Impact of External Financial Dependence on Growth of Pakistan's Manufacturing Industry: A Moderating Role of Financial Development

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This paper examines the relationship between dependence of Pakistan's manufacturing sector on external finance and industry growth with the moderating role of financial development. It is generally believed that the firms which depend more on external finance grow disproportionally if financial system of the country is developed. The sample includes 364 firms of manufacturing industry listed on Pakistan stock exchange of 14 manufacturing sectors of Pakistan over a sample period of 2000 to 2018. Considering the endogeneity of variables, we estimated the impact of external finance dependence on growth of manufacturing industry and moderating role of financial development using Generalized Method of Moments (GMM). This paper contributes to literature firstly, by computing external finance dependence ratio of the sub sectors of manufacturing industry in Pakistan. Secondly, by measuring the impact of external finance dependence on industrial growth with moderating role of financial development. The results show that the sectors which are financially more dependent on external finance in manufacturing industry grow more where financial development demonstrate a statistically significant positive moderating role.

KeyWords: Industrial Growth, External Finance Dependence, Financial Development, Manufacturing sector, Panel Data, GMM

INTRODUCTION

Firms need finance to operate and expand, which is obtained either through the internal or external sources of finance. When a firm's financing needs are not fulfilled internally by its operations, it looks for external sources to fulfill its requirements. How much firms depend on external finance differs industry wide and across countries, depending upon financial markets development, policy considerations and many other industry and country specific factors (Kabango & Paloni, 2011).

By the end of 18th century, several countries adopted financial development strategies and liberal financial framework which include financial sector reforms to stimulate economic growth. A large body of literature investigates the relationship between the development of financial markets and economic growth in various developing and developed countries. The firms which generate enough cash flows internally can grow well in countries having less developed financial markets (Rajan & Zingales (1998), Beck & Levine (2000) and Pang & Wu (2009). This is because the firms' financial needs are fulfilled by their internal cashflows and the liberalization of markets does not contribute much to benefit such industries (Shen, 2013).

Another strand of literature argues that the countries with well-developed financial markets provide growth opportunities to the industries relying heavily on external finance (Turco, Maggioni, & Zazzaro, 2019). In such countries well-developed financial markets remove credit constraints and facilitate firms' access to external finance at lower cost which promotes growth of existing firms and encourages entry of new firms (Fisman & Love, 2007).

The access to finance plays an important role in growth of firms and industries which leads to growth of the economy. The access to finance of a firm depends on several factors such as firm size, profitability, its borrowing relationships, financing cost, interest rate, asymmetry of information and law and order of the country (González, Lopez, & Saurina, 2007). The access and need for external finance vary significantly across industries and countries. The firms operating in different countries with same level of technology generate diverse cash flows depending upon the growth of their markets, internally generated cash flows and the investment opportunities available in their respective areas. Even if similar growth opportunities are available to the firms, their ability to capitalize upon opportunities is still affected by the financial development of the area in which they operate (DemirgÜÇ-Kunt & Maksimovic, 1998).

Pakistan has made several changes in its financial system in past decades to get benefited from efficient resource mobilization and distribution. Researchers such as Jalila and Feridun (2011), Khan and Rahman (2020), Mahmood (2013), Lal and Hussain (2009), Shahbaz and Rahman (2014) and Khan and Qayyum (2005) have analyzed the importance of these policy changes and studied the relationship between financial development and economic growth in Pakistan. However, to the best of our knowledge, no study has investigated the relationship between external finance dependence industrial growth with moderating role of financial development.

Pakistan's Manufacturing sector contributes 13.5-13.8% in the GDP, representing a significant contribution of large- and small-scale manufacturing, which plays a vital role in the development of an economy. The need for and dependence on external sources of finance of firms in manufacturing sector is important to investigate to know that whether firms depending more on external finance get more chances of growth due to financial development polices adopted by the government since 1980s. This paper attempts to find out the relationship between financial development and industry growth with a moderating effect of financial development in context of Manufacturing industry in Pakistan.

This section is followed by section 2 which includes review of literature, Section 3 includes data and methodology; section 4 contains the results and Section 5 concludes.

LITERATURE REVIEW

In the study of manufacturing industries of various developed and developing countries Rajan and Zingales (1998) computed external financial dependence ratios of firms in the manufacturing sector of the United States. They examined the relationship between financial development and economic growth of these firms and concluded that the firms with higher financial dependence ratios observe higher growth rates. Following Rajan and Zingales (1998), Turco, Maggioni, and Zazzaro (2019) examined the relationship between financial dependence and economic growth for several developed countries using input output linkages over the period 1995–2007. They found that the firms with higher dependence on external finance grow more in countries having developed financial markets.

