



Does Financial Development Volatility Affect Growth Volatility of Industries In Pakistan?

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Abstract

This article investigates whether financial development volatility effect on growth volatility of industries? The findings of the study are based on panel data consisting of seven manufacturing industries listed at Karachi Stock Exchange (KSE) over the period of 1994-2013. The Results of this study reveal that financial development in banking sector diminishes growth volatilities of industries that highly depend upon external liquidity. Whereas, financial development volatility in banking sector increases growth volatility of industries. Further, combined effect of both volatilities, banking sector and stock market, also raise growth volatility of Industries. Policy implications that come out from this study that regulatory authority should closely observe the behavior of financial markets to ensure the stability in economic growth more precisely, industrial growth of country. In addition, this study also suggests that there should be further development in banking sector in order to sustain economic growth and stability in Pakistan.

Keywords: Growth Volatility of Industries; Liquidity Needs; Volatility of Financial Development.

JEL Codes: C23; G00; O43.

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1. Introduction

An extensive amount of theoretical and empirical literature explored the association between financial sector development and economic growth. Theoretically, it is argued that well developed financial system intermediaries reduce the cost of making transaction, acquiring information and making transactions. Theoretically argued that well developed financial structure performs several duties like; it improves the efficiency of intermediaries by reducing cost making of transaction, monitoring and obtaining information. Financial sector development involves the establishment and enhancement of institutions, markets and tools that facilitate the economy through domestic and foreign saving into productive investment. Many studies (e.g; Schumpeter 1911; Patrick 1966; Goldsmith 1969; McKinnon 1973; and Shaw 1973) argued that well-functioning financial market spur economic growth.

Stability is one of the key macroeconomics challenges for sustainable economic growth and development that concerns government, policymakers, market experts, corporate managers and financial analysts. Numerous theoretical models have demonstrated that credit market flaws may lead to macroeconomic fluctuations (e.g; Bernanke and Gertler, 1989; Kiyotaki and Moore, 1997). Bernanke and Blinder (1992) confirmed that monetary policy can influence the real economy through credit market.

Numerous studies show that there is negative association between financial development and economic growth volatility³. However, few studies like Khadraoui (2011), Cermeno (2012) are contrast to them. The previous studies like (Behn (2014); Eweton (2014); Hoxha (2013); Francisco (2009); Binah (2005)) showed that financial development enhance industrial growth. Fang (2014) argued that volatility in financial sector development increase the industrial sector volatilities with high liquidity needs. Further, volatilities of both banking and stock market development have significant positive impact on industrial growth volatility. Lin and Huang (2012) found that volatility of banking sector reduces the growth of industries that highly depends on external finance. Levchenko (2009) stated that financial liberalization plays significant positive role in industrial growth and its volatility. Financial development diminishes output volatility of industries with more externally financially dependent (Larrin; 2006). Raddatz (2006) explored that financial development declines the growth volatility of industries with high external dependence.

Investment is more volatile component of GDP. Financial markets fluctuation can create uncertainty for investment in any project or business. In Pakistan, financial reforms started from late 1980's on the suggestion and financial support of World Bank (WB). Financial markets and industrial growth at aggregate and disaggregate (industry wise) level remained unstable since 1990s (see appendix). It is more likely that volatility in financial markets may adversely affect economic growth or more precisely industries growth and its volatility. Many studies like Khan, et al. 2005; Hussain, 2011; Hye and Wizarat, 2013; Munir et al, 2013 show that financial development enhance economic performance in Pakistan. All these studies show association between financial development and economic growth but largely ignore the shocks or variation or volatility at aggregate and disaggregate (agriculture, industrial and firm) level. Therefore purpose of this study is to examining the association between growth volatility of industries and financial development volatility in context of Pakistan.

