

## V. Special Topics

### V.1 Link between Commercial Loans and Firm Productivity: Is There Heterogeneity Among Bank Groups?

#### V.1.1 Introduction

In national economies, allocating resources to productive sectors and companies is a factor that can create more value added and support sustainable growth. Therefore, the productivity level of a sector or firm to which loans are extended is important for sustainable growth. In this special topic, we analyze the level and progress of productivity in firms that receive the commercial loans intermediated by a commercial bank on the basis of bank groups. In this context, we examine the productivity levels of firms borrowing from the Turkish banking sector using various parameters. Then, based on the productivity of these firms, we measure the productivity levels of loan portfolios of the various categories of banks of which they are clients.

#### V.1.2 Data and Methodology

Productivity is defined as the relationship between the input used by a firm for production and the output and revenue generated as a result of that production. If a company makes more sales or generates more value added than another company with the same number of employees and capital stock, it is considered more productive. In the related literature, there are many indicators to measure the productivity of a firm, but the ratio of Net Sales to the number of employees and the ratio of Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) to the number of employees stand out as they can be obtained from financial statements and are comparable across companies (OECD Manual, 2001). In this analysis, the ratio of Net Sales/Number of Employees is taken into account.<sup>1</sup> The analysis also looks at annual balance sheets of manufacturing firms for the period between 2009 and 2018, which contains the most up-to-date data. As internal dynamics and structural factors of main sectors will lead to divergence across sectors in the productivity analysis, the focus is on manufacturing industry firms that offer the highest contribution to Turkey's output potential and export volume. Since sales and EBITDA values of companies will also be affected by price movements, these values have been deflated by the annual producer price index based on the sector that firms operate in. Balance sheets and number of employees per company were obtained from the data set compiled by TURKSTAT, which consists of financial statements submitted by corporate-tax-paying firms to the Revenue Administration. Table V.1.1 shows descriptive statistics on the indicators for such firms.<sup>2</sup>

**Table V.1.1: Descriptive Statistics for Firms In Sample (TRY Thousand, Persons, %)**

	Period	No. of Firms	Average	Std. Error	Minimum	0.25	0.5	0.75	Maximum
Net Sales	10	549,779	47,658	332,908	115	2,719	7,970	25,006	50,299,452
EBITA	10	549,779	2,792	23,501	-508,288	51	261	1,137	4,327,023
Number of Employees	10	549,779	40	162	1	4	12	31	16,984
<b>Productivity Indicators</b>									
Net Sales/No. of Employees	10	549,779	995	855	115	405	714	1,273	4,590
EBITA/No. of Employees	10	549,779	50	72	-89	8	28	73	338

In the analysis made for bank categories, we used a data set from the BAT Risk Center to identify the firms in the portfolios of bank groups. Firm productivity is weighted by the share of the loan borrowed from the relevant bank group in the total loans granted by that bank group, and a loan-weighted

<sup>1</sup> To confirm basic findings, we repeated the analysis with the (EBITDA/Number of Employees) ratio and obtained similar results.

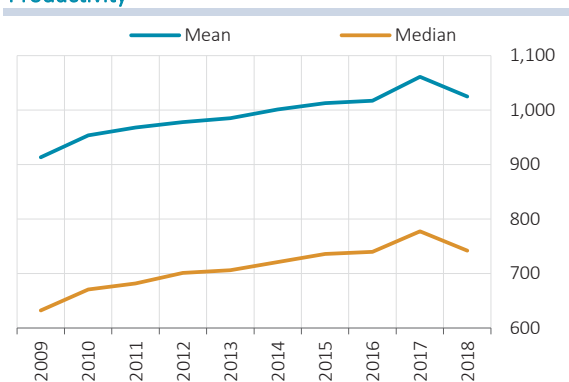
<sup>2</sup> Manufacturing industry firms account for 35% of value added in GDP and 30% of total commercial loans extended by the banking sector.

productivity value has been obtained. Assuming that banks grant loans by analyzing firms’ most up-to-date balance sheets, in weighting, instead of the loans corresponding to the balance sheet period we used the 12-month average of the loan stock in the following year. The analyses focus on approximately 550 thousand firms and 21 banks accounting for 89.5% of total banking sector assets, with which these firms work, from 2009 to 2018. Lastly, in order to prevent outlier values from distorting the general trend, data regarding firms with a productivity indicator in the highest and lowest 5% are not included in the analyses.