Rajan and Zingales (1998) claim that their computed financial dependence ratios may be generalized for other economies based on the arguments that firms do not need much of external finance in a steady equilibrium state but due to technological shocks their need for external finance may rise to capitalize upon opportunities. These shocks are up to some extent world-wide therefore, the U.S. firm's dependence on external finance can be similar to other countries (Turco, Maggioni, & Zazzaro, 2019). These technological factors can be economies of scale, cash harvest period and gestation period. However, even in case of different investment opportunities created by these technological factors across countries, the cash flows generated by firms of a particular sector will be similar across countries due to the similarity of ratio of cash flow to capital. Following their measure Galindo, Micco and Ordoñez (2002) produced similar findings that due to technological reasons financial development helps industries grow which depend more one external finance. Furstenberg and Kalckreuth (2006) reviewed the assumptions of dependence on external finance attributed to structural or technological changes made by Rajan and Zingales and could not find these to be valid worldwide. Similar argument was made by Kabango and Paloni (2011) on the generalization of the financial dependence ratios computed for the manufacturing sector of the U.S. by Rajan and zinagales (1998). According to them structural or technological factors are simply one of the determining factors of dependence on external finance and there are many other factors which determine firms' dependence on external finance such as firm size, firms in joint venture with foreign firms, subsidy received by certain industries etc.

Following the approach of Rajan and Zingales, Vlachos and Waldenstro (2005) used the financial dependence ratios computed by Rajan and Zingales for The U.S. manufacturing sector and examined the impact of financial development on industry growth for a sample of 42 countries including Pakistan and found no effect of liberalization on growth of firms depending more on external finance. They argue that this is so because financial development can facilitate firm creation, but the growth of the firm depends on the levels of financial development of the country which differs substantially across developing countries. This implies that financial dependence ratios computed by Rajan and Zingales may not be generalized for developing economies. As shown by Kabango and Paloni (2011) who computed financial dependence ratios for manufacturing sector of Malawi and reported that these ratios substantially differ from those of Rajan and Zingales (1998).

Financial Development and Economic Growth in Pakistan:

To eliminate entry barriers, speed up competition among financial institutions, increase the role of the State Bank of Pakistan and to eliminate segmentation of financial markets, the government of Pakistan took several measures to develop its financial sector in early 1990s. According to Khan and Rahman (2020) these reforms influence economic growth and financial development in different ways in different economies. Jalila and Feridun (2011) suggest more dynamic institutional reforms in financial sector of Pakistan due to the positive relationship between financial development and economic growth. They suggest opening Pakistani banking sector to foreign competition to increase their profitability. Similar findings are reported by Mahmood (2013), suggesting the adoption of both long and short run policies for bringing financial sector development in Pakistan. Khan and Qayyum (2005) found that the cost of external finance to the firms is affected by financial markets therefore, their effects should be materialized by accelerating the investment process. They emphasized on creating low-cost conditions for investment to bring the long run growth in economy.

The focus of the studies cited above was to investigate the growth-development nexus in the context of a developing economy like Pakistan, However, how manufacturing firms that depend more on external sources of finance react to these policy changes in financial sector is not examined in the literature. Hence, this paper contributes to the literature by bridging this gap.

First, based on above arguments on the generalizability of the ratios of external financial dependence developed by Rajan and Zingales, we calculated external finance dependence for manufacturing and service sectors of Pakistan. We found substantially different ratios for manufacturing sector of Pakistan indicating that ratios of Rajan and Zingales may not be generalized for Pakistan. Secondly, based on these ratios, we investigate the impact of firm's dependence on external finance on growth of different industrial sectors where financial development may moderate the said relationship.

METHODOLOGY

Data

To measure external finance dependence of firms in Pakistan, we followed the methodology of Rajan & Zingales (1998). We calculated firm's dependence on external finance as follows.

$$EFD = \frac{CE - CFO}{CE} \qquad (1)$$

Where EFD is the External finance dependence, CE is the Capital Expenditure and CFO is the Cash flow from Operations. The above formula shows fixed plus working capital expenditure not financed by internally generated cash flows (Kabango & Paloni, 2011) and (Rajan & Zingales, 1998).