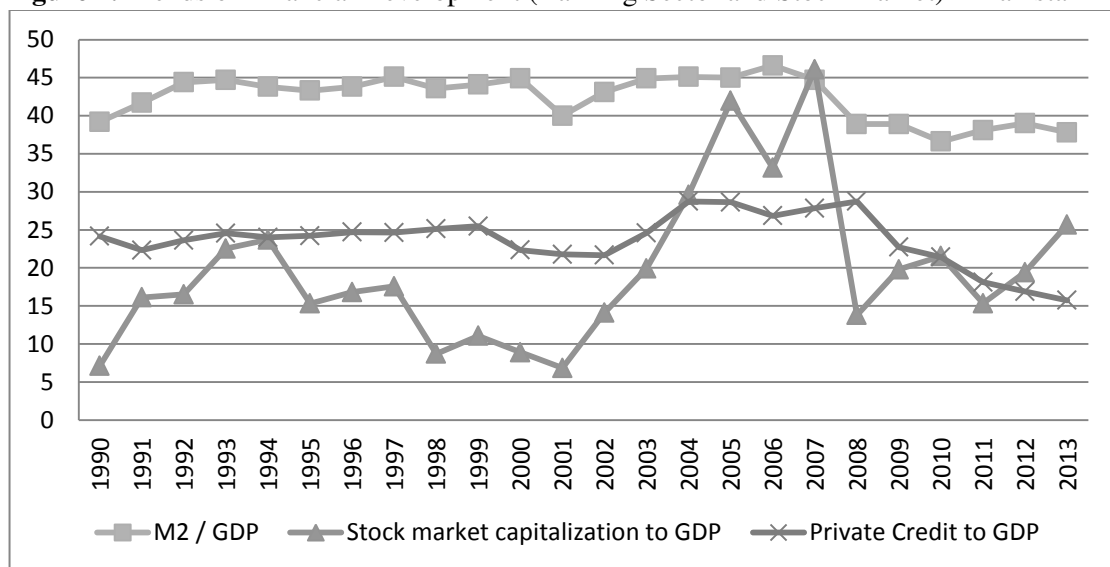
This paper organizes as follows; section 2 provides the summary the financial development in Pakistan. Section 3 presents the data description and methodology. Section 4 of study discusses empirical results. Finally, last section describes concluding remarks.

³ See Wahid and Jalil (2012), Gouider and Trabelsi (2006), Bekaert (2006) and Danizer (2002),and Omay (2011) has a detail analysis about the simultaneous estimation of related variables volatility (or uncertainty).

2. Overview of Financial Sector Development in Pakistan

Well-functioning financial institutions are essential for the economic development of a country. Before 1990s, financial sector in Pakistan was underdeveloped illustrated by credit ceiling, highly control on lending and deposit rates. Nationalized financial institutions hold about 93.8 percent of the aggregate resources of the whole financial sector till the end of 1980s. All these aspects created extreme inefficiencies, distortions and macroeconomic challenges in the late 1980s. To overcome these problems the Government of Pakistan initiated the process of financial sector development in early 1990s, keeping in view a significant role to achieve sustainable economic growth in the country. For this purpose, World Bank and agriculture development bank of Pakistan provided technical and financial support. Firstly, the Government of Pakistan liberalizes the entry of foreign and private banking industries, to create competition and efficiency in financial markets. Secondly, nationalized banking intuitions, like Muslim commercial bank and Allied Bank limited were mostly privatized. The privatization of financial intuitions raised greater competition and transparency among these organizations. Thirdly, big nationalized commercial banks were downsized their branches and also their employees. Fourthly, State bank of Pakistan (SBP) was given full autonomy for modification in SBP act 1956. Now Banks are free from high control restrictions of liquidity ratio and cash reserve ratio. Fifthly, monetary policy used open market operation as major instrument instead of credit-deposit ratio (CDR). Fully liberalized banks permitted to grow faster and enhance their market share. Collateral was encouraged to reduce the costs of lending. Nationwide saving schemes were improved to amalgamate the financial market. Finally, SBP played effective role as supervisory body and guardian of the banking sector to promote credit projects.

Figure 1. Trends of Financial Development (Banking Sector and Stock Market) in Pakistan



Source: M2/GDP from Pakistan Economic Survey and stock market capitalization and Private credit to GDP ratio from WDI

3. Data description and Methodology

3.1 Data Description

This study uses the panel data set of seven manufacturing industries (e.g; Textile, Sugar, chemical, cement, transportation, paper and paper products, fuel and energy) over the period of 1994-2013. Industrial level data set has been taken from “financial statement analysis of companies listed at Karachi Stock Exchange”, published by State Bank of Pakistan (SBP). Sectors are selected on the basis of completeness and consistency in data series. Financial markets data such as banking and stock market development is taken from World Development Indicator (WDI). Other control variables Inflation, Government Size and Trade openness are also taken from WDI.

