



## **SBP Working Paper Series**

No. 67

March, 2014

### **The Influence of Industry Financial Composition on the Exports from Pakistan**

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**STATE BANK OF PAKISTAN**

# SBP Working Paper Series

Editor: Dr. Hamza Ali Malik

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Pakistan: Rs 50 (inclusive of postage)

Foreign: US\$ 20 (inclusive of postage)

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Editor,  
SBP Working Paper Series  
Monetary Policy Department,  
State Bank of Pakistan,  
I.I. Chundrigar Road, P.O. Box No. 4456,  
Karachi 74000. Pakistan

Published by: Editor, SBP Working Paper Series, State Bank of Pakistan, I.I. Chundrigar Road, Karachi, Pakistan.

ISSN 1997-3802 (Print)  
ISSN 1997-3810 (Online)

<http://www.sbp.org.pk>

Printed at the SBPBSC (Bank) – Printing Press, Karachi, Pakistan

## The Influence of Industry Financial Composition on the Exports from Pakistan

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### *Abstract*

I determine the influence of the industry financial composition on the export flow between Pakistan and its trading partners. The importing countries are split according to their OECD membership status and their level of banking credit. The degree of financial dependence and asset tangibility of an industry may determine the ability of firms to obtain external finance and fund international trading activities. On the other hand, the level of financial development and exogenous shocks to the banking credit of the importing country is likely to impact the industry-level financial composition of the exports from Pakistan.

**JEL Classification:** E32, F1, F4, F37, G01, **Keywords:** Financial Development; Financial Dependence; Asset Tangibility; Export Flow; Pakistan;

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## Non Technical Summary

Participation in international trading activities may require exporters to borrow funds from banks and other creditors, domestic as well as foreign, in order to finance the related costs. Unfortunately, firms that operate in weakly developed financial markets may not be able to borrow enough funds from the domestic financial institutions to finance such activities. Exporters are likely to rely on foreign financial markets to fund their production and international trading activities. The exporters may enhance their relationship with importers to generate greater revenue than is likely from selling their products to the domestic consumers. Exporters may borrow from foreign banks, foreign creditors and other financial institutions that may provide credit in more favorable terms than it may be possible from their domestic financial institutions. For instance, exporters can obtain finance from importers in terms of investments that may help develop their facilities and improve the quality of production. In turn, the exporters may promise the importers greater return in terms of export value. The financial relationship is established between the exporter and its creditor, either domestic or foreign, and is likely to influence the ability of the exporters to maintain trading relationships with the importers.

The foreign financial markets with greater levels of financial development may allow the debtors to accumulate a larger volume of loans as there is greater confidence in the viability of the foreign financial markets to readily finance their investment activities. Furthermore, the importers may demand that the exporters produce varieties of higher quality. The production of higher quality of output demanded by the importers is likely to require purchase of modern equipment, investment in skill intensity as well as better quality of raw materials than necessary to produce output only for the domestic market. The trading relationship between the exporter and the importer is likely to be influenced by the degree of financial dependence of the exporter and its ability to borrow funds from a foreign market, particularly if the domestic market is relatively weak and not deep enough to provide the necessary funds. Therefore, the financial composition of the industries based on indicators such as financial dependence and asset tangibility is likely to play a large role in dictating the export flow of a country as exporters not only borrow from domestic financial markets but also foreign financial markets. I define financial dependence as the need for external funds from financial institutions in order to finance production activities and asset tangibility as the proportion of tangible assets, such as plant and equipment, to total assets owned by a firm. I also consider the importing countries based on the level of financial as well as economic development in order to determine whether the relationship between export value and financial composition industries is impacted by the characteristics of the importing countries. A positive effect of financial dependence will signify that firms in financially dependent industries are likely to export and a positive effect of asset tangibility suggests that the ability to provide collateral by firms is an important determinant of export flow. An additional consequence is that exporters that accumulate revenue are likely to diversify the number of trading partners and export to countries with low financially developed markets as well.

Episodes of financial uncertainty in the importing countries are likely to influence the effect of financial composition on export flow. When the importing country faces a banking crisis, the ability of the financial markets in the importing country to fund production of the exporters may diminish and severely hamper the influence of financial dependence on the export flow from Pakistan to the importing country. During the episodes of banking crises, the influence of industry-level financial dependence on exports may lose significance. In addition, asset tangibility of the industry may have a negative impact

on exports as local industries in the affected country that lack tangible assets may be negatively impacted due to the reduction in production within such industries.

In this paper, I consider bilateral export flow of Pakistan and indicators of financial composition at the industry-level borrowed from the US data in order to determine the influence of financial dependence and asset tangibility on the export flow of Pakistan. I split the importing partners of Pakistan according to their OECD membership status as well as according to the level of domestic credit provided by their banking sector as a percentage of GDP. The level of domestic credit provided by banking sector as a percentage of GDP in Pakistan is within the range of countries I define as with middle level of banking credit. I find that there is generally a positive influence of financial dependence on export flow to importing OECD member and non OECD countries but the effect is limited to importing countries with middle level of banking credit when considering importing countries with different levels of banking credit. This is not surprising as there are several OECD member countries that have middle level of domestic credit provided by the banking sector. It is also likely that the countries with higher levels of banking credit are likely to produce across all industries and lower the need for imports. The countries with middle level of banking credit are likely to import from Pakistan in financially dependent industries as the financial institutions in such countries may have better ability to understand the financial markets of Pakistan likely due to existence of similarities in their financial markets. On the other hand, firms in countries with low level of banking credit may be constrained in production across all industries to meet domestic demand and thus demand imports in a larger range of industries. Interestingly, I find that the financial dependence is positive and significant to non OECD importing countries regardless of the episodes of banking crisis faced by them. This points to the fact that the revenue generated by the exporters in certain industries may allow exporters to diversify the number of trading partners as the effect of financial dependence is insulated from the episodes of banking crisis.

In summary, the policymaker in Pakistan should promote exports in financially dependent industries as well as in industries with a lower proportion of tangible assets. Pakistani exporters may take advantage of the favorable credit terms in the importing countries in the developed financial markets as well as in the volatility in their credit markets during the episodes of banking crises as exports in such industries are likely to be preferred within selected trading partners. The development of the financial markets can allow for diversification of exports to more trading partners as well. Therefore, it is highly imperative for Pakistan to improve the level of development of its financial market.

# 1 Introduction

The financial dependence and the asset tangibility of an industry will determine the ability of firms to generate external sources of finance necessary to fund international trading activities within the industry. Participation in international trading activities may require exporters to borrow funds from banks in order to finance the fixed, sunk and variable costs related to international trading activities. Exporters within a weak financial market in which the domestic financial institutions may not supply them with enough credit to finance international trading activities may rely on foreign financial markets through bank loans as well as on their importers that are offered favorable terms of credit in return for greater revenue to be used for product development and expansion of their export sales. The purpose of this paper is to determine the influence of the financial composition of the industries on the export flow.

Exporters that face restricted access to finance in their home economy may take advantage of lower costs to finance production through bank loans from foreign lenders as well as sell on credit to buyers in other economies that provide them with a greater value on sales than that can be obtained from domestic consumers. The foreign financial markets with greater levels of financial development may allow their debtors, foreign and domestic, to accumulate a larger volume of loans as the debtors have greater confidence in the viability of the foreign financial markets to readily finance its investment activities. For instance, importers located in a country with relatively developed financial markets may obtain credit relatively easily compared to producers located in a country with relatively less developed financial markets and the financial environment may promise lower risks of default payments to the exporters. Consequently, the exporters may sell more to foreign customers that are able to finance their investments and purchases at lower financial costs than the domestic customers. However, apart from the relatively greater quantities demanded, the importers may demand inputs of better quality which may be produced with further investments in machinery and equipment as well as in more expensive varieties of inputs. This may compel the exporters to hold greater values of inventory and seek external finance to increase its exporting activities. Therefore, the strength of the foreign financial market influences the growth of investment across industries located domestically with varying degrees of financial dependence and asset tangibility as it lowers the risk of the provision of credit faced by the producers. The study of the effect of financial factors on international trading patterns is the focal point of this paper<sup>1</sup>.

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<sup>1</sup>The industry-level financial composition is likely to influence the borrowing patterns of a firm as it defines the need of a firm to seek external finance to fund its investment activities. A positive relationship between financial dependence and export flow within an industry suggests that industries in need of finance are more likely to establish or enhance relationships with foreign buyers. The variable I include in this study will account for the endogeneity effect between the financial composition of the industries and the export flow that may bias the results.

Episodes of financial uncertainty that reduce the availability of funds for the borrowers may also influence the financial factors that determine the export flow to their trading partners. Producers in industries that are likely to have a greater proportion of their finance from external funds can be sensitive to the shortage of availability of finance necessary to fund their production similar to producers that hold a smaller proportion of collateralizable tangible assets. An expectation in the failure of financial institutions to honor deposits may lead to considerable financial distress that could culminate into instances of bank runs by borrowers, bank liquidation and output loss. Such shocks to the economy can be interpreted as episodes of banking crises, where financial distress is often accompanied by significant policy intervention from the central bank in order to control for the negative consequences. A banking crisis is likely to determine the level of growth rate for investments in industries based on the level of financial dependence and asset tangibility. In this paper, I undertake a study to determine whether episodes of banking crises faced by an importing partner and its level of financial depth is likely to impact the influence of industry financial composition on the export flow from Pakistan, a country that exhibits less developed financial markets than the financial markets within its advanced and developed trading partners but has never itself faced a banking crisis.

## **1.1 Literature Review**

Financial dependence is calculated as the fraction of capital expenditure financed by external funds instead of internal sources of finance, such as cash flow. The seminal paper of Rajan and Zingales (1998) relate economic growth with financial dependence under different conditions of financial development and determine that industries which rely more on external sources of finance tend to grow disproportionately faster in countries that have financially developed markets. Becker and Greenberg (2003) incorporate export flow into the model of Rajan and Zingales (1998) and suggest that well developed financial systems play an important role to promote exports as large up-front fixed costs required for exports are easier to finance. I focus on the relationship between export flow and industry financial characteristics as I vary the development of financial markets in the importing country in order to determine whether financially dependent industries generate greater exports to importing countries with different levels of development in their financial markets. Although, the variable on financial dependence focuses on the impact of capital expenditures to promote international activities, the cash flow may be influenced by the demand for inventory and the extension of credit to the importers.

