.024)	(0.008)	(0.015)	(0.015)	(0.018)
Foreign	0.0101	0.0151	0.0108	0.0152	0.0180	0.0298*	0.0048	0.0057
	(0.008)	(0.010)	(0.011)	(0.015)	(0.012)	(0.018)	(0.004)	(0.005)
State	0.0008	0.0110	0.0025	0.0271	0.0064	0.0241	-0.0022	0.0057
	(0.006)	(0.010)	(0.009)	(0.021)	(0.008)	(0.017)	(0.004)	(0.011)
Bank fundamentals								
Equity ratio[a]	0.0016	0.0024	0.0075	0.0095	0.0151*	0.0127	-0.0170	-0.0047
	(0.009)	(0.012)	(0.023)	(0.034)	(0.009)	(0.014)	(0.021)	(0.021)
Liquidity ratio[a]	0.0556*	0.0678*	-0.0497	-0.0501	0.0796*	0.1079**	0.0336	0.0484
	(0.033)	(0.038)	(0.053)	(0.067)	(0.041)	(0.055)	(0.038)	(0.047)
Deposits ratio[a]	-0.0070	-0.0102	-0.0216	-0.0642	-0.0112	-0.0207	-0.0142	-0.0014
	(0.009)	(0.010)	(0.030)	(0.054)	(0.014)	(0.018)	(0.011)	(0.019)
Profits ratio[a]	-0.1188	-0.1474	-0.7114	-0.7060	-0.2006	-0.1969	-0.7770	-0.8712
	(0.255)	(0.257)	(0.728)	(0.735)	(0.219)	(0.215)	(0.819)	(0.862)
Bank controls								
Bank age[a]	0.0016	-0.0002	0.0049	0.0083	0.0026	0.0057	0.0025	0.0041
	(0.005)	(0.010)	(0.005)	(0.013)	(0.005)	(0.016)	(0.004)	(0.007)
Bank size[a]	-0.0021	-0.0038	-0.0028	-0.0078	-0.0025	-0.0070	-0.0025	-0.0066
	(0.002)	(0.004)	(0.002)	(0.005)	(0.003)	(0.007)	(0.002)	(0.005)
Macro controls								
Inflation	-0.2046**	-0.2071**	-0.1708	-0.1681	-0.1319***	-0.1464***	-0.3712	-0.3631
	(0.085)	(0.084)	(0.121)	(0.107)	(0.049)	(0.053)	(0.229)	(0.230)
GDP growth	-0.0438***	-0.0440***	-0.0265*	-0.0273**	-0.0315***	-0.0335***	-0.0657*	-0.0653*
	(0.014)	(0.014)	(0.014)	(0.013)	(0.008)	(0.009)	(0.035)	(0.036)
Observations	1040	1040	909	909	986	986	1014	1014
R-squared	0.0443		0.0498		0.0399		0.0608	
Sargan-Hansen (p-value)		0.286		0.772		0.709		0.299

See Table 3 for the definition of the variables. RE refers to random effects model, while HT refers to Hausman and Taylor (1981) estimator. a Indicates that the variable is lagged with one quarter. In HT estimations: the foreign bank dummy and bank bank-level control variables are treated as time-variant and endogenous, state-owned and Islamic bank dummies as time-invariant and exogenous, while macroeconomic variables are assumed to be time-variant and exogenous. Cluster-robust standard errors (to account for both heteroskedasticity and autocorrelation) are in parentheses.
* Significance level at 10%.
** Significance level at 5%,
*** Significance level at 1%,

Table 12
Banks' willingness to lend – Letters of Credit.