Table 1. Summary Statistics

Industry wise Growth Volatility	Mean	St.dev	Min.	Max	Obs.
Textile	22161.98	25804.33	2825.94	99083.21	20
Sugar	5475.08	7650.49	201.99	34909.33	20
Chem	20292.67	23289.27	94.01	89725.50	20
Cement	6871.62	9504.53	208.25	36388.45	20
Fuel	71381.88	92009.68	833.32	367698.61	20
Transp.	12488.87	9804.55	625.53	40477.16	20
Paper	1479.53	1625.60	19.76	7046.27	20
Overall targeted industries	20021.66	31113.29	19.76	367698.61	140
Sectorial Liquidity Needs					
Textile	0.95	0.08	0.40	0.70	20
Sugar	0.47	0.12	0.29	0.69	20
Chem	0.42	0.10	0.29	0.66	20
Cement	0.56	0.12	0.35	0.81	20
Fuel	0.39	0.11	0.22	0.59	20
Transp.	0.66	0.21	0.33	1.18	20
Paper	0.37	0.10	0.25	0.59	20
Overall targeted industries	0.55	0.04	0.22	1.18	140
Financial Development and Volatility					
Private Credit to GDP	23.71	3.75	15.75	28.74	20
Stock market capitalization to GDP	20.47	10.54	6.84	46.11	20
Volatility of private credit to GDP	1.05	1.14	0.03	0.03	20
Volatility of stock market capit. to GDP	4.97	4.95	0.54	22.84	20

Source: Author's calculations from financial statement of analysis of companies listed KSE and WDI

The primary measures for financial development in the context of banking sector, study uses the “ratio of private credit to GDP”⁴. Secondly, financial development in the context of stock market measure through the “ratio of stock market capitalization to GDP”⁵. To measure the volatility in financial market (either in form of banking or stock market), this study uses “standard deviation of private credit to GDP ratio” for volatility in banking sector and to measure the volatility of stock market development we use “standard deviation of stock market capitalization to GDP ratio”. For liquidity needs we use proxy as “short-run debt to sales ratio”⁶. Three main control variables are used in this study including other determinants of industrial growth, e.g; inflation, and government size and trade openness.

3.2 Methodology

To measure whether volatility of financial sector effects on growth volatility of industries in Pakistan, this study uses fixed effect method to estimate the both models. Fixed effects regressions are preferable not only because they control for all time-invariant factors but also they use only within-cross section variation in the data for estimation. Benchmark Model given as follows:

$$VINDG_{it} = \alpha_0 + \alpha_1 (LN_{it} * Fin.Dev) + \alpha_2 (LN_{it} * SD Fin.Dev) + \lambda OC_t + \mu_{it} \quad (1)$$

where subscript i denote i^{th} industry and t use for time period. The dependent variable (VINDG) is the standard deviation of real sales growth of industry. The explanatory variable (LN*Fin.Dev) is the interaction term of liquidity needs and financial development, which test whether financial development in banking sector leads a causal effect on growth volatility of industries which desire more liquidity needs⁷. Our core interest identifies with second explanatory variable (LN*SD Fin.Dev), which is the association between liquidity needs and financial volatility that determine whether fluctuation in banking sector exerts any effect on growth volatilities of industries with high demand for external liquidity. Finally, model (1) incorporates the other set control variables (OC) e.g; government Size, inflation rate and trade openness that are the additional determinants of industrial volatility and error term (μ). In an addition to this, study also estimates association of volatilities between stock market and industries with larger liquidity needs. This specify as follow Regression:

$$VINDG_{it} = \alpha_0 + \alpha_1 (LN_{it} * Fin.Dev) + \alpha_2 (LN_{it} * SD Fin.Dev) + \alpha_3 (LN_{it} * Stock.Dev) + \alpha_4 (LN_{it} * SD Stock.Dev) + \lambda OC_t + \mu_{it} \quad (2)$$

Model (2) is the same as Model (1) with the exception of two additional association terms, (LN_{it} * Stock.Dev) liquidity needs with stock market development and (LN_{it} * SD Stock.Dev) liquidity needs with stock market volatility. Which trying to explore role of

⁴This proxy is frequently used in literature see Fang (2014); Lin and Huang (2012); Levchenko et al. (2009); Raddatz (2006).