Asset tangibility measures the proportion of net property, plant and equipment in the total assets of a firm. Braun (2003) incorporates the level of asset tangibility into the Rajan and Zingales (1998)

model as it determines whether countries with lower levels of financial development are likely to be characterized by investments in industries that have a higher proportion of tangible assets to total assets. This relationship can be explained by the theory that the degree of asset tangibility within an industry can influence the ability of a lender to seize tangible assets in case of default payments by the borrower. Almeida and Campello (2007) link financial dependence of a firm with its asset tangibility and suggest that firms with lower asset tangibility are more likely to be financially constrained. In other words, an increase in asset tangibility diminishes the influence of financial constraints. Manova (2008) correlates liberalization of equity markets with the development of financial markets and finds that developed financial markets are likely to promote growth of firms in industries with lower levels of asset tangibility. Besedes et al (2012), on the other hand, suggest that higher asset tangibility can imply greater risk for firms, particularly in their initial years, as it may potentially increase the size of collateral that can be seized by lenders due to failure of repayment of loans by the borrowers. On the other hand, lower levels of financial development and poorer law enforcement may mitigate the probability of firm survival and counter the effect of asset tangibility on financial constraints.

As credit constraints can influence international trade, the exporters in one industry can be disproportionately affected by the level of financial dependence and the impact of the credit constraints may amplify when the importing country faces a credit crunch during the episodes of financial crises. Manova (2012) determines the role of credit constraints as it distorts trade flow in industries that have different needs of external finance and possess different levels of collateralizable assets across countries that vary in the level of financial development. Chor and Manova (2012) consider the role of credit constraints on international trade during the 2008-2009 global banking crisis. The effects of the global crisis is stronger in industries that require greater external financing or have fewer collateralizable assets as imports to the United States were significantly reduced in such industries. Using interbank rates to determine the level of tightness in the credit markets, Chor and Manova (2012) conclude that countries with higher interbank rates trade relatively less in industries that require external financing and trade relatively more in industries with greater collateralizable assets. On the other hand, Levchenko et al. (2010) determine little influence of financial characteristics of industries on U.S. trade as financial dependence and asset tangibility do not observe the predicted pattern in the regressions as expected.

Cheng and Ma (2005) study the effect of financial crisis on imports and observe a significant fall in imports during the year of the crisis as well as in the subsequent years. Do and Levchenko (2007) determine a positive correlation between the demand of external finance by the exporters and the development of the financial markets, indicated by the amount of credit provided to the private sector by

banks as a percentage of GDP. Although, Do and Levchencko (2007) include a variable to account for the banking crisis in the regressions to determine whether the occurrence of a banking crisis will lower the significance of external demand of finance by the exporters, they do not determine whether a country that faces a banking crisis is likely to still observe a significant effect for the industry financial factors on its trading patterns.

Laeven and Valencia (2010) define an occurrence of an episode of banking crisis if there are significant signs of financial distress in the banking system followed by significant banking policies as a response to mitigate the losses due to financial distress. This definition of a banking crisis will involve initial shortages in liquidity as lending by financial institution is reduced and is reflected in the contraction of output<sup>2</sup>. Braun and Larrain (2005) suggest that the impact of the shortage in liquidity and contraction in output is more severe in financially dependent industries and in industries with lower levels of tangible assets as well as in countries where poorer accounting standards are accompanied by lower levels of financial development. In addition, Dell’Ariccia et al (2008) study the effect of banking crisis on growth in terms of value addition, capital formation and number of firms in an industry and suggest that the differential effect of a banking crisis is stronger in financially dependent industries in developing countries. Firms in developing countries are likely to have fewer sources of external finance and can be exacerbated during a banking crisis as the limited number of funding options are likely to be reduced. Demirguc-Kunt and Detragiache (1998) determine that although weaker macroeconomic environment accompanied by low GDP growth increases the risk of a banking crisis, the cost of a banking crisis is likely to be higher in countries which have a larger share of credit to the private sector or in other words, a greater level of financial development.

On the other hand, Kroszner et al (2006) determine that the impact of the financial crisis is stronger in financially dependent industries in developed countries as they are likely to borrow more in pre-crisis periods relative to financially dependent industries in developing countries. This creates a greater exposure of financial credit and a negative effect on the growth rates compared to industries within shallower financial systems. However, the developed economies are likely to recover from a financial crisis faster than developing economies and in turn face a smaller impact on output in the long term compared to a developing economy. Furceri and Zdzienicka (2009) consider the influence of a financial crisis in the Central and Eastern European countries and find that the long term effects of a financial crisis

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<sup>2</sup>Governments may intervene by injecting liquidity through a bank recapitalization process in order to correct the shortage of credit resulting from the banking crisis. However, borrowers that have increased their leverage substantially during pre-crisis period may lose confidence in the financial institutions as a result of the crisis, and the lack of demand may reduce the amount of credit provided by the banking sector.

on the deterioration of output is stronger in the economies that have experienced 'excessive' growth in their credit markets. Such economies may undertake unsustainable credit expansion that can lead to financial instability and may have borrowers that lack the capacity to absorb financial shocks in the long term relative to borrowers in developed economies.

The lack of information on borrowers in weak financial markets can dominate the decision-making of the lenders. A credit crunch as a result of a banking crisis can have a devastating effect on the exporters from developing financial markets as provision of credit to exporters in such markets by lenders located in developed financial markets may be considered riskier than providing credit to their domestic borrowers. Financial institutions may prefer to reduce their exposure to borrowers in order to limit the negative effect of uncertainties that are prevalent during a crisis, particularly if the borrowers are located in exceptionally less developed financial markets. Berman and Martin (2012) consider the effect of financial crisis in the importing countries on the exports from sub-Saharan African countries and determine that the effect is negative on exports from the region. In addition, they also determine that the effect on the exports from the region is significantly greater compared to other regions as exporters from sub-Saharan African countries are likely to face declining exports due to the income and the disruption effects on trade. The former takes place as the richer importing countries are less likely to import goods from sub-Saharan African countries during a crisis. On the other hand, the latter takes place as a result of the fall in trade which is independent from the fall in income of importing countries. Khwaja and Mian (2008) suggest that a large proportion of borrowers in Pakistan are sensitive to liquidity shocks in the financial market<sup>3</sup>. If shocks in the foreign financial markets affect the borrowing patterns of Pakistani exporters, it is likely to impact the exports from Pakistan differently than when the importing country does not face a banking crisis. Therefore, financial dependence of an industry that may positively influence export flow during periods when the importing country does not face a banking crisis may have limited influence in the export flow from Pakistan during periods when the importing country faces a banking crisis.

I intend to study the influence of industry financial composition on export flow from Pakistan to countries with varying levels of financial development. Although, Pakistan may have a weakly developed financial market, the level of financial development in Pakistan is on average ranked higher than that observed in sub-Saharan African countries. Therefore, the pattern predicted for Pakistan may differ from that observed in sub-Saharan African countries as lenders in developed financial markets may lend

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<sup>3</sup>The liquidity shock faced by Pakistan as reported by Khwaja and Mian (2008) involves a shock induced into the economy because of political considerations and is not considered an episode of banking crisis as defined by Laeven and Valencia (2010).

to borrowers in Pakistan if they believe that certain industries are likely to grow as the importing country faces a banking crisis.

To the best of my knowledge, I conduct the first study on the effect of the financial composition of industries on export flow from Pakistan to its trading partners based on the level of development of financial markets in the importing countries as well as episodes of banking crisis faced by the importing country. The study is also unique as it determines the effect of industry financial composition on the export patterns originating from a developing country.

## **2 Theoretical Discussion**

There is a natural hierarchy in terms of the size of the borrowers and the lenders as the larger and the more dominant of the latter are more likely to lend to exporters rather than non-exporters and exporting firms are likely to borrow from lenders that provide them loans at the least cost of finance. A banking crisis that limits the availability of credit within an economy is likely to constrain financial opportunities for firms that invest in international trading activities. Amiti and Weinstein (2009) determine that there is a strong effect of the deterioration of the health of financial institutions on the exporting firms during a banking crisis. Exporters are likely to be sensitive to the availability of financing options due to their larger requirement of fixed and sunk costs to enter the export market as well as the need for higher working capital in order to finance the production of the exported goods relative to firms that produce only for the domestic market. The seminal paper of Myers and Majluf (1984) point out that the better performing firms, such as the exporting firms, are likely to prefer internal funds ( i.e. retained earnings) to finance their investment needs and will only seek external financing if the internal funds are not sufficient. As exporting activities may require large up-front payments from internal sources to finance fixed and sunk costs related to entering a new market, it is likely that exporters will demand external funds to finance the production activities and purchase the necessary fixed assets. Exporters from developing countries with weaker financial systems are likely to request finance from lenders located in a relatively developed financial market, provide favorable terms of credit to their importers in return for greater export revenue or borrow from large domestic financial institutions that have sufficient funds to finance their investments. Financial integration has promoted flow of funds from lenders in developed financial markets to borrowers in less developed financial markets that are characterized by riskier investments but compensated with a higher rate of return<sup>4</sup>. Lenders in relatively more developed markets may provide loans to

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<sup>4</sup>According to Claessens et al (2008), even if the foreign banks with headquarters in developing countries may have a larger proportion of subsidiaries, their proportion of assets is likely to be significantly lower than the assets of foreign banks with

borrowers in less developed markets where repayments are made in terms of the value of exported goods which is exchanged between the borrower and the lender<sup>5</sup>. Therefore, foreign lenders that have funding sources in a developed financial market are likely to lend to the exporters and finance their investments similar to foreign lenders located in the more developed financial markets. Iacoviello and Minetti (2010) determine the importance of foreign lenders to domestic borrowers, particularly exporting firms, as foreign lenders with their larger reserves and more stringent selection of borrowers compared to domestic lenders may select borrowers with greater productivity and output. On the other hand, firms that borrow from foreign lenders tend to be larger and more likely to export.

Mian (2006), using an extensive dataset on the Pakistani banking system that links borrower characteristics with lender characteristics at the loan-level, determines foreign lenders relative to domestic lenders are likely to finance borrowers in Pakistan that are less monitoring-intensive and have 'hard', or reliable, information about their firm characteristics<sup>6</sup>. On the other hand, when the importing countries face a banking crisis, lenders reduce their supply of credit to their own domestic borrowers. Such lenders may substitute their domestic borrowers for foreign borrowers in economies that are not facing a banking crisis. Demirguc-Kunt and Detragiache (1998) suggest that lenders in countries facing a banking crisis are likely to hedge some of their risk by lending to countries that do not face a banking crisis. With the assumption that large domestic lenders are also likely to own assets in financially developed markets, such lenders may also be affected by the banking crisis. Consequently, the banking crisis can have an adverse effect on the financially dependent industries. Given the supply of credit and the development of the financial markets, lenders may be willing to finance firms with lower levels of asset tangibility located in countries that do not face a banking crisis as such industries provide profitable opportunities for investments than the industries with similar levels of financial composition in the source country that faces a banking crisis.

