

## Box 2.2

### Effects of the Covid-19 Pandemic on Firms' Liquidity

The lockdowns imposed in the second quarter of 2020 and the policy measures taken in the following period to reduce the impact of the Covid-19 pandemic significantly affected the turnover and liquidity of firms. Various monetary and financial measures have been taken to overcome the cash flow and payment problems that many firms face due to the decrease in sales. In addition, firms have been supported financially by decreasing loan rates and loosening of loan standards. This box presents a firm-based liquidity estimation by using firm balance sheets, income statements and turnover indices. Thus, a prediction can be made about the number of firms with insufficient liquidity and the number of employees in these firms at the sectoral level. The study also examines how firms with insufficient liquidity benefited from the credit expansion in the second and third quarters of the year and their short, medium and long-term risks with respect to loan repayments.

#### Methodology

In order to measure the liquidity needs of the firms, we make use of their balance sheet and income statement information for 2019 obtained from the Revenue Administration (RA) in addition to the two-digit NACE Rev. 2 classification turnover indices for 2020 by quarters.<sup>1</sup> To estimate liquidity needs of firms, the method used in Schivardi *et al.* (2020) and Demmou *et al.* (2020) has been applied.<sup>2,3</sup> Accordingly, the liquidity of the firm in the current period is defined as the sum of its liquidity in the previous period and its cash flow in the current period. The "liquid assets item" on the balance sheet has been used as a liquidity indicator in the analysis. The cash flow of the firm has been calculated by subtracting items such as raw material and operating expenses, wage payments, and debt and tax payments from sales revenues. Nevertheless, starting from the second quarter of 2020, firms have been given the opportunity to postpone loan repayments and tax payments in order to eliminate cash shortages. Therefore, tax and debt payments have been excluded from the cash flow equation. In the cash flow equation, "cost of sales" and "operating expenses" have been used as expenses, and wage payments of firms are included in these items. Sales revenues in the cash flow equation are defined as the estimation of sales revenues in the previous period using the monthly change in nominal turnover indices. While the cost of sales and operating expenses are subtracted from sales revenues, the elasticity of these items to sales has been taken into account. As a result of the regression results and evaluations, the elasticity of cost of sales and operating expenses to sales have been assumed as 0.80 and 0.05, respectively. In this framework, the liquidity estimation has been made at the firm level, but the sales growth figures used in the forecasts have been used at the two-digit sector level.

#### Findings

There are different approaches to measuring the impact of pandemic lockdown measures on firms. This study excludes the bankruptcy of firms and focuses only on firms with insufficient liquidity (negative liquidity). Firms with insufficient liquidity are defined as firms whose operating cash flow is lower than their fixed costs (Guerini *et al.* 2020).<sup>4</sup>

<sup>1</sup> Firms that pay corporate tax are included in the study. Agriculture, fisheries, forestry, mining, public, education and social services sectors were excluded, and sectors coded 10-82 in two-digit turnover data were included in the analysis. The number of firms included in the analysis after data cleaning is 663,295.

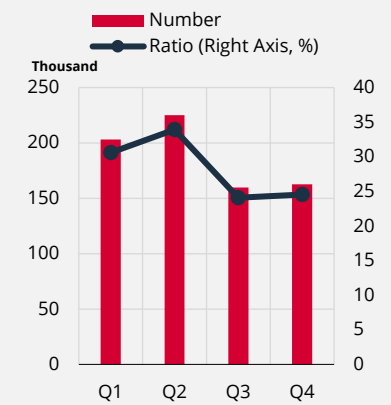
<sup>2</sup> Schivardi, F. and Romano, G. (2020). A simple method to compute liquidity shortfalls during the COVID-19 crisis with an application to Italy. <https://www.oecd.org/global-forum-productivity/webinars/SchivardiLiquidityOECD.pdf>. Demmou, L., Franco, G., Calligaris, S. and Dlugosch, D. (2020). Corporate sector vulnerabilities during the Covid-19 outbreak: Assessment and policy responses. <http://www.oecd.org/coronavirus/policy-responses/corporate-sector-vulnerabilities-during-the-covid-19-outbreak-assessment-and-policy-responses-a6e670ea/#biblio-d1e970>.

<sup>3</sup> As a robustness check, firms' 2018 liquidity was estimated using 2017 balance sheet, 2018 turnover data and following the same methodology. There is an 85% correlation between the 2018 liquidity forecast and its realization.