	MSMEs		Micro SMEs		Small SMEs		Medium SMEs	
	RE	HT	RE	HT	RE	HT	RE	HT
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank ownership								
Islamic	0.0970***	0.1094*	0.0123**	0.0166	0.0339***	0.0387***	0.0505***	0.0548*
	(0.029)	(0.058)	(0.006)	(0.017)	(0.009)	(0.015)	(0.017)	(0.029)
Foreign	-0.0249**	0.0028	-0.0099**	0.0041	0.0004	0.0074*	-0.0158***	-0.0083***
	(0.011)	(0.007)	(0.005)	(0.003)	(0.004)	(0.004)	(0.004)	(0.002)
State	0.0038	1.0001	0.0011	0.3140	-0.0055	0.2357	-0.0010	0.4407
	(0.028)	(0.613)	(0.005)	(0.227)	(0.011)	(0.177)	(0.015)	(0.295)
Bank fundamentals								
Equity ratio[a]	-0.0941	-0.0534	-0.0436	-0.0704	0.0022	0.0112	-0.0236	0.0046
	(0.060)	(0.055)	(0.027)	(0.048)	(0.013)	(0.015)	(0.018)	(0.016)
Liquidity ratio[a]	0.1273	0.1626*	0.0096	0.0573	0.0060	0.0093	0.0876**	0.0963**
	(0.087)	(0.092)	(0.029)	(0.056)	(0.032)	(0.033)	(0.038)	(0.039)
Deposits ratio[a]	-0.0016	-0.0210	-0.0016	-0.0115	-0.0063	-0.0080	0.0116	-0.0012
	(0.020)	(0.017)	(0.009)	(0.009)	(0.007)	(0.007)	(0.009)	(0.010)
Profits ratio[a]	1.4243**	1.0372**	0.6773	0.5008	0.6278*	0.5541*	0.1641	-0.0130
	(0.593)	(0.498)	(0.501)	(0.370)	(0.339)	(0.313)	(0.148)	(0.138)
Bank controls								
Bank age[a]	-0.0363*	-0.1836***	-0.0050	-0.0515*	-0.0105	-0.0408**	-0.0207*	-0.0890***
	(0.020)	(0.058)	(0.003)	(0.030)	(0.007)	(0.021)	(0.012)	(0.032)
Bank size[a]	-0.0075	0.0134	-0.0028	-0.0015	0.0023	0.0074	-0.0032	0.0071
	(0.008)	(0.010)	(0.002)	(0.004)	(0.003)	(0.005)	(0.004)	(0.004)
Macro controls								
Inflation	-0.0468	-0.0474	-0.0412	-0.0571	0.0258	0.0262	-0.0216	-0.0168
	(0.064)	(0.063)	(0.031)	(0.039)	(0.026)	(0.026)	(0.029)	(0.030)
GDP growth	-0.0263*	-0.0234*	-0.0207	-0.0207*	-0.0017	-0.0009	-0.0034	-0.0018
	(0.014)	(0.013)	(0.013)	(0.012)	(0.006)	(0.005)	(0.006)	(0.006)
Observations	1070	1070	1070	1070	1070	1070	1070	1070
R-squared	0.314		0.123		0.104		0.422	
Sargan-Hansen (p-value)		0.408		0.709		0.713		0.269

See Table 3 for the definition of the variables. RE refers to random effects model, while HT refers to Hausman and Taylor (1981) estimator. a Indicates that the variable is lagged with one quarter. In HT estimations: the foreign bank dummy and bank bank-level control variables are treated as time-variant and endogenous, state-owned and Islamic bank dummies as time-invariant and exogenous, while macroeconomic variables are assumed to be time-variant and exogenous. Cluster-robust standard errors (to account for both heteroskedasticity and autocorrelation) are in parentheses.
 * Significance level at 10%.
 ** Significance level at 5%,
 *** Significance level at 1%,

Table 11 presents the results of the comparative analyses. For each size category, the revenues are calculated as the generated (interest/premium) income divided by the volume of lending directed to each corresponding category. The results show that the captivity hypothesis holds for each size category, except the medium-sized small businesses. On average, Islamic banks generate more revenues from their total MSME lending portfolio than privately-owned banks: 1.76% more according to the random effects model (Column 1) and 2.06% according to the Hausman-Taylor results (Column 2). As for the conventional bank ownership groups, our findings reveal that public, private, and foreign banks charge similar rates on small business loans.