Foreign sales involve importers that rely on the financial markets of the importing countries to finance their purchases as well as investments. Importers that have easier access to external funds may purchase a larger value and provide greater revenue to the exporting firms than that earned on products sold in the domestic market. Exporters, with several sources of finance available, may sell their output

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headquarters in developed countries. Hence, the influence of foreign banks from developed countries can be significantly larger relative to the foreign banks from developing countries.

<sup>5</sup>To simplify the model, I assume that every industry may produce exportable goods and the lenders expect to be repaid in terms of tradable goods. As I consider manufacturing industries only, it is likely that majority of the goods produced are tradable goods.

<sup>6</sup>Although, I assume financial mobility between countries, capital markets are assumed to be imperfect. Similar to large domestic banks, foreign lenders are likely to have *transactional based* lending to its borrowers, where 'hard' information on the borrowers (such as information on size of tangible assets) is generally preferred.

to multiple countries with different levels of financial development but will maximize revenue by selling to countries that provide the highest returns in terms of value for the given fixed and sunk costs. Exporters that sell to foreign markets may require external finance from sources that may be domestic as well as foreign to not only support their short-term liquidity needs due to greater time lags in revenue received from importers relative to domestic buyers but to finance long-term investments that may be required to meet the standard in product quality desired by the importers. Bustos (2011) links exporting activities with the adoption of technology to produce output of better quality that may be demanded by the importers in the developed markets. Once the demand of the product sold by the exporters has been met in countries that provide the maximum returns, the exporters can sell their products to other countries after paying the related fixed and sunk costs to enter the additional markets. During a banking crisis in the home country, lenders may fund exporters located in foreign countries that are relatively less affected by the financial volatility, particularly in industries sensitive to a banking crisis as importers in the home country can instead purchase inputs produced previously by themselves from producers in countries where volatility is lower. This provides an opportunity to finance exporters in countries in which otherwise firms will not be provided financing due to the 'soft' nature of tangible assets available within the industry. Therefore, the level of financial development of the importing countries as well as shocks to their banking credit may generate opportunities for firms in the exporting countries to increase their penetration of export sales within the selected industries. The purpose of this paper is to determine whether financial composition of an industry influences the export pattern of Pakistan to importing countries that are in the process split according to the level of banking credit and whether they face an episode of a banking crisis.

### **3 Data**

In Appendix A, I list the definition and source of each variable used in the regressions. The data on export flow is borrowed from de Sousa et al. (2012), which is listed on the CEPII's website. The values of financial dependence, asset tangibility, capital intensity, human capital intensity and natural resource intensity at the industry-level is originally listed in Braun (2003) and borrowed from Manova (2008). I assume free flow of goods between countries and free flow of labor and natural resources between industries but not between countries. However, capital may flow between countries as Pakistani producers may purchase machinery and equipment from foreign sources but labor, with both high and

low skill intensity, and natural resources are immobile between countries<sup>7</sup>. Therefore, a labor abundant country like Pakistan with a relatively large proportion of unskilled labor and low on natural resources is likely to export in industries that is low on capital, human capital and natural resource intensities. The data on contract intensity of each industry is borrowed from Nunn (2007) and the import demand elasticities from Nicita and Olarreaga (2006) and Kee et al (2008). I include an industry-level variable that accounts for the cumulative exports from lower middle income countries, a classification defined by the World Bank that includes Pakistan, to each trading partner of Pakistan.

In Appendix B, the countries are sorted according to their OECD membership status and their level of banking credit. In Appendix B, I have also listed the countries that are considered as lower middle income countries by the World Bank.

In addition to sorting the group of countries according to their OECD membership status, countries have been split according to high, middle and low levels of banking credit<sup>8</sup>. Using the average banking credit, which is calculated as the mean of domestic credit provided by banking sector (% of GDP) for the importing countries over the time period, the degree of banking credit is classified with the benchmarks set at the 75th percentile (between 103.16% & 266.93%) and the 25th percentile (between -26.62% and 30.19%) of average banking credit of all importers for countries with high level of banking credit and low level of banking credit. Average banking credit of Pakistan (at 49.15%) ranks it amongst countries with middle level of banking credit. With domestic credit provided by the banking sector considered as an indicator for the level of financial depth within a country, Pakistan has a financial market that is more developed than the financial markets in countries with low level of banking credit but less developed than the financial markets with high level of banking credit. It is also important to note that the banking credit has only been included for those years for which an importing country is a trading partner of Pakistan as this will remove any variations in the level of banking credit that may occur when the country does not import goods from Pakistan.

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<sup>7</sup>For the purpose of this paper, trade between countries is only in manufactured products and capital goods. The industries with higher capital intensity may attract capital inflows from foreign sources, the bulk of the export revenue generated in Pakistan will be from industries with lower capital intensities. Exporters within such industries are likely to add more capital into their production process.

<sup>8</sup>Although, all OECD member countries have either high or middle level of banking credit, none of the OECD member countries have low level of banking credit. On the other hand, not all countries with high level of banking credit are OECD member countries.

## 4 Empirics

In Tables 1, 2, 3 and 4, I consider the flow of exports from Pakistan to its trading partner as the dependent variable. The equation for the regressions can be stated as:

$$\ln ExportFlow_{ijt} = \beta_1 Findep_i + \beta_2 Tang_i + \beta_3 Z_i + \alpha_j + \eta_t + \varepsilon_{ijt} \quad (1)$$

where  $ExportFlow_{ijt}$  is the industry-level export flow from Pakistan to its trading partner,  $Findep_i$  is the variable accounting for the financial dependence at the industry-level,  $Tang_i$  is the asset tangibility at the industry-level.  $Z_i$  is industry-level controls such as contract intensity, capital intensity, human capital intensity, natural resource intensity, import demand elasticity, and the sum of export flow from all lower middle income countries. Trading partners with similar levels of income per capita are likely to produce goods that involve similar intensities of labor and capital inputs in their production techniques. The total export flow from lower middle income countries that includes Pakistan, as classified by the World Bank, is likely to set the demand of goods produced with a certain mix of labor and capital within each trading partner and influence the export flow from Pakistan. To account for unobserved effects in the model, I include  $\alpha_j$  as the country fixed effect,  $\eta_t$  as the time fixed effect.  $\varepsilon_{ijt}$  is the error term which is distributed as  $\varepsilon_{ijt} \sim N(0, 1)$ . The notations  $i, j$  and  $t$  define industry, country and year respectively. In addition, although not reported for the regressions below, the F-statistics reject the hypothesis that year and country fixed effects are zero and strongly supports their inclusion. The industries are classified according to the *ISIC Revision 2*. Using the export flow as the dependent variable is similar to the concept introduced in Rajan and Zingales (1998), which uses growth rate in real value added for each industry as a dependent variable. I adopt a strategy consistent to Chor and Manova (2012) and Manova (2012). The former implements US imports at the industry-level and the latter implements bilateral exports between trading partners as their dependent variables to study the correlation between international trade and financial factors.

The inclusion of importing country and year fixed effects can reduce issues related to the omitted variable bias that may otherwise occur as importing country and year characteristics can influence trading patterns. The time and importing country fixed effects allow only the variance of the industry-level variables within the importing countries for a given year to influence the industry-level export flow of Pakistan. As the variables accounting for financial dependence and asset tangibility are borrowed from the US data, endogeneity between export flow and the independent variables is not considered a major issue in the above model. It is unlikely that trade flow between Pakistan and its trading partners is likely

to have any influence on the values of the financial indicators of industries in the importing country as the export flow from Pakistan will only be a small percentage of total trade flow, domestic and foreign, for an industry. The financial indicators will not be affected by any shocks to the development of financial markets within Pakistan as the values are borrowed from the US data<sup>9</sup>. Further, with the US considered as one of the most financially developed country, the values for the financial indicators are likely to be stable and can be adopted to create a similar ranking of industries based on the characteristics across other countries<sup>10</sup>. The simple assumption is that the financial factors of industries are influenced by level of demand and characteristics of the industries instead of country characteristics as borrowers in a domestic country are free to borrow funds from foreign sources but not necessarily free to move certain factors of production between countries. Financial characteristics at the industry-level can hence be considered uniform across countries.

The group is split on the basis of country-level indicators, such as OECD membership status, level of banking credit and whether a country faced a banking crisis during a particular year. This strategy introduces an exogenous variation as it is unlikely that industry-level financial characteristics will directly influence country-level indicators<sup>11</sup>. The export flow between Pakistan and an importing country is not likely to be significant to influence country-level characteristics such as the development of the financial markets and the occurrence of a banking crisis in the importing country. Even though the exports from Pakistan may significantly decline during the period the importing country faces a banking crisis, it is not likely that the decline in the export flow between Pakistan and the importing country is the cause for the banking crisis. This can be ascertained by the fact that the absolute value of correlation between industry-level and country-level indicators is less than 10%. In addition, the multicollinearity that would lead to a high correlation between the independent variables used in the regressions is also not a concern as the variance inflation factor does not exceed more than 10 for the independent variables. The standard errors are clustered at the importing country-level as export flow within importing countries across the industries may be highly correlated.

One of the major reasons for a banking crisis is the oversupply of banking credit within an economy in the period preceding the crisis. As noted in Hardy and Pazarbasioglu (1999), the domestic credit

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<sup>9</sup>The issues regarding the viability of the variables on the financial composition for cross-country studies as well as the use of indicators that represent the industry-level financial composition within countries other than the US are addressed in papers that consider a similar strategy such as Manova(2008), Manova (2012) and Chor and Manova (2012).

<sup>10</sup>For this reason, trade flow between the United States and Pakistan has not been considered.

