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IMPACT OF BANKING SECTOR CREDITS ON NET SME FORMATION IN TURKEY

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ABSTRACT

Purpose: This study examines the impact of banking sector credit on the growth of small and medium enterprises in Turkey. The main objective of the study is to investigate whether state-equity bank group or private-equity bank group credits have significant impact on the growth of net Small and Medium Enterprise (SME) formation a regional, urban and sectoral basis.

Methodology: As part of the methodology, quarterly data between 2010-2019 was collected and used in the study for Panel Cointegration Model.

Findings: The formulated hypotheses reveal that private-equity bank credits have significant impact on the growth of small and medium enterprises in Turkey. For statistical region segmentation, city segmentation and sectoral segmentation, private equity bank group credit coefficient is higher than state equity bank group. LPCT (private equity bank group city based logarithmic total credits) variable has a higher coefficient than LSCT (state equity bank group city based logarithmic total credits) variable.

Originality: During literature review, no work with these variables could be found. This work is expected to fill a gap in the literature.

Keywords: Banking Sector Credits, State-Equity Banks, Private-Equity Banks, Net SME Formation, SME Financing.

JEL Codes: G21, H81, L32, O47.

TÜRKİYE'DEKİ BANKACILIK SEKTÖRÜ KREDİLERİNİN NET KOBİ OLUŞUMUNA ETKİSİ

ÖZET

Amaç: Bu çalışma bankacılık sektörü kredilerinin Türkiye'deki küçük ve orta ölçekli işletmelerin büyümesi üzerindeki etkilerini incelemektedir. Çalışmanın temel amacı, bölgesel, şehirsel ve sektörel temelde; net Küçük ve Orta Büyüklükteki İşletme (KOBİ) oluşumuna kamu-sermayeli banka grubu veya kamu dışı-sermayeli banka grubu kredilerinin önemli etkisinin olduğunu araştırmaktır.

Yöntem: Çalışmada, yöntemin parçası olarak, Panel Eşbütünleşme Modeline ulaşmak için 2010-2019 çeyrek verileri toplanmış ve kullanılmıştır.

Bulgular: Formüle edilen hipotezler, kamu dışı sermayeli banka kredilerinin Türkiye'deki küçük ve orta ölçekli işletmelerin büyümesi üzerinde önemli etkisi olduğunu ortaya koymaktadır. İstatistiksel bölge bölümleme, şehir bölümleme ve sektörel bölümleme için kamu dışı sermayeli banka grubu kredi katsayısı kamu sermayeli banka grubuna göre daha yüksektir. LPCT (kamu dışı sermayeli banka grubu şehir bazlı logaritmik toplam krediler) değişkeni LSCT (kamu sermayeli banka grubu şehir bazlı logaritmik toplam krediler) değişkeninden daha yüksek katsayıya sahiptir.

Özgünlük: Literatür taraması sırasında; aynı değişkenlere sahip çalışmaya rastlanmamıştır. Bu çalışmanın literatürdeki bir boşluğu doldurması beklenmektedir.

Anahtar Kelimeler: Bankacılık Sektörü Kredileri, Kamu Sermayeli Bankalar, Kamu Dışı Sermayeli Bankalar, Net KOBİ Oluşumu, KOBİ Finansmanı.

JEL Kodları: G21, O47.

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1. INTRODUCTION

Economic growth is one of the main problems of all emerging economies and banking sector plays an important role in offering finance to businesses for enabling growth component of the economies. In fact, the Small and Medium Sized Enterprises (SMEs) are recognized as the backbones of economic growth to achieve high and sustainable growth in an economy. There are numerous studies showing that one of the major obstacles in front of the growth of SMEs worldwide is access to finance.

The entrepreneurship behind the SME formation plays an important role in the establishment and development of these enterprises, but too often is held back by a lack of ready access to financing from financial institutions. Here lies the scope of state and private equity bank groups to offer financing to this segment of the economy. On a medium- and long-term perspective these bank groups expect to gradually develop the creation of SMEs through proper financing and training to mitigate credit risks and other risks for a smooth flow of SME financing. Most businesses in Turkey are generally in need of small short-term loans to help finance their working capital needs, long term financing is needed for capital investments and new establishments.

In Turkey, most of the SMEs are dependent on bank financing. As of 2019; Banking sector in Turkey has a total of 11.299 domestic bank branches, 3.924 of which is owned by state-equity bank group, the rest is private-equity bank group branches (BRSA, 2020). Although, sector has at least 9 branches in every geographical region and more in every statistical region, SMEs (Small and Medium Sized Entrepreneurship) in Turkey suffer from limited access to long-term and affordable financing. In order to survive, on top of the bank credits, SMEs tend to borrow from their friends and family, and unfortunately, 57% of SMEs file for bankruptcy in their first five years of establishment (Apan and Islamoglu, 2014).

SME lending through banking industry grew steadily over the investigated period, with an exceptional major increase of 19% in 2018. The share of SME loans in total business loans remained broadly stable at an average of 35%. The share of SME non-performing loans out of total SME loans peaked at 6.69% in 2018, one of the main reasons on this rise is the excessive increases of the government guaranteed loans of 236.7 billion TRY in 2017. To prop up the economic growth, Treasury-backed Credit Guarantee Fund (KGF) provided access to finance for SMEs that cannot benefit from bank loans due to insufficient collateral. The increase in Non-Performing Loan (NPL) ratio can be explained by both SMEs having difficulties to repay their debts and the amount of new SME loans granted in these years (Table 1).

SME closures, including sole proprietorships, illustrates that bankruptcies constitute an uncommon way to close companies in Turkey. The closing of companies in Turkey takes place in three ways; liquidation (voluntary), dissolving without liquidation (mergers-demerges) and liquidation due to bankruptcy (upon court verdict). The number of closed SMEs in Turkey in 2019 amounted to 30.511, while 119.320 SMEs have been established in the same year (Table 1).

This study examines the impact of banking sector credit on the growth of small and medium enterprises in Turkey. The main objective of the study is to investigate whether state-equity bank group or private-equity bank group credits have significant impact on the growth of net SME formation on different regions, cities and sectors. As most of the loans to SMEs in Turkey come from banks, it is necessary to find out which bank groups support the SMEs most.

The data in this study is taken from two main sources of Banking Regulation and Supervision Agency database of Turkish State Statistical Program and The Union of Chambers and Commodity Exchanges of Turkey. All the data is a part of periodically announced websites parts. The data is obtained for the quarterly periods of 2010-2019. The data from Banking Regulation and Supervision Agency are composed of total credits on region basis and state-equity bank groups credits on different segmentation basis. The private-equity credits for different segmentation basis are calculated by subtracting state-equity bank group credits from total credits. The net SME formation data are taken from The Union of Chambers and Commodity Exchanges of Turkey. According to Turkish SME regulations, Incorporations, Limited Companies, Unlimited Liability and Limited Partnerships and individual proprietorships are SMEs, if they employ less than 250 employees. The net SME numbers are found by subtracting the SMEs closed in the same year. Finally, the data are aggregated for the Panel Cointegration Model of the study.

Next section discusses the literature review on the causality relationship between bank credits and SME formations. Third section is composed of data analyses, and the last section concludes.

