Essays on Firms, Banks, and Access to Finance

by

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Abstract

This thesis is a collection of three empirical essays on firms, banks, and access to finance.

Chapter 1 provides evidence that credit subsidies for exports are substantially misallocated towards financially unconstrained firms. Using loan level data for firms and exploiting an exogenous change in loan eligibility, I show that publicly listed firms are financially unconstrained, and are also allocated nearly 44% of all subsidized loans. The opportunity cost of these misallocated funds is significant as even the more productive privately held firms are shown to be financially constrained.

Chapter 2 studies the role of banks in the transmission of financial flows to the economy. Exploiting a large and unexpected liquidity upsurge in an emerging economy, the chapter examines changes in bank lending behavior and finds very stark results. Bank lending to firms did not increase despite a substantial drop in the cost of capital. The results suggest that banks may be limited in their ability to extend credit due to severe agency problems.

Chapter 3 analyzes changes in firm ownership structure that may be caused by the level and ease of obtaining outside financing. I combine a sector-specific financial shock with detailed data on the board of directors of firms and find that private firms that are adversely affected by the financial shock are more likely to have group-affiliated directors take positions on their boards. I also find that private firms that do not get a group director are significantly likely to acquire cross-holdings in other private firms, thus integrating horizontally.

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To Seemeen and Imaan

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Contents

CHAPTER 1

Financial Constraints and the (Mis)Allocation of Subsidized Credit: Evidence from Export Loans

Summary 1

The provision of subsidized credit to domestic firms is an important policy goal for many governments, especially in emerging market economies. This paper uses unique loan-level data from the exports sector in Pakistan to study the causal impact of credit subsidies on the real outcomes of firms. Exploiting an exogenous change in loan eligibility, the paper shows that removal of subsidized credit leads to a 29% relative decline in firm exports, but that this effect is heterogeneous across different types of firms – exports of large, publicly listed firms and corporate group firms are unresponsive to the subsidy exclusion, while those of privately owned firms are highly responsive. Publicly listed firms make no significant adjustments to assets, equity, capital structure, or long-term investments, and only their profits are reduced. These results persist over the long-term, indicating that these firms are financially unconstrained. Nearly 44% of all subsidized loans prior to the policy change are assigned to publicly listed firms, which implies a substantial misallocation of credit. The opportunity cost of these misallocated funds is significant as even the more productive private firms are financially constrained. The paper also shows that productivity differences between private and publicly listed firms cannot explain the heterogeneous response across firms.

I. Introduction

The provision of subsidized credit to domestic firms is an important policy goal for many governments around the world. One of the main justifications for these subsidies is that they help local industries overcome financial market failures, especially in emerging market economies where such market imperfections are common. Yet, there is little empirical evidence showing how effective these subsidies are in improving the real outcomes of firms, or how efficiently these subsidies are allocated across targeted firms – that is, are more financially constrained firms allocated a greater share of credit?

Credit subsidies for firms operating in export markets are particularly widespread.[1] The "miracle" growth of East Asian economies is often attributed to the extremely rapid export expansion achieved by these countries, which was accompanied by significant government involvement in supporting exports.[2] Some free-trade advocates, however, question the contribution that export subsidies made in improving the output of East Asian firms, and argue that the dramatic increase in exports was realized primarily because of favorable macroeconomic conditions, stable exchange rates, and a strong physical infrastructure (Panagariya, 2000; Little, 1996). Measuring the direct effects of subsidies on firm-level outcomes is hampered by such identification concerns, and rigorous empirical work on this question is lacking. The literature on exporting sectors instead focuses on the broader question of whether export subsidies enhance economic welfare, and provides inconclusive theoretical predictions in terms of cross-country macro gains and losses.[3]

This paper estimates the causal impact of credit subsidies on the real outcomes of exporting firms. This estimation is made possible by using a unique export loan and output dataset from Pakistan for a panel of five years. The Central Bank of Pakistan provides subsidized loans through the commercial banking sector to domestic firms that export an eligible set of commodities. I exploit an exogenous change in eligibility that resulted in the subsidies being

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[1] Banerjee and Newman (2004) incorporate credit market imperfections into a model of international trade and argue that if poor credit markets are what hold back resource reallocation, then providing capital subsidies to exporting sectors can enhance export growth.

[2] Government support for exporters in East Asia was not restricted to credit subsidies. For instance, Singapore and Taipei pursued policies of import substitution along with export credit, while Malaysia established duty-free export processing zones for its local exporters.

[3] Brander and Spencer (1985) argue that under certain market structure conditions export subsidies can enhance international market share and improve domestic welfare. Bagwell and Staiger (1989) suggest that these subsidies can help firms signal their product quality to foreign markets. Conversely, Bhagwati (1988, 1996) and Grossman (1986) argue that export subsidies cause large welfare distortions in the domestic economy.

discontinued for a specific commodity (*i.e.*, cotton yarn), and compare outcomes before and after the policy change for yarn and non-yarn textile firms. The results show a large and statistically significant effect of the removal of export credit subsidies on yarn firms: following the policy change, these firms are unable to replace their subsidized credit with market-rate loans, and their exports fall sharply.

Although the average effects on yarn firms are large and statistically significant, there is considerable heterogeneity in these effects across different types of firms. In particular, the total loans and exports of large, publicly listed firms and corporate group firms are unaffected by the removal of credit subsidies, while those of privately owned firms are significantly affected. The analysis presented in this paper suggests that these differences arise because privately owned firms are financially constrained by banks, while publicly listed firms and corporate group firms are unconstrained. The identification of financial constraints comes from exploiting the shock to the supply of subsidized credit, which as the paper shows, is uncorrelated with the export performance of yarn firms. This strategy avoids the typical problems associated with using cash-flow shocks to identify financing rigidities, as cash flow changes are likely correlated with the investment opportunities of firms.[4]

If some firms are financially constrained and others are not, then the effectiveness of the subsidized credit scheme depends on whether the subsidies go to the right firms. This paper provides evidence that credit subsidies in Pakistan are substantially misallocated. I show that nearly half of the subsidized credit prior to the policy change is assigned to firms that do not need it, that is, the unconstrained firms. At the same time, I show that there is a large majority of privately owned firms that are financially constrained, in the sense that their exports are highly sensitive to the removal of subsidized credit. In addition, among this latter group, even the more productive firms are financially constrained, which indicates that the opportunity cost of the misallocated funds is significant.

The misallocation argument is further strengthened by observing balance sheet changes for publicly listed firms. The results show that the additional cost of financing after the removal of credit subsidies is fully absorbed in the "interest expenses" entry in the profit and loss accounts of these firms. Moreover, there is no significant change in assets, capital structure, long-term

[4] The literature on investment-cash flow sensitivities is large. See Fazzari, Hubbard, and Petersen (1988) for an introduction; Poterba (1988) and Kaplan and Zingales (1997, 2000) for a critique.

investments, or total sales, rather only an adjustment in profits. Direct calculations show that the magnitude of the decline in profits matches almost one-to-one with the increase in borrowing costs. These findings suggest that the subsidies simply provided the publicly listed firms with an opportunity to earn windfall profits. Hence, not only are publicly listed yarn firms financially unconstrained, but the incentives from export subsidies are *infra-marginal* for these firms – that is, they would have borrowed the same amount irrespective of the credit subsidies.

This paper argues that the exports of privately owned firms decline sharply because they are more financially constrained than others. An alternative interpretation of these results is that privately owned firms are simply less productive than other firms, and that exporting is not feasible without subsidized credit. Indeed, Bhagwati (1996) and others have argued that export subsidies are economically wasteful because they aid in the preservation of such "low-quality" firms. Recent trade literature, following Melitz (2003), also argues that productivity differences across firms influence the extensive margin of trade. This paper, however, provides evidence against this alternative interpretation. First, prior to the change in subsidy policy, more than 95% of firms in the dataset (private, listed, and group) supplement their subsidized credit with some borrowing at regular market rates from banks. This implies that the marginal product curve for these firms lies above the market lending rate, and that exporting is still feasible after the subsidies are removed. Second, the paper directly tests whether productivity differences matter and does not find evidence that less productive firms are differentially more affected by the removal of subsidies – that is, the regression coefficient of the interaction between the main effect and productivity is very close to zero and statistically not significant.

The results of this paper provide some useful policy implications for the design of export credit schemes in general. While the paper shows that export subsidies help alleviate credit constraints, it also shows that a substantial proportion of these subsidies are allocated to financially unconstrained firms. The paper distinguishes which types of firms are unconstrained, and hence the most important policy implication it provides is that the misallocation of credit is identifiable.

This paper is organized as follows. The next section describes the export subsidy scheme in Pakistan, its institutional environment, and the policy change. Section III explains the data, and Section IV outlines the conceptual framework, identification strategy, and empirical

specifications. Sections V and VI present results of the empirical analysis. Section VII performs a series of robustness checks, and Section VIII concludes.

II. Institutional Setting and Policy Change Details

A. The Textile Export Sector in Pakistan

The textile industry in Pakistan presents a particularly relevant setting in which to study the effects of export credit subsidies. The exporting sector of the country is dominated by the textile industry, which accounts for 67% of Pakistan's total exports (SBP Annual Report, 2003). These exporters are price-takers on the international market,[5] which allows the quantity effects of subsidy provision to be identified independent of changes in price. In addition, firms within the textile industry are heavily export-oriented with more than 70% of industry production sold overseas.

A large proportion of these textile exports are supported by government loan subsidies provided under the Export Finance Scheme (EFS). As Table I shows, exports under EFS account for 38% of country-wide exports and 42% of total exports in the textile sector. Hence, the textile sector accounts for the majority of Pakistan's exports and is also the main beneficiary of the government-sponsored subsidy scheme.

B. The Credit Subsidy Scheme in Detail

The Government of Pakistan sponsors and operates the Export Finance Scheme (EFS) through the State Bank of Pakistan (SBP), which is the central bank of the country. The scheme has been operational since 1973 and provides working capital loans to exporters of eligible commodities at subsidized interest rates. The scheme works entirely through the formal banking sector, and banks earn a fixed 1.5% spread on the loans that they provide under EFS. All banks in Pakistan face the same regulatory environment, which allows the SBP to operate EFS through the entire commercial banking sector of the country.[6]

Credit provided under EFS comprises short-term working capital loans with a maturity of 180 days. Commercial banks extend credit to firms and then receive refinancing from the SBP, which also monitors and regulates the entire scheme. An original export order is required before

[5] Pakistani Textiles have a 2% share in the global market.

[6] As of June 2003, there were 6 government-owned, 24 foreign, and 12 private domestic commercial banks in Pakistan, all of which participated in EFS.

a loan can be approved, and copies of this document are forwarded to the regional SBP field offices at loan signing. At the time of loan repayment, firms are required to submit their sales invoice along with shipping documents and a customs appraisal letter. Details provided in these documents are matched with the original export order, and copies are then forwarded to the SBP.[7] Fines are imposed by the SBP if firms fail to provide shipping documents, even if they are able to repay their loan amounts. Firms with overdue fines are barred from further EFS borrowing until their fine balances are cleared. The imposition of fines, however, is quite rare – as summary statistics in Table II (b) show, a fine for late submission is imposed on less than 3% of all EFS loans, whereas complete non-submission occurs in less than 0.5% of loans.

