

Post COVID-19 financial distress in Pakistan: Prediction of corporate defaults at Pakistan Stock Exchange

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Abstract

COVID-19 has slowed down the global economic activity. This slowdown is expected to turn into an economic recession, where firms are expected to experience financial distress leading to corporate defaults. Predicting such defaults is important to safeguard the stakeholders' interest in the financial markets. This study has estimated the extent of financial distress among the firms listed at PSX and constituting KSE 30 index, by using Altman's Z-Score. The score has been computed using the financial statements of year 2019-20, and on the proforma financial statements for year 2019-20 and 2020-21. These financial years are considered as pre and post COVID-19 closing dates respectively for the financial statements. The proforma financial statements have been drawn for financial year 2019-20 and 2020-21 using established accounting conventions of prudence, conservatism, substance over form, and foreseeable future. The results of Z-score in pre and post COVID-19 have been compared to assess the change in degree of financial distress among the selected firms. A significant increase in the degree of financial distress has been observed, which may lead to an increased number corporate default for the firms listed at PSX. The firms and corporate regulators need to curtail the rate of corporate defaults.

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1. Introduction

The escalating death toll caused of geometric spread of COVID-19 has slowed down the global economic activity. Beginning with the existence of firm, moving on to the governance challenges of these firms, the discussion in this moves on to the financial distress which may lead these firms to default. Anticipating these defaults is important to protect the stakeholders' interest in the financial markets. Therefore, a default prediction mechanism must be in place to foresee corporate default. This study has evaluated the efficacy of Altman's Z-Score, as a default prediction mechanism to anticipate post Covid-19 defaults. The following section elaborate upon the same.

1.1. The existence of firm

Why firms/corporations exist, has been the subject of academic investigation since the separation of ownership and control (Anderson *et al.*, 2020). This separation has led to creation of a new type of citizenship, i.e., the corporate citizens (Spash, 2020). These citizens, in the present economic and financial system, not only exist as a separate legal, financial, and social entity, but also own 95% of the global wealth (Atkeson, 2020). This has even led to the inclusion of the term 'corporatocracy' into the dictionary, referring it as an economic or political system in which everything is controlled by corporations (Asai, 2020). Unlike human, these corporations exist in perpetuity. This perpetual existence ceases only once the firm is liquidated, files a bankruptcy or faces corporate default (Baker *et al.*, 2020).

1.2. The limited liability companies

These corporations, for which the 'firm' is an academic synonym, exist as a separate entity. Such existence allows the firm to have unique legal entity, where it may sue and vice versa in its own name. This holds the firm accountable for its social, legal, economic, and financial actions, limiting the owners' liability only to the extent of their ownership in the firm (Baker *et al.*, 2020). These corporations are known as Limited Liability Companies (LLCs). This limited liability is by the virtue of restriction to the owners' obligation towards business debts. These corporations are financed by equity and debt, the sum of which is invested into resources, i.e., assets. This gives birth to the basic accounting equation where sum of equity and liability equals assets, also known as the balance sheet of the firm.

In minimalistic terms, assets are economic resources of the firm, which are financed by owners' equity and lenders' debt. Assets generates economic value, i.e., the operating profit which is distributed among lenders, state, owners, and the firm itself as interest, tax, dividend and retained earnings respectively in the same order as stated. These firms being the corporate citizens are regulated through a governance system, i.e., code of corporate governance, having a regulatory body known as the Securities and Exchange Commission (SEC). The name of respective country is added to it for identification. For instance, SEC in Pakistan would be known as SECP, so on so forth.

1.3. Governing the LLCs

SEC regulates these corporation through code of corporate governance. The regulation becomes more important in the backdrop of the firms being LLCs. Firm failure erodes investors' confidence in the financial markets alongside damaging stakeholders' stake in firm.

Owners, lenders, employees, suppliers of goods and services, state, tax authorities, and society are the few to name as the key stakeholders. Firm failure causes or may be caused by the economic recessions. Such recession geometrically progresses as downwards spiral, catalyzing the setting in of an economic failure (Baldwin & Tomiura, 2020).