Table 1. SME statistics (2010-2019)

Indicator	*Unit*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*Jun.19*
Outstanding Business Loans, SMEs	TRY Billion	125,5	162,8	199,7	271,4	333,3	388,7	420,5	513,2	611,3	-
Outstanding Business Loans, Total	TRY Billion	353,2	459	528,8	715,5	884,6	1100	1314	1610	1890	-
Share of SME Outstanding Loans	% of Total Outstanding Business Loans	35,52	35,47	37,77	37,94	37,67	35,34	32	31,88	32,34	-
Government Loan Guarantees, SMEs	TRY Billion	0,9	1,1	1,1	1,1	1,4	1,6	5,3	236,7	94,5	-
Government Guaranteed Loans, SMEs	TRY Billion	1,3	1,6	1,6	1,5	1,9	2,3	7,2	262,6	107,9	-
Direct Government Loans, SMEs	USD Million	855	1174	928	2632	1709	1764	1749	284,5	457	-
Non-performing Loans, Total	% of All Business Loans	3,43	2,61	2,82	2,69	2,64	2,68	2,9	2,81	4,01	-
Non-performing Loans, SMEs	% of All SME Loans	4,49	3,1	3,17	3,12	3,27	3,92	4,9	4,71	6,69	-
Established Firms in the Year, SMEs*	Thousand	101	114	106	108	126	114	106	116	119	51
Closed Firms in the Year, SMEs*	Thousand	41	54	46	35	37	31	31	31	31	15
SME as of December**	% of total company numbers	83,8	99,8	83,6	83,5	99,8	99,7	99,7	99,7	99,7	99,7

Sources: OECD (2020), *TOBB (2020), **SGK (2021). (There are two main criteria for a company to be SME according to Turkish Laws. If the company does not have any revenue (which shows it is newly established) the only criterion is having employee number less than 250, for this table new established SME percentage is calculated.)

2. LITERATURE REVIEW

The practical aim of this study is to guide governmental institutions to efficiently channel their credit lines to productive group of SMEs. As most large firms start out their life cycles as SMEs, it is important that banks play a critical role in enhancing the sustainability of small- and medium-sized enterprises through offering financial services, technology, and business solutions (Berger and Udell, 2006). According to the Social Security Statistics of Turkey (2021), over 99% of firms employ less than 250 employees and considered as SMEs, therefore, it is important to encourage the new SME formations and maintain their sustainability through different sources of financing. Thus, SMEs are making a vital contribution to employment regarding both the number employed and the employment rate in an economy (De la Torre et al., 2010).

With globalization and the transition to the information society, SMEs are faced with change, in terms of employment; with their harmonious, flexible, constructive, creative, and crisis-resistant structures; they have become indispensable actors of the economy (Ozdemir et al., 2007). On the other hand, according to the study of Green (2003), both for developing and developed countries, it was seen that the problem of financing was among the most important problems. In addition, according to Alicioglu (2020), there are three main funding items of SMEs related to financing: equity financing, bank loans, and vendors. It was detected that 57% of SMEs fail within the first five years of their establishment and it has been observed that raw material suppliers are not desired to open a loan account thinking that they will go bankrupt during the first five years of their establishment (Ceylan and Korkmaz, 2012:389-390). Mahmud and Akın (2019), stated in their study that SMEs turn to banks even for their working capital needs. For these reasons, newly established and even at the phase of establishment SMEs depend of hugely, banking loans. As a result, the relationship between bank loans and SMEs is crucial and worth studying.

According to the study of Demirci (2017) by using 1999-2015 data; the author found that manufacturing industry sector production and bank loans are cointegrated and in the long run, there is causality from industry sector production to banking loans. Hacievliyagil and Eksi (2019) used monthly data between 1999

to 2015 and analyzed the relationship from banking sector loans to Industrial Production Index in all sub-segments except machinery and concluded that banking sector loans increase Industrial Production Index. In this study, the sub-segmentation of the Industrial Production Index is not used.

Mhadbhbi et al. (2019) empirically tested the impact of banking sector loans on economic growth in 40 developing countries and found a positive relation between banking sector loans to growth. Moreover, John and Lawal (2019) conducted a similar study for Nigeria and stated that banking sector loans have positive effect on economic growth. Cernhorsky's (2017) similar study on Chezch Republic found the same positive relation between banking sector loans and economic growth.

Cetorelli and Gambera's (2001) empirical study shows the positive impact of government supported programs on the welfare of SMEs in 41 countries. Tongurai and Vithessonthi (2018) studied on the world countries between the dates of 1960-2016 and found a negative relationship between the impact of bank loans on agricultural development and a positive impact on industrial development. However, Leitao's (2012) study on EU-27 countries found negative relationship from banking sector loans to economic growth. Moreover, Drozdowska et al. (2019), realized negative relationship for the same subject on the East, Middle and South European countries between 1995-2015.

The literature on Turkish SMEs shows that banking sector credits generate growth (Zortuk and Celik, 2014; Koc, 2015; Turgut and Ertay, 2016; Karahan et al., 2018; Sahin and Durmus, 2019). Zortuk and Celik (2014) found cointegration between banking sector loans and economy. According to Koc (2015), loans granted to the top ten industries generate long term growth by SMEs to economy. Karahan et al. (2018) discuss the cyclic relationship between banking loans and economy. Sahin and Durmus (2019) showed that 1% increase in the banking sector loans boost economic growth by 0,37%. However, in times of recession, an increase in non-performing loans has adverse consequences in the economic growth, Kucukkocaoglu and Daver's (2019) study discusses the origins of loans whether they are originated from state or private banks and their quality mechanisms. They stated that the reason of non-performing loans may be the credits that are not monitored carefully and they are granted without considering the quality of the receivables. It is thought that monitoring the credits would increase the productivity and performance of SMEs, thus contribute to their survival.

In this study, it is assumed that SMEs access to financing whether it is directly or indirectly, total credits granted by any bank groups may affect the number of net SME formation. Moreover, Alicioglu and Kucukkocaoglu (2020) further analyses this effect on a circular relationship; from banking sector total loans to SME formation and from SME formation to Industrial Production Index and from Industrial Production Index to net SME formation.

This paper is a further study to Alicioglu and Kucukkocaoglu (2020). In the mentioned study, the theoretical framework was set, but in this one, practical analysis for productivity is made. In these terms, this study is distinguished from the other studies in the literature.

3. METHODOLOGY

The model is searching for the practical relation between the channeling of banking sector credits to net SME formation in different segmentations. The segmentations used in this study are statistical region segmentation, city segmentation and sectoral segmentation. Three main hypotheses are graphed in Figure 1.

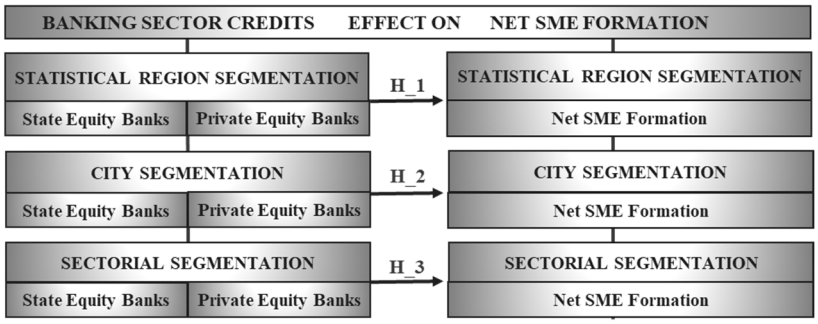

Figure 1. Banking sector credits effect on net SME formation

H_1: State-equity bank group credits affect net SME formation more than private-equity bank group credits in Turkey for statistical regions.