<sup>4</sup> Guerini, M., Nesta, L., Ragot, X. and Schiavo, S. (2020). Firm liquidity and solvency under the Covid-19 lockdown in France. OFCE Policy Brief No. 76.

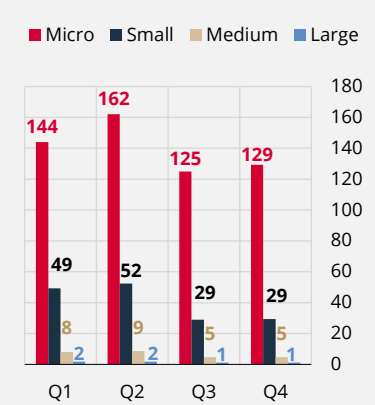
According to forecasts, the number of illiquid firms increased in the second quarter of 2020, declined in the third quarter, and increased slightly in the October-November period again (Figure 1). It is observed that the negative effects of the pandemic differ across firm sizes and the number of illiquid firms increases as the firm size become smaller. (Figure 2).

**Chart 1: Number of Illiquid Firms and their Ratio to the Number of Total Firms**



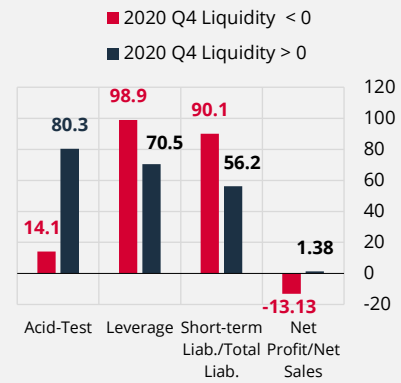
Sources: Authors' calculations, CBRT, RA.

**Chart 2: Number of Illiquid Firms By Size (Thousands)**



Sources: Authors' calculations, CBRT, RA.

**Chart 3: Median of Selected Ratios (%)**

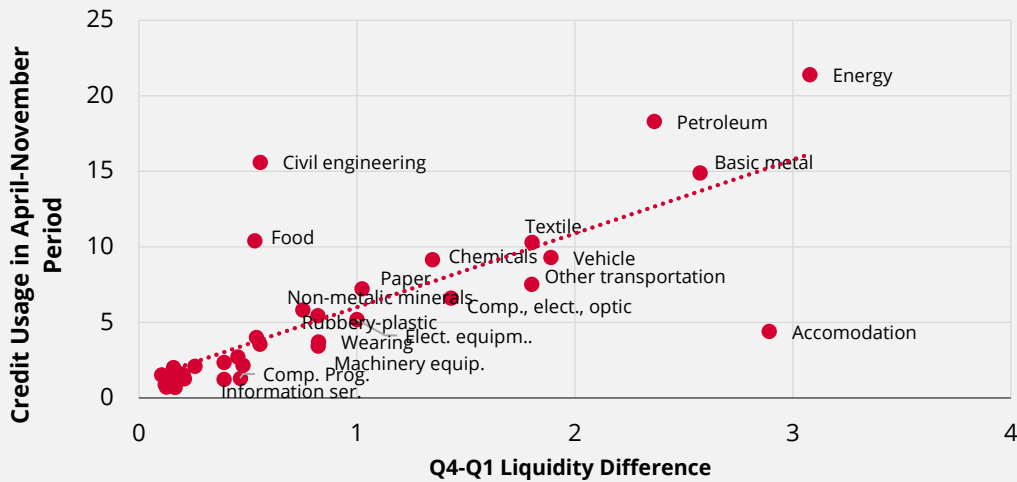


Sources: Authors' calculations, CBRT, RA.

Illiquid firms are more common in services sectors such as construction, trade, transportation, and accommodation and food, while manufacturing sectors perform relatively better. The services sector has the highest ratio of illiquid firms to total number of firms. In November, the number of employees working in illiquid firms was around 1 million 198 thousand and constituted 12% of the total number of employees in the sample.<sup>5</sup> The sectors with the highest ratio of the number of employees in illiquid firms to the total number of employees in the sector were the construction and service sectors. An analysis of various ratios taken from 2019 balance sheets of illiquid firms in November reveals that the liquidity of these firms was lower, their total and short-term debt ratios were higher and they were in net loss (Figure 3). In the second and third quarters of 2020, loan facilities were expanded within the scope of monetary and financial measures introduced to support the cash flow of firms, and commercial loans increased significantly. Total commercial loans that were not adjusted for exchange rate effect increased by 14% and 7%, respectively, on a quarterly basis in the second and third quarters, while the growth rate slowed down slightly in the final quarter. Although credit expansion spread across sectors during the epidemic period, the third quarter-to-first quarter loan growth rate of illiquid firms in the second quarter of 2020 was approximately 9 percentage points below the general averages. In order to understand to what extent loans used by firms compensated their liquidity deficits, the liquidity of firms and loans they used in the April-November period were analyzed. The liquidity increase in sectors such as accommodation, vehicle, other transportation, computer-optics, wearing, machinery-equipment etc. was greater than the increase implied by their credit growth (Figure 4). On the other hand, in sectors such as food, non-building construction, petroleum products and energy, the increase in liquidity remained limited despite high credit utilization.