1.4. Major economic and financial crises

The world has seen many economic and financial crises in past hundred and twenty years. US economic crises of 1901, US economic recession with failure of banking sector in 1907, economic depression of 1920-21, Wall Street crash 1929, 1929-39 great depression, energy crises of 1970, secondary banking crises in UK 1973-75, early 1980 recession, Chilean crises of 1982, bank stock crises 1983 in Israel, Japanese bubble in assets pricing 1986-92, Cuban economic crises 1990-94, early 1990s economic recession, Indian economic crises 1991, Swedish banking crises 1990, Mexican economic crisis 1994, Asian financial crisis 1997, Russian financial crises 1998, Ecuador financial crises 1998-99, Argentine economic crises 1999-2002, Brazilian Samba effect 1999, early 2000 recession and energy crisis, dot com bubble in US 2000-02, Uruguay banking crisis 2002, Venezuelan general strike 2002-03, global financial crises 2007-09, subprime mortgage crisis in US 2007-10, US housing market correction 2003-11, automotive industry crisis in US 2008-10, Iceland financial crisis 2008-12, Irish banking crisis 2008-09, Russian financial crisis 2008-09, Venezuelan banking crisis 2009-10, Spanish financial crisis 2008-16, European sovereign debt crisis 2009-19, Russian financial crisis, Brazilian economic crisis 2014-17, Chinese stock market crash 2015, Turkish currency and debt crisis 2018, and finally socio-economic COVID-19 pandemic crisis 2020 are the major economic and financial crises in the modern world history from nineteenth century to date. Scores of firms file bankruptcies, furnish corporate defaults, and opt for liquidation during or onset such crisis.

1.5. Firm failure, bankruptcy and defaults

There are scores of reasons for firms to fail. These reasons may be classified into two broad categories, intrinsic and extrinsic (Caballero & Simsek, 2009). Intrinsic reasons are within-firm specific (Enderle, 2020). These are attributable to the actions taken, decision made, and alternates chosen out of the options available at strategic, operational, and tactical level of the management. The responsibility the consequences lie very much with the firms' management. While the extrinsic reasons are the beyond-firm reasons (Feldman, 2020). These may include change in global business environment, natural calamities, epidemics, or pandemics, and any such reason associated with increasing business risks.

1.6. COVID-19's economic and financial impact

World Health Organization (WHO) has declared the lately spread Corona Virus Disease - 2019 (COVID-19), as the pandemic by the (Hafiz *et al.*, 2020). The likelihood of a global recession caused by COVID-19 is now more of a certainty than a hypothesis (Haldane & May, 2011). The International Monetary Fund (IMF) expects this recession to be worse than the Global Financial Crises (GFC) of 2007-09. At one side WHO is advising countries to take extraordinary measures boost their public health systems, while at second, the IMF has issued warning for economic and financial crisis. For any country, the public health is a natural priority and protecting the citizens' health is the point of immediate concern. Social distancing and lockdowns have put many firms in financial turmoil. Central banks have curbed the

discount rates to offset the effects of economic slowdown. More would need to be done on the fiscal side to avoid the global economy from sliding down into an economic depression.

The faster and the earlier containment of the COVID-19 spread is being considered as the key to contain the economic recession. The world economy contracted by a percent, and this crisis seems to surpass that level. IMF has already deployed a one trillion dollars lending capacity as a massive stepping up of the emergency financing. More than a hundred countries have already requested for this financing. Both the number of countries and the lending capacity are likely to go up. COVID-19, which is a highly contagious respiratory illness, now stands in comparison with the devastating 1918 Spanish Flu. The literate pockets of global society have called for a global ceasefire to fight the virus and save the world from the COVID-19 first, and then from the economic recession.

The consequences of COVID-19 driven economic recession on the emerging markets and the low-income countries like Pakistan are even staggering. Country specific factual data has yet to flow in, but investors have already pulled out close to a 100 billion US\$ from the emerging markets, leaving these markets in a significantly challenging situation (Haldane & May, 2011). The situation has put these countries into debt distress for which IMF has called on its members to contribute towards its Catastrophe Containment and Relief Trust (CCRT) and expects to replenish it to help the poorest of the countries. These countries are expected to exercise their Special Drawing Rights (SDRs) in order to replenish their official reserves. The way WHO has advised for timely preventive measures to be taken for COVID-19 to break the chain, similarly timely prediction of the anticipated corporate defaults would enable regulators, in this case the SECP and PSX, to break the trickle-down spiral spread of the corporate default.