5.3. Banks' willingness to lend – letters of Credit

Thus far, our focus has been on MSME loans held on the balance sheet, and the results suggest that bank orientation matters for explaining credit supply towards different types of MSME borrowers. The CBRT data, however, allow us to distinguish between the actual extension of funds (held on-balance sheet) and commitment loans (held off-balance sheet) towards different MSME types. The loans made under commitment arguably capture banks' willingness to lend more effectively. However, the bank has less control over the lending flows from previously negotiated commitments than it does with the newly negotiated terms for actual loan extensions (Hirtle, 2009). Further, loan commitments require more intensive monitoring efforts because the borrower is more likely to access the negotiated facility when performing poorly (Berger and Udell, 1995). On the empirical side, Drucker and Puri (2009) confirm the differential treatment between term loans and loan commitments in the loan sales market, suggesting the relevance of this distinction.

Table 12 reports the regression estimates of the impact of bank orientation on the commitment lending towards the aggregate pool of MSMEs and its sub-segments. The results for the commitment lending mirror very closely the share regressions for the actual extension of funds (see Table 6): Islamic banks, on average, issue more commitment loans than conventional banks, and the results for the MSME sub-categories indicate that their appetite to do so is more robust for the small-sized and medium-sized segments.

Table 13
Non-performing loans in banks' MSME lending portfolio.

	MSMEs		Micro SMEs		Small SMEs		Medium SMEs	
	RE	HT	RE	HT	RE	HT	RE	HT
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank ownership								
Islamic	-1.6314	-11.0584	-0.0134	0.1394	-0.1661	-0.1938	-0.0217	-0.0550
	(1.971)	(9.897)	(0.179)	(0.160)	(0.440)	(0.566)	(0.018)	(0.038)
Foreign	-0.2250	1.1674	-0.2012	0.0236	-0.1456	-0.0481	-0.0176	-0.0033
	(0.434)	(1.198)	(0.270)	(0.081)	(0.191)	(0.070)	(0.014)	(0.018)
State	-2.6922	-8.2158	0.2722	-0.4053	-1.1111	-1.0961	0.0014	-0.0301
	(2.158)	(7.721)	(0.282)	(0.372)	(0.796)	(0.741)	(0.012)	(0.030)
Bank fundamentals								
Equity ratio[a]	2.9311	5.1669	-1.4585	0.3552	1.1803	0.5989	0.2757	0.3618
	(4.152)	(4.896)	(1.870)	(0.904)	(1.026)	(0.760)	(0.222)	(0.271)
Liquidity ratio[a]	-13.2258	-23.3693	-0.7432	-4.2286	-1.1740	-0.6971	0.0628	-0.0391
	(11.294)	(19.011)	(2.134)	(4.095)	(0.773)	(0.596)	(0.091)	(0.125)
Deposits ratio[a]	5.5947	19.6568	-1.6945	-0.4233	-0.2362	-0.0707	0.0105	0.0710[**]
	(5.808)	(18.194)	(1.582)	(0.575)	(0.325)	(0.171)	(0.038)	(0.036)
Profits ratio[a]	26.7678	-19.5446	-20.8641	0.7238	-4.8689	-8.0890	0.9216	1.0865
	(24.554)	(20.482)	(17.610)	(4.657)	(8.906)	(12.007)	(1.342)	(1.360)
Bank controls								
Bank age[a]	0.1596	-7.9779	-0.2705	0.1007	0.6954	0.7685	-0.0254	-0.0677
	(0.556)	(6.965)	(0.269)	(0.150)	(0.458)	(0.501)	(0.019)	(0.049)
Bank size[a]	0.2145	3.8514	0.0094	0.0970	-0.0417	-0.1024	0.0064	0.0331
	(0.200)	(3.325)	(0.047)	(0.074)	(0.064)	(0.069)	(0.008)	(0.025)
Macro controls								
Inflation	4.2442	6.5875	2.8398	5.5861	3.2790	3.0323	-0.1474	-0.1163
	(4.705)	(6.297)	(2.872)	(5.174)	(2.541)	(2.310)	(0.112)	(0.109)
GDP growth	1.9139	2.9380	2.1983	2.2063	0.1914	0.2017	0.0419	0.0465
	(1.842)	(2.278)	(1.954)	(2.033)	(0.159)	(0.162)	(0.045)	(0.050)
Observations	1040	1040	909	909	986	986	1014	1014
R-squared	0.051		0.023		0.049		0.091	
Sargan-Hansen (p-value)		0.794		0.580		0.592		0.731