<sup>11</sup>Exports from Pakistan constitute a small percentage to its total GDP and exports to any single trading partner is a much smaller percentage of the total GDP of the importing countries. It is unlikely that exports by itself will influence the development of the financial markets in Pakistan as well as the development of foreign financial markets. Therefore, we can assume that the development of the foreign financial markets has an exogenous effect on the trading patterns of Pakistan.

provided by the banking sector as a percentage of GDP (gross domestic product) follows a boom and bust pattern in advance of a crisis and falls during a banking crisis. Further, a banking crisis also results in lower output levels that may negatively affect GDP. With banking credit and GDP both falling, it is difficult to predict the intensity of the boom and the bust of the domestic credit provided by the banking sector as a percentage of GDP. Therefore, although the episodes of banking crisis may lower the absolute value of the domestic credit provided by the banking sector, it may be independent from the domestic credit provided by banking sector as a percentage of GDP. However, as banking crisis is related to loss of output, it can be used as a suitable indicator for a fall in demand of exports from Pakistan as it inhibits the ability of the importing country to purchase foreign goods, particularly in industries that require an efficient financial market. Though, as discussed earlier, the effect of the banking crisis can only be exogenously related to the export flow from Pakistan and the industry financial characteristics.

## 5 Results

### 5.1 Discussion on Figures

[Insert Figure 1 about here]

In Figure 1, I observe an overall decline in the annual average real value of bilateral exports from Pakistan at the industry-level between 1980 and 2006. An increase in the number of industries that export coupled with lower growth rates in export value relative to the inflation rate in Pakistan may have attributed to this decline over time. The decline in the average value in 1995, particularly to the OECD members, corresponds to the induction of Pakistan into the WTO as the lower trade barriers may have had a positive impact on the number industries exported.

[Insert Figure 2 about here]

[Insert Figure 3 about here]

In Figures 2 and 3, financial dependence and asset tangibility were affected by the financial liberalization program introduced in 1988<sup>12</sup>. As expected, the results in Figures 2 and 3 are similar to the results for the impact of financial liberalization on the average levels of financial dependence and asset tangibility reported in Manova (2008). As the government allowed private banks to operate in the country, loans for product development and participation in international trade may have become easier to

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<sup>12</sup>The year fixed effects are included in the regressions in order to account for any variations caused by the introduction of the financial liberalization program within Pakistan.

avail from banks and subsequently helped to increase the exports in industries that are financially dependent. The volatility is greater for exports to the non OECD countries than the exports to OECD member countries, an indication that exporters to the former are more dependent upon the financial depth in the home market than the foreign market. A prominent decline in the asset tangibility of industries exporting to non OECD countries around the time Pakistan experienced liberalization in its financial sector can be attributed to the presence of greater availability of sources of external financing as banks were relatively more willing to fund industries which were characterized by a lower level of asset tangibility. As the effect of the shock from financial liberalization subsided, the average financial dependence and asset tangibility of the industries exported rebounded to their original levels. The OECD member countries and countries with higher levels of domestic credit may produce more in financial dependent industries and industries with lower asset tangibility and may require imports in less financially dependent industries and industries with higher asset tangibility from Pakistan relative to non OECD member countries and countries with lower levels of bank credit.

[Insert Figure 4 about here]

[Insert Figure 5 about here]

[Insert Figure 6 about here]

In Figures 4, 5 and 6, I observe a similar pattern to Figures 1, 2 and 3. In Figure 4, the average real value of exports to countries with high, middle and low levels of banking credit observe a similar trend as the real value of bilateral exports to OECD member and non OECD countries respectively. Similarly, in Figures 5 and 6 there is a similar trend of the financial characteristics as in Figures 2 and 3. Although, the direction of the real value of bilateral exports and financial characteristics is similar across both OECD member and non OECD countries as well as countries with high, middle and low levels of banking credit, the volatility in the numbers is greater in non OECD countries and countries with middle and low levels of banking credit than OECD member countries and countries with high level of banking credit. An increase in average financial dependence and a decrease in average asset tangibility of all the industries within the country should indicate an improvement in the capability of firms to participate in international trade. Therefore, I predict that bilateral export value will be positively associated with financial dependence and negatively associated with asset tangibility.

In Appendix C, I sort the industries according to the size of exports. The top five exporting industries by export value for Pakistan are the manufacture of textiles, wearing apparel, food industries, leather and petroleum products.

In Appendix D.1, the export flow from Pakistan falls when the importing country faces a banking crisis. The average of the bilateral exports from Pakistan is more than 30% greater during the periods when importing countries are not facing a banking crisis against the periods when importing countries are facing a banking crisis. The results hold across all categories of countries, regardless of OECD membership status and banking credit<sup>13</sup>. In Appendix D.2 and Appendix D.3, the industry-level composition of exports based on the financial characteristics, although small, increases in financial dependence and decreases in asset tangibility for periods when an importing country does not face a banking crisis. The average financial dependence and asset tangibility is calculated on the basis of the number of industries that export during a period. This may result in a lower average when the number of industries that export is higher because of the demand-side effects. During a banking crisis, the decline in domestic output in financially dependent industries and in industries with lower asset tangibility may generate import demand within these industries in countries that do not face a banking crisis to fulfill the lack of domestic production. This may result in an increase in average financial dependence and a decrease in asset tangibility at the industry-level. This direction in the average financial dependence and asset tangibility across the level of financial development of importing countries explains that the pattern of the financial composition of exporting industries from Pakistan to importing countries with different levels of financial development and their experience of financial crisis. However, Appendix D.2 and Appendix D.3 do not explain the intensity at which each industry exports to each importing partner during a particular period. The intensity of exports in the financially dependent industries may be higher during periods when the importing countries do not face a banking crisis even if the average of the financial dependence of the number of industries that participate is lower. The tables presented later will explain the influence of the financial composition of the industries on the intensity of the export flow to the various trading partners.

The influence of the industry financial composition on the export flow can have a differing effect within countries with varying country-level characteristics after controlling for few industry effects such as contract intensity and factor intensities. I include country-level and year fixed effects along with a few industry controls in the regressions listed below. The group of importing countries is divided according to the various measures of economic development and development of financial markets, using the OECD membership status and the level of banking credit respectively. In addition, the influence of

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<sup>13</sup>OECD membership status and the level of banking credit as well as the episodes of banking crisis in importing countries are all assumed to be exogenous to the export flow from Pakistan. Exports from Pakistan, as it may account for only a small percentage of total imports to its trading partner, is not likely to influence country-level characteristics related to economic and financial development of its trading partner.

the financial factors on export flow and ratio of exports can differ when importing countries face a certain period of banking crisis. This will determine whether the relationship between financial characteristics and export pattern differs across countries at different levels of economic, financial development and experience a shortage of banking credit through a banking crisis.

## 5.2 Discussion on Tables

[Insert Table 1 about here]

In Table 1, the bilateral export flow from Pakistan is positively associated with financial dependence for the pooled set of countries, OECD member and non OECD countries at 1% level, 10% level, and 5% level of significance respectively. It is also positively associated with asset tangibility within the set of OECD member countries at 5% level of significance. The developed OECD member countries are likely to demand exports from industries that also provide higher levels of asset tangibility. As larger lenders are likely to provide loans to exporters that belong to industries with a greater proportion of tangible assets or with 'hard' information, export flow to OECD member countries is likely to increase as the asset tangibility of such industries increases. Contract intensity is negatively associated with bilateral exports but significant at 1% level for all three set of countries. This may imply that importers within all set of countries are likely to import goods from Pakistan that are available in a spot market rather than the goods that require a contractual agreement between the importers and the exporters. The weaker legal framework characterized in Pakistan can result in trade in the less contract intensive industries.

Capital intensity is negative and significant at 5% level and 1% level within pooled countries and OECD member countries respectively. The export flow of Pakistan to OECD member countries is likely to be labor intensive. Human capital intensity and natural resource intensity are negatively influence the export flow at 1% level of significance. Import demand elasticity is negative and significant at 1% level within OECD member countries but at 5% level with the pooled set of countries and non OECD countries. The negative effect of import demand elasticity suggests that exports are likely to be price sensitive as the percentage decrease in quantity imported is greater than the percentage increase in import price. Lastly, the sum of exports from lower middle income countries is likely to be positive and significant at 1% level within all set of countries. This indicates that the value of sum of exports from lower middle income countries is positively associated with export flow from Pakistan, proving the complementary nature of exports from lower middle income countries and export flow from Pakistan.

[Insert Table 2 about here]

In Table 2, financial dependence has a positive influence on the export flow that is significant at 1% level within countries with middle level of banking credit<sup>14</sup>. Asset tangibility is not significant for any set of countries. Financial dependence influences exports from Pakistan to countries with middle level banking credit but asset tangibility at the industry-level has no influence on export flow from Pakistan in countries with high, middle and low levels of banking credit<sup>15</sup>. Although, the level of financial development may be similar to that of Pakistan within the countries with middle level of banking credit, there are several countries within this group of countries that have better developed financial markets relative to Pakistan. It is likely that Pakistani exporters in financially dependent industries will seek trading relationships with the importers in the more developed financial markets within the range of countries with middle level of banking credit. Pakistani exporters are likely to export goods in financially dependent industries to countries that have neither high levels of banking credit nor low levels of banking credit but have a middle level of banking credit. The countries with a high level of banking credit may demand products in industries with low financial dependence as they may lack production in such industries to fulfill the domestic demand. Although, exporters would prefer to sell products in financially dependent industries to the more developed financial markets due to better returns, the interest from importers to enhance relationships with exporters in significantly weaker financial markets may be limited. On the other hand, the exporters to countries with low levels of banking credit may prefer to sell in industries that are less financially dependent but the importers may demand products in industries that are more financially dependent due to the lack of domestic production in particular industries. The importers in countries with middle level of banking credit may have better understanding of the financial markets that are similar to their own country and generate demand for exports from financially dependent industries in such countries. It is also likely that the domestic production is less concentrated within industries of particular financial dependence within such countries. The significant effect of financial dependence on export flow within the OECD member countries but not within the countries with high level of banking credit suggests that economic development apart from the level of financial development in the import-

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<sup>14</sup>OECD member countries have either high level of banking credit or medium level of banking credit. The significance of financial dependence within countries with medium level of banking credit along with the lack of significance in countries with high level of banking credit and the relative levels of financial dependence of the export flow to countries with high and middle level of banking credit as observed in Figure 5 suggest that the importers in the countries with middle level of banking credit are being influenced by the financial composition of the industries than the importers in the other countries. As Pakistan has several major trading partners that feature amongst its top ten export destinations in countries with high levels of banking credit, the demand originating from such countries could be more diversified across industries and lower the significance of the financial dependence variable.

<sup>15</sup>It is important to note that Pakistan is a major exporter in the textile industry and the value it generates from textile exports contributes significantly to the total export value from Pakistan. As the financial dependence of the textile industry is higher than several other industries and several of the countries with middle level of banking credit may be importing textile products from Pakistan, it is likely that financial dependence has a significant influence on the export value, particularly if the exports to this group of countries is not diversified relative to the other groups of countries.

ing countries may influence the ability of firms to generate external finance to participate in the export market.