⁵See Fang (2014); Lin and Huang (2012); Fishman and love (2003); Udegbumam (2002);

⁶ Fang et al.(2014) uses three proxies to measure liquidity needs of industries; i) cash conversion cycle ii) labour cost to sales ratio iii) short run debt to sales.

⁷ Rajan and Zingales (1998) and Raddatz (2006) tested whether financial development effects on the industrial output volatility with more liquidity needs. Results explored that financial development declines the growth volatility of industries with high external dependence.

stock market development or its volatility has any significant affect on industrial growth volatility with high liquidity needs?

Table 2. Correlation Matrix

	1	2	3	4	5	6	7	8
1	1,000							
2	0,366	1,000						
3	-0,098	0,028	1,000					
4	0,455	0,217	-0,015	1,000				
5	0,009	0,034	0,038	0,220	1,000			
6	0,038	-0,037	0,092	-0,298	-0,068	1,000		
7	-0,258	-0,158	0,203	-0,116	0,187	0,459	1,000	
8	0,458	0,153	0,184	0,153	-0,029	-0,001	0,006	1,000

Note: 1) Private Credit to GDP, 2) Stock market capital to GDP, 3)Volume of Private Credit to GDP, 4) Volume of stock market capital to GDP, 5) Short-run Debt to Sales, 6) Volume in Government Expenditure, 7) Volatility of Inflation, 8) Volatility in Trade Openness.

4. Econometrics Results and Discussions

4.1 Financial Development (Banks), Volatility and Growth Volatility of industries

Table 3 explores the empirical results of model (1) as follows:

Table 3. Impact of Financial Development (Banks) Volatility on Growth Volatility of Industries by Using Fixed Effect

Independent Variables	Model 1.1	Model 1.2	Model 1.3	Model 1.4	Model 1.5	Model 1.6	Model 1.7	Model 1.8
C	11.362 (0.000)	11.279 (0.000)	11.013 (0.000)	11.129 (0.000)	10.631 (0.000)	10.992 (0.000)	10.944 (0.000)	10.536 (0.000)
1	-0.961 (0.008)	-0.989 (0.007)	-0.978 (0.006)	-0.868 (0.023)	-1.057 (0.003)	-0.881 (0.021)	-0.947 (0.012)	-1.016 (0.006)
2	0.282 (0.000)	0.268 (0.001)	0.268 (0.001)	0.276 (0.001)	0.226 (0.004)	0.260 (0.001)	0.266 (0.001)	0.223 (0.005)
3	-	-0.142 (0.274)	-	-	-0.359 (0.001)	-0.156 (0.232)	-	-0.361 (0.011)
4	-	-	0.290 (0.011)	-	0.433 (0.001)	-	0.284 (0.015)	0.426 (0.001)
5	-	-	-	-0.074 (0.451)	-	-0.088 (0.371)	-0.024 (0.806)	-0.032 (0.735)
R ²	0.515	0.520	0.539	0.517	0.561	0.523	0.539	0.562

Note: Values in parenthesis indicate p values. All variable are in natural logarithm. The independent variables are listed as follows; 1){(Private Credit)(Liquidity Needs _i)}, 2){(Volatility of Private Credit _{t-1})(Liquidity Needs _{i t-1})} {(Volatility of Private Credit _{t-1})(Liquidity Needs _{i t-1})}, 3) Volatility of Government Size, 4) volatility of Inflation, 5) Volatility of Trade openness. Dependent variable is Growth volatilities of Industries. Number of observation is 140.

Source: Author's calculations from financial statement of analysis of companies listed KSE of respective years and WDI.