See Table 3 for the definition of the variables. RE refers to random effects model, while HT refers to Hausman and Taylor (1981) estimator. a Indicates that the variable is lagged with one quarter. In HT estimations: the foreign bank dummy and bank bank-level control variables are treated as time-variant and endogenous, state-owned and Islamic bank dummies as time-invariant and exogenous, while macroeconomic variables are assumed to be time-variant and exogenous. Cluster-robust standard errors (to account for both heteroskedasticity and autocorrelation) are in parentheses. * ** Significance level at 1%,
* Significance level at 10%, Significance level at 5%,

5.4. Non-performing loans in banks' MSME lending portfolio

Differences in asset quality across Islamic and conventional banks are, a priori, not well known. The consideration of non-performing loans (NPLs) of a particular segment of the credit market, namely the MSME sector, renders a prediction even more difficult. Indeed, the empirical literature on the relationship between asset quality of MSME credits and conventional bank ownership has not settled yet. The only study we are aware of is Beck et al. (2008), who, in a cross-country analysis, show that asset quality does not differ across different bank ownerships. Perhaps surprisingly, even the literature on the impact of bank ownership on the total loan portfolio NPLs is quite limited. As for foreign banks, for example, Barajas et al. (2000) find that foreign banks in Columbia have fewer problems with asset quality than do domestic banks. This evidence might result from foreign banks' adoption of better credit-risk management practices (Berger et al., 2009). It, however, might also reflect foreign banks' different customer mix because they are believed to pursue more conservative lending policies, in which they tend to 'cherry pick' more transparent and creditworthy borrowers (Beck and Brown, 2015). On the other hand, state-owned banks are more likely to make poor lending decisions because of political interference and moral hazard problems arising from soft-budget constraints (Mian, 2003; Cornett et al., 2010). As for Islamic banks, for a sample of 22 countries, Beck et al. (2013) report that Islamic banks have higher asset quality. Likely because of the activation of religious and moral norms, Baele et al. (2014) show for Pakistan that loans originated from Islamic banks are subject to much lower default rates.

Table 13 presents the estimation results for MSMEs' non-performing loans. For the aggregate MSMEs and sub-segments, the NPLs are calculated as the share of credits directed for each corresponding category (see Table 3). As for the determinants of the credit quality of the aggregate MSMEs category and across different size classifications: Islamic banks do not process the entire MSMEs portfolio and its sub-segments any different from conventional banks. Although we acknowledge that transactions with Islamic principles may activate moral norms (Baele et al., 2014), which limit dishonest behavior, the aggressive MSME lending practices of Islamic banks in Turkey are likely to temper the (average) borrower's moral salience.