Contract intensity is negative and significant at 1% level within all set of countries. Capital intensity is negative and significant at 1% level for countries with high level of banking credit. Human capital intensity and natural resource intensity are negative and significant at 1% level for all set of countries, while import demand elasticity is negative and significant at 1% level within countries with high and low levels of banking credit but significant at 5% level for countries with middle level of banking credit. Sum of exports from middle lower income level countries is positive and significant at 1% level within all set of countries.

### **5.2.1 Considering Episodes of Banking Crises**

[Insert Table 3 about here]

In Table 3, financial dependence is positive and significant at 1% level and 5% level within the pooled set of countries and OECD member countries not facing a banking crisis respectively. Financial dependence is positive and significant at 5% level for non OECD countries, regardless of whether a country faces a crisis<sup>16</sup>. Larger lenders are likely to lend to exporters in financially dependent industries that export to OECD member countries as such industries are likely to experience greater growth in revenue than exporters to other countries. As financially dependent industries experience a larger number of exporters and a higher growth rate in exports, they may export to non OECD member countries. Exporters are not likely to export to OECD member countries that face a banking crisis. Credit supply from lenders that would normally contribute to lending in industries with potentially higher growth rates is constrained during this period. In addition, the lack of demand for imports of intermediate manufactured goods used to produce consumer goods within OECD member countries in financially dependent industries will also reduce exports in such industries. On the other hand, the exports to non OECD countries may be a result of the surplus export revenue generated by exporting to OECD member countries that may allow firms in financially dependent industries in Pakistan to export to non OECD countries even if the non OECD countries face a banking crisis.

Asset tangibility is negative and significant at 1% level for the pooled set of countries and non OECD

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<sup>16</sup>Pakistan belongs within the range of countries with middle level of banking credit (between 25th and 75th percentile). Although, it can be assumed that Pakistan is less financially developed than majority of the trading partners within the middle level of banking credit countries but majority of the non OECD countries belong within the range of countries with middle and low banking credit, it is likely that Pakistan has similar or greater financial depth relative to other non OECD countries. Therefore, Pakistani exporters will seek finance from the more developed markets in the countries with high level of banking credit and middle level of banking credit.

countries facing a banking crisis but is positive and significant at 1% level for OECD member countries not facing a banking crisis. Levchenko et al (2010) determine a negative and significant effect of asset tangibility on U.S. imports for the period between the second quarters of 2008 and 2009 and the results can closely relate to the imports to other developed financial markets. It is likely that in developed economies, trade in intangible industries will be domestic and between other developed OECD member countries that can more easily support the financing requirements of industries with a higher proportion of intangible assets. Consequently, this trading pattern may reduce the demand of imports from Pakistan within such industries. Aghion et al (2008) show that R&D investments as a ratio of total investments tend to fall during the period when the country faces a credit crunch but does not necessarily increase proportionally during non banking crisis periods. Further, Booth et al (2001) suggest that long-term debt is likely to be positively associated with asset tangibility but short-term debt is likely to be negatively associated. As exporting activities may constitute long-term financing, this can explain the positive effect of asset tangibility on export flow within OECD member countries during the non-crisis period. On the other hand, in less developed countries with weaker property rights, collateral can be seized by relatively powerful lenders in case of default payments and this may exacerbate during a credit crunch<sup>17</sup>. When OECD member countries face a banking crisis, financial dependence and asset tangibility at the industry-level do not significantly influence the value of export flow from Pakistan. Therefore, this pattern can indicate that exports from Pakistan are likely to occur in any industry regardless of financial dependence and asset tangibility of industries as OECD members may face a credit crunch that limits the ability of firms to generate revenue from export sales in financially dependent industries.

Contract intensity is negative and significant at 1% level for all set of countries except when OECD member countries are facing a banking crisis, for which the variable is insignificant. Capital intensity is negative and significant at 5% and 1% level respectively for pooled and OECD member countries not facing a banking crisis. Human capital intensity is negative and significant at 1% level for all set of countries regardless of whether they face a banking crisis. Natural resource intensity is negative and significant at 1% level across all set of countries except for OECD member countries facing a banking crisis. Income demand elasticity is negative and significant between 1% level and 10% level across all set of countries and the sum of exports from lower middle income countries is positive and significant at 1% level across all set of countries. Therefore, we can predict that all variables except for capital intensity

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<sup>17</sup>The onset of a banking crisis creates an output loss and lowers the supply of banking credit. As there has been no reported banking crisis in Pakistan during the sample period, I can assume that Pakistan as an exporting country has faced neither an output loss nor a credit crunch to the degree faced by the importing country when it experiences a banking crisis. Therefore, the export flow from Pakistan is affected but not the domestic production.

is likely to influence export flow, either negatively or positively across all set of countries. However, when an OECD countries faces a banking crisis, the only variables that have influence are human capital intensity, import demand elasticity and sum of exports from lower middle income countries.

[Insert Table 4 about here]

In Table 4, financial dependence positively and significantly influences export flow at 1% level for countries with a middle level of banking credit that do not face a banking crisis. Asset tangibility negatively and significantly influences export flow within countries with high level of banking credit at 10% level and within countries with a middle level of banking credit at 5% level that face a banking crisis. The effect of financial dependence and asset tangibility is consistent with Rajan and Zingales (1998) and Levchenko et al (2010). The former predicts growth in financially dependent industries as banking credit increases and the latter reveals that the imports into the U.S. are negatively impacted by asset tangibility during a banking crisis. In this paper, I observe that the financial markets of the importing countries with similar levels of financial development as the exporting countries are likely to play an important role in defining the trade patterns based on the financial composition of the industries. Importers within countries with middle level of banking credit that do not face a banking crisis are likely to increase export flow from financially dependent industries within Pakistan. However, when such countries face a banking crisis, the credit crunch within their financial markets may influence a negative relationship between asset tangibility and export flow. Contract intensity negatively and significantly influences export flow at 1% level for all set of countries except for within countries with high and low levels of banking credit facing a banking crisis, which is significant at 10% level and 5% level respectively. Interestingly, I do not observe a negative effect of financial dependence that significantly influences the export flow from Pakistan. This would suggest that a decrease in financial dependence across industries is not likely to generate greater export flow under any circumstances.

Capital intensity negatively and significantly influences export flow at 1% level within countries with high level of banking credit that do not face a banking crisis. Human capital intensity negatively and significantly influences export flow at 1% level within all sets of countries except within countries with low level of banking credit not facing a banking crisis, for which it is insignificant. Natural resource intensity negatively and significantly influences export flow at 1% level within countries with low level of banking credit regardless of them facing a banking crisis, and within countries with high and middle levels of banking credit not facing a banking crisis. This variable negatively influences export flow within countries with high level of banking credit facing a banking crisis at 5% level and within countries

with middle level of banking credit facing a banking crisis at 10% level. Income elasticity demand negatively and significantly influences export flow at 1% level within countries with high and low levels of banking credit not facing a banking crisis and significantly influences export flow at 5% level within the remaining groups of countries. Sum of exports from lower middle income countries positively and significantly influences export flow at 1% level within all groups of countries.

## **6 Conclusion**

The positive influence of financial dependence and the negative influence of asset tangibility on the export value indicates that exports are likely to increase with financial dependence of an industry but decrease with its level of asset tangibility. Therefore, industries with more liquidity needs and higher demand for external finance may generate greater export value. This pattern seems to hold for importing partners with developed financial markets, indicated by the high and middle level of banking credit. In financially developed countries, industries with higher financial dependence are likely to grow faster than the industries with lower financial dependence, particularly during the period when the country is not facing an episode of a banking crisis. This relation can explain the effect of industry financial dependence on export flow from Pakistan to financially developed countries. This indicates that the financial market of Pakistan is likely to provide a greater proportion of export value in industries that are more financially dependent in economies where markets are relatively financially developed. However, the negative influence of asset tangibility when the importing country faces a banking crisis points to growth in export value in industries that are likely to have 'soft' information. Lenders are willing to fund borrowers with a lower proportion of tangible assets when the importing country faces a banking crisis as the lack of domestically produced products may increase demand from countries that do not face a banking crisis.

Exporters to the more developed financial markets, as suggested by their OECD membership status, are likely to export in industries that are financially dependent and have higher asset tangibility as they seek access to finance from deeper financial markets. During periods of banking crises, Pakistani exporters have an opportunity to trade with importers in industries with lower asset tangibility as either Pakistani exporters may trade less with importers they believe may have their assets seized during negative financial shock or the Pakistani exporters may fill a vacuum that is a result of the lack of production in industries with lower levels of tangible assets.

I suggest to the policymakers that, given the level of development of the financial market in Pakistan

compared to other developing financial markets, they should promote exports in financially dependent industries as well as in industries with a lower proportion of tangible assets. Pakistani exporters may take advantage of the credit provided by the importers in the developed financial markets as well as in the volatility in their credit markets during the episodes of banking crises. The development of the financial markets can allow for diversification of exports to more trading partners within this group of countries. Therefore, it is highly imperative for Pakistan to promote production in financially dependent industries and improve the level of development of its financial market.