H_2: State-equity bank group credits affect net SME formation more than private-equity bank group credits in Turkey for city segmentation.

H_3: State-equity bank group credits affect net SME formation more than private-equity bank group credits in Turkey for sectoral segmentation.

The list of abbreviations used to analyze all the hypotheses are given in Table 2.

Table.2 Main list of abbreviations

		Abbreviation		*Log. Abbreviation*	
Description		*Private-Eq. Bank Group*	*State-Eq. Bank Group*	*Private-Eq. Bank Group*	*State-Eq. Bank Group*
H_1	Net Change in the Number of SME at the Date	SME		-	
	Total Credits at the Date	PRT	SRT	LPRT	LSRT
	TR n Statistical Region Total Credits at the Date	PRn	SRn	LPRn	LSRn
H_2	Net Change in the Number of SME at the Date	SME		-	
	Total Credits at the Date	PCT	SCT	LPCT	LSCT
	Number n City Total Credits at the Date	PCn	SCn	LPCn	LSCn
H_3	Net Change in the Number of SME	SME		-	
	Total Credits	PST	SST	LPST	LSST
	Number n Sector Total Credits	PSn	SSn	LPSn	LSSn

LSRT: State equity bank group region based logarithmic total credits; LPRT: Private equity bank group region based logarithmic total credits; LSCT: State equity bank group city based logarithmic total credits; LPCT: Private equity bank group city based logarithmic total credits; LSST: State equity bank group sector based logarithmic total credits; LPST: Private equity bank group sector based logarithmic total credits. State-equity bank group credits in TRL and private-equity bank group credits in TRL and the net SME data are transformed into logarithmic values.

The dependent variable in this study is the growth rate of SME's while the explanatory variables are the banking sector credits. The functional form of the model is expressed as in Equations 1 and 2.

Private-Equity Bank Group Credits in Segment i Model:

$$SME = \beta_1 + LP_{in} * \beta_2 + e_n \quad (1)$$

State-Equity Bank Group Credits in Segment i Model:

$$SME = \beta_3 + LS_{in} * \beta_4 + e_n \quad (2)$$

For all the hypotheses, Pesaran Cross Sectional Dependence Tests, Extended Fisher ADF Unit Root Statistics, Swamy S Tests, Westerlund Panel Cointegration Tests, Westerlund Panel Error Correction Model Tests, Westerlund Long- and Short-Term Results and Dumitrescu-Hurlin Causality Tests are performed for achieving Panel Cointegration Model.

3.1. Testing the Statistical Region Hypothesis

To begin with; Pesaran Cross Sectional Dependence Test is performed for testing cross-sectional dependence. All the variables are cross-sectional dependent at 99% confidence interval (Table 3). Cross-sectional dependence forces the analysis to continue with second generation unit-root tests. Secondly, ADF Unit Root Statistics are performed. For statistical region segmentation, SME variable is stationary at level, but all the other variables are stationary at first level. To sum up, the stationarity of variables is; SME I (0), LSRT I (1) and LPRT I (1) (private equity bank group region based logarithmic total credits). Thirdly, Swamy S Test is used to test heterogeneity for panel data. For statistical region segmentation, LSRT and LPRT variables are heterogeneous at 99% confidence interval. Heterogeneity enables this study to perform Dumitrescu-Hurlin statistics.

When the cross dependence and heterogeneity are observed between the variables, Westerlund Panel Cointegration test is performed to check the cointegration. All the variables are cointegrated at 99% confidence interval for their Ga and Gt statistics. For Dumitrescu-Hurlin Causality Test, at 99% confidence

interval; there are causal relationships from LSRT to SME and from LPRT to SME (Table 1). The panel error correction model is working at 99% confidence Interval, because error correction term has a negative sign, and its absolute value is under 2. The model is assigned to the equilibrium by correcting the deviations throughout the periods.

In long-term, for statistical region segmentation, at 95% confidence interval, LSRT has a statistically significant and positive-sign coefficient (β=246.7284 and p<0.05). LPRT has a statistically significant and positive-sign coefficient at 95% confidence interval (β=420.0521 and p<0.05). In addition, LPRT (variable has a higher coefficient than LSRT variable (Table 3). The formulated statistical region hypotheses reveal that private-equity bank credits have significant impact on the growth of small and medium enterprises in the long-term.

In short-term, for statistical region segmentation, at 90% confidence interval, LSRT has a positive and statistically significant coefficient (β=280.6355 and p<0.10). At 95% confidence interval, LPRT has a positive and statistically significant coefficient (β=525.902 and p<0.05). In addition, LSRT variable has a smaller coefficient than LPRT variable (Table 3). The formulated statistical region hypotheses reveal that private-equity bank credits have significant impact on the growth of small and medium enterprises in the short-term as well.

3.2. Testing the City Segmentation Hypothesis

In Table 4, the results for the panel cointegration model; Pesaran Cross Sectional Dependence Tests, Extended Fisher ADF Unit Root Statistics, Swamy S Tests, Westerlund Panel Cointegration Tests, Westerlund Panel Error Correction Model Tests, Westerlund long- and short-term results and Dumitrescu-Hurlin Causality Tests; for City Segmentation Hypothesis can be found.

To begin with, Pesaran cross-sectional dependence test is performed for testing cross-sectional dependence. All the variables are cross-sectional dependent at 99% Confidence Interval. Cross-sectional dependence forces the analysis to continue with second generation unit-root tests. Secondly, for unit root testing, all the variables except LSCT are stationary at level, LSCT is stationary at level. The stationarity of variables can be summed up as: SME I (0), LSCT I (1), LPCT I (0). Thirdly, Swamy S homogeneity tests are performed. LSCT and LPCT variables are heterogeneous at 99% confidence interval. In addition, all the variables are cointegrated at 99% confidence interval for their Ga and Gt statistics. Moreover, error correction term is negatively signed, and its absolute value is less than two, which shows model is statistically working at 99% confidence interval.

For Dumitrescu-Hurlin Causality Test, at 99% confidence interval; there are causal relationships from LSCT (state equity bank group city based logarithmic total credits) to SME and from LPCT to SME. (see Appendix)

In long-term, for city segmentation, at 95% confidence interval, LSCT (state equity bank group city based logarithmic total credits) has a statistically significant and positive-sign coefficient (β=36.11014 and p<0.05). LPCT also has a statistically significant and positive-sign coefficient at the same confidence interval (β=59.5665 and p<0.05). Moreover, LPCT variable has a higher coefficient than LSCT (state equity bank group city based logarithmic total credits) variable.

In short-term, for city segmentation, at 90% confidence interval, both LSCT and LPCT have positive and statistically significant coefficients (LSCT β=39.79041 and p<0.10), (LPCT β=70.47963 and p<0.10). And, LSCT variable has a smaller coefficient than LPCT variable. For city segmentation, there are causal relationships from LSCT to SME and from LPCT to SME; at 99% confidence interval. (see Appendix).