6. Conclusions

The core principles of Islam emphasize social justice and empowerment. The specific implication stemming from this argument for MSME financing is that Islamic banks can promote financial inclusion by offering more suitable products for those that are unbanked and underbanked. This paper verifies whether Islamic banks indeed serve as a catalyst for inclusive growth. We do this by examining various aspects of MSME lending (lending, foreign exchange lending, loan commitments, loan quality, and revenues) across different MSME size categories (micro, small and medium-sized firms) and whether bank orientation is an explaining factor of lending behavior. We find that, on average, Islamic banks extend more loans to MSMEs in aggregate and across the three size categories. Since growth rates in lending do not seem to be affected by bank orientation, the difference in lending behavior towards MSMEs is persistent between Islamic and conventional banks. Instead of making a comparison between Islamic and conventional banks only, as is typically done in the literature, the comparison between Islamic and different conventional bank ownership forms gives us a more nuanced view. Once controlled for bank characteristics, Islamic banks lend to different types of MSMEs more than all other types of banks, except in the medium-sized segment where they were not discernable from privately-owned commercial banks. Hence, firm size affects the access to finance: the smaller the MSME, the more likely it is to have a loan from Islamic banks. This finding suggests incorporating different conventional ownership groups rather than treating them as one homogeneous group in comparative studies with Islamic banks. Similar findings were found for revenue generation and the issuance of letters of credit. These results confirm that Islamic banks have a comparative advantage in lending to opaque borrowers. We believe that the specificities of Islamic financing modes and Islamic banks' specialization in the acquisition of soft information are the contributing factors to this observation. We also observe that Islamic banks do not extend more foreign exchange lending, nor do they have a different rate of non-performing loans compared to conventional banks.

Given the importance of small firms to value-added and job creation, Turkish Islamic banks' favorable attitude towards the financing of MSMEs has also been praised by international organizations (WB-IDB, 2015). Further, as evidenced by Aysan et al. (2018), Islamic banks hold larger shares of their portfolios to MSMEs, which makes monetary transmission more effective through these banks. However, Turkey's Islamic financial sector is still far less developed when compared to countries such as Bahrain and Malaysia. In seeking to expand the Islamic finance industry, the government has increased its efforts by putting public Islamic banks on the agenda. Ziraat Participation Bank and Vakif Participation Bank, the Islamic unit of two state-owned lenders, have started their operations. This process will continue with the establishment of Halk Participation Bank. Rather than competing with the existing Islamic banks, these public banks should concentrate on the sector's growth. Next to these efforts by the government, the large Muslim population will drive the sector to grow in the longer term. According to a survey conducted by Thomson Reuters (2013), there is much scope for further advancement in the Islamic finance industry. The survey uncovered that there is indeed a strong demand for Islamic banks' home and MSME financing. However, to broaden Islamic banks' appeal to customers, several issues remain that need to be addressed by policymakers. First, there is an urgent need to increase the awareness of banking customers toward Islamic finance (Thomson Reuters, 2013). Secondly, the Banking Regulation and Supervision Agency of Turkey has the authority to supervise and enact legislation applicable to Turkish banks, including Islamic banks. This institution, however, lacks the necessary expertise and experience to steer and control Islamic banking activities. Active involvement of the Presidency of Religious Affairs (Diyanet) is necessary to create a much-needed *Shariah* governance framework. Finally, the sector should focus on product diversification, such as offering *Shariah*-compliant insurance or Takaful, which at present has a minimal profile in the Turkish market.

Acknowledgements

Appendix A

See Tables A1 to A4.

Table A1
Banks' MSME financing – Initial values of explanatory variables.