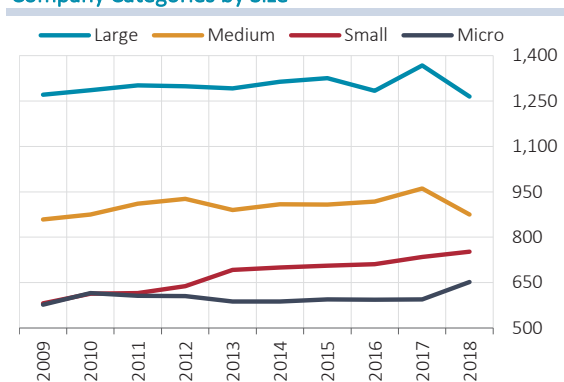
### V.1.3 Firms’ Productivity by Size

Chart V.1.1 shows the progress of the average and median productivity values of the firms in the sample. Both series have a similar trend, and productivity indicators have a steady increase except for 2018. The 2018 August exchange rate shock and the following environment of uncertainty seem to have affected company balance sheets and sales in 2018. Classified on a scale basis defined by the KOSGEB, firms have a higher productivity level as they grow in scale, which is consistent with the relevant literature (Chart V.1.2). Looking at progress over time, the productivity of small-sized firms appears to have increased steadily while the shock of 2018 had no adverse impact on the productivity of "Small" and "Micro" sized firms. After remaining almost flat, productivity levels of "Large" and "Medium" sized firms declined in 2018.

**Chart V.1.1: Average and Median Values for Company Productivity**



**Chart V.1.2: Median Values of Productivity Indicators for Company Categories by Size**



Source: Authors’ calculations

Note: “Net Sales/No. of Employees” is used as an indicator for company productivity.

Last Observation: 2018

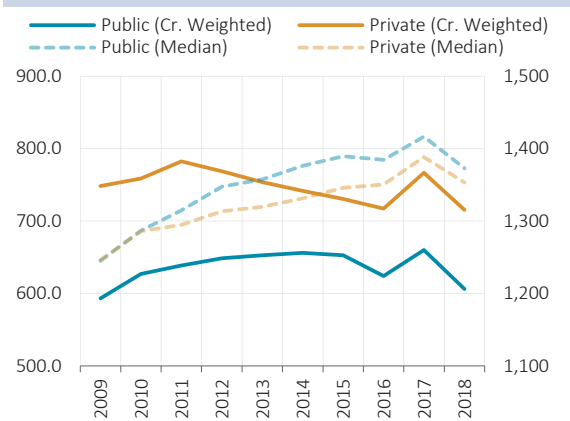
### V.1.4 Productivity across Bank Groups

In this section, we analyzed whether there is a heterogeneity in productivity levels across borrowing firms in a breakdown of bank groups. First, we examined banks in two groups as state-owned and private based on their ownership structure, and tracked the productivity of their portfolios.<sup>3</sup> In this regard, Charts V.1.3 and V.1.4 show the progress of median and credit-weighted productivity levels of the loan portfolios of state-owned and private banks. As illustrated by the findings, across median productivity ratios, the productivity of firms borrowing from state-owned banks is higher than that of private banks, but the results are similar for both types of banks, which indicates that state-owned banks generally offer lending to firms that are more productive. The productivity indicator weighted by loan size suggests that state-owned banks had a lower level in the entire period. This shows that among firms that work with private banks, those with higher productivity accounted for a larger share of private banks’ loans. The relevant literature points out that state-owned banks may diverge from private banks across the world in some periods due to their countercyclical policies and continue to lend to firms whose business activities

<sup>3</sup> Companies working with different bank categories are included in the estimations for both categories.