Table.3 Statistical region hypothesis test results

CD Test	*Variable*			*CD-Test*	*p*	*Corr.*	*Abs(corr.)*
	SME			25,70***	0,000	0,513	0,513
	LSRT			49,66***	0,000	0,992	0,992
	LPRT			49,86***	0,000	0,996	0,996
Extended Fisher ADF Unit Root	*Variable*			*Constant*		*Trend and Constant*	
	SME			-20,7556***	(0,0000)	-22,1149***	(0,0000)
	LSRT			-0,4425	(0,3298)	-2,6054***	(0,0057)
	Δ LSRT			-26,4973***	(0,0000)	-24,1275***	(0,0000)
	LPRT			-2,5110**	(0,0073)	-1,5985*	(0,0574)
	Δ LPRT			-34,6166***	(0,0000)	-32,1657***	(0,000)
Heterogeneity	*Model*					X^2	*P*
	LSRT					1482,18***	0,0000
	LPRT					1160,66***	0,0000
Panel Cointegration	*Model*	*Gt*	*Ga*	*Z (gt)*	*Z (ga)*	*p(Gt)*	*P(Ga)*
	LSRT	-5,53	-32,73	-14,564***	-16,32***	0,000	0,000
	LPRT	-5,94	-34,23	-16,149***	-17,28***	0,000	0,000
Panel Error Correction Model	*Model*	*β*		*s. e.*		*Z*	*P*
	LSRT	-1,096003		,0574783		-19,07***	0,000
	LPRT	-1,183002		,0703482		-16,82***	0,000
Long-Term Parameters	*Variable*			*β*	*s. e.*	*Z*	*P*
	LSRT			246,7284	113,7785	2,17**	0,030
	Constant			-2743,629	1669,789	-1,64*	0,100
	LPRT			420,0521	190,5582	2,20**	0,028
	Constant			-6129,502	3262,646	-1,88*	0,060
Short-Term Parameters	*Variable*			*β*	*s. e.*	*Z*	*P*
	LSRT			280,6355	147,9072	1,90*	0,058
	Constant			-3016,754	2172,396	-1,39	0,165
	LPRT			525,902	235,1506	2,08**	0,038
	Constant			-7655,126	4326,031	-1,77*	0,077
Dumitrescu-Hurlin Causality	*Causality*					*Z*	*P*
	LSRT→SME					5,4025***	0,0000
	LPRT→SME					4,0796***	0,0000

CD Test: *** Cross-sectional dependence at 99% confidence interval.
Extended Fisher ADF Unit Root: Stationarity at *90%, **95%, ***99% confidence interval. ADF Optimal lag Schwarz information criterion and Akaike information criterion (Max.Lag:4).
Heterogeneity: ***heterogeneity present at 99% confidence interval.
Panel Cointegration: Cointegration present at ***99% confidence interval. Gt, Ga are the estimates that give robust statistics in heterogeneity.
Panel Error Correction Model: *** Statistically significant at 99% confidence interval.
Long-Term Parameters: Statistically significant at ***99%, **95%, *90% confidence interval.
Short-Term Parameters: Statistically significant at ***99%, **95%, *90% confidence interval.
Dumitrescu-Hurlin Causality: Statistically significant at ***99%, **95%, *90% confidence interval.

3.3. Testing the Sectoral Segmentation Hypothesis

In testing the hypothesis on sectoral segmentation, first Pesaran Cross Sectional Dependence test is conducted. As all the variables are cross-sectional dependent at 99% confidence interval, ADF Unit-Root tests are performed to find out, all the variables except SSME (sector-based SME) are unstationary at level, SSME is stationary at level. The stationarity of variables can be summed up as SSME I (0), LSST I (1) and LPST I (1).

Next Swamy S Homogeneity Tests are performed, LSST and LPST variables are heterogeneous at 99% confidence interval. All the variables are cointegrated at 99% confidence interval for their Ga and Gt statistics. Error correction terms are negatively signed, and their value is less than two, which shows that they are statistically working at 99% confidence Interval.

In long-term, for sectoral segmentation, even at 90% confidence interval, both LSST and LPST have unmeaningful parameters, showing that there is not any long-term relationship. In short-term, even at 90% confidence interval, both LSST and LPST have unmeaningful parameters, showing that there is not any short-term relationship. For sectoral segmentation, there is a causal relationship from LPST to SME formation at 99% confidence interval. (see Appendix).

Table.4 City segmentation hypothesis test results

CD Test	*Variable*			*CD-Test*	*p*	*Corr.*	*Abs(corr.)*
	SME			89,90***	0,000	0,256	0,282
	LSCT			345,80***	0,000	0,986	0,986
	LPCT			344,63***	0,000	0,982	0,982
Extended Fisher ADF Unit Root	*Variable*			*Constant*		*Trend and Constant*	
	SME			-52,0862***	(0,0000)	-53,7089***	(0,0000)
	LSCT			-1,3955	(0,0818)	-2,6685***	(0,0040)
	Δ LSCT			-72,0209***	(0,0000)	-63,9441***	(0,0000)
	LPCT			-11,9448***	(0,0000)	-7,4433***	(0,0000)
Heterogeneity	*Model*					X^2	*P*
	LSCT					7364.02***	0.0000
	LPCT					6785.65***	0.0000
Panel Cointegration	*Model*	*Gt*	*Ga*	*Z (gt)*	*Z (ga)*	*p(Gt)*	*P(Ga)*
	LSCT	-6,17	-38,21	-44,376***	-51,50***	0,000	0,000
	LPCT	-6,09	-36,81	-43,492***	-49,17***	0,000	0,000
Panel Error Correction Model	*Model*		*B*		*s.e.*	*z*	*P*
	LSCT		-1,016267		0,0266945	-38,07***	0,000
	LPCT		-1,006870		0,0281525	-35,76***	0,000
Long-Term Parameters	*Variable*			*B*	*s. e.*	*z*	*P*
	LSCT			36,11014	17,26558	2,09**	0,036
	Constant			-353,8055	240,975	-1,47	0,142
	LPCT			59,5665	28,37678	2,10**	0,036
	Constant			-793,0789	470,6836	-1,68*	0,092
Short-Term Parameters	*Variable*			*B*	*s. e.*	*z*	*P*
	LSCT			39,79041	21,93264	1,81*	0,070
	Constant			-388,4353	301,5322	-1,29	0,198
	LPCT			70,47963	36,93392	1,91*	0,056
	Constant			-954,1458	608,8583	-1,57	0,117
Dumitrescu-Hurlin Causality	*Variable*					*z*	*P*
	LSCT→SME					4,3819***	0,0000
	LPCT→SME					4,0799***	0,0000

CD Test: *** Cross-sectional dependence at 99% confidence interval.
Extended Fisher ADF Unit Root: Stationarity at *90%, **95%, ***99% confidence interval. ADF Optimal lag Schwarz information criterion and Akaike information criterion (Max.Lag:4).
Heterogeneity: ***heterogeneity present at 99% confidence interval.
Panel Cointegration: Cointegration present at ***99% confidence interval. Gt, Ga are the estimates that give robust statistics in heterogeneity.
Panel Error Correction Model: *** Statistically significant at 99% confidence interval.
Long-Term Parameters: Statistically significant at ***99%, **95%, *90% confidence interval.
Short-Term Parameters: Statistically significant at ***99%, **95%, *90% confidence interval.
Dumitrescu-Hurlin Causality: Statistically significant at ***99%, **95%, *90% confidence interval.