| | MSMEs | | Micro SMEs | | Small SMEs | | Medium SMEs | |
| | Share | | Share | | Share | | Share | |
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank ownership								
Islamic	0.1189 * *	0.0955 * *	0.0101	0.0170	0.0403 * * *	0.0394 * * *	0.0686 * *	0.0337
	(0.049)	(0.048)	(0.012)	(0.011)	(0.015)	(0.014)	(0.028)	(0.028)
Foreign		-0.0257		0.0048		0.0027		-0.0400 * * *
		(0.025)		(0.006)		(0.013)		(0.015)
State		-0.0282		0.0244		-0.0222 *		-0.0326 * *
		(0.052)		(0.033)		(0.012)		(0.014)
Bank fundamentals								
Equity ratio[a]	-0.1015	-0.1168	0.0370	0.0307	-0.0246	-0.0104	-0.1110 *	-0.1407 * *
	(0.117)	(0.114)	(0.027)	(0.020)	(0.038)	(0.036)	(0.067)	(0.065)
Liquidity ratio[a]	0.2916	0.3012	0.1126	0.1076	0.0869	0.0884	0.0853	0.1006
	(0.435)	(0.404)	(0.099)	(0.101)	(0.139)	(0.144)	(0.221)	(0.188)
Deposits ratio[a]	-0.0520	-0.0312	0.0229	0.0122	-0.0127	-0.0055	-0.0604	-0.0326
	(0.083)	(0.083)	(0.023)	(0.020)	(0.024)	(0.026)	(0.047)	(0.045)
Profits ratio[a]	-1.6895	-1.5763	-0.3310	-0.3606	-0.6881	-0.6954	-0.7003	-0.5206
	(1.564)	(1.481)	(0.311)	(0.308)	(0.480)	(0.478)	(0.888)	(0.755)
Bank controls								
Bank age[a]	-0.0140	-0.0142	0.0029	0.0019	-0.0028	-0.0014	-0.0141 * *	-0.0151 * *
	(0.010)	(0.010)	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)	(0.006)
Bank size[a]	0.0033	0.0007	0.0063 * * *	0.0060 * * *	0.0020	0.0033	-0.0049	-0.0095
	(0.010)	(0.010)	(0.002)	(0.002)	(0.003)	(0.003)	(0.006)	(0.006)
Macro controls								
Inflation	0.2013 * *	0.2043 * *	0.0021	0.0016	0.1405 * * *	0.1401 * * *	0.0581	0.0628
	(0.088)	(0.088)	(0.040)	(0.040)	(0.030)	(0.030)	(0.068)	(0.068)
GDP growth	0.0325 * * *	0.0336 * * *	-0.0009	-0.0011	0.0142 * * *	0.0141 * * *	0.0192 * *	0.0208 * * *
	(0.011)	(0.011)	(0.004)	(0.004)	(0.005)	(0.005)	(0.008)	(0.008)
Observations	1158	1158	1158	1158	1158	1158	1158	1158
R-squared	0.156	0.211	0.187	0.190	0.137	0.140	0.202	0.318

See Table 3 for the definition of the variables. The models are estimated using random effects. a Indicates initial (beginning of sample) values. Cluster-robust standard errors (to account for both heteroskedasticity and autocorrelation) are in parentheses. * * * Significance level at 1%, * * Significance level at 5%, * Significance level at 10%.

Table A2

Banks' MSME financing – Time-fixed effects.

	MSMEs		Micro SMEs		Small SMEs		Medium SMEs	
	Share		Share		Share		Share	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank ownership								
Islamic	0.0983 * **	0.0865 * *	0.0157 * **	0.0215 * **	0.0357 * **	0.0378 * **	0.0461 * *	0.0229
	(0.036)	(0.036)	(0.006)	(0.007)	(0.009)	(0.009)	(0.023)	(0.024)
Foreign		-0.0238		0.0074		0.0071		-0.0426 * **
		(0.016)		(0.009)		(0.009)		(0.011)
State		-0.0019		0.0385		-0.0134		-0.0376 * *
		(0.057)		(0.031)		(0.016)		(0.015)
Bank fundamentals								
Equity ratio[a]	-0.1067	-0.1116	-0.0296	-0.0298	-0.0476	-0.0441	-0.0271	-0.0388
	(0.090)	(0.092)	(0.038)	(0.040)	(0.046)	(0.046)	(0.052)	(0.054)
Liquidity ratio[a]	0.0680	0.0773	-0.0285	-0.0311	-0.0029	-0.0064	0.0963	0.1145
	(0.163)	(0.164)	(0.042)	(0.043)	(0.072)	(0.073)	(0.093)	(0.097)
Deposits ratio[a]	-0.0119	-0.0083	-0.0091	-0.0108	-0.0145	-0.0145	0.0141	0.0223
	(0.040)	(0.041)	(0.015)	(0.015)	(0.018)	(0.018)	(0.024)	(0.024)
Profits ratio[a]	0.0610	0.0389	-0.2156 *	-0.2095 *	0.0285	0.0266	0.2214	0.1915
	(0.262)	(0.263)	(0.116)	(0.116)	(0.102)	(0.101)	(0.188)	(0.186)
Bank controls								
Bank age[a]	-0.0156	-0.0157	0.0087	0.0064	-0.0025	-0.0014	-0.0193 *	-0.0181
	(0.022)	(0.020)	(0.007)	(0.006)	(0.005)	(0.005)	(0.012)	(0.011)
Bank size[a]	-0.0072	-0.0081	0.0000	-0.0001	0.0005	0.0016	-0.0059	-0.0084
	(0.013)	(0.013)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Time-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1070	1070	1070	1070	1070	1070	1070	1070
R-squared	0.146	0.192	0.123	0.131	0.172	0.151	0.185	0.284

