Box: 5.1: Credit riskiness of corporate non-financial listed firms – An econometric analysis

The credit allocation is an important driver of the economic growth and the firms utilizing the credit are the engines of real growth. The credit, however, tends to be pro-cyclical and its availability to riskier firms increases during expansions.[256] The easy monetary conditions, therefore, tend to breed financial excesses, which unwind during contractions, leading to defaults.[257] This will have consequences for the real growth as well as financial stability.

The corporate non-financial firms (NFFs) of Pakistan happen to be the largest borrowers of the banking sector. Of the PKR 4,982.1 billion loans extended by the banks to the domestic private sector as of December 2017, the corporate private sector has availed PKR 3,589.9 billion.

While banks institute all measures to ensure that the selected borrowers are financially sound and solvent, and have capability to service their obligations, the idiosyncratic and systemic uncertainties always leave a possibility of default, however small it may be. As of end-CY17, the loan delinquency rate in the domestic corporate lending stands at 10.11 percent. Given the high exposure of banks to the non-financial sector, it would be interesting to explore how the dynamics of financial and macroeconomic factors affect the possibility of corporate delinquencies, based on the information of already delinquent corporates. Specifically, we use five accounting ratios of a sample of 276 listed firms as well as macroeconomic variables over 2013-2017 period and assume that

$$P(D_{i,t} = 1) = \Phi\left(\alpha + \sum_i X_{i,t-1} + \sum_k Y_{k,t-1}\right),$$

where X_i refers to the firm-specific financial information and Y embodies the systemic factors common to all firms, both lagged one period, while $\Phi(.)$ is the probability transform function, the logit model in our case.[258] The X_i includes the working capital, retained earnings, earnings before tax, equity and sales, all normalized by total assets, while the Y_k includes industrial sector growth and interest rate. The D_i equals unity if the firm, i, has defaulted on its credit obligations in year t, or zero otherwise. We proxy the default by using firm specific data from SBP's Credit Registry, where a firm is taken to have defaulted if its credit obligations remain overdue by 365 days and above (OD 365).

Important as the overall NFF sector is, the textile industry is the mainstay of Pakistan's economy. The industry's contribution in the export earnings of the country is around 55.81 percent in CY17. It also constitutes a substantial share of the corporate lending of the banking industry – around 27.24 percent. Although, better energy supply, grant of GSP Plus status and government's incentive package has turned the negative growth of textiles exports during last couple of years into positive during CY17,[259] the major concentration of NPLs continues to be in the textile sector – 49.11 percent of the total corporate NPLs. Given that textile sector is a key borrower, it has been subjected to the same analysis as the NFFs.

Empirical Results

(a)   All Non-financial Firms

The financial performance of the NFFs in terms of above-mentioned five ratios over five-year periods shown in **Figure 1**.[260] The working capital ratio, though positive on average, remains highly tilted towards lower

[256] Borio C. and Lowe P. (2002). Asset prices, financial and monetary stability: exploring the nexus. BIS Working Paper No. 114

[257] IMF (2018) Global Financial Stability Report, *April.*

[258] This is in essence an Altman-type model augmented with macro-variables. [Altman E. (1968). Financial Ratios, Discrimnant Analysisand the Prediction of Corporate Bankruptcy. *The Journal of Finance*, 23(4), 589-609.] A similar analysis has also been carried out in Chapter 2 of IMF (2018).

[259] (a) See State of Pakistan's Economy: Third Quarterly, FY17 for discussion on the Prime Minister's Package of Incentives for Exporters; (b) The year-on-year growth of textile exports during CY13-CY17 has been recorded at 8.50 percent, -2.26 percent, -4.25 percent, -5.01 percent and 8.77 percent, respectively.

[260] **wcta**=Working Capital to Total Assets; **retta**=Retained Earnings to Total Assets; **salesta**=Sales to Total Assets;**eqtyta**=Equity to Total Assets[260] and **ebitta**=Earnings Before Interest and Taxes to Total Assets . For CY17, the average accounting information of last five years has been used.

quartile with substantial outliers, implying reliance of firms on sources other than their own in the short run. This corroborates the fact that working capital finance dominates the lending by the banks (**see Chapter 3.1**).

Figure 1

Financials of non-financial corporates improves

Financial Indicators – Non-Financial Firms
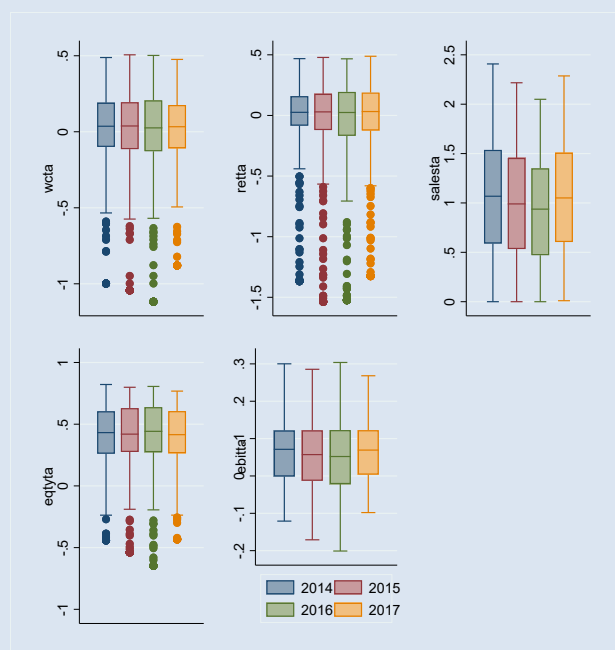
Source: SBP Staff Calculations

The retained earnings also turn out to be highly concentrated below the median, with substantial number of outlying firms, implying low incidence of retention. The corporates' sales, on the other hand, remains robustly positive with some firms having sales more than double their asset size. The dispersion of this indicator is the highest amongst all the variables. With strengthening domestic demand conditions, the sales are expected to rise in the future.