Result of First interaction term of Private Credit to GDP and liquidity need is statistically negatively significant at 1% level. This coefficient shows that financial development in banking sector reduces growth volatility of industries that are highly dependent on external liquidity. This estimate of the study authenticates Raddatz's (2006), Larrin (2006), Lin and Huang (2012) and Fang (2014). Second, Estimate of associated term that is standard deviation of Private Credit to GDP and liquidity need of industry is statistically positively significant at 1% level. Result of this interact term suggests that volatility of financial development in banking sector enhance the growth volatility of industries having higher liquidity needs. This estimate authenticates the Fang (2014) results. Hence, to overcome the problem of growth volatility of industries it is obligatory to stabilize the financial system of the country.

Control variables, like volatility in Government size is statistically negatively significant at 5 % level. This means that government expenditure reduces the volatility of industrial growth. Second, inflation volatility is positively significant at 1 % level. It recommends that volatile inflation stimulates the growth volatility of industries. Finally, fluctuations in trade openness have no significant effect on growth volatility of industries in Pakistan.

4.2 Financial Development, Banks and Stock Market, Volatility and Growth Volatility of Industries

Table 4 reported the results of model (2) as follows:

Table 4. Impact of Financial Development (Banks and Stock Market) Volatility on Growth Volatility of Industries by Using Fixed Effect

Independent Variables	Model 2.1	Model 2.2	Model 2.3	Model 2.4	Model 2.5	Model 2.6	Model 2.7	Model 2.8
C	11.643 (0.000)	11.614 (0.000)	11.363 (0.000)	11.545 (0.000)	10.895 (0.000)	11.488 (0.000)	11.677 (0.000)	11.157 (0.000)
1	-1.562 (0.000)	-1.558 (0.000)	-1.828 (0.000)	-1.516 (0.001)	-1.834 (0.000)	-1.503 (0.002)	-2.001 (0.000)	-1.969 (0.000)
2	0.217 (0.011)	0.215 (0.013)	0.186 (0.022)	0.218 (0.011)	0.148 (0.072)	0.215 (0.014)	0.182 (0.026)	0.146 (0.076)
3	0.355 (0.131)	0.356 (0.132)	0.509 (0.026)	0.351 (0.138)	0.561 (0.014)	0.352 (0.139)	0.534 (0.021)	0.579 (0.012)
4	0.300 (0.014)	0.294 (0.023)	0.359 (0.002)	0.293 (0.020)	0.285 (0.019)	0.283 (0.036)	0.387 (0.002)	0.310 (0.015)
5	-	-0.020 (0.884)	-	-	-0.276 (0.048)	-0.028 (0.840)	-	-0.267 (0.058)
6	-	-	0.424 (0.000)	-	0.524 (0.000)	-	0.453 (0.000)	0.543 (0.000)
7	-	-	-	-0.025 (0.801)	-	-0.029 (0.773)	0.084 (0.383)	0.066 (0.492)
R ²	0.550	0.550	0.597	0.550	0.609	0.550	0.599	0.611

Note: 1) {(Private Credit)(Liquidity Needs)}, 2) {(Stock market Capitalization)(Liquidity Needs_i)}, 3) {(Stock market Capitalization)(Liquidity Needs_i)}, 4) {(Volatility of Stock market Capt.)(Liquidity Needs_i)}, 5) Volatility of Government Size, 6) Volatility of Inflation, 7) Volatility of Trade openness Dependent variable is Growth volatilities of Industries. Number of observation is 140.

Source: Author's calculations from financial statement of analysis of companies listed KSE of respective years and WDI.

First interaction (α_1) term, private credit and liquidity needs is statistically negatively significant at 1 % level. This estimate states that financial development in banking sector decline growth volatility of industries that highly rely on external liquidity. Second interaction term (α_2), standard deviation of private credit and liquidity needs is statistically positively significant at 5% level. This interaction term explores that volatility of financial intermediaries in banking sector enhance the growth volatility of industries highly relying on external liquidity. Both estimates confirm the result reported in Table 3 that private credit and its standard deviation have significant impact on growth volatility of industries with high liquidity needs.