See Table 3 for the definition of the variables. The models are estimated using random effects. a Indicates that the variable is lagged with one quarter. Cluster-robust standard errors (to account for both heteroskedasticity and autocorrelation) are in parentheses. * ** Significance level at 1%, * * Significance level at 5%, * Significance level at 10%.

Table A3
Banks' MSME financing – Pooled OLS.

	MSMEs		Micro SMEs		Small SMEs		Medium SMEs	
	Share		Share		Share		Share	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank ownership								
Islamic	0.0948 * **	0.0266 * *	0.0069 * **	-0.0032	0.0308 * **	0.0102 * *	0.0571 * **	0.0196 * **
	(0.011)	(0.012)	(0.003)	(0.003)	(0.004)	(0.004)	(0.006)	(0.007)
Foreign		-0.0965 * **		-0.0181 * **		-0.0275 * **		-0.0508 * **
		(0.007)		(0.002)		(0.003)		(0.004)
State		-0.0609 * **		0.0187 * **		-0.0299 * **		-0.0498 * **
		(0.011)		(0.006)		(0.003)		(0.004)
Bank fundamentals								
Equity ratio[a]	-0.1420 * **	-0.1819 * **	-0.0192 * *	-0.0345 * **	-0.0603 * **	-0.0684 * **	-0.0625 * **	-0.0789 * **
	(0.030)	(0.029)	(0.008)	(0.008)	(0.011)	(0.011)	(0.018)	(0.017)
Liquidity ratio[a]	-0.2244 * *	-0.1893 *	-0.0779 * **	-0.0653 * *	-0.0254	-0.0178	-0.1211 * *	-0.1061 * *
	(0.101)	(0.097)	(0.028)	(0.028)	(0.038)	(0.036)	(0.054)	(0.051)
Deposits ratio[a]	0.0169	0.0850 * **	0.0138 *	0.0194 * **	-0.0053	0.0172 * *	0.0084	0.0485 * **
	(0.021)	(0.020)	(0.007)	(0.006)	(0.008)	(0.008)	(0.011)	(0.011)
Profits ratio[a]	-1.6932 * **	-1.7694 * **	-0.1925	-0.2706 * *	-0.5116 * **	-0.5069 * **	-0.9890 * *	-0.9919 * *
	(0.636)	(0.590)	(0.133)	(0.121)	(0.172)	(0.159)	(0.408)	(0.385)
Bank controls								
Bank age[a]	-0.0129 * **	-0.0208 * **	0.0041 * **	-0.0006	-0.0034 * *	-0.0044 * **	-0.0135 * **	-0.0158 * **
	(0.005)	(0.005)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)
Bank size[a]	-0.0017	-0.0084 * **	0.0043 * **	0.0020 * **	0.0004	-0.0010	-0.0064 * **	-0.0094 * **
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Macro controls								
Inflation	0.2710	0.2357	0.0179	0.0096	0.1434	0.1340	0.1097	0.0921
	(0.294)	(0.273)	(0.095)	(0.091)	(0.099)	(0.093)	(0.166)	(0.155)
GDP growth	0.0522	0.0497	0.0033	0.0034	0.0211	0.0202	0.0278	0.0261
	(0.046)	(0.043)	(0.015)	(0.014)	(0.016)	(0.015)	(0.027)	(0.025)
Observations	1070	1070	1070	1070	1070	1070	1070	1070
R-squared	0.159	0.274	0.180	0.246	0.156	0.236	0.181	0.295