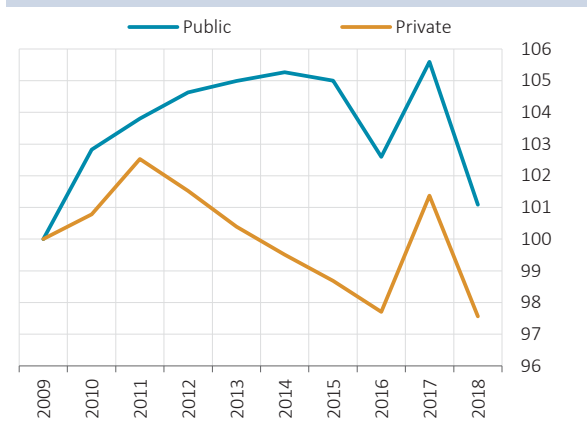
worsened by helping them access to liquidity in times of economic slowdown (Bertay, et al., 2015; Behr, et al., 2017 ). The reason why the credit-weighted productivity indicator for state-owned banks is at low levels may be explained by their countercyclical motivation or financial inclusion promoting policies.

**Chart V.1.3: Productivity Indicators for Bank Groups (Credit Weighted, Median)**



Source: Authors' calculations Last Observation: 2018

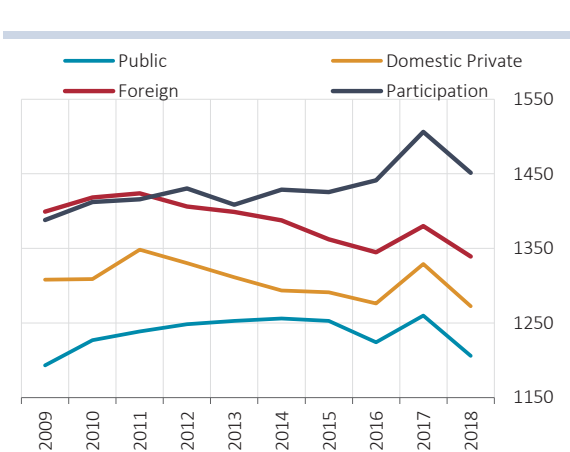
**Chart V.1.4: Index of Productivity Indicators for Bank Groups (Credit Weighted, 2009=100)**



Source: Authors' calculations Last Observation: 2018

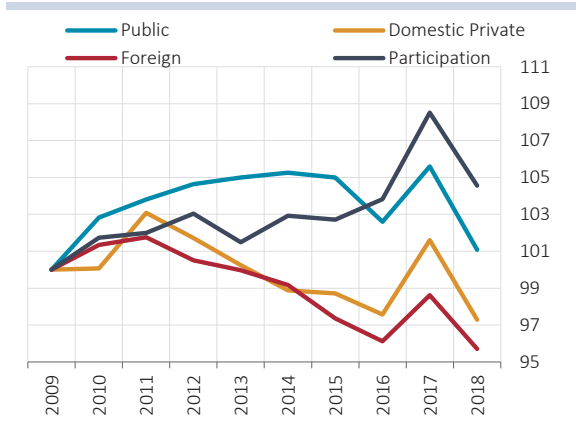
In Chart V.1.4, the series are indexed to 2009 in order to compare productivity developments across bank groups over time. The results indicate that the portfolio productivity of state-owned banks increased steadily except in 2016 and 2018, thanks to a base effect. An increase or decrease in productivity levels across all bank groups reflects the general positive or negative progress in firms' balance sheets, and the divergence in bank groups indicates that the productivity of the firms in their portfolios performed differently or firms switched between bank groups. The loan portfolio productivity decreased for private banks but increased for state-owned lenders between 2012 and 2014, which can be interpreted as a divergence in portfolio performance or a switch between groups. The increase in firm productivity due to the economic rebound boosted by CGF-guaranteed loans in 2017 is evident in the portfolios of both groups participating extensively in CGF loans. The financial shocks of 2018 had a similar negative impact on the productivity indicators of firms in the loan portfolios of state-owned and private banks.