Table.5 Sectoral segmentation hypothesis test results

CD Test	*Variable*			*CD-Test*	*p*	*corr.*	*Abs(corr.)*
	SSME			11.31***	0.000	0.167	0.251
	LSST			43.19***	0.000	0.640	0.743
	LPST			48.10***	0.000	0.712	0.830
Extended Fisher ADF Unit Root	*Variable*			*Constant*		*Trend and Constant*	
	SSME			-15.5902***	(0.0000)	-15.2077***	(0.0000)
	LSST			-1.2980	(0.0989)	-0.9688	(0.1677)
	Δ LSST			-25.5058***	(0.0000)	-20.0522***	(0.0000)
	LPST			-0.1160	(0.5461)	-2.4246***	(0.0087)
	Δ LPST			-41.8825***	(0.0000)	-36.0249***	(0.0000)
Heterogeneity	*Model*					X^2	*P*
	LSST					6141.45***	0.0000
	LPST					6763.57***	0.0000
Panel Cointegration	*Model*	*Gt*	*Ga*	*Z (gt)*	*Z (ga)*	*p(Gt)*	*P(Ga)*
	LSST	-4.719	-23.517	-13.163***	-12.043***	0.000	0.000
	LPST	-4.706	-24.630	-13.105***	-12.865***	0.000	0.000
Panel Error Correction Model	Model	β		s.e.		z	P
	LSST	-.7971064		.1102605		-7.23***	0.000
	LPST	-.8446786		.1007976		-8.38***	0.000
Long-Term Parameters	Variable			β	s. e.	z	P
	LSST			94.19326	107.1172	0.88	0.379
	Constant			-551.9225	1657.809	-0.33	0.739
	LPST			210.8926	165.7728	1.27	0.203
	Constant			-2712.938	2777.045	-0.98	0.329
Short-Term Parameters	Variable			β	s. e.	z	P
	LSST			144.6766	91.93261	1.57	0.116
	Constant			1464.707	1294.335	-1.13	0.258
	LPST			252.9775	155.5357	1.63	0.104
	Constant			-3525.328	2536.138	-1.39	0.165
Dumitrescu-Hurlin Causality	*Causality*					*z*	*P*
	LSST→SME					0.8762	0.3809
	LPST→SME					5.0212***	0.0000

CD Test: *** Cross-sectional dependence at 99% confidence interval.
Extended Fisher ADF Unit Root: Stationarity at *90%, **95%, ***99% confidence interval. ADF Optimal lag Schwarz information criterion and Akaike information criterion (Max.Lag:4).
Heterogeneity: ***heterogeneity present at 99% confidence interval.
Panel Cointegration: Cointegration present at ***99% confidence interval. Gt, Ga are the estimates that give robust statistics in heterogeneity.
Panel Error Correction Model: *** Statistically significant at 99% confidence interval.
Long-Term Parameters: Statistically significant at ***99%, **95%, *90% confidence interval.
Short-Term Parameters: Statistically significant at ***99%, **95%, *90% confidence interval.
Dumitrescu-Hurlin Causality: Statistically significant at ***99%, **95%, *90% confidence interval.

4. CONCLUSION and DISCUSSION

The aim of this study is to analyze whether state-equity bank group or private-equity bank group credits have significant impact on the growth of net small and medium enterprise formation on different regions, cities and sectors. The first hypothesis tests whether state-equity bank group credits affect net SME formation more than private-equity bank group credits for statistical regions. The second hypothesis tests whether state-equity bank group credits affect net SME formation more than private-equity bank group credits for city segmentation. The last hypothesis tests whether state-equity bank group credits affect net SME formation more than private-equity bank group credits for sectoral segmentation.

For the first hypothesis, TR1 region outweighs the other regions, with the highest values, showing that, each amount of credit given in that region, has a higher productivity in terms of net SME formation, than other regions. This rationale behind this might be the dense industrialization in that region. On the other hand, the analysis may result in different conclusions, depending on the time and structure of the data. For the second hypothesis, Giresun city has the highest productivity, in terms of credits turning into net SME

formation. Some other cities in the list, for example Siirt, might be outlier, because their huge credit productivity cannot be observable with their industry in daily life. For the third hypothesis, human health and social work activities seem to be more productive than the other sectoral segments. Education sectoral segment comes second in terms of productivity of credits on net SME formation.

The formulated hypotheses reveal that private-equity bank credits have significant impact on the growth of small and medium enterprises in Turkey. For statistical region segmentation, cities segmentation and sectoral segmentation, private equity bank group credit coefficient is higher than state equity bank group.

The findings of this study is consistent with the literature from Turkey, Alicioglu and Kucukkocaoglu (2020); banking loans effect net SME formation positively, Zortuk and Celik (2014); there is a cointegration between banking sector loans and economic growth, Koc (2015); banking loans granted to top ten sectors effect the economic growth positively, Turgut and Ertay (2016) and Sahin and Durmus (2019); show a positive relationship from banking sector loans to the economic growth, Karahan, et al. (2018); found two-way causality between banking sector loans and economic growth.

In addition, the findings of this study are partially or fully consistent with the world literature, Cetorelli and Gambera (2001); stated that government support to SMEs through bank credits contributes to economic growth, Cernhorsky (2017), John and Lawal (2019), Mhadbhbi et al. (2019); found the positive relationship from banking loans to the economic growth, Tongurai and Vithessonthi (2018); found a negative relationship between the impact of bank loans on agricultural development and a positive impact on industrial development.

However, there are also some studies, Tuna and Bektas (2013), Leitao (2012) and Drozdowska et al. (2019) found negative relationship between sector credits and growth. The only constriction of this study is the assumption that 99% of newly established firms are SMEs, as it can be seen at Table 1. For future studies, same practical analysis can be done for different banking segmentations, such as Islamic Banking-Conventional Banking segmentation.

This study tries to help state decision makers in deciding the channel and priority of statistical regions in terms of net SME formation. In this regard, the state officials should start thinking of why private-equity bank groups are more productive than state-equity bank groups in all areas of this study.