1.7. Forecasting COVID-19 led financial distress at the PSX

Economic recessions are not new to the world. The corporate regulators have gained humble experience in handling such crises. This study modestly presents Pakistan's post COVID-19 economic and financial outlook by identifying the sectors in which firms are expected to face financial distress, which may lead to corporate default. This expectation has been drawn using established accounting techniques of Balance Sheet Analysis (BSA) and the Proforma Financial Statements. Altman's Z-score, one of the most established accounting information based corporate default prediction models, has been used to identify the financially distressed firms in post COVID-19 time. Firms listed at PSX, composing the KSE-30 index have been taken as the sample. Next section presents the world view of handling corporate default in the times of financial crisis and economic recessions.

1.8. The recent pandemics

Roubini (2008), forecasting the coming financial pandemic because of US sub-prime mortgage failure, predicted many bankruptcies in the US financial markets. The study mentioned this failure as the American financial virus spreading across the globe and slowing down the global markets. In subsequent months, the global trade dropped as a result of the US recession spilling over rest of the globe. To make the matters worst the weakening US dollar made it less attractive for the suppliers to consider US as the export market.

Till date US a large market claiming roughly a quarter of the world market (Hofmann, 2020). Anything going wrong there has a spillover effect on most of the globe. US becoming the next

epicenter for the spread of COVID-19 is expected to affect the global economy in an unwelcoming manner. The downwards spiral seems to have set in, which may only be slowed down by the earliest containment of the COVID-19 spread. To make the matters worse, global prices of Crude Brent prices have hit eighteen years low, and unless the major oil producers have consensus on stabilizing the market, prices are expected to be volatile.

Moodie *et al.*, (2013) while finding relationship between profiteering and epidemics, highlight the imbalance among various business sectors in an environment such as COVID-19. Though the context of their study is of non-communicable diseases but simulating their findings in context of a contagious disease, the consequences may be even more staggering. They find that the transnational corporations have been tracked for the spread of non-communicable epidemics for the purpose of profiteering, specially by increased consumption of unhealthy products like tobacco, alcohol, and ultra-processed food and drinks. These products position the low-income countries as a fertile market for their products. It may be such actions on the part of corporate conglomerates which might have earned a meaning having negative connotation for the term 'corporatocracy'.

Since corporatocracy is about maximizing wealth for the key stakeholders, it is quite likely for the for pandemics to disturb the market balance by rewarding the few, while depriving the rest. The market imbalance occurring out of the preemptive or reactive measures on the part of governments may be exploited for corporation. And if such an exploitation is rewarding, there is a likelihood that epidemics may be engineered. For instance, it would not be unfair to hypothesize that this shift in profiteering may not observe whether the disease remains non-communicable or communicable. This hypothesis may find its grounds in the COVID-19 scenario where pharmaceutical industry profiteer at the cost of other industries, hence needing immediate attention of corporate regulators. Governments would need to establish strong protocols for microbial research, deterioration in human immune systems, food processing, preservation, and re-engineering.

Peckham (2013) while discussing the economies of contagion and the relationship between financial crises and pandemic, particularly refer to the southeast Asian economies for shaping up the theory of financial contagion. The study stresses upon that the conceptual entanglement of financial and biological 'contagions' must be traced. This traceability is important for understanding the interconnected global environment within which the risk is increasingly evaluated. There is stark need to understand the setting-in of the financial crises and framing-in of the responses to such crisis. Review of relevant literature supports the interconnectedness between the 2007-2008 Credit Crunch, 2008-2009 global financial crises, and the 2009 pandemic of swine-origin influenza A(H1N1) (Lukashov, 2020)

Caballero and Simsek (2009) find that during 2008, in the height of financial crises, a warrantable opinion existed for a inter financial system characterized by its complexity to trace its roots concepts imported from epidemiology and infectious diseases. S-OIV, a hybrid of human, pig and avian influenza virus was first identified in Mexico close to the same financial crises (Zimmer & Burke, 2009). Though not empirically established but both events, financial crunch and the pandemic, invariably seemed to have been constructed by media commentators, public health officials, policy makers and a range of pop-up experts in such times, as a crisis caused by destabilizing the global norms. The analogy between the epidemics and financial crises is not really the subject of this study but identifying the sector which might go into financial distress, and how cope-up with that at PSX, forms the focus for this paper.