The equity of the firms on average remains strongly positive as well, though some outliers on the negative side can also be observed. Finally, the corporate sector remains largely profitable and is expected to witness a rise in earnings.

Figure 2

More firms are expected to travel to non-default zone

Probability of Default - Corporate Non-financial Firms
(Number of Firms)
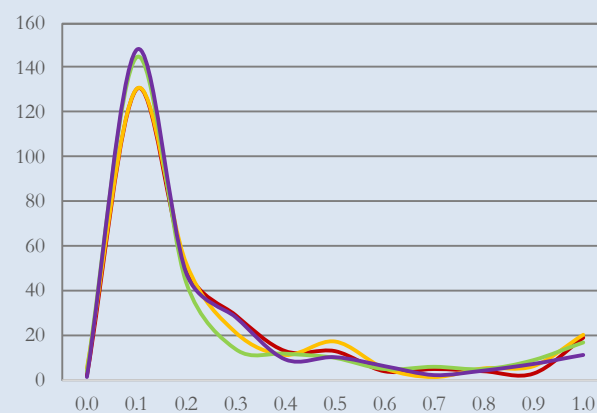
Source: SBP Staff estimates

Table 1

Actual and projected number of defaults

|	2014	2015	2016	2017	2018
All NFFs					
No. of Firms, *of which*	272	271	272	270	273
OD 365*	54	58	60	61	NA
P(D>=0.5)**	43	47	53	51	39
Textile Sector					
No. of Firms, *of which*	109	108	109	109	109
OD 365*	33	37	40	41	NA
P(D>=0.5)**	29	35	40	38	36

Source: Finanial Statements of Firms and Credit Information Bureau, SBP
* Firms with credit obligations overdue by 365 days and above as per CIB data;
** Model based projections.

The model-based distribution of probabilities of default (PDs) are depicted in **Figure 2**. The mass of PDs are concentrated in the range of 0.01 percent to 0.40 percent, i.e. in the *safe zone*. The curve beyond 0.50 percent, the *default zone*, remains thinner and is projected to thin out further in 2018. Indeed, as shown in Table 1, the number of firms expected to default in 2018 is 40 against 61 that actually defaulted in 2017 (see **Table 1**), largely on the back of improving sales and profitability.

Figure 3

Financials of textile sector are improving

Financial Indicators – Textile Sector
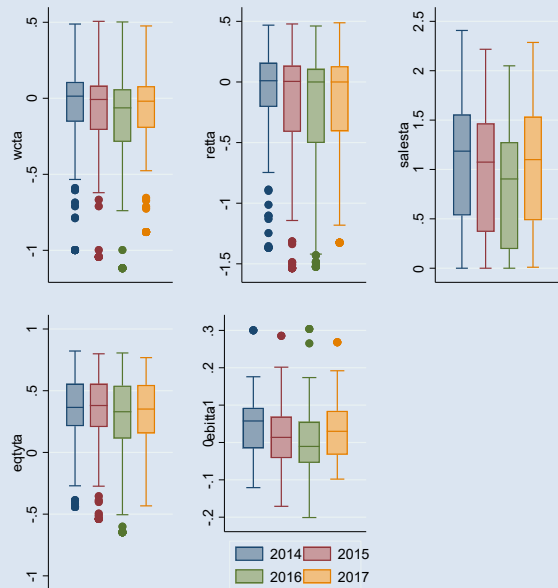
(b) Textile Sector

The financials of the textile sector depict some improvement. The sales and profitability indicators present a better picture, although the sector remains net borrower in the short term (see WCTA ratio in **Figure 3**). With more firms moving into positive territory in terms of earnings, the solvency has strengthening as well.

The distribution of default probabilities presents some interesting facts (see **Figure 4**). The mass under *safe zone* has shrunk during 2016-17 period compared with 2015. Moreover, the distribution seems to have worsened during 2017.
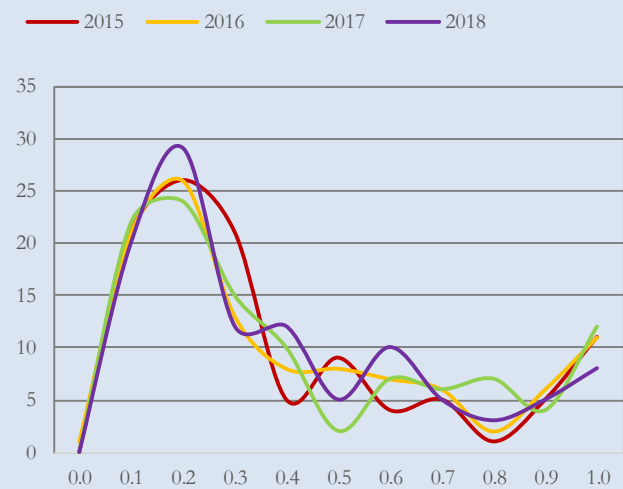
In 2018, a significant movement within the *default zone* is expected: area under 0.5-0.7 percent interval is estimated to increase while the area under 0.7-0.9 percent is anticipated to decrease. This is indicative of the fact that some firms are moving away from the state of extreme default to just-default condition. Some firms are even expected to migrate to safe zone as the mass under 0.4-

0.5 percent interval is expected to increase in 2018. In number terms, 36 firms are projected to be delinquent in 2018 as against actual 41 in 2017.

From a policy perspective, there is a need for banks to strengthen their credit origination and monitoring standards while a continuous regulatory macro-prudential oversight is warranted as well.

Probability of Default- Textile Sector
(Number of Firms)