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APPENDIX

Table A1. List of Abbreviations and Regression Map for Statistical Region Hypothesis

	Abbreviation		*Logarithmic Abbreviation*	
Description	*Private-Equity Bank Group*	*State-Equity Bank Group*	*Private-Equity Bank Group*	*State-Equity Bank Group*
Net Change in the Number of SME at the Date	SME		-	
Total Credits at the Date	PRT	SRT	LPRT	LSRT
TR1 Statistical Region Total Credits at the Date	PR1	SR1	LPR1	LSR1
TR2 Statistical Region Total Credits at the Date	PR2	SR2	LPR2	LSR2
TR3 Statistical Region Total Credits at the Date	PR3	SR3	LPR3	LSR3
TR4 Statistical Region Total Credits at the Date	PR4	SR4	LPR4	LSR4
TR5 Statistical Region Total Credits at the Date	PR5	SR5	LPR5	LSR5
TR6 Statistical Region Total Credits at the Date	PR6	SR6	LPR6	LSR6
TR7 Statistical Region Total Credits at the Date	PR7	SR7	LPR7	LSR7
TR8 Statistical Region Total Credits at the Date	PR8	SR8	LPR8	LSR8
TR9 Statistical Region Total Credits at the Date	PR9	SR9	LPR9	LSR9
TRA Statistical Region Total Credits at the Date	PRA	SRA	LPRA	LSRA
TRB Statistical Region Total Credits at the Date	PRB	SRB	LPRB	LSRB
TRC Statistical Region Total Credits at the Date	PRC	SRC	LPRC	LSRC

Table A2. Results for statistical region segmentation hypothesis

Description	*Private-Equity Bank Group*		*State-Equity Bank Group*	
TR1 Statistical Region Total Credit at the Date	LPR1	379.1544	LSR1	403.9744
TR2 Statistical Region Total Credit at the Date	LPR2	28.19081	LSR2	28.895
TR3 Statistical Region Total Credit at the Date	LPR3	114.9708	LSR3	118.3406
TR4 Statistical Region Total Credit at the Date	LPR4	89.27477	LSR4	92.53491
TR5 Statistical Region Total Credit at the Date	LPR5	127.977	LSR5	131.7569
TR6 Statistical Region Total Credit at the Date	LPR6	101.7588	LSR6	104.8589
TR7 Statistical Region Total Credit at the Date	LPR7	31.94264	LSR7	32.30003
TR8 Statistical Region Total Credit at the Date	LPR8	25.24163	LSR8	25.54423
TR9 Statistical Region Total Credit at the Date	LPR9	15.13731	LSR9	15.38404
TRA Statistical Region Total Credit at the Date	LPRA	7.705881	LSRA	7.531505
TRB Statistical Region Total Credit at the Date	LPRB	19.99258	LSRB	19.92686
TRC Statistical Region Total Credit at the Date	LPRC	70.44015	LSRC	72.59325

100+: Highest contribution to SME formation and thus economy, 50-100: High contribution to SME formation and thus economy, 26-50: Moderate contribution to SME formation and thus economy, 11-25: Low contribution to SME formation and thus economy, 0-10: Lowest contribution to SME formation and thus economy, Higher values represent greater contribution to SME formation and thus economy.

Table A3. List of abbreviations and regression map for city segmentation hypothesis

	Abbreviation		*Logarithmic Abbr.*	
Description	*Private-Eq. Bank Group*	*State-Eq. Bank Group*	*Private-Eq. Bank Group*	*State-Eq. Bank Group*
Net Change in the Number of SME at the Date	SME		-	
Total Credits at the Date	PCT	SCT	LPCT	LSCT
Adana City Total Credit at the Date	PC1	SC1	LPC1	LSC1
Adıyaman City Total Credit at the Date	PC2	SC2	LPC2	LSC2
Afyonkarahisar City Total Credit at the Date	PC3	SC3	LPC3	LSC3
Ağrı City Total Credit at the Date	PC4	SC4	LPC4	LSC4
Amasya City Total Credit at the Date	PC5	SC5	LPC5	LSC5
Ankara City Total Credit at the Date	PC6	SC6	LPC6	LSC6
Antalya City Total Credit at the Date	PC7	SC7	LPC7	LSC7
Artvin City Total Credit at the Date	PC8	SC8	LPC8	LSC8
Aydın City Total Credit at the Date	PC9	SC9	LPC9	LSC9
Balıkesir City Total Credit at the Date e	PC10	SC10	LPC10	LSC10
Bilecik City Total Credit at the Date	PC11	SC11	LPC11	LSC11
Bingöl City Total Credit at the Date	PC12	SC12	LPC12	LSC12
Bitlis City Total Credit at the Date	PC13	SC13	LPC13	LSC13
Bolu City Total Credit at the Date	PC14	SC14	LPC14	LSC14
Burdur City Total Credit at the Date	PC15	SC15	LPC15	LSC15
Bursa City Total Credit at the Date	PC16	SC16	LPC16	LSC16
Çanakkale City Total Credit at the Date e	PC17	SC17	LPC17	LSC17
Çankırı City Total Credit at the Date	PC18	SC18	LPC18	LSC18
Çorum City Total Credit at the Date	PC19	SC19	LPC19	LSC19
Denizli City Total Credit at the Date	PC20	SC20	LPC20	LSC20
Diyarbakır City Total Credit at the Date	PC21	SC21	LPC21	LSC21
Edirne City Total Credit at the Date	PC22	SC22	LPC22	LSC22
Elazığ City Total Credit at the Date	PC23	SC23	LPC23	LSC23
Erzincan City Total Credit at the Date	PC24	SC24	LPC24	LSC24
Erzurum City Total Credit at the Date	PC25	SC25	LPC25	LSC25
Eskişehir City Total Credit at the Date	PC26	SC26	LPC26	LSC26
Gaziantep City Total Credit at the Date	PC27	SC27	LPC27	LSC27
Giresun City Total Credit at the Date	PC28	SC28	LPC28	LSC28
Gümüşhane City Total Credit at the Date	PC29	SC29	LPC29	LSC29
Hakkari City Total Credit at the Date	PC30	SC30	LPC30	LSC30
Hatay City Total Credit at the Date	PC31	SC31	LPC31	LSC31
Isparta City Total Credit at the Date	PC32	SC32	LPC32	LSC32
Mersin City Total Credit at the Date	PC33	SC33	LPC33	LSC33
İstanbul City Total Credit at the Date	PC34	SC34	LPC34	LSC34
İzmir City Total Credit at the Date	PC35	SC35	LPC35	LSC35
Kars City Total Credit at the Date	PC36	SC36	LPC36	LSC36
Kastamonu City Total Credit at the Date	PC37	SC37	LPC37	LSC37
Kayseri City Total Credit at the Date	PC38	SC38	LPC38	LSC38
Kırklareli City Total Credit at the Date	PC39	SC39	LPC39	LSC39

Table A3. (*Continued*)