There is a limit on how much EFS credit any single firm can receive in a year, dependent on its market valuation. Specifically, private firms are allowed to borrow up to 5 times their capital and reserves, and publicly listed firms 2 times their capital and reserves. The motivation for these different limits is that publicly listed firms have access to other forms of financing such as share-holder equity that are not available to private firms. In addition, each bank is assigned a sanctioned limit by the SBP based on the size of its equity and reserves, which indicates the maximum amount of EFS credit it can extend.[8]

The size of the EFS subsidy on average is 6 percentage points (*i.e.*, market rate - EFS rate = 6%), though in recent years it has been much lower. This subsidized rate of interest, by EFS rules, is consistent across all banks and firms. Figure I plots the time-series trend in EFS rate against the market lending rate and the 6-monthly Treasury-bill (T-bill) rate. Up until very recently, the EFS lending rate was set on an *ad-hoc* basis, with some functional relationship to the T-bill rate. Starting in June 2002, however, under pressure from the International Monetary Fund (IMF) to implement more market-oriented policies, the EFS rate was strictly pegged a few basis points above the T-bill rate.

C. Policy Change Details

Access to EFS loans is not open to all firms. Specifically, SBP maintains a *negative list* of products not eligible for subsidized loans. The range of items on this list is quite diverse, from

[7] If the shipping date provided in the original export order is beyond the 180 day loan term, then firms are required to submit the shipping documents within 30 days of that date.

[8] Bank refers to all bank branches in sum. The head-office of each bank provides SBP a schedule of disbursement that details how much EFS credit each branch is assigned.

petroleum products and crude minerals to animal hides and fur skins. Interviews with SBP officials indicate that the motivation for the negative list is to encourage the export of finished goods rather than basic raw materials.

A major change in the EFS eligibility criteria was announced by SBP in late 2000 and came into effect in June, 2001. Specifically, in an attempt to focus more on value-added goods, the SBP decided to exclude the export of cotton yarn from EFS and added it to the negative list. At the time of the policy change, yarn spinners occupied a very large fraction of the EFS-supported textile industry – pre-period loans to yarn spinners comprised on average 30% of all EFS loans to the textile sector. The policy change was announced, retracted, and a revised version issued through a series of SBP circulars from June to December, 2000. The initial version called for an immediate cessation of loans for yarn while the revised version, issued very soon afterwards, allowed the EFS facility to continue until the end of the fiscal year. The data clearly shows that EFS loans for yarn exports cease abruptly in June, 2001.

The empirical analysis presented in this paper relies on the identification assumption that the EFS policy change was uncorrelated with prior export performance of yarn firms. It is, therefore, important to understand the government's motivation for the change in EFS policy. In particular, the subsidies could have been discontinued precisely because of poor export growth of the yarn sector, which would imply that the policy change was not exogenous to prior firm performance. However, I show later in the paper that this was not the case – that is, the growth trend of yarn exports prior to the policy change was very similar to that of non-yarn exports.

III. Data and Summary Statistics

This paper brings together three original datasets, two of which were collected specifically for this research. The first has detailed loan-level credit and output information for all exporting firms operating under the umbrella of EFS from June, 1998 to June, 2003. The second dataset provides similar detailed loan-level information for total corporate loans given out by banks in all of Pakistan for the same sample period. Finally, the third dataset consists of detailed annual accounts for all publicly listed firms in Pakistan for the sample period of interest.

A. Exports Database

The loan-level export database used in this paper provides detailed loan and export output information for all firms (publicly listed and private) borrowing under EFS. Each row in the

database corresponds to a firm-loan entry. For each of these entries, the dataset provides information on exporter name and location, importer name and location, exporter industry and commodity type, loan amount, export amount, and default amount, if any. Overall, the dataset is a panel from 1998 to 2003, comprising 97,937 unique loans given to 3,122 unique firms over the 5-year period. The textile sector received 50,661 of these loans, and the sector comprised 1,120 firms. This data constitutes the entire universe of EFS loans and corresponding exports for the given period.[9]

As discussed earlier, yarn exporters have been excluded from EFS since June, 2001. Since the export data is only for firms operating within the scheme, these firms disappear from the dataset after this date. However, data on total exports for yarn and non-yarn textile firms was collected from commercial banks for the period June, 2000 to June, 2003. Due to less stringent reporting requirements prior to 2000, this data was not available for earlier years.

Tables II (a) and II (b) present summary statistics for several loan-level variables from the EFS data. These include pre-period averaged loan amounts, export valuations, and net fines imposed for late submission of shipping documents. The figures are reported for all firms and also separately for yarn and other textiles. Table II (b) shows that the average loan amounts for yarn are on average much larger than those for other textiles, and correspondingly, average exports per loan are also greater for yarn.

B. Total Loans Database

The total loans database, like the EFS data, is provided by the SBP and is unique both in terms of its coverage and detail. It contains yearly information on the entire universe of total corporate bank loans outstanding in Pakistan for the 5-year panel from 1998 to 2003. The data is at the level of bank, borrowing firm, and year, and traces the history of lending with information on the amount of loan and interest outstanding, type of loan (working capital, fixed investment, or other), and any defaults on these loans. In addition, this data provides information on group affiliation of firms and the size of these groups. Since the empirical strategy used in this paper does not exploit differences across banks but rather differences across firms, the total borrowing and other variables of interest are aggregated to the level of the firm. Firm-level variables

[9] Although all available data was extracted from SBP record rooms, some of the earlier year files could not be located. The unbalanced nature of the panel, however, does not differentially affect any particular group of firms.

provided in this dataset are matched with EFS firms to create a unified panel spanning 5 years.[10] Panel A of Table III shows brief summary statistics on total loans and default rates, restricted to the subset of EFS matched firms. The default rate on loans to exporters is fairly low, with the 75th percentile corresponding to a firm with zero default.

C. Corporate Sector Financial Accounts

While the EFS and total lending databases provide detailed loan and output information, they do not contain any firm-level attributes such as size of assets, equity, total sales, or trade credit. This paper supplements these two datasets with corporate annual accounts data obtained directly from the Securities and Exchange Commission of Pakistan (SECP). This database consists of audited financial accounts for all publicly listed companies for a panel of over 10 years, starting in 1990. These firms are required by law to file their annual reports with the SECP.

Firms in this dataset are matched with their EFS and total loan information to create a firm-level dataset with exports, total loans, assets, and liabilities for all publicly listed firms borrowing under EFS. Panel B of Table III presents summary statistics for some borrowing firm attributes from the corporate financial accounts data.

IV. Conceptual Framework and Identification

A. Productivity Differences or Credit Constraints?

A large body of trade literature has shown that exporting firms perform better than non-exporting firms. They are consistently larger, more productive, more capital-intensive, and pay higher wages.[11] Bernard and Jensen (1999a), (2001), and Clerides, Lach, and Tybout (1998) find evidence that more productive firms self-select into export markets. Part of the reason why we observe this consistent pattern across countries is that entering and operating in export markets requires firms to undertake large fixed costs, and only the more productive firms are able to

[10] A name-matching algorithm was used to match firms across the two datasets. This was followed by a series of manual cross checks to ensure that the match was correct. 90% of EFS firms were successfully matched.

[11] See Bernard and Jensen (1995), (1999a), (1999b) and Richardson and Rindal (1995) for evidence on US firms; Bernard and Wagner (1998) on German firms; Aw and Hwang (1995) and Aw, Chung, and Roberts (2000) for Taiwanese and South Korean firms; and Clerides, Lach, and Tybout (1998) for Columbian, Mexican, and Moroccan firms.

cover these costs and still remain profitable.[12] Melitz (2003) uses these empirical findings to motivate a model of trade with firm heterogeneity, where the fixed costs of exporting directly influence the extensive margin of trade. Under these conditions, export subsidies that reduce production costs will allow some relatively unproductive firms to enter export markets that otherwise would not find it profitable to do so. Removing subsidies will induce these same firms to exit. Hence, fixed costs and productivity differences can explain why the response to removal of export subsidies may be heterogeneous across firms.

However, an implicit assumption underlying this literature is that firms are uniformly unconstrained in their access to capital, and that any differences in marginal costs are due to differences in production technology. This is a very strong assumption, especially in the context of developing countries where many firms are credit rationed despite having very profitable projects. Chaney (2005) incorporates credit constraints into Melitz's model and argues that these constraints prevent even some of the profitable firms from entering export markets.[13]

The theoretical foundation for the existence of lending limits is well-established. Starting from Stiglitz and Weiss (1981) who demonstrate that credit may be rationed in equilibrium, theories of banking with asymmetric information can explain why credit constraints may affect some firms more than others. Specifically, if banks face information asymmetries when lending to firms, then the level of the interest rates charged has direct implications for the riskiness of loans. A higher interest rate may induce only firms with riskier project to demand loans (adverse selection). These firms are willing to pay high interest rates because they perceive their probability of repaying the loan to be low. Similarly, a higher interest rate reduces payoffs for firms and may induce mangers to undertake riskier projects that will yield high payoffs if successful (moral hazard). Hence, once the subsidies are removed, banks will be willing to lend at higher market rates only to firms that can credibly signal their good type or ones that can provide loan assurances. For instance, firms with verifiable performance indicators such as audited accounts or stock market listings can provide banks with an observable performance history that can signal their good type. In addition, firms that can offer significant collateral or

[12] These fixed costs include the cost of learning foreign regulatory environments, and establishing and maintaining shipping and distributional channels. Das, Roberts, and Tybout (2004) estimate the initial export market entry costs to average $300,000 - $500,000 amongst Colombian leather and industrial chemical manufacturers.

[13] Specifically, his model predicts that the most productive firms become exporters because they are able to generate sufficient finances from internal resources, while some relatively less productive firms, for whom exporting would still be profitable, cannot enter because of credit constraints.

explicit guarantees for their loans will face lower lending limits since banks will have the option to seize their assets or demand restitution from their loan guarantors in the case of default.

Differentiating between the productivity view and the credit constraints view is empirically important, and this paper provides evidence in contrast to the former. The empirical setting of the paper serves as the first piece of evidence: specifically, the data shows that more than 95% of firms in the EFS sample supplemented their subsidized loans with regular market-rate credit prior to the policy change, which implies that the marginal product curve for these firms is higher than the market lending rate. Hence, exporting would still be feasible for these firms without the subsidies. Results shown later in the paper (in Table XII) serve as the second piece of evidence: I directly test whether productivity differences matter, and do not find evidence that the less productive firms are significantly more affected by the removal of subsidies. In addition, the focus of my analysis is to study differences across firms on the *intensive margin* – that is, firms that remain in the export market after the subsidies are removed. Indeed, if the subsidies are essential for firms to cover large fixed costs of exporting, then removing subsidies will cause a large effect on the *extensive margin* – that is, firms for whom the fixed costs outweigh the surplus from exporting will simply exit the export market. An overwhelming majority of firms in the sample, however, remain in the export market after the subsidies are removed, and the ones that do exit comprise primarily the 5% that were not supplementing their EFS credit with regular market loans.[14]

These findings suggest that the presence of fixed costs and productivity differences across firms cannot explain the differential response to the removal of subsidies. Instead, as this paper argues, the differential response is consistent with varying degrees of information asymmetries between lending institutions and firms.