**Chart V.1.5: Productivity Indicators for Bank Groups**



Source: Authors' calculations

**Chart V.1.6: Productivity Indicators for Bank Groups (Indexed, 2009=100)**



Last Observation: 2018

In the following section, we analyzed private banks in three sub-groups. Chart V.1.5 shows the progress of credit-weighted productivity of portfolios in four bank groups, i.e. state-owned, local

private, foreign private and participation, for the sampling period.<sup>4</sup> Despite a gap in its level, productivity is on a similar path for both local and foreign private banks. During the sampling period, the productivity level of the portfolios of state-owned banks was lower than that of other groups while the productivity level of the portfolios of participation banks was higher than that of other groups, which can be attributed to the fact that participation banks extend loans against an invoice related to the purchase of a good/service instead of cash loans, as per their business model. Firms with disrupted cash flows and hence reduced productivity are unable to borrow from participation banks to support their cash flows without making any purchase or sale against an invoice. Therefore, loan portfolios of participation banks are expected to be composed of firms that can sustain their business activities or make investment expenditures, and thus their portfolio productivity is likely to be higher than the average. In addition, based on the sample, participation banks seem to work with larger firms than other bank groups (Table V.1.2). The abovementioned positive correlation between firm size and productivity may also be a factor behind the high productivity level of participation banks. However, excluding 2018, when the volatility in macroeconomic conditions affected firms' balance sheets negatively, the productivity curve moved generally upward for state-owned and participation banks but downward for private banks over the sample period (Chart V.1.6). The productivity of portfolios of all bank groups reflected the increasing productivity across firms thanks to the CGF-guaranteed loans of 2017.

**Table V.1.2: Sizes of Firms in a Breakdown of Bank Groups They Borrowed from**

	State-owned		Local Private		Foreign Private		Participation		TOTAL
	No. of Firms	Share (%)	No. of Firms	Share (%)	No. of Firms	Share (%)	No. of Firms	Share (%)	
Large	21,786	7	51,517	7	33,946	9	12,643	11	119,892
Medium	82,359	27	189,866	25	106,453	28	39,629	35	418,307
Small	148,807	48	353,935	46	163,237	44	48,396	42	714,375
Micro	56,871	18	166,088	22	71,482	19	14,061	12	308,502
<b>TOPLAM</b>	<b>309,823</b>		<b>761,406</b>		<b>375,118</b>		<b>114,729</b>		<b>1,561,076</b>

### V.1.5 Conclusion

In sum, the average productivity of manufacturing firms has been increasing since 2009 and the productivity of large-scale firms is higher than that of SMEs. On average, state-owned banks lend to firms that are more productive, but when weighted by loans extended, portfolio productivity is lower for state-owned banks than private banks, with an upward trend over the years. Due to their business models and company size preferences, participation banks have a higher productivity than other bank groups. Lastly, whether the countercyclical loan policy followed by state-owned banks throughout 2019 and during the 2020 coronavirus pandemic has led to a structural change in the portfolio productivity of banks can be analyzed with the release of post-2018 data.

### Reference

A.C. Bertay, A. Demirguc-Kunt, & H. Huizinga. "Bank ownership and credit over the business cycle: Is lending by state banks less procyclical?" *Journal of Banking & Finance*, 50 (2015), pp. 326-339.

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Behr, P., Foos, D., & Norden, L. "Cyclicality of SME lending and government involvement in banks." *Journal of Banking & Finance*, 77 (2017), pp. 64-77.

<sup>4</sup> In order to prevent changes in bank ownership from causing large volatility in calculations, banks are classified according to the category they were in for the longest during the sampling period.