	Abbreviation		*Logarithmic Abbr.*	
Description	*Private-Eq. Bank Group*	*State-Eq. Bank Group*	*Private-Eq. Bank Group*	*State-Eq. Bank Group*
Kırşehir City Total Credit at the Date	PC40	SC40	LPC40	LSC40
Kocaeli City Total Credit at the Date	PC41	SC41	LPC41	LSC41
Konya City Total Credit at the Date	PC42	SC42	LPC42	LSC42
Kütahya City Total Credit at the Date	PC43	SC43	LPC43	LSC43
Malatya City Total Credit at the Date	PC44	SC44	LPC44	LSC44
Manisa City Total Credit at the Date	PC45	SC45	LPC45	LSC45
Kahramanmaraş City Total Credit at the Date	PC46	SC46	LPC46	LSC46
Mardin City Total Credit at the Date	PC47	SC47	LPC47	LSC47
Muğla City Total Credit at the Date	PC48	SC48	LPC48	LSC48
Muş City Total Credit at the Date	PC49	SC49	LPC49	LSC49
Nevşehir City Total Credit at the Date	PC50	SC50	LPC50	LSC50
Niğde City Total Credit at the Date	PC51	SC51	LPC51	LSC51
Ordu City Total Credit at the Date	PC52	SC52	LPC52	LSC52
Rize City Total Credit at the Date	PC53	SC53	LPC53	LSC53
Sakarya City Total Credit at the Date	PC54	SC54	LPC54	LSC54
Samsun City Total Credit at the Date	PC55	SC55	LPC55	LSC55
Siirt City Total Credit at the Date	PC56	SC56	LPC56	LSC56
Sinop City Total Credit at the Date	PC57	SC57	LPC57	LSC57
Sivas City Total Credit at the Date	PC58	SC58	LPC58	LSC58
Tekirdağ City Total Credit at the Date	PC59	SC59	LPC59	LSC59
Tokat City Total Credit at the Date	PC60	SC60	LPC60	LSC60
Trabzon City Total Credit at the Date	PC61	SC61	LPC61	LSC61
Tunceli City Total Credit at the Date	PC62	SC62	LPC62	LSC62
Şanlıurfa City Total Credit at the Date	PC63	SC63	LPC63	LSC63
Uşak City Total Credit at the Date	PC64	SC64	LPC64	LSC64
Van City Total Credit at the Date	PC65	SC65	LPC65	LSC65
Yozgat City Total Credit at the Date	PC66	SC66	LPC66	LSC66
Zonguldak City Total Credit at the Date	PC67	SC67	LPC67	LSC67
Aksaray City Total Credit at the Date	PC68	SC68	LPC68	LSC68
Bayburt City Total Credit at the Date	PC69	SC69	LPC69	LSC69
Karaman City Total Credit at the Date	PC70	SC70	LPC70	LSC70
Kırıkkale City Total Credit at the Date	PC71	SC71	LPC71	LSC71
Batman City Total Credit at the Date	PC72	SC72	LPC72	LSC72
Şırnak City Total Credit at the Date	PC73	SC73	LPC73	LSC73
Bartın City Total Credit at the Date	PC74	SC74	LPC74	LSC74
Ardahan City Total Credit at the Date	PC75	SC75	LPC75	LSC75
Iğdır City Total Credit at the Date	PC76	SC76	LPC76	LSC76
Yalova City Total Credit at the Date	PC77	SC77	LPC77	LSC77
Karabük City Total Credit at the Date	PC78	SC78	LPC78	LSC78
Kilis City Total Credit at the Date	PC79	SC79	LPC79	LSC79
Osmaniye City Total Credit at the Date	PC80	SC80	LPC80	LSC80
Düzce City Total Credit at the Date	PC81	SC81	LPC81	LSC81

Table A4. Results for city segmentation hypothesis

Description	*Private-Equity Bank Group*		*State-Equity Bank Group*	
Adana City Total Credit at the Date	LPC1	18.7601	LSC1	19.47672
Adıyaman City Total Credit at the Date	LPC2	7.802594	LSC2	8.016398
Afyonkarahisar City Total Credit at the Date	LPC3	1.90983	LSC3	1.908841
Ağrı City Total Credit at the Date	LPC4	2.243832	LSC4	2.073534
Amasya City Total Credit at the Date	LPC5	-0.9617418	LSC5	-0.9897563
Ankara City Total Credit at the Date	LPC6	2.871794	LSC6	2.922037
Antalya City Total Credit at the Date	LPC7	2.297768	LSC7	2.298976
Artvin City Total Credit at the Date	LPC8	35.33872	LSC8	36.8206
Aydın City Total Credit at the Date	LPC9	3.798306	LSC9	3.824713
Balıkesir City Total Credit at the Date e	LPC10	1.105801	LSC10	1.0811355
Bilecik City Total Credit at the Date	LPC11	4.869615	LSC11	4.90041
Bingöl City Total Credit at the Date	LPC12	3.588076	LSC12	3.623735
Bitlis City Total Credit at the Date	LPC13	15.16818	LSC13	15.70274
Bolu City Total Credit at the Date	LPC14	13.05915	LSC14	13.55752
Burdur City Total Credit at the Date	LPC15	1.848771	LSC15	1.879877
Bursa City Total Credit at the Date	LPC16	5.336319	LSC16	5.419289
Çanakkale City Total Credit at the Date e	LPC17	1.678781	LSC17	1.672413
Çankırı City Total Credit at the Date	LPC18	2.905046	LSC18	2.821328
Çorum City Total Credit at the Date	LPC19	15.48175	LSC19	15.97891
Denizli City Total Credit at the Date	LPC20	27.60965	LSC20	28.72872
Diyarbakır City Total Credit at the Date	LPC21	2.742207	LSC21	2.752455
Edirne City Total Credit at the Date	LPC22	0.9772734	LSC22	0.9259654
Elazığ City Total Credit at the Date	LPC23	5.915582	LSC23	5.90953
Erzincan City Total Credit at the Date	LPC24	1.491403	LSC24	1.385726
Erzurum City Total Credit at the Date	LPC25	14.71684	LSC25	15.19957
Eskişehir City Total Credit at the Date	LPC26	3.395116	LSC26	3.45774
Gaziantep City Total Credit at the Date	LPC27	22.70992	LSC27	23.8548
Giresun City Total Credit at the Date	LPC28	379.1544	LSC28	403.9477
Gümüşhane City Total Credit at the Date	LPC29	60.24314	LSC29	62.39363
Hakkari City Total Credit at the Date	LPC30	1.396669	LSC30	1.371982
Hatay City Total Credit at the Date	LPC31	1.841487	LSC31	1.861153
Isparta City Total Credit at the Date	LPC32	16.76727	LSC32	17.36883
Mersin City Total Credit at the Date	LPC33*	3.415966*	LSC33*	3.480956*
İstanbul City Total Credit at the Date	LPC34	1.654747	LSC34	1.619847
İzmir City Total Credit at the Date	LPC35	1.274747	LSC35	1.23436
Kars City Total Credit at the Date	LPC36	24.32384	LSC36	25.56685
Kastamonu City Total Credit at the Date	LPC37	23.39528	LSC37	23.83986
Kayseri City Total Credit at the Date	LPC38	4.113841	LSC38	4.167899
Kırklareli City Total Credit at the Date	LPC39	6.507599	LSC39	6.621084
Kırşehir City Total Credit at the Date	LPC40	10.93862	LSC40	11.15844
Kocaeli City Total Credit at the Date	LPC41	10.40065	LSC41	10.55694
Konya City Total Credit at the Date	LPC42	7.457494	LSC42	7.63399
Kütahya City Total Credit at the Date	LPC43*	16.19104*	LSC43*	17.05055*
Malatya City Total Credit at the Date	LPC44	0.1264203	LSC44	0.1354449
Manisa City Total Credit at the Date	LPC45	2.182343	LSC45	2.188344

Table A4. (*Continued*)