May it be coincidence, or pharma-financial engineering, but there has been an analogy between epidemics and the financial crises. The underlying logic, if any, needs an examination for an increasingly persuasive use epidemiological language in financial theory. Pandemics come as a handy explanations or destabilization of many eco-systems, may it be environmental, biological, financial, or economic. The possibility of such destabilization for profiteering few commercial segments at the cost of bankruptcies for the rest needs immediate attention of academia and researchers. Haldane and May (2011), experts in banking and theoretical ecology respectively, stress upon the need for research in the emerging phenomenon of financial ecology. It is expected that research community would shed more light on the financial ecology, but an absence of regulatory input into any suspected commercial ingress into this ecology is likely to cause more financial distress globally, that too with a valid explanation of changes in environmental and biological ecology of the globe.

2. COVID-19

McKibbin and Fernando (2020) while studying the impact of COVID-19 global spread suggest the corporate community and regulators to beef up the efforts to protect their assets and economic interest. Assets in terms of their human resource and economic interests in terms of preparedness for the economic downturn. Sustained economic downturn leads to foreclosure, bankruptcy, and corporate defaults. Anderson *et al.* (2020) advise the governments for taking necessary steps to keep economy in shape, while finding out how will country based mitigation measures influence the course of COVID-19 epidemic. They argue that governments will not be able to minimize both deaths and the economic impact of COVID-19.

When it comes to prioritizing between loss of human life and economic loss, governments would naturally tend to minimize the loss of lives, and that is what we are observing right now is the strategy of the governments. In doing so the governments might be able to flatten the curve for the COVID-19 spread. Flattening of curve would help to avoid the choking of existing public health system in addition for buying more time to invent the vaccine. During such time the economy must stay in better shape, else not many governments would be able to fight on pandemic and economic front simultaneously. Hence governments must put in enough safeguard to avert corporate defaults and bankruptcies.

The ability of governments to do so would largely depend upon the governance structure, social fiber, and responsiveness from citizens. For instance, in China, the effectiveness of quarantine measures may be attributed to the writ of state, while same may not stand as effective in other countries for the same reason. After handling the epidemic, China now appears to be moving towards toning down the economic repercussions of the situation. So would rest of the world in a lag of 4-6 weeks. Their social fiber, individual led social behavior, and pro-citizen stance is making it difficult to home quarantine the population in many countries, while China had been able to impose lockdown at a very early stage. Similarly, China might find it relatively easier to undo the economic loss, as compared to rest of the countries. The UK has just moved on from 'containing' the COVID-19 to 'delaying' it for flattening the curve of its spread. There is a high likely hood that if quarantine measures are relaxed after a few months to avoid severe economic impact, the spread may increase again.

Furthermore, there would be a considerable monetary impact of self-isolation or mandated quarantine, and this has been quite visible in case of China even. The government of Pakistan has not yet opted for a mandated quarantine because of the apparent stance of government for

the quarter of population living below the poverty line. High actual data has yet to flow in but majority of population having informal employment is likely to face an acute economic crunch. Governments must make tough and quick choices now. It is now apparent that governments are caught between loss of human life either because of the epidemic, or the mortality linked with economic aftershocks caused by this epidemic. Strong economies and developed markets would be able to absorb the economic shocks to some extent, at least to the extent of safeguarding human loss of life, but for poorer countries and the emerging economies, the repercussions might be dire.

Governments are routing all the possible resources towards curtailing the COVID-19, while the spread is taking its economic toll. Economic activity and the COVID-19 appear to be mutually exclusive at present. Extensions in the lock down period is causing compromise on economic certainty. Metaphorically, the economy appears to be slipping like sand underneath the governments' feet. If not addressed in time, the number of foreclosures, defaults, and bankruptcies, is expected to rise, igniting a financial epidemic. Pakistan falls among the list poorer countries. It is also considered as an emerging economy. Hence, there is a reason to worry. The existing economic is already dilapidated. It may get graver in a few months from now, if the expected financial distress of business community is not foreseen. Hence the suggestion made in this study need immediate attention on the part of government to make its way through from this crisis.

3. Theoretical framework

3.1. The formulation of KSE-30 Index

The primary objective of forming a stocks index is to provide a benchmark against which the actual performance of an exchange or a particular script may be measured. KSE-30 Index, in this context provides a benchmark for the stocks listed on PSX. It is designed to provide investors with a sense as to the magnitude with which a company's scrips perform in Pakistan's equity market. It is like other indicators such as Gross National Product (GNP), Consumer Price Index (CPI) etc. that track various sectors of country's economic activity. Globally, the Free-float methodology of index construction is an industry best practice. All major index providers like MSCI, FTSE, S&P, STOXX and SENSEX have adopted the same methodology. MSCI, a leading global index provider, shifted all its indices to the Free-float Methodology in 2002. Free-Float Market Capitalization (FFMC) methodology is used to calculate KSE-30 Index. The level of index at any point of time reflects the free-float market value of 30 companies in relation to the base period, in accordance with the FFMC.