We used data of 364 firms listed on Pakistan stock exchange of 14 manufacturing sectors of Pakistan (sub sectors and number of

firms in each sector is reported in Table 1). The selection of sample depends upon data availability which is acquired from the annual reports of firms from their respective websites for a period of 19 years from 2000 to 2018. Selection of sectors and subsectors is based on the composition of sectors given by the Census of Manufacturing Industries Pakistan (Census of Manufacturing Industries (CMI) 2005-06). To make this measure of dependence comparable across industries and overtime we sum the capital expenditure minus cash flow from operating activities of a firm overtime and divide it by the sum of capital expenditures over time. The industry median is then used to sum these ratios. By doing so we reduce the effect of outliers in the data.

Table 1: Names of Sectors, subsectors, and number of firms in each sector

Sectors Name	No of Firms
Food and Beverages	39
Tobacco	03
Textile	110
Leather	04
Paper and paper products	08
Coke, petroleum, sand nuclear fuel	13
Chemical and chemical products	46
Rubber and plastic products	04
Other non-metallic mineral products	26
Electrical machinery and apparatus	06
Radio tv and communication equipment	02
Motor vehicles and trailers	22
Other transport Equipment	06
Manufacturing not elsewhere specified	16

To estimate the impact of external finance dependence of firms on the industry growth, we compute the industry growth rate by the growth in ratio of value addition by each sector to GDP. This is the measure of firms entering the industry and continue doing business due to the attractiveness of industry. Data for this is taken from Pakistan Bureau of statistics. The moderating variables used in this paper is financial development. The data on financial development is taken from the State Bank of Pakistan. Financial development is calculated as the ratio of domestic credit to GDP (Rajan & Zingales, 1998).

The following model is specified to estimate the above-mentioned relationships.

$$IG_{it} = \beta_1 + \beta_2 EFD_{it} + \beta_3 FD_{it} + \beta_4 FD * EFD_{it} + u_{it} \qquad (2)$$

Where, IG is industrial growth, EFD is external finance dependence, FD is financial development and FD*EFD is the interaction term.

To estimate the above model, we use panel data estimation technique which is generalized method of moments which is good approach for estimation of dynamic panel data models as it does not require the distributional assumptions made by Classical Linear Regression Model. The lagged values of independent variables are used as instrument variables.

Results and Discussion

We constructed external finance dependence ratios for a sample of 14 manufacturing sectors of Pakistan following Rajan and Zingales (1998). The names of sectors and subsectors in manufacturing industry along with number of firms in each sector are reported in Table 1.

Table 2 shows the external finance dependence ratios calculated for firms in sub sectors of Pakistan's manufacturing industry. A negative ratio indicates no dependence on external finance and a positive one shows sector's dependence on external finance (Rajan & Zingales, 1998). The results show that the electrical machinery and apparatus sector of manufacturing depends more on external finance as it observes the highest ratio, and the other transport equipment sector is least dependent on external finance (the financial dependence ratio is -0.97). These ratios are different than those of Rajan and Zingales because the degree of dependence of firms on external finance is affected by institutional factors and policy issues which are different for every country. These factors may include more access to external finance to large firms due to their dominance in industry, subsidies given to some industries and firms having joint ventures with international firms (Kabango & Paloni, 2011). The technological or structural reason stated by Rajan and Zingales is just one factor of determining dependence on external finance and may not be generalized to other countries. The fourth column of the Table 2 reports the average growth. It is observed that a weak positive correlation between external financial dependence and industrial growth exists (coefficient of correlation is 0.21). This relationship is further investigated by estimating model 2.

Table 2: External Finance Dependence ratios of Pakistani Manufacturing Firms

Sectors	D ratio	D Ratio (Rajan and Zingales)	Average Industry Growth Rates
Textile	0.06	0.16	0.70
Rubber and Plastic Products	0.19	0.9	-
Tobacco	0.24	-0.45	4.77
Electrical Machinery and Apparatus	0.45	0.95	11.22
Food and Beverages	-0.28	0.11	7.06
Leather	-0.87	-0.14	
Paper and Paper Products	-0.30	0.17	4.85
Coke, Petroleum and Nuclear Fuel	-0.35	0.08	-
Chemical and Chemical Products	-0.42	0.5	7.23
Other Non-metallic Mineral Products	-0.11	0.06	4.87
Radio Tv and Communication Equipment	-0.85	0.96	-
Motor Vehicles and Trailers	-0.63	0.39	-
Other Transport Equipment	-0.97	0.36	-
Manufacturing not Elsewhere Specified	-0.04	0.47	-

Notes: The second column of the table reports dependence ratios computed by authors while third column reports the Dependence ratios reported by Rajan and Zinglaes (1998). The fourth column reports average industry growth rate. The data for growth rate is available for seven sub sectors of manufacturing industry only.