See Table 3 for the definition of the variables. The models are estimated using OLS. a Indicates that the variable is lagged with one quarter. Cluster-robust standard errors (to account for both heteroskedasticity and autocorrelation) are in parentheses. * * * Significance level at 1%, * * Significance level at 5%, * Significance level at 10%.

Table A4
Banks' MSME financing – Pooled OLS and time-fixed effects.

| | MSMEs | | Micro SMEs | | Small SMEs | | Medium SMEs | |
| | Share | | Share | | Share | | Share | |
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank ownership								
Islamic	0.1018 * **	0.0321 * **	0.0068 * **	-0.0032	0.0336 * **	0.0126 * **	0.0613 * **	0.0228 * **
	(0.010)	(0.011)	(0.003)	(0.003)	(0.004)	(0.004)	(0.006)	(0.007)
Foreign		-0.1001 * **		-0.0183 * **		-0.0286 * **		-0.0531 * **
		(0.007)		(0.002)		(0.003)		(0.004)
State		-0.0596 * **		0.0188 * **		-0.0295 * **		-0.0489 * **
		(0.010)		(0.006)		(0.003)		(0.003)
Bank fundamentals								
Equity ratio[a]	-0.1697 * **	-0.2162 * **	-0.0182 * *	-0.0348 * **	-0.0693 * **	-0.0793 * **	-0.0821 * **	-0.1021 * **
	(0.030)	(0.029)	(0.009)	(0.008)	(0.012)	(0.012)	(0.017)	(0.016)
Liquidity ratio[a]	-0.5127 * **	-0.5074 * **	-0.0786 * **	-0.0734 * *	-0.1295 * **	-0.1297 * **	-0.3047 * **	-0.3042 * **
	(0.118)	(0.110)	(0.030)	(0.030)	(0.048)	(0.046)	(0.061)	(0.055)
Deposits ratio[a]	0.0498 * *	0.1236 * **	0.0144 * *	0.0211 * **	0.0061	0.0301 * **	0.0293 * *	0.0725 * **
	(0.020)	(0.020)	(0.006)	(0.006)	(0.007)	(0.007)	(0.011)	(0.011)
Profits ratio[a]	-0.8648	-0.8265	-0.1913	-0.2386 * *	-0.2636	-0.2299	-0.4099	-0.3581
	(0.606)	(0.550)	(0.134)	(0.120)	(0.162)	(0.148)	(0.392)	(0.366)
Bank controls								
Bank age[a]	-0.0133 * **	-0.0219 * **	0.0040 * **	-0.0007	-0.0036 * *	-0.0047 * **	-0.0137 * **	-0.0165 * **
	(0.005)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)
Bank size[a]	-0.0048 * *	-0.0124 * **	0.0043 * **	0.0018 * **	-0.0006	-0.0023 * **	-0.0085 * **	-0.0119 * **
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Time-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1070	1070	1070	1070	1070	1070	1070	1070
R-squared	0.199	0.321	0.186	0.252	0.197	0.282	0.231	0.353

See Table 3 for the definition of the variables. The models are estimated using OLS. a. Indicates that the variable is lagged with one quarter. Cluster-robust standard errors (to account for both heteroskedasticity and autocorrelation) are in parentheses. * * * Significance level at 1%, * * Significance level at 5%, * Significance level at 10%.

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