3.2. Altman's Z score on actual and proforma financial statements

The formula for predicting corporate bankruptcy, known as the Z-Score, is based on accounting ratios. It was published in 1968 by Edward. I. Altman, that time an Assistant Professor of Finance at the New York University. Z-Score is used to predict the default probability of any firm to face financial bankruptcy within a time window of two years. The formula, along with many of its variants, is used to predict corporate default. Its convenience to use makes it widely acceptable in the hands of practitioners. The Z-score measures the financial health of a company, using multiple corporate income and balance sheet values. The components of Z-Score are comprised of five common accounting ratios, linearly combined and weighted by coefficients. The determination of coefficients is based on an estimation by identifying a set of

firms which had declared bankrupt. These firms then have been matched by a sample of firms that survived bankruptcy. The weightage has been assigned on the basis of significance of the information for its ability to act as a differentiating factor between survival and bankruptcy.

The original Z-score formula was as follows:

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5.$$

Where;

X_1 = working capital/total assets.

X_2 = retained earnings/total assets.

X_3 = earnings before interest and taxes/total assets.

X_4 = market value of equity/book value of total liabilities.

X_5 = sales/total assets.

Z-score bankruptcy model:

$$Z = 0.012X_1 + 0.014X_2 + 0.033X_3 + 0.006X_4 + 0.999X_5$$

X_1, X_2, X_3, X_4 are in percentage points

Zones of discrimination:

$Z > 2.99$ – "safe" zone

$1.81 < Z < 2.99$ – "grey" zone

$Z < 1.81$ – "distress" zone

Z-score estimated for non - manufacturers and emerging markets:

X_1 = (current assets – current liabilities)/total assets

X_2 = retained earnings/total assets

X_3 = earnings before interest and taxes /total assets

X_4 = book value of equity/total liabilities

Z-score bankruptcy model (non-manufacturers):

$$Z = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

Z-score bankruptcy model (emerging markets):

$$Z = 3.25 + 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

Zones of discrimination:

$Z > 2.6$ – "safe" zone

$1.1 < Z < 2.6$ – "grey" zone

$Z < 1.1$ – "distress" zone

4. Research methodology

4.1. Research methods

This section describes the procedure followed in this study and provides information about the way research has been carried out. It is a systematic way to provide a solution for the research problem. It deals with all the necessary steps, including what researcher has taken in carrying out the research, and those towards synthesizing the unit of analysis for this study. The business sectors, and the firms within those sectors, have been selected on the basis of their contribution in forming the Pakistan Stock Exchange (PSX) market index. The financial statements for these selected firms have been analyzed for financial distress. Proforma financial statements have been drawn from the existing ones. While drawing the proforma statements the established accounting conventions of due diligence, prudence, conservatism, and substance over form have been kept in view. In addition, the best practices in financial management and forecasting have been followed to incorporate market information related to the COVID-19 in drafting the proforma financial statements. Both set of statements, i.e., existing and proforma, have been evaluated for ascertaining the degree of financial distress in the selected firms, through key financial ratios. These ratios include profitability, liquidity, solvency, and efficiency. Sectoral financial outlook, instead of firms within these sectors, has then been presented to the stakeholders. The aim is to present the corporate regulators with the set of sector specific measures to avert the likely COVID-19 financial distress which may lead to corporate default for the companies listed at the PSX.

4.2. Research objectives

The study aims to detecting financial stress within Pakistan's economy by anticipating corporate defaults at PSX. The aim is achieved through ascertaining the financial distress on the firms listed on PSX as the ones forming KSE-30 index. The financial distress has been computed using Altman Z-Score on the existing, as well as proforma financial statements of the KSE-30 firms. The comparative analysis, on existing and proforma statements, of the Z-score has been carried out to ascertain any change in the Z-score in pre and post COVID-19 scenario. This change has been evaluated for its likelihood to result for firms to default. Based on above discussion the research objectives may be crystalized as following:

- To ascertain the degree of financial distress in the KSE-30 index firms at PSX through Altman Z-Score, based on the recent financial statements.
- To re-ascertain the degree of financial distress in the KSE-30 index firms at PSX through Altman Z-Score, based on the proforma financial statements.
- To identify the change is the state of financial distress among the KSE-30 index firms and foresee any possible corporate defaults.
- To suggest the government and its subordinate regulatory institutions, the measures to be adopted for aversion of the predicted corporate defaults at PSX.