Reported result of parameter (α_3) shows that market capitalization to GDP has no statistically significant impact on growth volatility of industries with higher liquidity needs. Finally, interaction term (α_4) the standard deviation of stock market capitalization and liquidity needs is statistically positively significant at 5 percent level. It shows volatilities of stock market also have positive impact on growth volatility of industries having higher liquidity needs. Finally control variables like, volatile inflation has statistically positive significant at 1% level. Whereas, fluctuation in trade openness and government expenditure have no or weak impact on growth volatility of industries

5. Conclusions

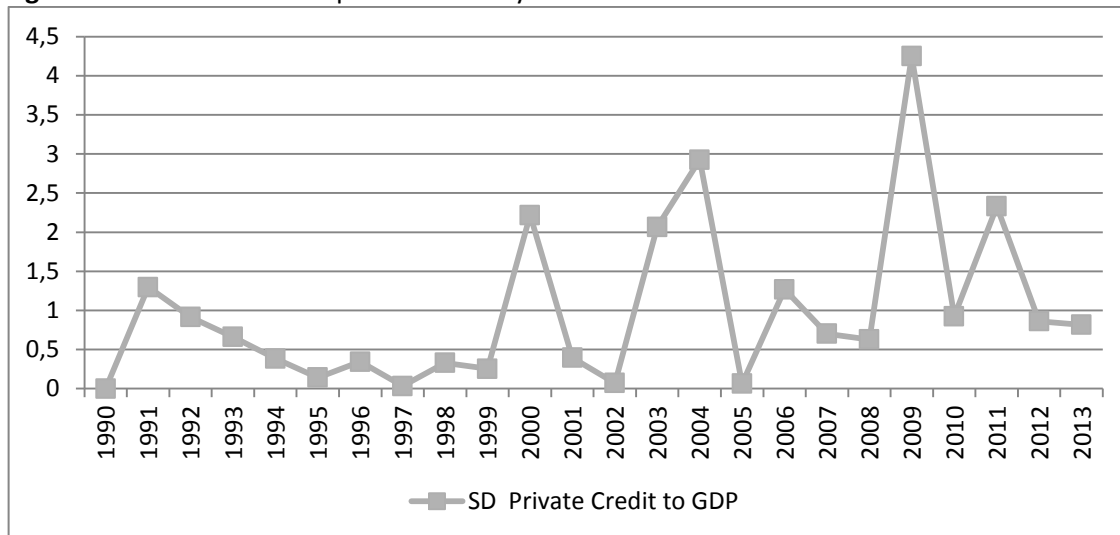
This article investigates whether financial development volatility, which an indicator of stability of financial development, has an effect on growth volatilities as of industries in Pakistan? Results of this study reveal that financial development in banking sector diminishes growth volatility industries that highly rely on external liquidity. Secondly, Stock market development has no or weak impact on growth volatilities of industries. Thirdly, volatility of financial sector development (banking) increases the growth volatility of industries. Finally, major contribution of this paper is that combined effect of both volatilities, banking sector and stock market, has positive impact on industrial growth volatility that demand high liquidity needs

Thus, fluctuations of financial development either in form of banks or stock market enlarges the growth volatility of industries in developing countries like Pakistan. Further, well-functioning financial intermediaries can smooth industrial growth volatilities, whereas highly volatile financial intermediary raises growth volatility of sectors with high liquidity needs.

Policy implications that come out from this study that regulatory authority should closely observe the behavior of financial markets to ensure the stability in economic growth more precisely industrial growth. In addition, this study also suggests that there should be further development in banking sector in order to sustain economic growth and stability in Pakistan.