B. Identifying Credit Constraints

If access to credit varies across firms after the subsidies are removed, then the effects on total loans and export output will be very different for firms that are financially constrained by banks and those that are not. Specifically, a constrained firm will be unable to fully substitute

[14] Note that it is possible that fixed costs also affect the intensive margin. For instance, the subsidies could have allowed firms to export to an additional market, and removing subsidies simply induces them to shutdown operations for that market only. I discuss this possibility in detail in Section VII, and show that the interpretation of the main results is robust to this concern.

subsidized credit with regular market-rate loans once the subsidies are suspended. Total loans and export output will decline. Conversely, an unconstrained firm will be able to make this substitution as banks will be willing to lend funds to it at higher market rates. Total loans and export output will remain relatively unaffected.[15]

Since EFS firms finance their exports through both subsidized and regular market-rate loans, their loan supply curve is represented by a step-function, *i.e.*, they can borrow up to their EFS limit at lower rates and then have to pay higher market rates if they want to borrow further. The initial equilibrium with EFS subsidies is shown separately for unconstrained and constrained firms in panels A1 and B1 of Figure II, respectively. Once the subsidies are taken away, unconstrained firms will be able to substitute all subsidized loans with market-rate loans. The effect on the loan supply curve, shown in Panel A2 of Figure II, will simply be that the kink now disappears, and since the intersection point of the marginal product and loan curves does not change, the total loans and export output for these firms do not change.

The effect on constrained firms is quite different. By definition, these firms are unable to substitute all subsidized loans with regular rate loans as they are rationed by banks. Hence, total loans and export output for these firms decline, and by how much depends on how credit constrained these firms are. Panel B2 of Figure II shows the change in loan supply curve for constrained firms, and is drawn for the extreme case where no loan substitution is possible. Hence, the fully constrained firms are unable to substitute any EFS loans with regular bank credit, and are only allowed access to their pre-period level of regular bank loans.

It is worth noting that the total loans for unconstrained firms may actually increase after the subsidy removal. Given that the subsidy provides these firms direct interest savings, the optimal decision for them is to use these savings to pay down some of their bank debt. Once the subsidies and the corresponding interest savings are taken away, unconstrained firms will not only have to substitute EFS credit with regular bank credit, but also increase their bank borrowing that was previously covered by the interest savings. The direction of change in loans (increase), however, is opposite from that of the constrained firms (decrease). For clarity, this paper focuses on changes to export output in order to identify credit constraints. Specifically, export output will

[15] This methodology parallels that of Banerjee and Duflo (2004), who use the expansion of a directed credit program in India to test for credit constraints.

remain unchanged for an unconstrained firm, while it will decline for a constrained firm. These sharp predictions provide a framework for evaluating the empirical results that follow.

C. Empirical Methodology

The institutional setting and eligibility change described in this paper allow for an empirical strategy that compares outcomes of yarn firms with those of non-yarn firms before and after the policy change. Figure III first establishes that non-yarn firms are a good comparison group: panel A plots the product level export growth separately for yarn and non-yarn textiles, and shows that the export growth trends for both groups shadow each other before the policy change and diverge sharply afterwards.[16] Moreover, Panel B plots the difference between the two growth rates and clearly shows a flat trend prior to policy change and an immediate differential trend afterwards. This evidence of parallel trends strengthens the identification as it rules out the possibility that the policy change was enacted precisely in response to poor yarn exports.[17]

This paper uses different specifications to identify the total loan and export output effects at the firm-level. While a difference-in-difference specification is adopted for total loan regressions, this type of framework is not ideal for the export regressions owing to the differences in composition of data before and after the policy change. Specifically, the pre-period data consists of only EFS exports, whereas the post-period data consists of total (EFS + Non-EFS) exports for all firms. This "jump" in the data will be absorbed by the post year dummies in a difference-in-difference framework only under the identification assumption that the ratio of EFS-to-total exports does not significantly vary across yarn and non-yarn firms. Instead of relying on this strong assumption, it is possible to use a much more flexible specification that allows the relationship between pre and post exports to independently vary within the regression framework.

The specification for total loan regressions is the following:

$$Log(Total\ Loans)_{it} = \alpha_i + \delta_t + \beta_1.(YarnDummy^{*}\ Post)_{it} + \varepsilon_{it} \qquad (1)$$

[16] I have checked and not found a significant announcement effect. Moreover, yarn exports do not show a significant change exclusive of pre-period trend due to the announcement of EFS policy change in late 2000.

[17] Referred to in the labor literature as the *Ashenfelter dip*, in reference to Ashenfelter and Card (1985) who find that workers entering training programs are precisely the ones experiencing declining wages.

where the LHS variable is the log of total loans for firm i in year t. $(YarnDummy^{*}\ Post)_{it}$ is an interaction between a yarn dummy (=1 if yarn firm; =0 if non-yarn firm) and a post-period dummy. β_1 is the difference-in-difference coefficient of interest and measures the relative impact of EFS policy change on yarn firms. A full set of firm dummies, α_i, absorb all unobserved time-invariant differences across firms, which implies that β_1 is measured using changes within the *same* firm. The year dummies, δ_t, control for any time-series trends in the data common to all firms, and ε_{it} is the error term. Since the variation in eligibility is at the level of the firm, all standard errors are clustered at the firm level, which corrects for any time-series correlations in the data.

The specification for export output regressions is the following:

$$Log(Post\ Exports)_{it} = \gamma_t + \beta_1.(YarnDummy)_i + \beta_2.Log(Avg\ Pre\ Exports)_i + \varepsilon_{it} \qquad (2)$$

where first the data is reduced to the firm-post-period level. The LHS variable, $Log(Post\ Exports)_{it}$, is the log of post-period exports for each firm i in post period t. β_1 measures the percentage change in exports of yarn firms relative to the change in exports of non-yarn firms. The interpretation of β_1 is identical to that of a difference-in-difference coefficient, that is, it provides an estimate of the impact of subsidy removal on the exports of yarn firms relative to non-yarn firms. $Log(Avg\ Pre\ Exports)_i$ is the log of average pre-period exports for each firm i, and β_2 represents the statistically determined relationship between post and pre period exports.[18] The variable, γ_t, represents post period year dummies and ε_{it} is the error term.

D. Yarn Ratio Variable Construction

The use of a firm-level yarn indicator dummy in (1) and (2) is not ideal since it does not differentiate between firms that export very little yarn from those that produce and export only yarn. Figure IV shows the density of yarn-to-total exports for all firms in the dataset. The shape of the distribution confirms that while there are many firms that export all yarn and many that

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[18] In a difference-in-difference framework, $(\beta_2 = 1)$ is an imposed restriction, whereas in (2) it is allowed to independently vary.

export none, there are also many diversified firms that export some yarn and some of other textiles. The indicator variable treats all diversified firms as yarn firms even if yarn exports form a very small proportion of their total EFS proceeds. In order to provide a more precise measure of the impact of yarn subsidy removal on firm-level outcomes, this paper makes use of loan-level information from the pre-period to construct a measure of the proportion of yarn exported by each firm. This variable is defined as follows:

$$Yarn\ Ratio = \left(\frac{Yarn\ Exports}{Yarn\ Exports + Non\text{-}Yarn\ Exports} \right)_{i,PRE} \tag{3}$$

where for each firm *i*, *Yarn Ratio* is the ratio of their yarn exports to yarn plus non-yarn exports under EFS in the pre-period.[19] Hence, *Yarn Ratio* will be equal 1 for yarn-only firms, 0 for non-yarn firms, and will range between 0 and 1 for diversified firms depending on the ratio of their yarn to total exports.

The main specifications for total loan and export regressions then become:[20]

$$Log(Total\ Loans)_{it} = \alpha_i + \delta_t + \beta_1.(YarnRatio^{*}\ Post)_{it} + \varepsilon_{it} \tag{4}$$

and

$$Log(Post\ Exports)_{it} = \gamma_t + \beta_1.(YarnRatio)_i + \beta_2.Log(Avg\ Pre\ Exports)_i + \varepsilon_{it} \tag{5}$$

V. Results – Main Specifications

A. Average Effects

Table IV presents the results of estimating (1) and (4) for all firms in the sample. The results show that controlling for all firm-level factors and time trends, the relative effect on total loans of yarn firms is negative and significant. Moreover, relative to non-yarn firms, the total loans for yarn firms decline by 19%. This result is significant at the 5% level. Hence, the average yarn

[19] The results are robust to alternative measurements of Yarn Ratio, such as using the Yarn Ratio just for 2000-01 – the period immediately preceding the policy change.

[20] The empirical specifications using Yarn Ratio can be derived from an indirect production function of the form: $Y = e^{yarnratio} k^{\alpha}$, where Y represents export sales, $e^{yarnratio}$ represents the shift parameter, and k represents working capital credit. The assumption required to get this form of indirect production function from a Cobb-Douglas technology is that all inputs are purchased using working capital, and in competitive markets. Since what matters for the regressions is the relative Yarn Ratio values across firms (and any monotonic transformation preserves order), the functional form of the indirect production function chosen here is not critical.

firm is unable to substitute its EFS lending with regular market-rate loans. Yarn firms are also 10% more likely to exit loan relationships with banks, as shown in column 3.

Table V shows the results of estimating (2) and (5) for export output, and the effects are even stronger. Relative to non-yarn firms, the exports for yarn firms decline by 31%. This result is significant at the 1% level. Column 3 presents export output results restricting data to only the intensive margin firms. Conditional on remaining in the bank loan market, the export output for yarn firms declines by 29% relative to that of non-yarn firms. This result is also significant at the 1% level. Hence, on average yarn firms are unable to fully substitute loans, and their exports decline significantly. Figure V plots the year-by-year coefficients for total loan and export regressions and shows a sharp change in slope immediately after the subsidies for yarn are removed.

Since the export regressions use total firm-level exports in the post-period, an important concern about product switching can be addressed. The concern specifically is that after the policy change, yarn firms reorganized their export portfolio toward an EFS-eligible textile, and used their yarn produce as an input rather than an export product itself. This scenario implies that firms would have continued to generate export proceeds comparable to before the subsidies were removed. However, the results find a significant negative effect using total firm-level exports in the post-period, which suggests that even if such switching occurred, it did not completely compensate for the removal of subsidies.[21]

B. Publicly Listed vs. Private Firms

Although the average results for firms show strong and statistically significant coefficients, there is considerable variation in these results across different types of firms. In particular, this paper finds that both total loans and exports for publicly listed firms are unaffected by the removal of credit subsidies.