4.3. Research hypothesis

Based on the scope of this study and the objectives, the hypotheses are drawn as follows:

- The degree of financial distress computed through comparative computation of Z-

score on existing and proforma financial statements of the KSE-30 index firms shows the increased in financial distress among these firms in the COVID-19 scenario.

- The increase in the level of financial distress in post COVID-19 scenario for the KSE-30 index may lead to corporate few firms to default.

4.4. Limitations and future research

Like any study, this too has limitations and direction for the future research. Major limitations and directions listed below:

- Given the geometrically progressed spread of COVID-19 the research community needs to make the research available at a much faster pace than usual, enabling the stakeholders to reposition their stakes and holding in the financial markets, hence the model testing has been limited to KSE-30 index firms. The study may be expanded to other indices and indexes, both regionally and globally.
- Corporate default prediction has been estimated using Altman's Z-score which is one of the established accounting-based models. While there are more accounting based models available. In addition, market-based models, and the models based on artificial intelligence may also be used.
- Small and medium enterprises (SME) sector is expected to be on the front line of bankruptcy by the virtue of limited capacity to go through such recession. Research in SME default prediction may be of significant help for economic, financial, and market regulators in absorbing the economic recession with minimal damage.

5. Data

The data has been gathered primarily from secondary data in form of published financial statements of the KSE-30 index leading firms listed at PSX.

5.1. Primary data

Primary data is collected by the researcher directly from the respondents for the specific research work. In the context of the objectives laid down, and the hypotheses framed this data has been collected from corporate analysts, officials at PSX, and the related ministries of the government of Pakistan, along with the documented opinions from the credit rating agencies.

5.2. Secondary data

Secondary data pre-exists and used for some other purpose and being re-used for the researcher for the purpose specific to the subject of investigation. This study is primarily based upon the inferences from the published secondary data in form of: (a) The latest annual reports and the financial statements of the KSE-30 index firms; and (b) The previous studies about the financial distress caused by the pandemics and the resultant corporate defaults reported at recognized stock exchanges in the world.

5.3. Sampling method

Convenience sampling has been using while selecting the sample for this study, based on the

rationale that KSE-30 index firms represent the most of trading activity taking place at any given point in time.

5.4. Time period

The study covers a time span of two financial years, i.e. 2018-19, and 2019-20. The financial statements of 2018-19 for the KSE-30 firms have been used for computing the existing Z-Score as the pre COVID-19 financial distress within these firms. While the projected statements for 2019-20 have been used to compute the post COVID-19 financial distress within these firms. For projecting the data of 2019-20 as proforma financial statements, the data for first three quarters has been obtained from the firm's quarterly financial statements, while the fourth quarter has been estimated based on the legitimate projections and in the light of established accounting conventions.

5.5. Tools and techniques

The performance of the selected firms through accounting ratios has been used as the tool, while multivariate analysis used in Altman Z-Score has been used as the technique to identify the level of financial distress in the firm. Following the constitution of Z-Score the distress level of firms has been classified and low, medium, and high. The results are shown below.

6. Data analysis and findings

Z-score has been computed for the firms listed on PSX and forming KSE-30 index. These companies being the ones whose traded shares volume forms significant portion of the market capitalization, forms the KSE-30 index. This index is one of the representative indicators of market performance in terms of stakeholders' confidence in the financial markets. The representative sectors in the above mentioned 30 firms include Fast Moving Consumer Goods (FMCGs), Textiles, Autos, Banking, Energy, Pharmaceutical, Services, Petroleum, Autos, Oil exploration, Chemical, Power, Fertilizer, and Cement. The traded shares' volume for these firms represents the confidence which investors and other stakeholders place in Pakistan's economy and its financial institutions. This confidence is crucial to have enough cushion for absorbing the economic shocks. Till the time stakeholders keep this confidence in market, the investment and spending keep its pace in the market, hence providing continues evolution to the market for absorbing the shocks. May these shocks originate from any source, stock market absorbs these shocks and stimulates the requisite corrections to other financial markets, which is critical for economy to avoid recession, if not stay static or even grow.