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## Figures and Tables

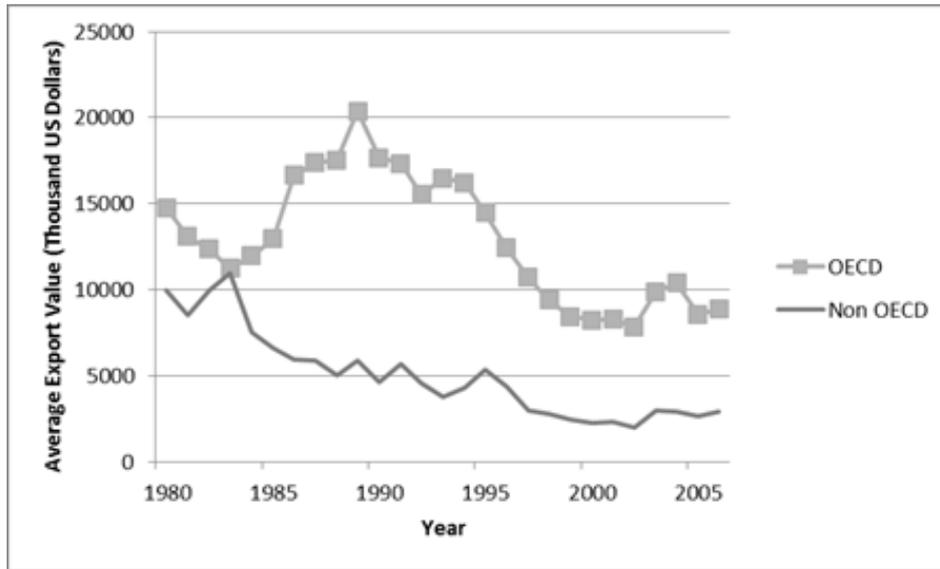


Figure 1: Average Bilateral Export Flow from Pakistan in Each Industry by OECD Membership Status

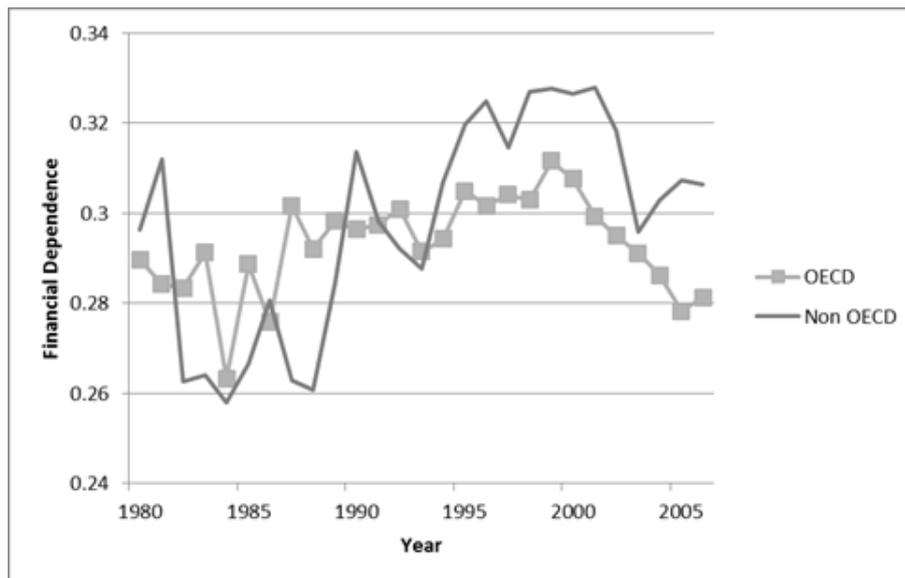


Figure 2: Average Financial Dependence of Exports from Pakistan by OECD Membership Status

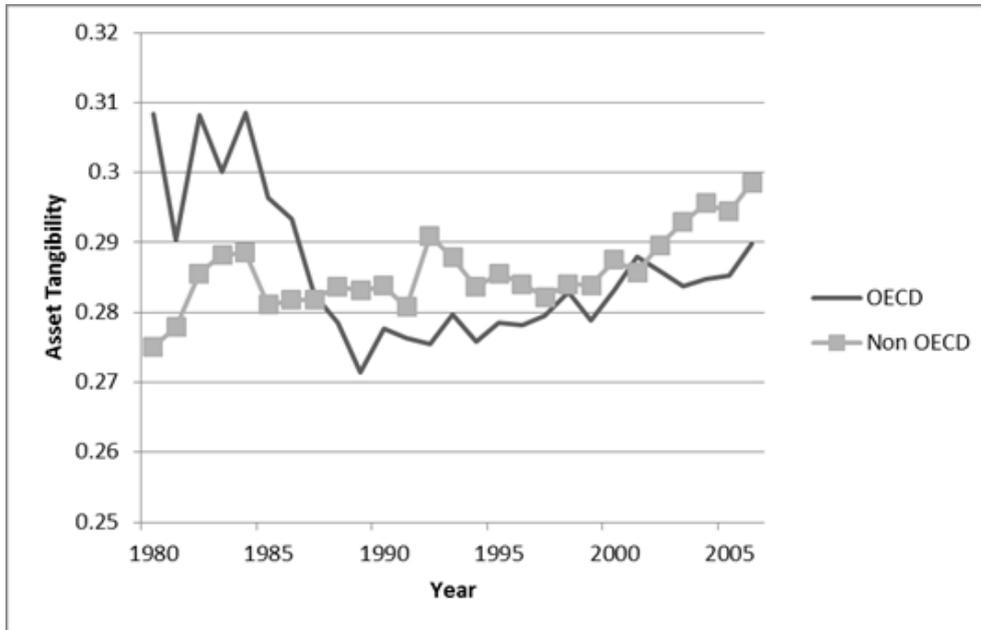


Figure 3: Average Asset Tangibility of Exports from Pakistan by OECD Membership Status

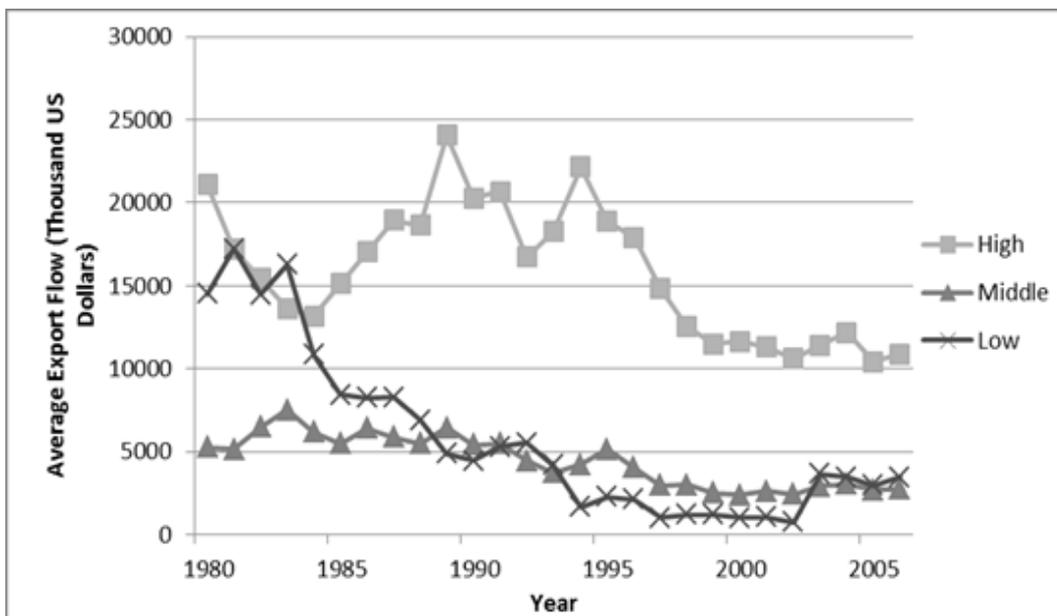


Figure 4: Average Bilateral Export Flow from Pakistan in Each Industry by Level of Banking Credit

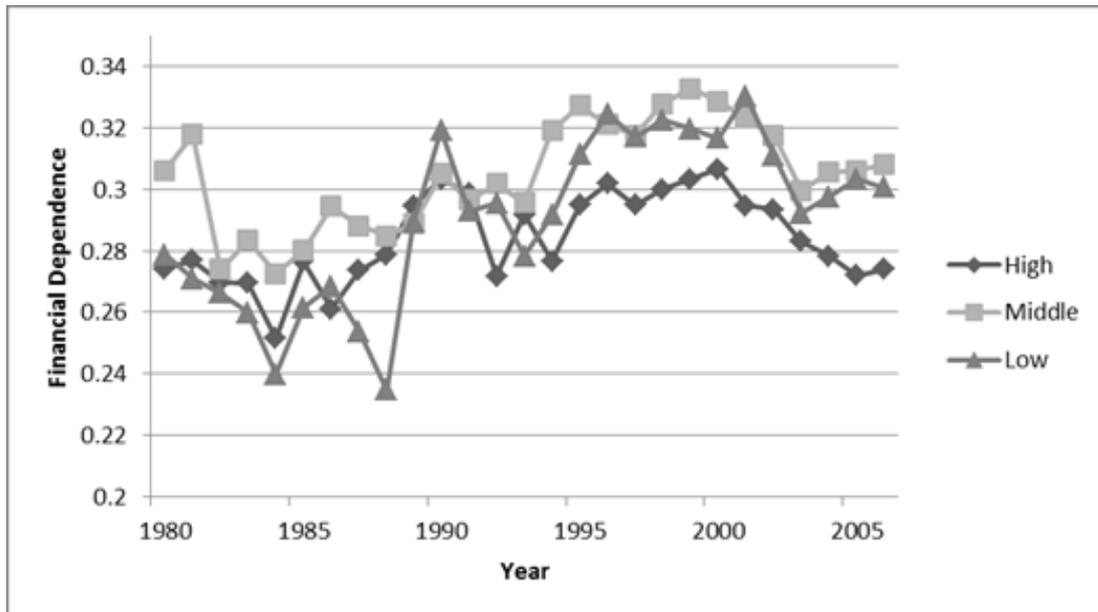


Figure 5: Average Financial Dependence of Exports from Pakistan by Level of Banking Credit

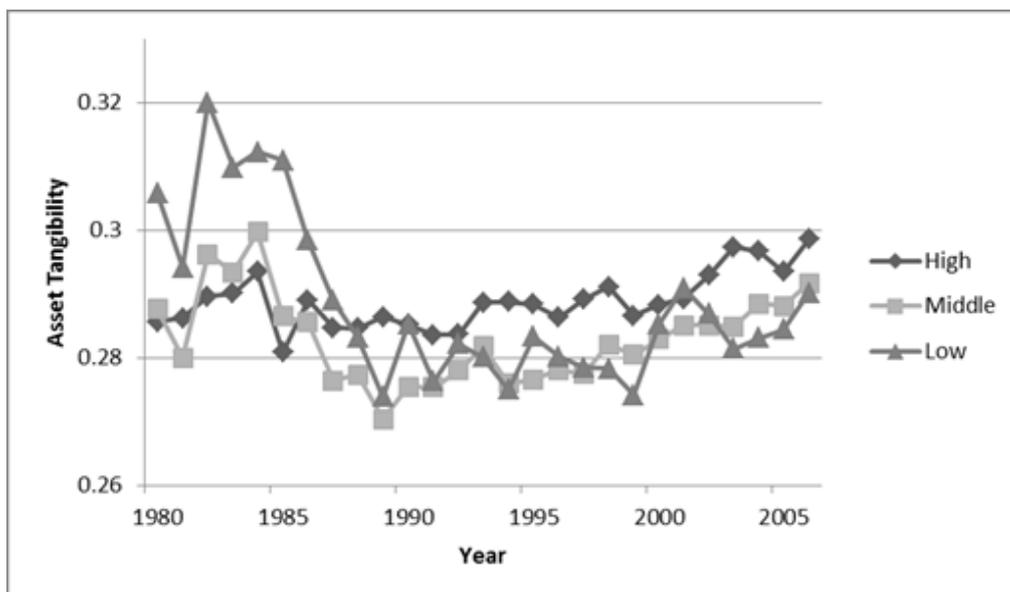


Figure 6: Average Asset Tangibility of Exports from Pakistan by Level of Banking Credit