Publicly listed firms typically keep detailed corporate accounts, which banks can rely on the evaluate credit risk. The importance of corporate accounts in lending relationships is recognized by the macroeconomics literature on credit constraints. Bernanke and Gertler (1989) and Greenwald and Stiglitz (1993) develop business cycle models in which the condition of

[21] Data on firm exports differentiated by product is not available for the post-period, so it is not possible to directly test for product switching.

borrowers' balance sheets affects the degree of information asymmetry between borrowers and lenders, and influences the amount of borrowing and investment. Access to audited balance sheets makes it easier for banks to monitor firm performance and effectively reduces the limit on the amount of loans available. Further, publicly listed firms are on average larger and more established than private firms, which enables them to offer greater collateral on their loans.[22] These firms also have access to alternative sources of financing such as shareholder equity that can be mobilized as substitutes for bank debt. This subsection tests whether the removal of export subsidies has a differential impact on publicly listed and private firms.

As a first step, Table VI presents some summary statistics comparing publicly listed and private firms in the sample, and shows that publicly listed firms are on average much larger in terms of both exports and total loans. The average listed firm exports 4 times as much as the average private firm, while it borrows more than 8 times as much from banks. While the size differences are significant, yarn export composition is comparable across these two groups. Among yarn exporters, yarn forms 67% of total firm-level exports on average for publicly listed firms and 45% for private firms.

Table VII presents the results of estimating (4) and (5) separately for publicly listed and private firms. The results show that publicly listed yarn firms behave identically to publicly listed non-yarn firms – the coefficient on both total loans and exports is close to zero and non-significant. Private yarn firms, on the other hand, have large significant effects with a 20% decline in total loans and 30% drop in exports relative to private non-yarn firms. Columns (3) – (4) and (7) – (8) of this table control for differential trends based on size differences across firms. Since data on total assets is unavailable for private firms, I proxy for firm size by using the log of average pre-period loans for all firms. This control is introduced non-parametrically in all specifications: the total loan regressions include the interaction of each firm size decile dummy with *Post*, and the export regressions include all the firm size decile dummies. The results show that the coefficient of interest (*YarnRatio*Post)* remains stable in all specifications when controls for size trends are introduced.

Overall, Table VII shows that private firms are unable to fully substitute their EFS borrowing with regular market loans and their exports decline significantly, which indicates that these firms

[22] This finding is consistent with evidence from the corporate finance literature. For instance, Pagano, Panetta, and Zingales (1998) find that publicly listed firms are larger than private firms and that the likelihood of an IPO is increasing in firm size.

are financially constrained. Publicly listed firms, conversely, are unconstrained as their total loans and exports are unaffected by the removal of subsidies.[23]

C. Private Group vs. Private Non-Group Firms

Although this paper finds that private firms on average are rationed by banks after the subsidies are removed, there is a subset of private firms that are able to substitute EFS with regular market borrowing. Apart from access to verifiable performance indicators, banks may be willing to relax lending constraints for firms that are able provide credible guarantees for their loans. In particular, the corporate finance literature finds that firms belonging to corporate groups often enjoy better access to credit than stand-alone firms. Hoshi, Kashyap, and Scharfstein (1991) show that Japanese firms belonging to industrial groups have close ties with lenders and that many large banks are in fact their shareholders. These close connections reduce the information asymmetries between the two and result in better loan access for the entire group. In addition, group members often share resources and have close product-market relations, which lead to significant stakes in each others' equities. Gopalan, Nanda, and Seru (2005) show that Indian business group firms often provide guarantees for the borrowing of other group members because of reputation concerns. Such guarantees are acceptable to banks as they can restrict credit access for the entire group in the case of default.[24] Similarly, Khanna and Yafeh (2004) show that Indian business groups often use intra-group loans to smooth liquidity across member firms.[25]

By dividing the sample into group and non-group firms, this paper directly tests whether private yarn firms belonging to a corporate group are better able to cope with the removal of EFS subsidies. Data on group affiliation is provided in the SBP total loans database and is collected directly from firms by commercial banks at the time of loan signing. It is in the interest of commercial banks to accurately record such affiliations for their own borrower assessment and

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[23] Quantile regressions for every 10^{th} percentile indicate significant negative coefficients for private firms starting from the 10^{th} percentile of yarn ratio. For publicly listed firms, the 70^{th} percentile and above show marginally significant negative coefficients.

[24] As in Diamond (1989), reputation concerns imply that group members have an *ex ante* incentive to avoid default since it results in their being denied future credit.

[25] Also, Khanna and Palepu (2000); Van der Molen and Gangopadhyay (2003); and Shin and Park (1999) examine the role of internal capital markets in improving external finance access for group firms.

loan recovery purposes. Conversations with SBP officials confirm that these classifications, at least in the cross section, are accurate and that group affiliations are generally widely known.

Table VIII presents regression results for the main specification separately for group and non-group firms, restricted to only private firms. Total loans for non-group yarn firms decline by 24% relative to non-yarn firms, and exports fall by 33%. Conversely, total loans and exports for group yarn firms remain unchanged relative to non-yarn firms. These results indicate that private yarn firms belonging to corporate groups are financially unconstrained, while non-group firms are significantly constrained.

VI. Results – Detailed Financial Analysis

A. How do Unconstrained Firms Absorb the Subsidy Shock?

The results on publicly listed yarn firms show that these types of firms are able to continue exporting at the same rate as non-yarn firms after the subsidies are removed, and that they manage this by maintaining the same borrowing level. This latter result is particularly interesting as it provides insight into how these firms absorb the EFS shock. Tables IX-XI use detailed annual accounts data, available only for publicly listed firms, to explore this mechanism in detail.

First, Panel A of Table IX finds no significant differential change in firm size (as measured by either fixed or total assets), capital expenditure, shareholder equity, or total sales for publicly listed yarn firms. There is, however, a significant drop in profits for these firms, indicating that the additional cost of financing due to higher interest rates on market loans is covered by the profits of these companies. Next, Panel B of Table IX shows regression results for capital structure changes and finds that the shares of equity, trade credit, and bank debt remain constant across the policy change. This is quite a remarkable finding – publicly listed yarn firms make no adjustments to either equity or trade credit and are willing and able to internally bear the additional cost of bank loans, which is not a trivial cost. As Panel A of Table X shows, financial interest expenses form the second largest portion of the cost structure, even more so than administrative expenses. Moreover, Panel B of Table X finds a 36% increase in financial costs after the policy change, while other operational costs remain relatively unchanged. Hence, the absolute increase in production costs is substantial and is fully covered by the profits of these firms. Estimating the regressions in levels rather than logs indicates that the magnitude of decline in profits matches almost one-to-one with the increase in financial costs. These results imply that

access to EFS was essentially an opportunity for publicly listed yarn firms to earn windfall profits, and that they were not credit constrained. Moreover, the financial incentives from the subsidies were *infra-marginal* for these firms – that is, they would have borrowed the same amount irrespective of the subsidies.

Table XI uses two additional years of balance sheet data and finds that even in the long run, up to four years after the policy change, publicly listed firms do not make any adjustments to assets, equity, long-term investments, or sales, and the long-term effect on profits is still negative and statistically non-discernable from the short-term effect.

B. Misallocation of Credit

The preceding sections identify two important findings. First, publicly listed yarn firms are financially unconstrained as their exports are unaffected by the removal of EFS subsidies. These firms make no significant adjustments to their balance sheets, which implies that the subsidies are simply a profit-making opportunity for them. Second, a large number of yarn firms in the exporting sector (*i.e.,* the privately owned firms) are financially constrained in the sense that their exports are highly sensitive to the removal of EFS subsidies. These two findings, combined, imply a misallocation of export credit. Moreover, given that there are constrained firms in the exporting sector that will use the subsidies to increase export production, allocating these subsidies instead to unconstrained firms that evidently use the funds to earn super-normal profits is a misallocation of credit. The size of this misallocation is substantial: a simple back-of-the-envelope calculation shows that in the three sample years prior to the policy change, nearly 44% of all subsidized loans were awarded to publicly listed firms, which represent only 16% of eligible firms in the dataset.

It is worth emphasizing that the misallocation of credit identified here is with respect to firms within the exporting sector that are also eligible for EFS financing. Indeed, the opportunity cost of having an export subsidy program itself may be significant relative to other sectors of the economy where government spending could instead be directed. This paper does not attempt to answer this larger question, as it requires one to estimate the returns to investment for other sectors of the economy, which cannot be done with the available data. Instead, this paper focuses on the allocation of subsidies across exporting firms provided there is an export credit scheme.

Evidence presented in Table XII indicates that the misallocation of export subsidies is particularly costly. The table presents the results of a difference-in-difference-in-difference analysis based on export productivity, where export productivity is defined as the average ratio of exports to working capital loans in the pre-period for each firm. Hence, a more productive firm is one that can produce a larger export output for the same amount of working capital loans, or alternatively can generate the same level of exports using fewer working capital loans.

As Chaney (2005) emphasizes, more productive firms typically accumulate larger internal revenues, which they can use as insurance against the removal of subsidies. Hence, the adverse effects on export output may be less severe for these firms. The results, however, show that this is not the case: controlling for export productivity does not alter the main effects for either publicly listed or private firms.[26] Focusing on private firms, column 2 of the table shows that the more productive firms are unable to substitute EFS with market-rate loans, and that the decline in the export output of more productive firms is the same as the average decline for private firms – the interaction of the main effects with export productivity is close to zero and non-significant. These results demonstrate that the opportunity cost of funds allocated to the publicly listed firms is significant as even the more productive private firms are unable to maintain their export levels without the subsidies.

Export productivity is a sensible measure of total firm-level productivity in the context of this paper. Ideally, one would like to estimate the ratio of total sales to total working capital as a measure of productivity, but balance sheet data for private firms is unavailable. Instead, this paper uses export productivity, which is a satisfactory proxy measure because, first, firms in the textile industry and especially firms in the EFS dataset are primarily export oriented – more than 70% of industry wide production is sold overseas. Second, the main source of financing for these firms is bank credit – even for the large, publicly listed firms that have access to shareholder equity, bank loans on average comprise 63% of total capital structure. This figure is likely much higher for private firms as they do not have access to shareholder equity. These facts illustrate that exports are the main source of sales revenue for firms in the sample, and also that these exports are financed primarily through bank loans. The ratio of exports to bank loans, therefore, is a reasonable proxy for firm-level productivity. In addition, the empirical strategy used in this

[26] The productivity variable is de-meaned in all specifications, thus the coefficients on Yarn Ratio*Post in total loan regressions and Yarn Ratio in export regressions still represent the average effects for firms.

paper compares outcomes for the same *type* of firms across yarn and non-yarn sectors – that is, it compares outcomes for private yarn firms with those of private non-yarn firms, and similarly for other types of firms. Hence, the regression coefficients represent the effects of EFS exclusion for firms that have access to similar sources of external finance.