6.1. Pre COVID-19 Z-Score computation

The Z-Score for the emerging markets has been computed for the firms in above table. Except one firm, TRG Pakistan on serial number 29, which is in theoretical default, rest of the 29 firms are in either healthy or above average healthy state. The financial statements of these firms have been analyzed and Z-Score ratios have been computed. TRG Pakistan, which reports negative equity in its balance sheet is in theoretical default, offsetting equity needs through excessive borrowing. FMCG, Chemical, Oil fields, Argo related, Textile, and Pharmaceutical sectors are among the very healthy category, while petroleum, banking, and power are healthy, and services are among the distressed sectors. These findings corroborate with Pakistan's economic outlook too.

6.2. Post COVID-19 outbreak Z-score computation

Z-score has been recalculated in the manner same as pre COVID-19 outbreak scenario, except using the proforma financial statements instead of the historical ones. The proforma financial statements have been drawn according to the established accounting conventions of hindsight-foresight, prudence, realism in estimations, conservatism, substance over form, and foreseeable future. All sectors experience the decline in the Z-score representing a decline in the financial health, irrespective of the health score these are in at the time pre COVID-19 outbreak stage.

6.3. Comparison of pre and post COVID-19 outbreak scenarios

After computing the Z-Score in both scenarios, a comparative analysis has been carried out to ascertain if the firms have moved into any direction or stayed static as to their financial health. The results are shown in the below table 1.

Table-1: Tabulation of Z-Score pre and post COVID-19

| No. | Name | June 30-2019 | | June 30, 2020 | | Change | |
|-----|--------------------|---------------------------------|-------------------|-----------------------------------|-------------------|---------|-----------|
| | | Actual statements Z-Score | financial Zone | Proforma Statements Z-Score | financial Zone | Z-score | Direction |
| 1 | Bank Alfalah | 4 | Safe | 3 | Safe | -1 | Negative |
| 2 | Bank Al-Habib | 4 | Safe | 3 | Safe | -1 | Negative |
| 3 | Bank of Punjab | 4 | Safe | 2.5 | Distress | -1.5 | Negative |
| 4 | DG Cement | 4 | Safe | 3 | Safe | -1 | Negative |
| 5 | Engro Corporation | 9 | Safe | 5 | Safe | -4 | Negative |
| 6 | Engro Fertilizers | 4 | Safe | 2.4 | Distress | -1.6 | Negative |
| 7 | Engro Polymer | 4 | Safe | 2.2 | Distress | -1.8 | Negative |
| 8 | Fauji Cement | 5 | Safe | 3 | Safe | -2 | Negative |
| 9 | Fauji Fertilizer | 3 | Safe | 2.4 | Distress | -0.6 | Negative |
| 10 | Habib Bank | 4 | Safe | 3 | Safe | -1 | Negative |
| 11 | Hubco | 3 | Safe | 2 | Distress | -1 | Negative |
| 12 | Kot Addu Power | 6 | Safe | 4 | Safe | -2 | Negative |
| 13 | Lotte Chemical | 7 | Safe | 4 | Safe | -3 | Negative |
| 14 | Lucky Cement | 4 | Safe | 3 | Safe | -1 | Negative |
| 15 | Mari Petroleum | 5 | Safe | 2.5 | Distress | -2.5 | Negative |
| 16 | Maple Leaf Cement | 3 | Safe | 1.8 | Distress | -1.2 | Negative |
| 17 | MCB Bank | 4 | Safe | 3 | Safe | -1 | Negative |
| 18 | Meezan Bank | 4 | Safe | 3 | Safe | -1 | Negative |
| 19 | Millat Tractors | 6 | Safe | 4 | Safe | -2 | Negative |
| 20 | National Bank | 4 | Safe | 3 | Safe | -1 | Negative |
| 21 | Nishat Mills | 6 | Safe | 3 | Safe | -3 | Negative |
| 22 | OGDC | 5 | Safe | 2.5 | Distress | -2.5 | Negative |
| 23 | PEL | 6 | Safe | 2 | Distress | -4 | Negative |
| 24 | Pakistan Oilfields | 7 | Safe | 4 | Safe | -3 | Negative |
| 25 | Pakistan Petroleum | 6 | Safe | 3 | Safe | -3 | Negative |
| 26 | Pakistan State Oil | 5 | Safe | 3 | Safe | -2 | Negative |
| 27 | Searle | 6 | Safe | 7 | Safe | +1 | Positive |
| 28 | Sui Northern | 4 | Safe | 2 | Distress | -2 | Negative |
| 29 | TRG Pakistan | -1 | Distress | -2 | Default | -1 | Negative |
| 30 | United Bank | 4 | Safe | 2.5 | Distress | -1.5 | Negative |

It has been observed that with the exception of firms in pharmaceutical sector, rest of the firms in all sectors have moved down wards in their financial health, entering either financial distress or default zone. Based on the discussion above, the conclusions have been made and recommendation have been presented in the next section.