	Pooled (1)	OECD Member (2)	Non OECD (3)
Dep. Variable: Export Flow (ln)			
Financial Dependence	0.32*** (0.11)	0.36* (0.20)	0.34** (0.13)
Asset Tangibility	-0.42 (0.44)	1.60** (0.61)	-0.87 (0.54)
Contract Intensity	-1.92*** (0.21)	-1.45*** (0.33)	-2.40*** (0.26)
Capital Intensity	-6.58** (2.98)	-22.82*** (4.35)	-1.23 (3.19)
Human Capital Intensity	-1.87*** (0.16)	-1.32*** (0.24)	-1.76*** (0.18)
Natural Resource Intensity	-1.44*** (0.10)	-1.38*** (0.17)	-1.50*** (0.13)
Import Demand Elasticity	-0.09** (0.03)	-0.33*** (0.07)	-0.07** (0.03)
Sum of Exports from Lower Middle Income Economies (ln)	0.67*** (0.04)	0.93*** (0.03)	0.55*** (0.05)
Constant	1.49*** (0.32)	-1.48** (0.58)	2.16*** (0.41)
Observations	31,044	10,452	20,125
R-squared	0.45	0.51	0.41

Robust clustered standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Includes importer and year fixed effects.

Export flow and sum of exports have been adjusted at 2005 CPI

Table 1: The Effects of Financial Characteristics on Export Flow From Pakistan By OECD Membership Status of Importing Countries

	(1)	(2)	(3)
Average Banking Credit Level:	High	Middle	Low
Dep. Variable: Export Flow (ln)			
Financial Dependence	0.02 (0.22)	0.50*** (0.18)	0.16 (0.18)
Asset Tangibility	1.06 (0.80)	-1.14 (0.71)	0.46 (0.79)
Contract Intensity	-1.81*** (0.43)	-2.03*** (0.26)	-2.02*** (0.42)
Capital Intensity	-18.20*** (4.55)	-4.11 (4.92)	-3.37 (4.35)
Human Capital Intensity	-1.20*** (0.16)	-1.97*** (0.24)	-1.87*** (0.30)
Natural Resource Intensity	-1.74*** (0.20)	-1.09*** (0.14)	-1.87*** (0.17)
Import Demand Elasticity	-0.35*** (0.08)	-0.06** (0.03)	-0.24*** (0.08)
Sum of Exports from Lower Middle Income Economies (ln)	0.92*** (0.04)	0.57*** (0.06)	0.64*** (0.06)
Constant	0.42 (0.64)	2.90*** (0.71)	2.43*** (0.56)
Observations	8,289	14,966	7,299
R-squared	0.51	0.37	0.51

Robust clustered standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Includes importer and year fixed effects.

Export flow and sum of exports have been adjusted at 2005 CPI

High is Greater than 75th percentile, Middle is between 75th and 25th percentile and Low is less than 25th percentile of average banking credit

Table 2: The Effects of Financial Characteristics on Export Flow From Pakistan By Banking Credit of Importing Countries

	(1)	(2)	(3)	(4)	(5)	(6)
	Pooled		OECD Member		Non OECD	
Banking Crisis:	No	Yes	No	Yes	No	Yes
Dep. Variable: Export Flow (ln)						
Financial Dependence	0.32*** (0.11)	0.40 (0.32)	0.43** (0.19)	-0.62 (0.50)	0.32** (0.13)	0.76** (0.37)
Asset Tangibility	-0.24 (0.43)	-3.70*** (1.15)	1.78*** (0.61)	-1.16 (1.44)	-0.65 (0.53)	-4.77*** (1.44)
Contract Intensity	-1.89*** (0.21)	-2.89*** (0.57)	-1.50*** (0.33)	-0.55 (0.76)	-2.32*** (0.26)	-3.92*** (0.61)
Capital Intensity	-7.00** (2.98)	-5.15 (6.17)	-23.84*** (4.06)	-6.97 (10.17)	-1.43 (3.20)	-2.84 (7.28)
Human Capital Intensity	-1.83*** (0.15)	-1.98*** (0.32)	-1.25*** (0.24)	-2.42*** (0.62)	-1.73*** (0.18)	-1.70*** (0.35)
Natural Resource Intensity	-1.47*** (0.10)	-0.86*** (0.26)	-1.41*** (0.16)	-0.77 (0.58)	-1.52*** (0.13)	-0.95*** (0.27)
Import Demand Elasticity	-0.08** (0.03)	-0.76*** (0.20)	-0.30*** (0.06)	-0.69* (0.33)	-0.07** (0.03)	-0.74*** (0.25)
Sum of Exports from Lower Middle Income Countries	0.69*** (0.04)	0.53*** (0.06)	0.95*** (0.03)	0.77*** (0.07)	0.56*** (0.05)	0.45*** (0.06)
Constant	1.31*** (0.32)	2.68** (1.24)	-1.15* (0.60)	2.84** (1.07)	2.80*** (0.56)	4.89*** (1.12)
Observations	29,022	2,022	9,884	568	18,676	1,449
R-squared	0.46	0.38	0.52	0.44	0.42	0.37

Robust clustered standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Includes importer and year fixed effects

Export flow and sum of exports have been adjusted to 2005 CPI

Table 3: The Effects of Financial Characteristics on Export Flow From Pakistan By OECD Membership Status and Banking Crisis of Importing Countries

	(1)	(2)	(3)	(4)	(5)	(6)
Average Banking Credit Level:	High		Middle		Low	
Banking Crisis:	No	Yes	No	Yes	No	Yes
Dep. Variable: Export Flow (ln)						
Financial Dependence	0.06 (0.20)	-0.36 (0.83)	0.51*** (0.18)	0.50 (0.40)	0.15 (0.18)	0.69 (0.46)
Asset Tangibility	1.27 (0.79)	-3.21* (1.68)	-0.95 (0.71)	-3.70** (1.63)	0.54 (0.77)	-1.64 (3.58)
Contract Intensity	-1.73*** (0.42)	-3.49* (1.71)	-2.03*** (0.27)	-2.65*** (0.60)	-2.02*** (0.42)	-2.49** (1.20)
Capital Intensity	-19.01*** (4.38)	-4.95 (6.68)	-4.50 (4.99)	-4.93 (8.71)	-3.43 (4.30)	-17.52 (16.23)
Human Capital Intensity	-1.14*** (0.17)	-2.08*** (0.41)	-1.92*** (0.24)	-2.11*** (0.43)	-1.86*** (0.30)	-0.79 (0.89)
Natural Resource Intensity	-1.77*** (0.20)	-1.18** (0.48)	-1.10*** (0.14)	-0.67* (0.37)	-1.88*** (0.16)	-2.10*** (0.61)
Import Demand Elasticity	-0.31*** (0.09)	-0.86** (0.31)	-0.06** (0.03)	-0.72** (0.29)	-0.23*** (0.07)	-1.10** (0.53)
Sum of Exports from Lower Middle Income Economies (ln)	0.93*** (0.04)	0.74*** (0.06)	0.58*** (0.06)	0.49*** (0.08)	0.65*** (0.05)	0.51*** (0.10)
Constant	0.15 (0.57)	3.24* (1.47)	2.63*** (0.71)	2.87** (1.18)	1.98*** (0.59)	5.32*** (1.04)
Observations	7,862	427	13,686	1,280	6,984	315
R-squared	0.51	0.48	0.38	0.34	0.52	0.44

Robust clustered standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Includes importer and year fixed effects.

Export flow and sum of exports have been adjusted at 2005 CPI

High is Greater than 75th percentile, Middle is between 75th and 25th percentile

and Low is less than 25th percentile of average banking credit

Table 4: The Effects of Financial Characteristics on Export Flow From Pakistan By Banking Credit and Banking Crisis of Importing Countries

## Appendix A

<b>Description of Variables</b>			
<b>Variable</b>	<b>Definition</b>	<b>Source</b>	
Export Flow	Bilateral Export Flow at 3 digit ISIC level	De Sousa et al. (2012)	
Financial Dependence	Ratio of capital expenditures less cash flow from operations to capital expenditures for a median firm in an industry	Manova (2008)	
Asset Tangibility	Ratio of net property, plant and equipment to total book value of assets for a median firm in an industry	Manova (2008)	
Contract Intensity	Fraction of inputs neither sold on an exchange nor reference priced	Nunn (2007)	
Capital Intensity	Median of gross capital formation to value added ratio for each industry	Braun (2003)	
Human Capital Intensity	Industry's mean wage over that of the whole manufacturing sector	Braun (2003)	
Natural Resource Intensity	If industry includes the use of minerals and fossil fuels, timber, non-timber forest benefits, cropland, and pastureland as main input	Braun (2003)	
Import Demand Elasticity	Constructed with a GDP function, using import and domestic prices of $n$ good and import shares of $n$ good in GDP.	Nicita and Olarreaga (2006) and Kee et al. (2004)	
Sum of Exports From Lower Middle Income Countries	Sum of Bilateral Export Flow at 3 digit ISIC level from Lower Middle Income Countries	De Sousa et al. (2012)	
Banking Credit	Domestic credit by banking sector (% of GDP) to all sectors except central govt	World Development Indicators (2012)	
Banking Crisis	Two conditions need to be met: a) Significant signs of distress in the banking system through bank runs, liquidation and losses and b) Significant policy intervention in response to the distress.	Laeven and Valencia (2010)	
<p>Note: Financial dependence, asset tangibility, capital intensity, human capital intensity and natural resource intensity are defined at 3 digit ISIC Rev 2 and are borrowed from US data.</p>			

### Appendix A: Description of Variables

## **Appendix B**

**Appendix B.1: OECD Member Countries:** Australia, Austria, Belgium-Luxemburg, Canada, Czech Republic (member since 1995), Denmark, Finland, France, Germany, Greece, Hungary (member since 1996), Iceland, Ireland, Italy, Japan, Mexico (member since 1994), Netherlands, New Zealand, Norway, Poland (member since 1996), Portugal, Republic of Korea (member since 1996), Slovakia (member since 2000), Spain, Sweden, Switzerland, Turkey, United Kingdom

**List of Lower Middle Income Countries (as defined by the World Bank):** Albania, Armenia, Belize, Bhutan, Bolivia, Cameroon, Cape Verde, Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., El Salvador, Fiji, Georgia, Ghana, Guatemala, Guyana, Honduras, India, Indonesia, Iraq, Kiribati, Kosovo, Lao PDR, Lesotho, Marshall Islands, Micronesia, Fed. Sts., Moldova, Mongolia, Morocco, Nicaragua, Nigeria, Pakistan, Papua New Guinea, Paraguay, Philippines, Samoa, Sao Tome and Principe, Senegal, Solomon Islands, Sri Lanka, Sudan, Swaziland, Syrian Arab Republic, Timor-Leste, Tonga, Ukraine, Uzbekistan, Vanuatu, Vietnam, West Bank and Gaza, Yemen, Rep., Zambia.