Description	*Private-Equity Bank Group*		*State-Equity Bank Group*	
Kahramanmaraş City Total Credit at the Date	LPC46	2.922543	LSC46	2.974034
Mardin City Total Credit at the Date	LPC47	2.488314	LSC47	2.495348
Muğla City Total Credit at the Date	LPC48	3.807779	LSC48	3.87779
Muş City Total Credit at the Date	LPC49	1.637876	LSC49	1.662774
Nevşehir City Total Credit at the Date	LPC50	11.18721	LSC50	11.51655
Niğde City Total Credit at the Date	LPC51*	9.101476*	LSC51*	9.290811*
Ordu City Total Credit at the Date	LPC52	0.2958046	LSC52	0.3411452
Rize City Total Credit at the Date	LPC53	0.8000124	LSC53	0.7758758
Sakarya City Total Credit at the Date	LPC54	4.94611	LSC54	4.875761
Samsun City Total Credit at the Date	LPC55	13.93755	LSC55	14.55886
Siirt City Total Credit at the Date	LPC56	105.8838	LSC56	109.3132
Sinop City Total Credit at the Date	LPC57	3.414946	LSC57	3.423541
Sivas City Total Credit at the Date	LPC58	6.489502	LSC58	6.733877
Tekirdağ City Total Credit at the Date	LPC59	0.6529015	LSC59	0.6216737
Tokat City Total Credit at the Date	LPC60*	16.18391*	LSC60*	16.67374*
Trabzon City Total Credit at the Date	LPC61	1.136934	LSC61	1.153386
Tunceli City Total Credit at the Date	LPC62	7.120789	LSC62	7.077699
Şanlıurfa City Total Credit at the Date	LPC63	1.935667	LSC63	1.876158
Uşak City Total Credit at the Date	LPC64	2.945552	LSC64	3.035173
Van City Total Credit at the Date	LPC65	3.559777	LSC65	3.540123
Yozgat City Total Credit at the Date	LPC66	0.441257	LSC66	0.421236
Zonguldak City Total Credit at the Date	LPC67	36.84018	LSC67	38.13092
Aksaray City Total Credit at the Date	LPC68	2.994944	LSC68	3.00041
Bayburt City Total Credit at the Date	LPC69	1.694851	LSC69	1.715539
Karaman City Total Credit at the Date	LPC70	5.452501	LSC70	5.786833
Kırıkkale City Total Credit at the Date	LPC71	3.866405	LSC71	3.913925
Batman City Total Credit at the Date	LPC72	1.078614	LSC72	1.088212
Şırnak City Total Credit at the Date	LPC73*	0.4428498*	LSC73*	0.3987314*
Bartın City Total Credit at the Date	LPC74	0.2340226	LSC74	0.2408092
Ardahan City Total Credit at the Date	LPC75	4.991101	LSC75	5.185479
Iğdır City Total Credit at the Date	LPC76	1.432481	LSC76	1.47976
Yalova City Total Credit at the Date	LPC77	1.734195	LSC77	1.720505
Karabük City Total Credit at the Date	LPC78	1.161297	LSC78	1.140973
Kilis City Total Credit at the Date	LPC79	3.90872	LSC79	3.956427
Osmaniye City Total Credit at the Date	LPC80	2.709486	LSC80	2.787343
Düzce City Total Credit at the Date	LPC81	12.58489	LSC81	12.86857

100+: Highest contribution to SME formation and thus economy. 50-100: High contribution to SME formation and thus economy. 26-50: Moderate contribution to SME formation and thus economy. 11-25: Low contribution to SME formation and thus economy. 0-10: Lowest contribution to SME formation and thus economy. *: Undefined. Higher values represent greater contribution to SME formation and thus economy

Table A5. List of abbreviations and regression map for sectoral segmentation hypothesis

	Abbreviation		*Logarithmic Abbreviation*	
Description (at the date value)	*Private-Equity Bank Group*	*State-Equity Bank Group*	*Private-Equity Bank Group*	*State-Equity Bank Group*
Net Change in the NUMBER of SME	SSME		-	
Total credits	PST	SST	LPST	LSST
Agriculture, Forestry and Fisheries Sector Total Credits	PS1	SS1	LPS1	LSS1
Mining and Quarrying Sector Total Credits	PS2	SS2	LPS2	LSS2
Production Sector Total Credits	PS3	SS3	LPS3	LSS3
Electricity, Gas, Steam and Air Conditioning Production and Distribution Sector Total Credits	PS4	SS4	LPS4	LSS4
Construction Sector Total Credits	PS5	SS5	LPS5	LSS5
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles Sector Total Credits	PS6	SS6	LPS6	LSS6
Transportation, Storage and Communication (Info. And Communication) Sector Total Credits	PS7	SS7	LPS7	LSS7
Accommodation and Food Service Activities Sector Total Credits	PS8	SS8	LPS8	LSS8
Finance and Insurance Activities Sector Total Credits	PS9	SS9	LPS9	LSS9
Retail Commercial. Rental and Management Operational. Sector Total Credits	PS10	SS10	LPS10	LSS10
Public Administration and Defense; Compulsory Social Security Sector Total Credits	PS11	SS11	LPS11	LSS11
Education Sector Total Credits	PS12	SS12	LPS12	LSS12
Human Health and Social Work Activities Sector Total Credits	PS13	SS13	LPS13	LSS13
Other Services Sector Total Credits	PS14	SS14	LPS14	LSS14
Private Persons Employing Workers Sector Total	PS15	SS15	LPS15	LSS15
International Organizations Sector Total Credits	PS16	SS16	LPS16	LSS16

Table A6. Results for sectoral segmentation hypothesis

Description	*Private-Equity Bank Group*		*State-Equity Bank Group*	
Agriculture, Forestry and Fisheries Sector total credit	LPS1	14.54674	LSS1	13.92672
Mining and Quarrying Sector total credit	LPS2	143.6524	LSS2	150.411
Production Sector total credit	LPS3	1.954686	LSS3	1.819487
Electricity, Gas, Steam and Air Conditioning Production and Distribution Sector total credit	LPS4	23.69192	LSS4	25.72604
Construction Sector total credit	LPS5	18.75458	LSS5	20.14737
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles Sector total credit	LPS6	24.70013	LSS6	25.48245
Transportation, Storage and Communication (Info. And Communication) Sector total credit	LPS7	-0.0080879	LSS7	-0.0119075
Accommodation and Food Service Activities Sector total	LPS8	-0.0099482	LSS8	-0.0029447
Finance and Insurance Activities Sector total credit	LPS9	8.106159	LSS9	8.797485
Retail Comm. Rental and Management Operations Sector total credit	LPS10	137.3913	LSS10	143.2743
Public Administration and Defense; Compulsory Social Security Sector total credit	LPS11	14.97586	LSS11	16.14402
Education Sector total credit	LPS12	213.1023	LSS12	226.6084
Human Health and Social Work Activities Sector total credits	LPS13	280.167	LSS13	292.7038
Other Services Sector total credits	LPS14	92.8218	LSS14	97.44895
Private Persons Employing Workers Sector total credits	LPS15	69.62978	LSS15	73.83044
International Organizations Sector total credits	LPS16	6.520545	LSS16	6.936338

100+: Highest contribution to SME formation and thus economy. 50-100: High contribution to SME formation and thus economy. 26-50: Moderate contribution to SME formation and thus economy. 11-25: Low contribution to SME formation and thus economy. 0-10: Lowest contribution to SME formation and thus economy. *: Undefined. Higher values represent greater contribution to SME formation and thus economy