7. Conclusion and recommendations

7.1. Conclusion

Considering the findings based on analysis of data it may be concluded that the firms in KSE-30 index are health firms. The financial statements of these firms have been drawn according to the best accounting practices. These statements have been duly audited by reputed audit firms and represent the true and fair view of the affairs. Altman Z-score has been used for assessing the financial health of the firms. It is an established model for predicting financial distress which may led to corporate default. The score computed on historical financial statements shows that all the firms, except one, are in healthy zone. The re-competition of Z-score on the proforma financial statements of these firms shows that all the firms, except one in pharmaceutical sector, could experience significant deterioration in their financial health in the foreseeable future. Most of the firms have moved into the financial distress zone. It may be strongly argued that the COVID-19 led economic recession is expected to force more firms to face financial distress which may lead to corporate default. Unless strong preemptive measures are taken at state level, these corporate defaults would become inevitable.

7.2. Recommendations

Measures having proven financial regulatory muscle to defuse upcoming financial crisis are strongly recommended to be adopted at firm, sector, and national level. These measures are expected to have an expanded impact in backdrop of an immediate political consensus alongside the economic and fiscal measures. The measures including the following.

7.2.1. Posture of regulatory and monitoring institutions

At national level state needs to adopt a friendly posture towards the business community, contrary to what it has in the past eighteen months. The role of National Accountability Bureau (NAB) needs to be rolled back at least till the economy regains its growth rate. Similarly, the FBR, instead of bringing hostility for tax collection and burdening of the existing taxpayers' base, needs to broaden it, simultaneously bringing the tax percentage in lower brackets.

7.2.2. Revision of the discount

The government of Pakistan needs to ease the fiscal and monetary stress existent at present including downside revision in the KIBOR and remove the current restrictive monetary measures on funds flow. An example of it may be the incentives which lately government has informally announced for the construction industry. Subsidizing the trigger sectors would also provide much needed stimulus to the allied sectors.

7.2.3. Sectoral incentives

Sectoral incentives, specially to the sector which trigger growth in allied sectors, need to be

immediately offered. The incentives need to match the commercial fiber and operating modality of each, rather than one-fits-all measures. The trigger sector for Pakistan may include real estate development, construction, agriculture, and services.

7.2.4. Role of Collective Bargaining Agents (CBA)

Shared vision to face the financial crises would play an important role for firms to sustain its adverse effects.

7.2.5. Revising the state of competition

Competition Commission of Pakistan (CCP) needs to reassess the existing state of inter-sector commercial competition and simulate it to a healthy one. It should protect the smaller firms, especially when bigger firms adjust to the changing economic and financial environment.

7.2.6. Capital structure and sectoral discount rates

Cheaper borrowing helps firms in lowering their Weighted Average Cost of Capital (WACC), hence lowering the KIBOR is significant. Furthermore, considering sectoral discount rates would insulate the endangered sector against the adverse effects of financial crisis.

7.2.7. Cost structure within sector rate

The firms also need to pay special attention to their cost structures, basing their costs on leaner built, shedding the fixed costs, and converting it on the revenue driven cost structure. The above-mentioned measures would need the regulatory bodies to harmonize the measures. Role of the State Bank of Pakistan (SBP), Securities and Exchange Commission of Pakistan (SECP), Federal Board of Revenue (FBR), Competition Commission of Pakistan (CCP), Federation of Pakistan Chambers of Commerce and Industry (FPCCI), Ministry of Commerce and Trade, and the Collective Bargaining Agents CBA) is of critical importance. The corporate default prediction has been an important subject of academic investigation with the research community. It becomes even more important in environments such as post COVID-19. It is expected the findings of this study would help the corporate regulators in diluting the effects of anticipated financial crisis and economic recession.

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