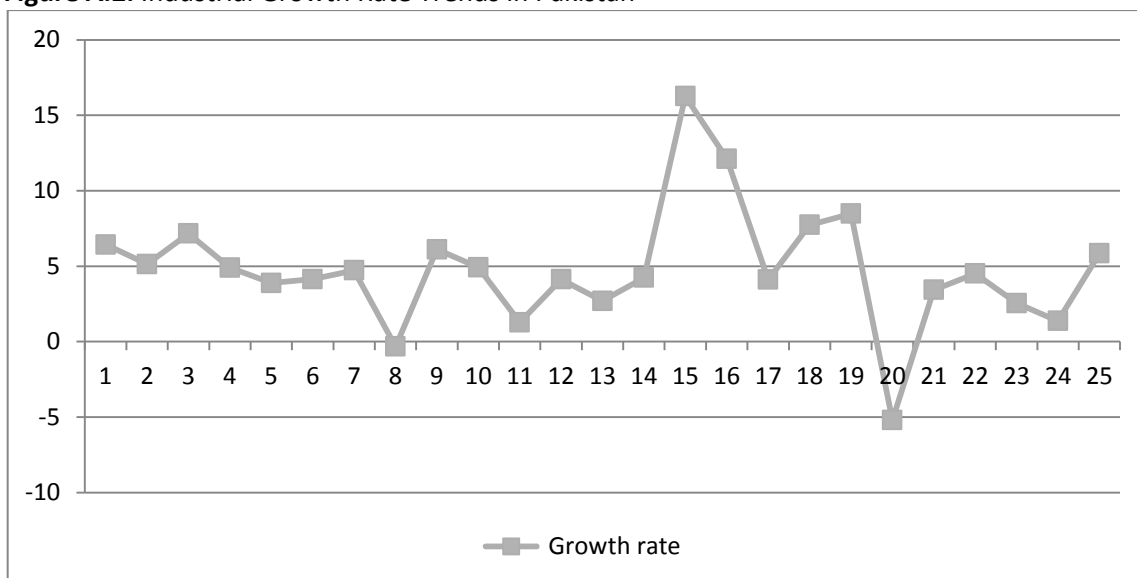
Appendix

Figure A.1. Financial Development Volatility in Pakistan



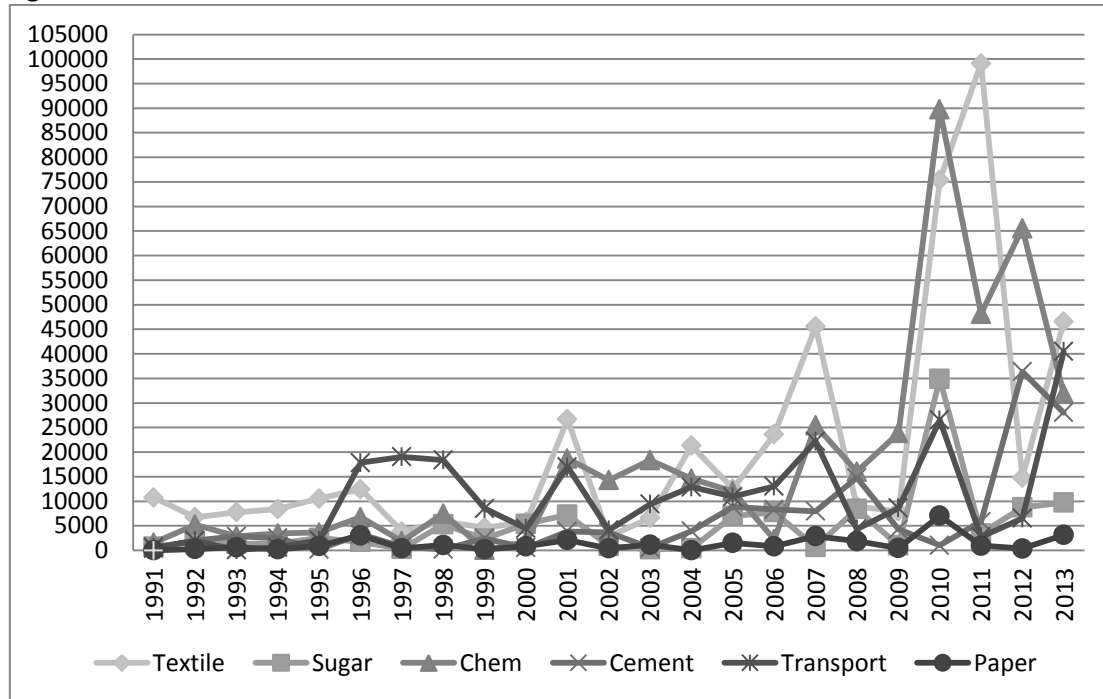
Source: Author's calculations from WDI

Figure A.2. Industrial Growth Rate Trends in Pakistan



Source: Author's calculations from WDI

Figure A.3. Sectorial Volatilities In Pakistan



Source: Author's calculations from financial statement of analysis of companies listed KSE of respective years

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