<sup>5</sup> Total number of employees working in the firms included in this analysis is reported as 9,716,400 in 2019 balance sheets. According to the Household Labor Force Survey (HLFS) 2019 data, the total number of employees in the sectors covered in this study is 16,664,750. Some of this difference is attributed to unregistered workers included in the HLFS but not included in the RA data. In fact, according to the Social Security Institution records, the total number of employees of the sectors covered by the study in 2019 is 11,255,662.

**Chart 4: Firms' Liquidity and Loan Utilization in April-November Period \***  
(Sectoral Averages, Million TRY)

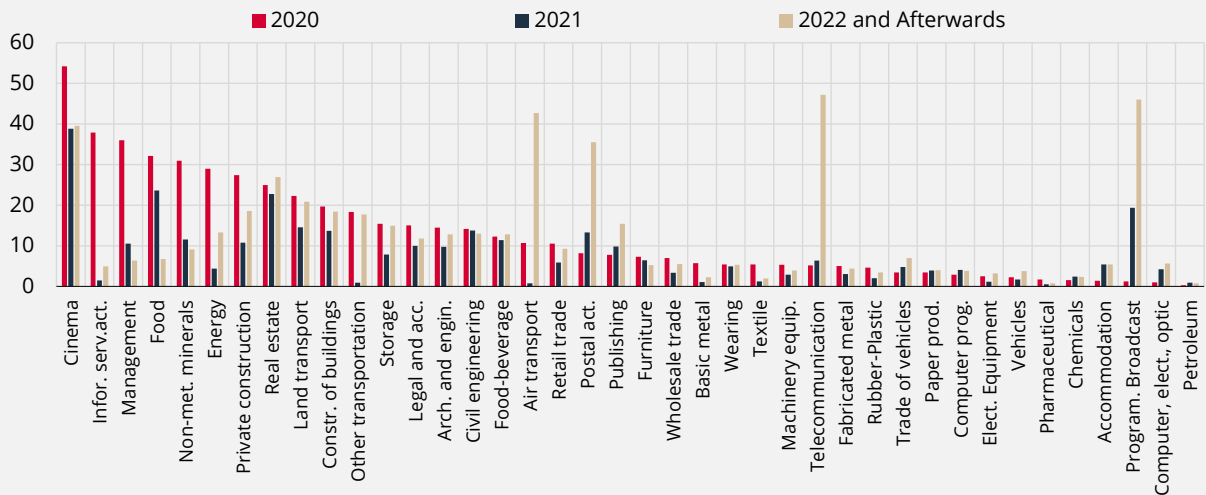


Sources: Authors' calculations, CBRT, RA.

\* The loan amount is weighted by the ratio of firms' sales to the sector total.

Finally, loan repayment projections of illiquid firms in November have been analyzed. Cinema, information service activities, administrative activities, food, non-metallic minerals, energy, construction, real estate, transportation, food and beverage and professional activities sectors have been the ones that experienced the most short-term vulnerabilities (Figure 5). The ratios of term loans to total loans in these sectors in 2020 and 2021 are higher compared to other sectors. The share of long-term loans is higher in the airline transport, postal, telecommunications and program broadcasting sectors.

**Chart 5: Ratio of TL Loans to Total Loans of Illiquid Firms in November 2020 (By Maturity Breakdown, %)**



Sources: Authors' calculations, CBRT, RA.

As a result, credit expansion in the second and third quarters of 2020 provided financial support to a significant range of firms. The number of illiquid firms, which increased in the second quarter, declined in the third quarter and increased slightly again in the October-November period. Tightening of lockdown measures due to the epidemic in the November-December period will adversely affect the cash flow of many firms, particularly those in transportation, accommodation-food and related sectors. Designing selective and targeted support programs for the most vulnerable sectors and firms most severely affected by the epidemic is important with respect to financial stability and price stability.