**Appendix B.2: Sorting Countries According to Average Level of Banking Credit from 1980 to 2006.**(High is greater than 75th percentile, Middle is between 25th and 75th percentile and Low is less than or equal to 25th percentile).

**High Level of Banking Credit Countries:** Austria, Canada, China, Cyprus, Eritrea, France, Germany, Guyana, Hong Kong, Japan, Lebanon, Liberia, Malaysia, Malta, Netherlands, Portugal, Saint Kitts and Nevis, South Africa, Spain, Sweden, Switzerland, Thailand, United Kingdom

**Middle Level of Banking Credit Countries:** Albania, Algeria, Argentina, Aruba, Australia, Bahamas, Bangladesh, Barbados, Belgium-Luxemburg, Belize, Bolivia, Bosnia and Herzegovina, Brazil, Bulgaria, Cape Verde, Chile, Colombia, Costa Rica, Croatia, Czech Republic, Djibouti, Denmark, Dominican Republic, Egypt, El Salvador, Estonia, Ethiopia, Fiji, Finland, Greece, Grenada, Haiti, Honduras, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Jamaica, Jordan, Kenya, Kuwait, Latvia, Macao, Maldives, Mauritania, Mauritius, Mexico, Moldova, Morocco, Myanmar, Nepal, New Zealand, Nicaragua, Norway, Panama, Philippines, Poland, Republic of Korea, Qatar, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, Slovak Republic, Slovenia, Sri Lanka, Syria, Trinidad and Tobago, Tonga, Tunisia, Turkey, Uruguay, Vietnam, Vanuatu, Zambia, Zimbabwe

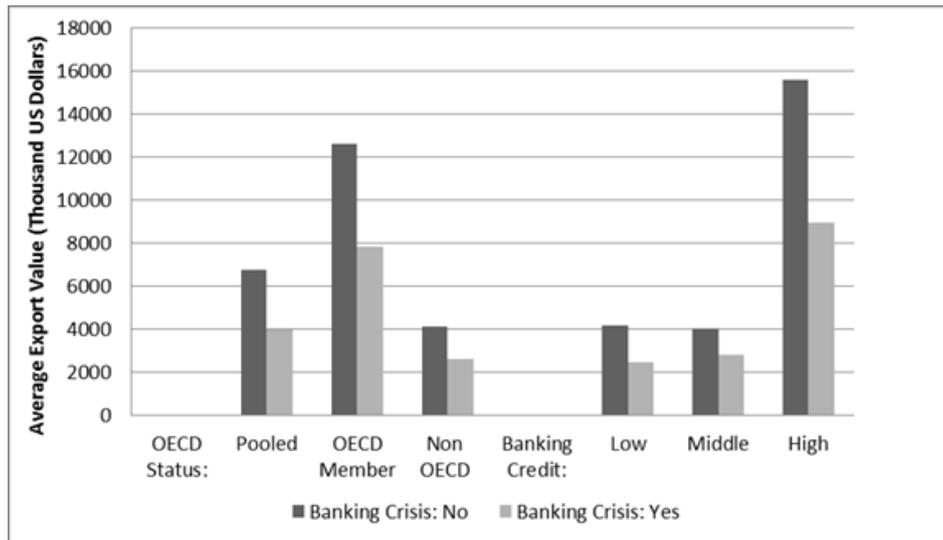
**Low Level of Banking Credit Countries:** Afghanistan, Angola, Armenia, Azerbaijan, Bahrain, Belarus, Benin, Bhutan, Brunei Darussalam, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Comoros, Cote D' Ivoire, Dem. Republic of Congo, Ecuador, Equatorial Guinea, Fed. States of Micronesia, Gabon, Gambia, Georgia, Ghana, Guinea, Guinea-Bissau, Iraq, Kazakhstan, Kyrgyz Republic, Laos, Libya, Lithuania, Macedonia, Madagascar, Malawi, Mali, Mongolia, Mozambique, Niger, Nigeria, Oman, Papua New Guinea, Paraguay, Peru, Republic of Congo, Romania, Russia, Rwanda, Samoa, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Solomon Islands, Sudan, Tajikistan, Tanzania, Timor Portuguese, Togo, Turkmenistan, Uganda, Ukraine, United Arab Emirates, Venezuela, Yemen

## Appendix C

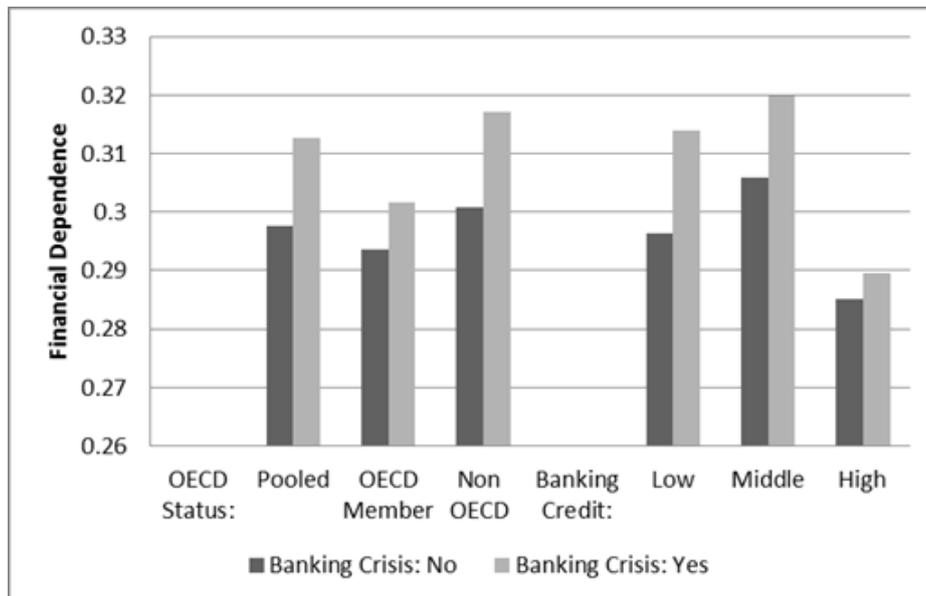
Ranking of Cumulative Bilateral Exports From Pakistan By Industry (1980-2006)					
Adjusted for 2005 CPI					
Ranking	ISIC Rev 2	Sector Description	Ranking	ISIC Rev 2	Sector Description
1	321	Manufacture of textiles	14	369	Manufacture of other non-metallic mineral products
2	322	Manufacture of wearing apparel, except footwear	15	383	Manufacture of electrical machinery apparatus, appliances and supplies
3	311	Food manufacturing	16	372	Non-ferrous metal basic industries
4	323	Manufacture of leather and products of leather	17	356	Manufacture of plastic products not elsewhere classified
5	353	Petroleum refineries	18	313	Beverage industries
6	351	Manufacture of industrial chemicals	19	314	Tobacco manufactures
7	384	Manufacture of transport equipment	20	355	Manufacture of rubber products
8	385	Manufacture of professional and scientific equipment	21	342	Printing, publishing and allied industries
9	324	Manufacture of footwear	22	341	Manufacture of paper and paper products
10	382	Manufacture of machinery except electrical	23	362	Manufacture of glass and glass products
11	381	Manufacture of fabricated metal products	24	361	Manufacture of pottery, china and earthenware
12	352	Manufacture of other chemical products	25	332	Manufacture of furniture and fixtures
13	371	Iron and steel basic industries	26	331	Manufacture of wood and wood and cork products

Appendix C: Ranking of Cumulative Bilateral Exports From Pakistan (1980-2006)

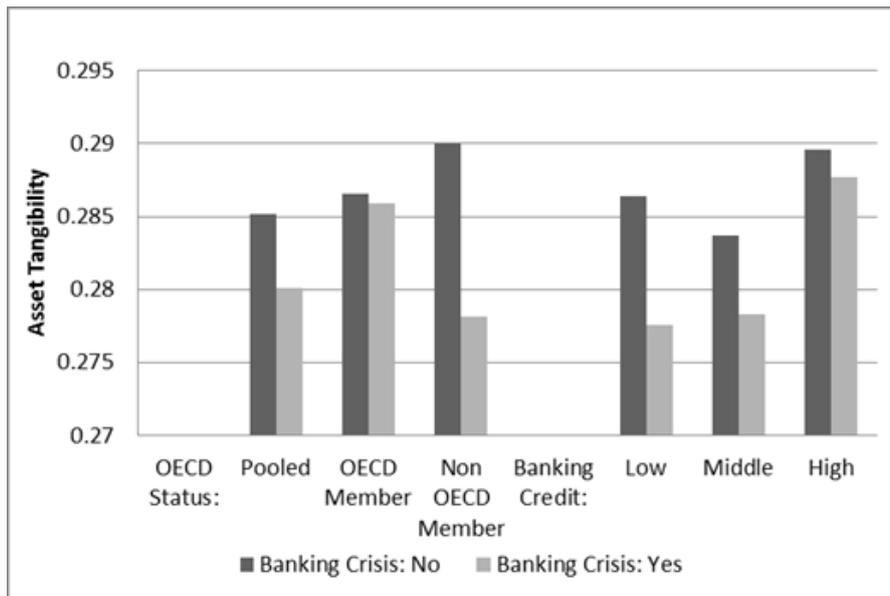
## Appendix D



Appendix D.1: Export Flow and Banking Crisis Status of Importing Countries



Appendix D.2: Industry Financial Dependence of Exports and Banking Crisis Status of Importing Countries



Appendix D.3: Industry Asset Tangibility of Exports and Banking Crisis Status of Importing Countries