VII. Alternate Explanations and Robustness Checks

This section discusses some concerns about the evidence presented in the paper and conducts robustness checks on the main results. Note first that omitted variables at the firm level such as managerial efficiency or firm "influence" cannot explain the results since these effects are absorbed by the firm-level fixed effects. Further, the empirical strategy used in this paper accounts for any economy-wide or interaction effects that do not differentially influence yarn and non-yarn firms.

A. Validity of Non-Yarn Textiles as a Comparison Group

1. Are Yarn Firms Simply More Dependent on External Finance?

An important concern regarding the main regression results is that non-yarn textiles may not be a suitable comparison group. In particular, the large significant effects reported in this paper could be driven by factors specific to the product "type" (*i.e.*, yarn). In a difference-in-difference regression framework, this implies that the time effects, which are assumed constant for all firms, are in fact not the same for yarn and non-yarn firms. For instance, if yarn exports require a greater level of bank financing than other textiles, then the subsidy removal will disproportionately hurt yarn firms.[27] This, however, does not seem to be the case. Measures of external finance dependence reported in Rajan and Zingales (1998) suggest that the opposite may in fact be true – that is, external finance dependence is much lower for yarn spinning than it is for regular textiles. For unconstrained US firms, their paper reports the dependence ratio, $\frac{CAPX - CashFlow}{CAPX}$, as -0.09 for the spinning industry and 0.40 for the textile industry (-0.04 and 0.14 respectively for mature companies).

[27] The subsidy removal may also disproportionately hurt yarn firms if there is a contemporaneous negative shock that only affects yarn. However, detailed interviews with SBP officials indicate no evidence for such yarn-specific shocks.

Although these differences are large, they represent the external finance dependence for the US manufacturing sector, which may not be representative of the situation in Pakistan. Using annual accounts for publicly listed firms in the EFS dataset, this paper constructs the same measures of external finance dependence as Rajan and Zingales for firms that produce just yarn and those that produce no yarn in the pre-period. For yarn firms, the average dependence ratio is 0.17, while for non-yarn firms, it is 0.24. The relative comparison predicted by the Rajan and Zingales measure still holds, though the difference between the two figures is fairly small. Taken literally, these figures imply that the impact of the subsidy removal should be slightly *lower* for yarn firms. The results of this paper, however, show a large significant impact on yarn firms, which strengthens the argument that these firms are financially constrained.

2. Is the Domestic Price of Yarn Affected?

Another concern regarding the main regression results is whether the EFS policy change had an effect on the domestic price of yarn – that is, the domestic price dropped following the policy change. Since yarn is an input in the production processes of the comparison group which consists of textile manufacturers, a drop in production costs may mechanically lead to greater output and exports for these firms. This would imply that the policy change effects identified in this paper are over-estimates.

There is direct evidence that rules out this concern. Figure VI plots the time-series trend of the real domestic price of cotton yarn matched against that of raw cotton. The figure shows that the two lines virtually shadow each other throughout the time-series, indicating that any changes to yarn prices are in fact induced by changes in price of raw cotton, a direct input into yarn production.

3. Where are the Left-Over EFS Funds Allocated?

Another important concern is regarding the EFS funds that are freed up as a result of yarn firms being excluded from EFS. Which firms benefit from these left-over funds? Indeed, if the non-yarn textile firms get allocated extra loans precisely because of the policy change, then again the regression coefficients will overestimate the true policy effect.

It is possible to empirically test for this concern. Since the EFS dataset provides detailed loan and export information for other industries apart from textiles, one can directly check whether

these other industries start receiving extra credit allocations following the policy change. Specifically, this paper runs the following regressions:

$$Log(Y)_{it} = \alpha_i + \beta_1.Post_t + \varepsilon_{it} \quad (6)$$

and

$$Log(Y)_{it} = \alpha_i + \delta_t + \beta_2.(NonTextiles = 1 * Post)_{it} + \varepsilon_{it} \quad (7)$$

where Y_{it} in both (6) and (7) refers to either EFS loans or EFS exports. First, specification (6) is run separately for non-yarn textile firms and non-textile firms in order to estimate the simple differences in outcomes before and after the policy change for each group.[28] Next, specification (7) estimates the relative difference in outcomes (difference-in-difference) between the two groups, and where $(NonTextiles = 1)$ is a dummy that equals 1 if firm i belongs to a non-textile industry and equals 0 if the firm is in textiles *and* is non-yarn.

The results in Table XIII show that the left-over EFS funds are being allocated outside of the textile industry. The simple before and after differences in EFS loans, shown in columns 1 and 2, are significantly positive for non-textile firms, and are non-significant and close to zero for non-yarn textiles. Similar results hold for EFS exports. Further, columns 3 and 6 show results for the difference-in-difference specifications and find EFS loans to non-textiles increase by 23% more relative to non-yarn textiles, and exports by 26%.

B. Fixed Costs and the Intensive Margin

If export subsidies are necessary for firms to overcome large fixed costs of exporting, then the removal of these subsidies will induce firms to exit the export market, as the costs will now exceed the surplus. As discussed earlier, the main effects identified in this paper are for firms that continue to export even after the subsidies are removed. It is possible, however, that fixed costs directly affect this intensive margin. For instance, the subsidies could have allowed firms to export to a new market and removing subsidies simply induces them to shutdown operations for that market only. This effect will show up in the intensive margin as firms will exit only part and

[28] Non-yarn textile firms are firms with Yarn Ratio = 0. Although defining the variable in this manner excludes all diversified firms, I have repeated these regressions by aggregating loan-level data up to the product level, and then comparing loans given to non-yarn textiles and non-textiles before and after the policy change. The results are similar to the ones presented in the paper.

not all of their operations. More productive firms will be able to continue exporting everywhere, whereas less productive firms will be forced to shut down operations in some markets. This effect should be observable for all yarn firms, but as the data suggests, it should be especially strong for publicly listed yarn firms – while the exports of private firms in the pre-period are concentrated in a few large foreign markets, publicly listed firms are more diversified and serve several different and sometimes small markets abroad.

Results presented in Table XII already show that differences in export productivity across firms (publicly listed or private) cannot explain the differential response to the EFS exclusion. Using balance sheet data to construct more standard measures of productivity for publicly listed firms, Table XIV adds to the evidence by showing that the interactions of these variables with the main effects are also not significant. Specifically, the results show that firms that rank higher in terms of their return on assets, return on equity, sales-to-assets ratio, or net margin do not respond differently than average to the removal of subsidies. These results suggest that fixed costs do not significantly affect the intensive margin of firms in the sample.

C. Political Connectedness of Publicly Listed Firms

The results of this paper show that publicly listed firms make no significant changes to their balance sheets in response to the removal of subsidies. But, these firms may be able to maintain their exports and bank borrowing simply because their directors have personal connections with banks. Although having close ties with banks is consistent with lower information asymmetries, it is possible that publicly listed firms start defaulting more on their loans after the policy change and are nonetheless able to maintain their credit because of political connections.[29] This could explain why there are no adjustments in assets, investments, or capital structure for these firms.

This paper, however, finds that the default rates for publicly listed firms do not change differentially between yarn and non-yarn firms after the subsidies are removed. In addition, the absolute levels of default are very low – the 75th percentile represents a firm with zero default. Even more convincingly, the paper shows that banks do a good job of screening out defaulting firms even if they are publicly listed. Interacting an indicator of pre-period default with

[29] Khwaja and Mian (2005) find strong evidence for politically connected loans in Pakistan. They show that such preferential treatment occurs exclusively in government bank borrowing and that the default rate for such "political" firms is differentially high. La Porta, Lopez-de-Silanes, and Zamarripa (2003) present similar findings for related lending in Mexico, and argue that firms that have close ties with banks engage in extensive looting.

*YarnRatio*Post* and *Post*, the results in Table XV show very strong negative coefficients on *Default*Post* for both publicly listed and private firms. These results imply that any firm that has defaulted in the past experiences large reductions in its bank loans. Figure VII further shows that default screening by banks is not correlated with the EFS policy change. Firms that defaulted in 1998-99 experience an immediate reduction in loans in 1999-00 and further reductions in following years.

These findings are consistent with the theme of this paper. Banks face information asymmetries when lending to firms, and rely on previous default as an indicator of firm quality. The default history of all borrowers is directly observable by banks through the Central Bank's credit register, and future credit access is restricted for firms that default on their current loan obligations.

VIII. Conclusion

This paper uses a unique loan-level panel dataset from Pakistan to investigate the causal impact of directed credit subsidies on firm-level exports and capital structure. I explore the variation of these effects across firms and use insights from the banking and corporate finance literature to identify firms as financially constrained and unconstrained. The results show that removal of credit subsidies significantly hurts the exports of small, privately owned firms, while the exports of large, publicly listed firms and corporate group firms are unaffected. The latter group of firms is typically able to provide verifiable performance indicators and explicit loan guarantees to banks, whereas the credit risk of private firms is harder to evaluate and their assets are often insufficient for loan collateral.

While the paper shows that export subsidies help alleviate financial constraints for the private firms, at the same time it shows that these subsidies serve as super-normal profits for the publicly listed firms, which are not financially constrained. Nearly half of all subsidized loans prior to the policy change are assigned to this latter group, indicating a substantial misallocation of credit.

The fact that the interest rate charged on these loans is lower than the market rate is a mixed blessing. On the one hand, a lower interest rate makes it possible for banks to lend to private firms since the incentive and sorting problems are less severe at lower interest rates. On the other hand, lower interest rates also attract the unconstrained firms to demand subsidized loans, even though they are able to borrow at market rates. Regardless of the interest rate, banks will prefer

to lend first to firms that can provide more loan security (*i.e.*, less information asymmetry). Hence, even at the subsidized rates, banks will first serve all the publicly listed firms before anyone else. This fact is clear from looking at the data – the mean ratio of EFS loans to capital for publicly listed firms in the sample is almost 2, which indicates that the program borrowing limits for these firms are indeed binding. Given this argument, the allocation of credit subsidies to publicly listed firms is not very surprising. These firms seize an opportunity to earn windfall profits, and banks are willing to lend to them up to the limit that the program permits because these are the least informationally opaque borrowers.

These findings not only indicate a flaw in the design of the subsidy scheme in Pakistan, but also provide policy implications that are more generalizable. The analysis highlights the risks involved in having a subsidized credit scheme that does not have strict qualification rules based on observable firm characteristics, and provides insight into what these firm characteristics might be. Moreover, the results of this paper suggest that the misallocation of credit is identifiable.