Table 3 reports the regression results of the model below where industry growth is the dependent variable. Regression results indicate that there exists a significant positive relationship between external finance dependence and industry growth indicating that indsutries depending more on external finance grow more. This finding is in line with Rajan & Zingales (1998). Financial development has a positive but insignificant relationship with indsutry growth indicating that so far financial development does not facilitate indsutry growth in Pakistan. This may be due to the fact that financial markets of Pakistan are not yet developed enough to support growth. On the other hand the interaction between external finance dependence and financial development which measure the moderating role of finacial development in the relationship of external finance dependence and industrial growth, has a statistically significant positive impact on indutry gorwth (p-value < 0.01). The results are consitent with Rajan and Zingales (1998) and (Eichengreen, Gullapalli, & Pani, 2011) implying that sectors depending more on external finance grow more in presence of financial development. Contrary to this, the findings of Vlachos & Waldenstro (2005) show that financial openness (a dimension of financial development) does not lead to the growth of firms depending more on external finance however, they state that these

findings may differ in countires with different level of financial development.

Though the coefficient of finacial development appears as positive but insignificant, nevertheless, it has a significant moderationg role in the relationship of external finance dependence and industrial growth implying that the firms which have access to finance due to financial development and depend more on external finance grow disproportianlly as compared to the firms which are less dependent on external finance. Finally, the p- value of J. statistics (0.20) shows that instrument variables are not over identified.

Table 3: Estimation Results of the model

Independent Variables	Coefficients	t statistics	P value
EFD	0.70**	4.27	0.0001
FD	117.75	0.20	0.8458
EFD*FD	533.08**	4.21	0.0001
Probability (J. statistics): 0.20			

Notes: EFD represents External finance dependence, FD is financial development, EFD*FD is the interaction term and **, * show Significance level at 1% and 5% respectively.

CONCLUSION

This paper attempts to empirically investigate the impact of external finance dependence on industrial growth in manufacturing sector of Pakistan. The literature on financial development and economic growth asserts that in financially developed systems, the firms which heavily depend on external finance grow more than the firms which are less dependent of external finance. Many studies follow the seminal work of Rajan and Zingales (1998) and used the external finance dependence ratios calculated by them as they state that their computed ratios for the United States may be generalized for other countries. However, by using the data of 364 firm listed in Pakistan Stock Exchange of 14 sub sectors of manufacturing industry, we computed external finance dependence ratios. The index of financial dependence computed for Pakistan is different from that of Rajan and Zingales (1998) which justifies our earlier stance that Rajan and Zingales ratios may not be generalized for all countries because of different level and extent of financial development across countries. These results are consistent with those of Kabango and Paloni (2011), who computed the external finance dependence ratios for Malavi and found that they were different from the ratios computed by Rajan and Zingales (1998).

To estimate the impact of external finance dependence on industrial growth, we estimated the model using GMM approach. The results show that the industries that depend more on external finance grow more; as the presence of extenral finance enables firms to improve capital allocation by investing in huge projects (Almeida & Wolfenzon, 2005). The positive relationship of financial development and industry growth indicates that financial development fosters indsutry growth in a coutnry however, this relationship is insignificant. The relationship of the interaction of external finance dependence and financial development and industry growth is positive and significant indicating that the countries with financial development provide growth opportunities to industries that depend more on external finance (Beck & Levine, 2000) (Kabango & Paloni, 2011).

The study provides new insights on the impact of external finance dependece on industry growth in manufacturing industry of Pakistan. It has significant policy implication. The measures

of finacial development may disporpotionaltely benefit those subsectors of manufacturing industry which depend more on external finance. This implies that the policies for financial development and the removal of constraints from access to external finance may lead the indsutrial sector towards growth. This encourages firms in having efficent and effective credit plicies in order to imporve their level of growth. Asad, Iftikhar and Jafary (2019) urge on the development and implementation of financial development policies in order to facilitate firms dependent on external finance. Futurer research can be conducted by increasing the number of control varibales such as increasing interest rates might be the reason for firms not using internal soucres of finance. It would also be interesting to conduct future research on finding the impact of financial develoment policies on growth of sectors other than manufacturing industry.

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