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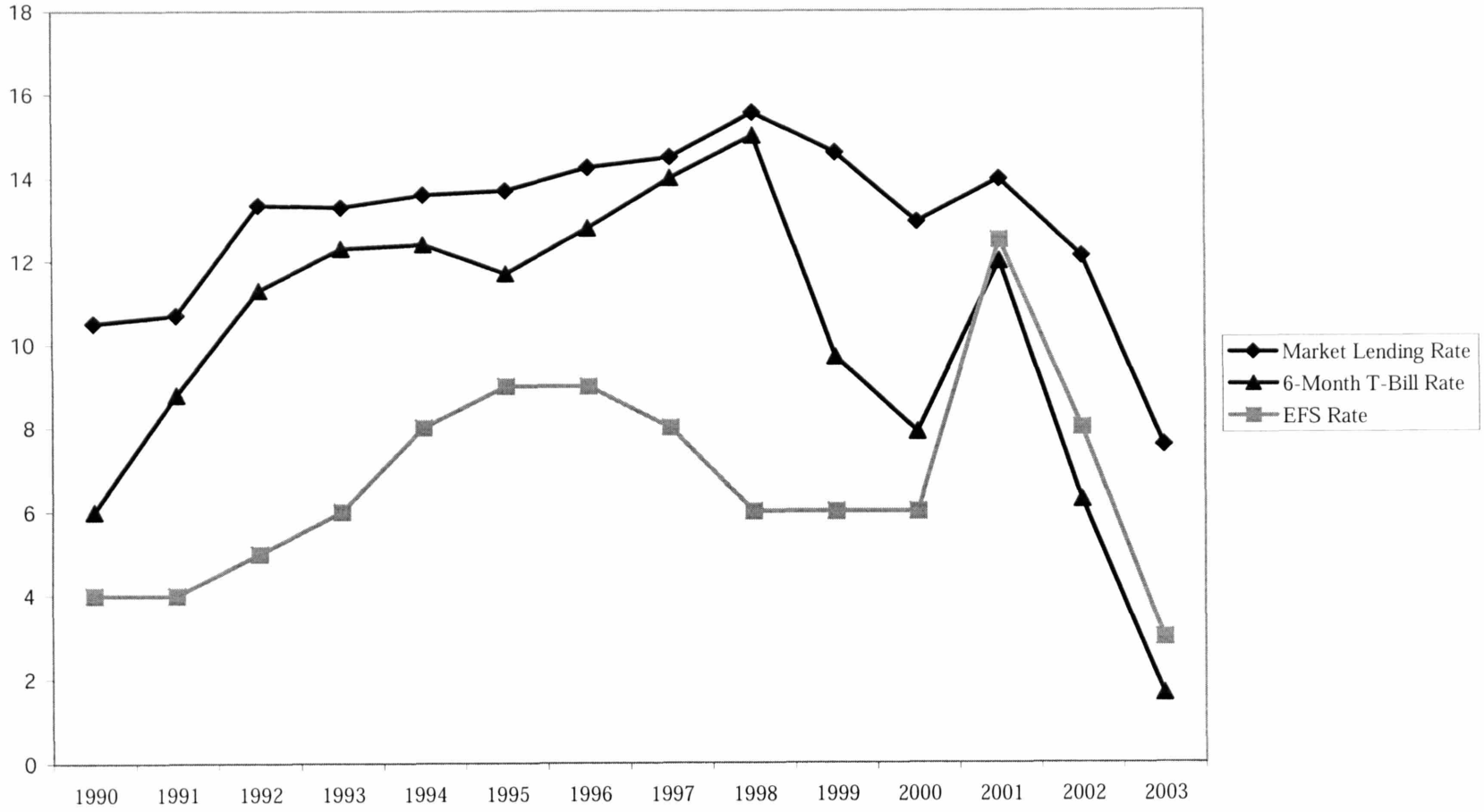
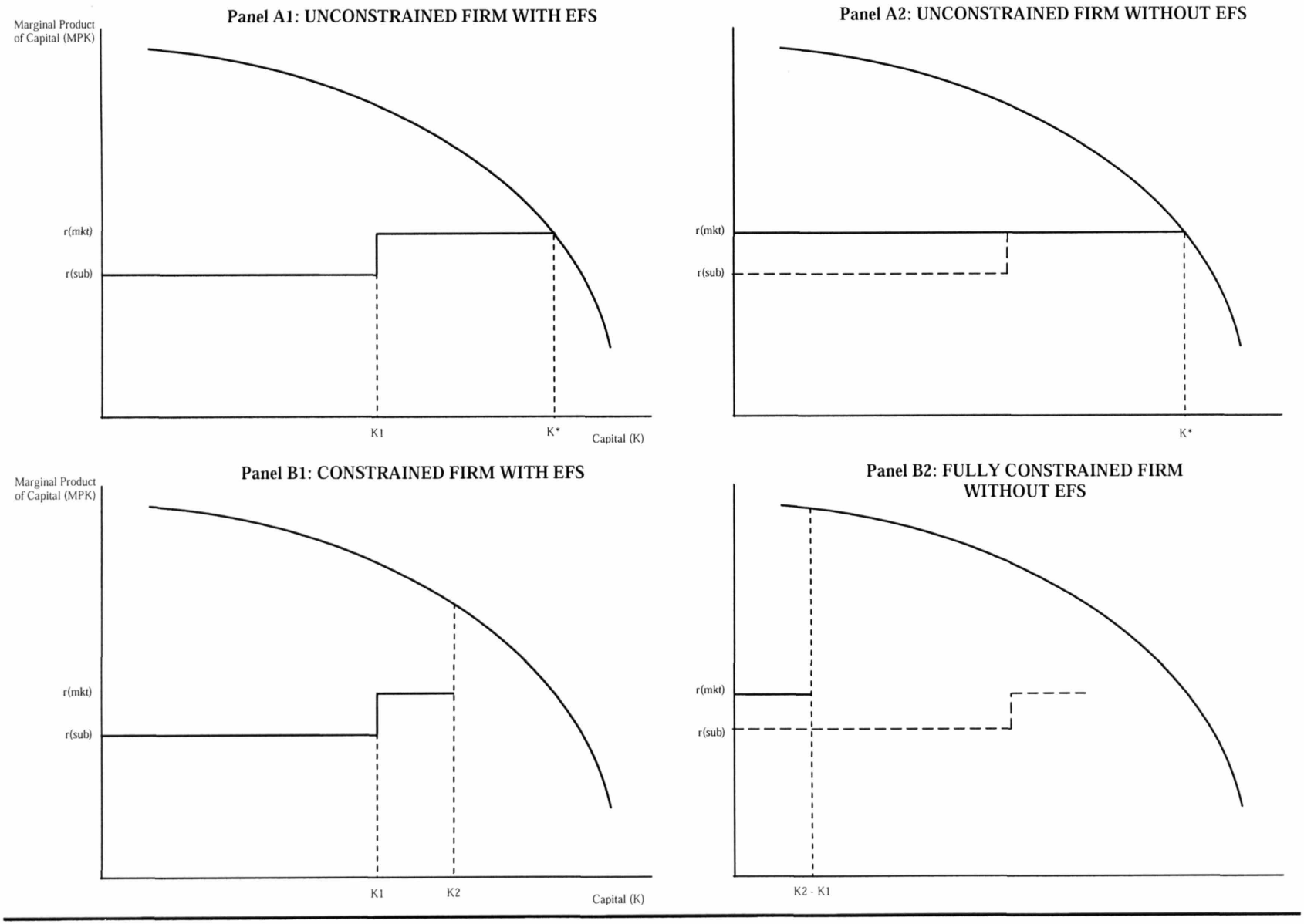
Figure I: Interest Rate Trend



This figure plots the time-series trend in interest rates for the following categories: 1) Regular Market Lending Rate, 2) 6 Monthly Government Treasury Bill Rate, and 3) EFS Lending Rate.

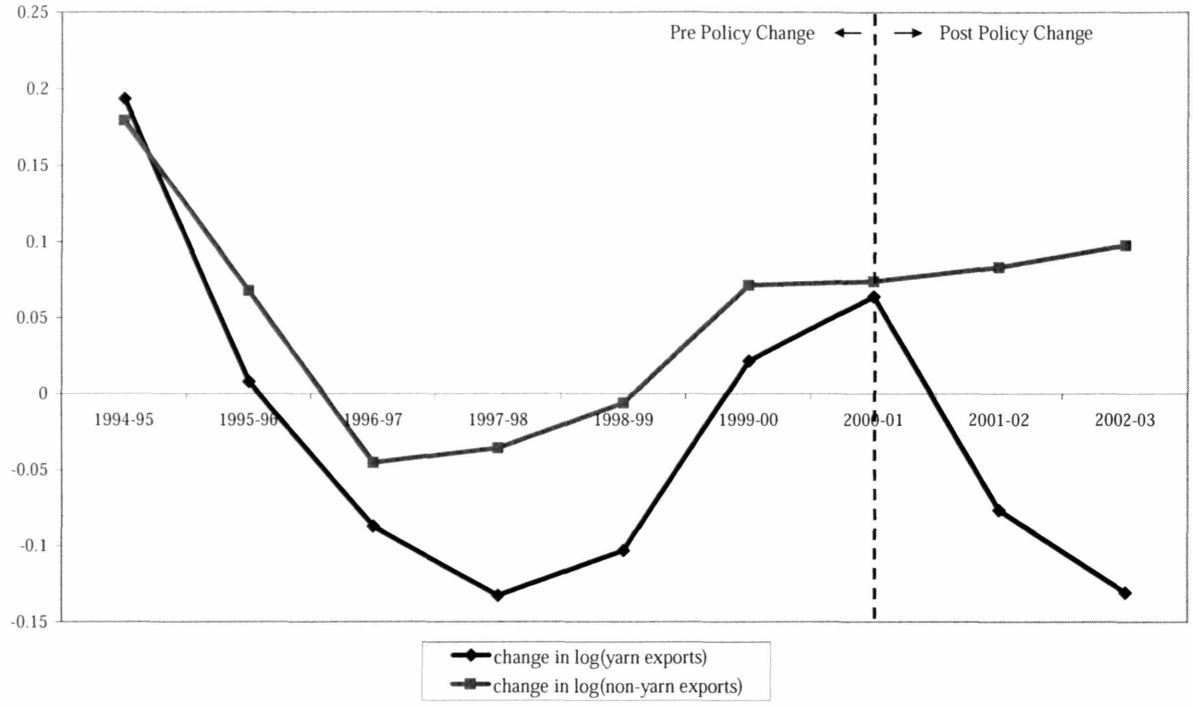
Figure II: Output Response for Constrained and Unconstrained Firms



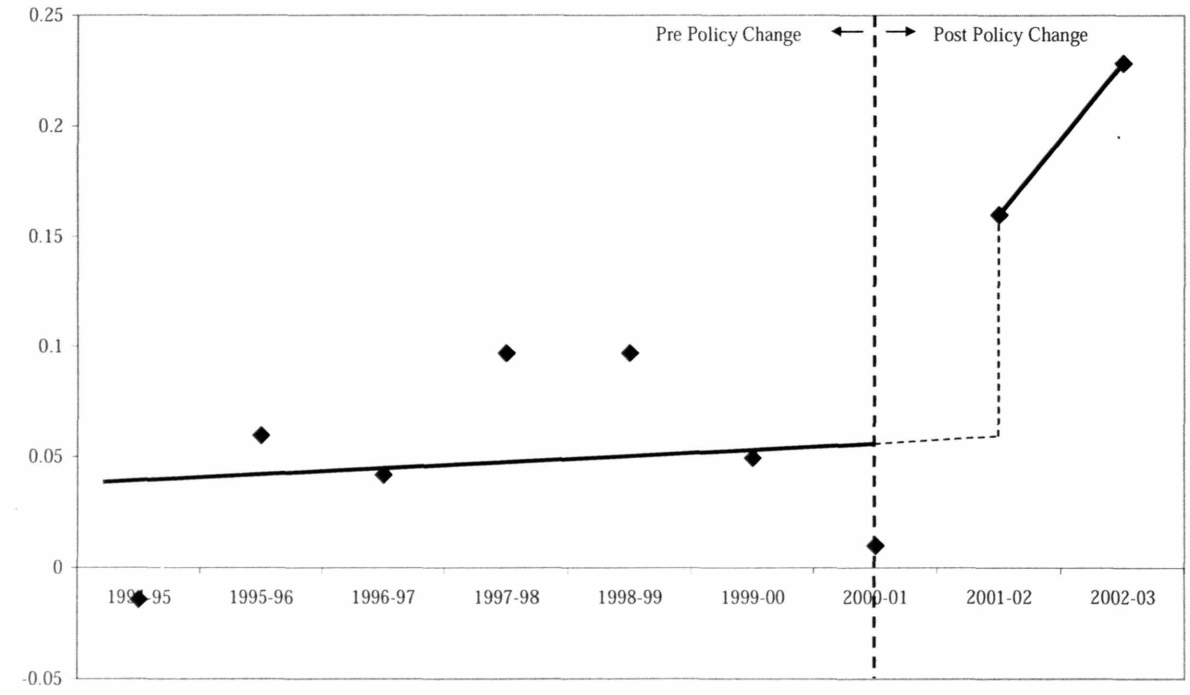
This figure shows the export output and total loan effects for financially constrained and unconstrained yarn firms following the removal of EFS subsidies.

Figure III: Product Level Trend in Yarn and Non-Yarn Exports

Panel A: Product Level Trend in Total Exports of Yarn and Non-Yarn Textiles



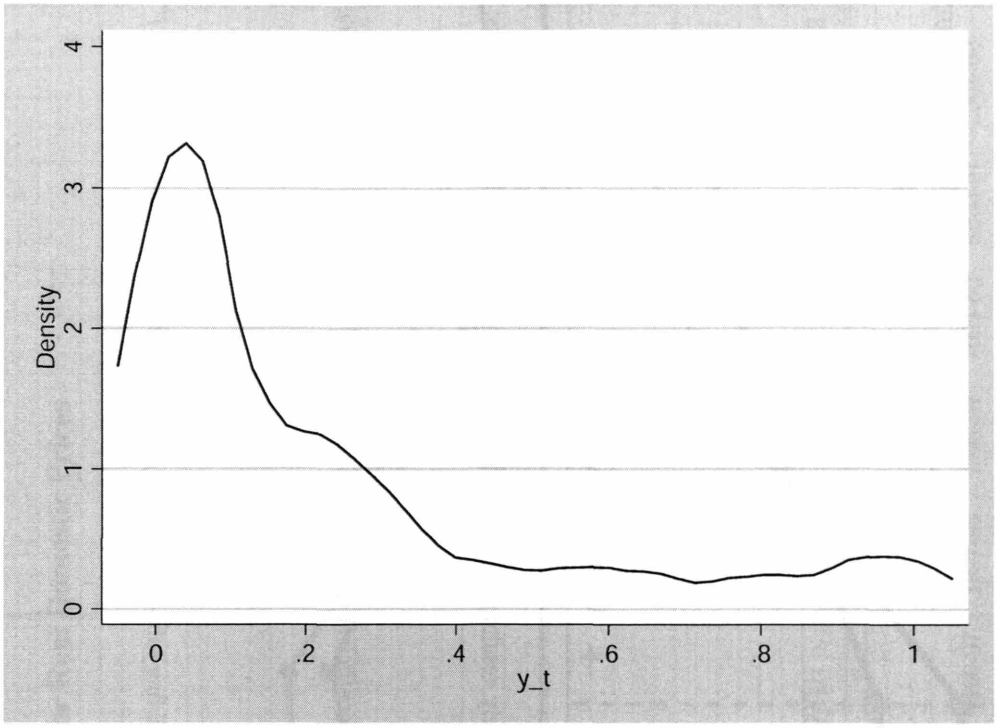
Panel B: Pre and Post Policy Change Difference in Yarn and Non-Yarn Textiles



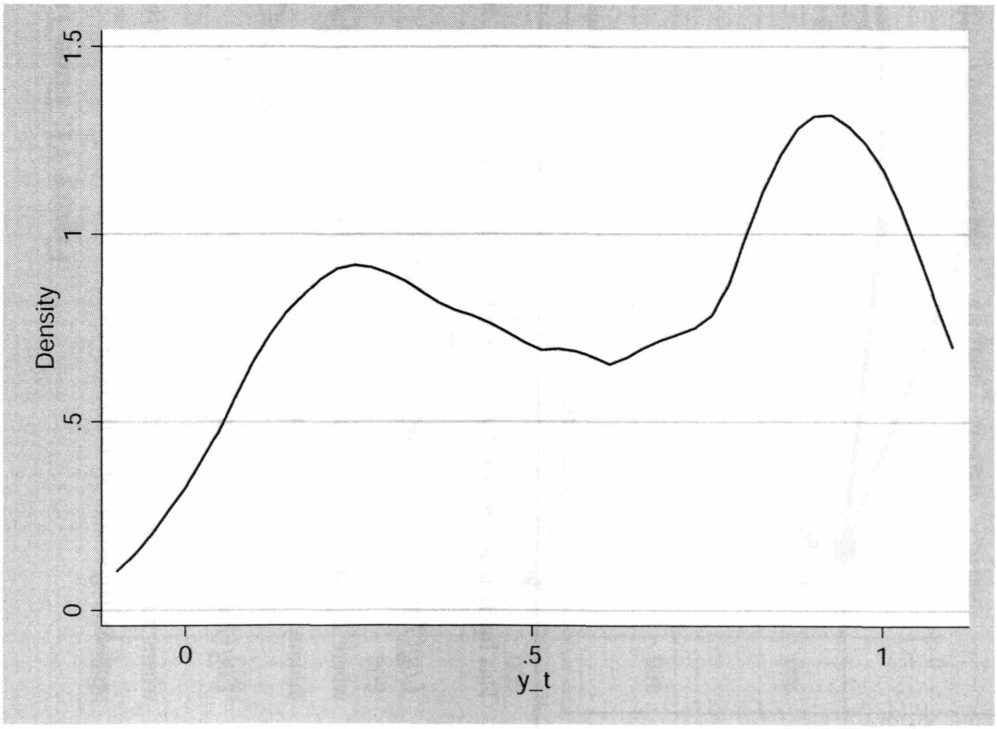
Panel A of this figure plots the product level change in log (exports) of yarn and non-yarn textiles, where the variable of interest is total country level exports (i.e. EFS *and* non-EFS exports). Panel B plots the difference between the two variables in Panel A.

Figure IV: Yarn Ratio Density

Panel A: **Full Sample**

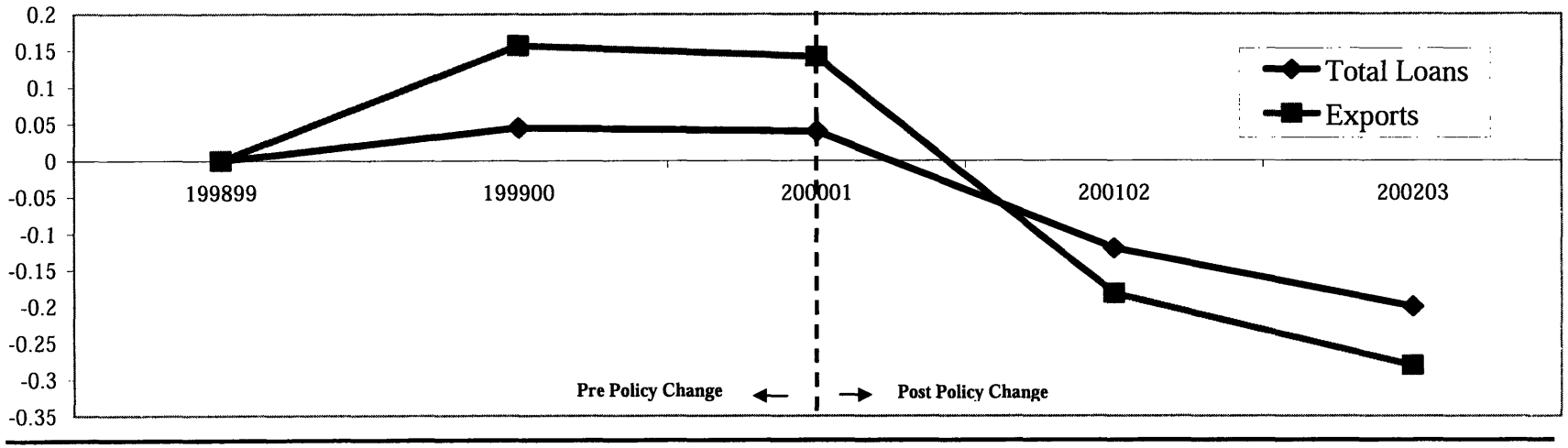


Panel B: **Conditional on being a Yarn Exporter**



Panel A of this figure plots the density of firm level Yarn Ratio in the pre period, where Yarn Ratio is the ratio of a firm's yarn exports to its total (yarn + non-yarn) exports in the pre-period. Panel B plots the density restricted to firms that export yarn.

Figure V: Year-by-Year Regression Coefficients for Total Loans and Exports



This figure plots the year-by-year regression coefficients, β_t and β_j respectively, resulting from the following regressions for total loans and exports:

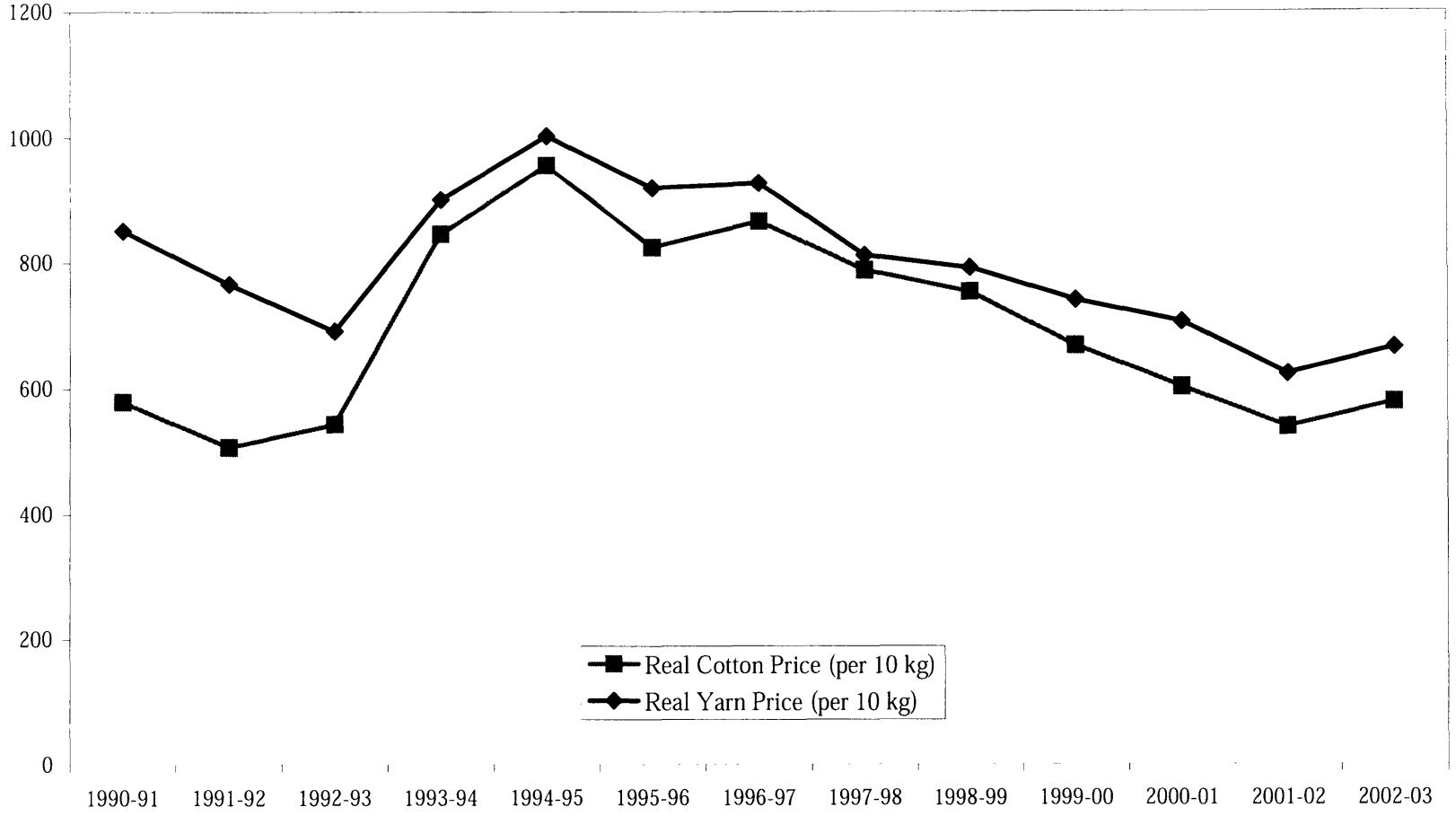
$$Log(Total\ Loans)_{it} = \alpha_i + \delta_t + \beta_t.(YarnRatio_i * \delta_t) + \varepsilon_{it}$$

where α_i and δ_t are firm and year dummies respectively, and each β_t is the coefficient of the interaction between Yarn Ratio and the corresponding year dummy. ε_{it} is the error term.

$$Log(Exports)_{i,\tau+j} = Log(Exports)_{i,\tau} + \beta_j.YarnRatio_i + \varepsilon_i$$

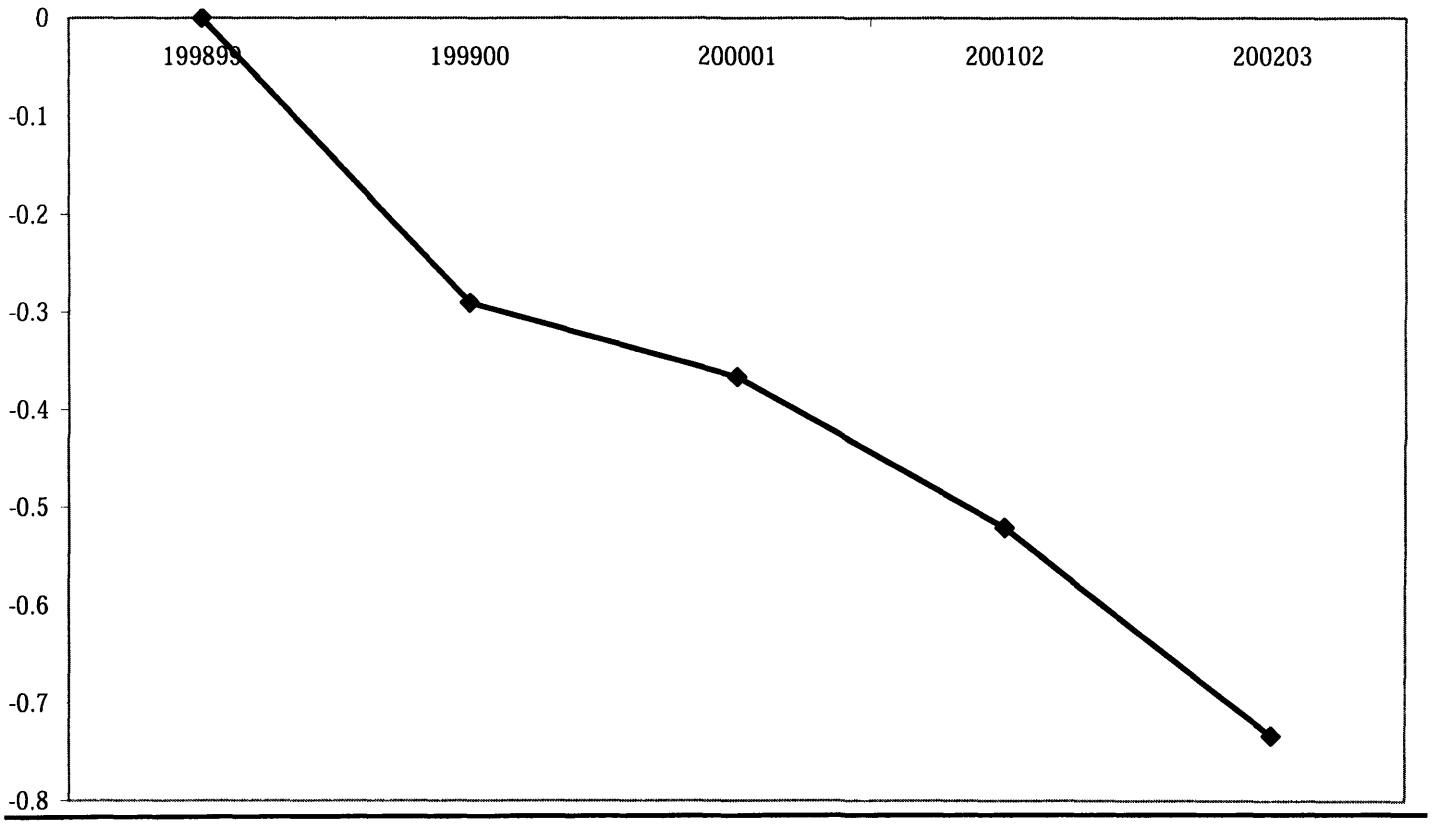
where τ refers to year 1 in the sample (i.e. 1998-99), and $j=1,2,3,4$ refers to all four subsequent years. β_j is the coefficient on Yarn Ratio for each j^{th} cross-sectional regression. ε_i is the error term.

Figure VI: Time Trend for Real Domestic Prices



This figure plots the time-series trend in real prices of yarn and raw cotton, where raw cotton is an input into yarn production. Real prices are calculated by normalizing all year values to 2000-01 prices using the Consumer Price Index for Pakistan.

Figure VII: Do Banks Screen Out Defaulting Firms?



This figure tests if firms that default on their loans in the first sample period (1998-99) are awarded less loans in the following years. The figure plots the regression coefficients, β_t, from the following regression:

$$Log(TotalLoans)_{it} = \alpha_i + \delta_t + \beta_t.(Default_i * \delta_t) + \varepsilon_{it}$$

where α_i and δ_t are firm and year dummies, and Default is a firm-level dummy=1 if firms have non-zero defaults on their loans in 1998-99, and =0 otherwise. β_t are the coefficients on the interaction of Default and year dummies.

Table I
Pakistan Export Composition and EFS Coverage

	(1) Total Country Exports	(2) Total Exports under EFS	(3) EFS Coverage (%)
Textile Sector	347.45	146.14	42%
Other Commodities	204.65	63.00	31%
All Sectors	552.10	209.14	38%

Figures are in Rs. Billion and correspond to data from 1999-00.

Table II (a)
EFS Data Description

	(1)
All Sectors	
Years Covered	1998-99 to 2002-03
Total no. of Unique Loans	97,937
% Loans to Textile Sector	51.73%
Textile Sector	
No. of Unique Loans	50,661
No. of Unique Firms	1,120
No. of Matched Firms*	978

*This refers to the number of firms successfully matched with the Total Loans database.

Table II (b)
EFS Data Summary Statistics

		(1) Mean	(2) Std. Dev.	(3) Min	(4) Max	(5) # of loans
Loan Amount (Rs.)						
	Other Textiles	2,509,215	4,070,170	100,000	172,000,000	27,100
	Yarn	4,693,878	7,798,886	100,000	110,000,000	8,948
	All Textiles	3,051,882	5,336,440	100,000	172,000,000	36,048
Shipment Value (Rs.)						
	Other Textiles	3,090,001	4,364,866	104,701	173,000,000	27,116
	Yarn	5,408,996	8,178,908	108,633	116,000,000	8,951
	All Textiles	3,666,021	5,654,027	104,701	173,000,000	36,067
Net Fine (Rs.)						
	Other Textiles	184,996	1,025,954	300	20,000,000	750
	Yarn	317,847	1,609,918	480	20,000,000	218
	All Textiles	214,915	1,183,213	300	20,000,000	968
Net Fine/Shipment Value Ratio						
	Other Textiles	0.151	0.735	0.00004	6.714	0.027
	Yarn	0.109	0.617	0.00002	7.656	0.024
	All Textiles	0.142	0.71	0.00002	7.656	0.027

Figures are in Rs. and correspond to loan-level observations in the pre-period (1998-99 to 2000-01).

Table III
Summary Statistics for Firm-Level Total Loans and Corporate Accounts Data

	Mean	Std. Dev.	25th Percentile	50th Percentile	75th Percentile	80th Percentile	Max
Panel A: Total Loans Data (Rs. 000)							
Loan Amount	168,015	1,043,830	3,945	16,726	111,278	185,610	44,197,700
Default Rate (%)	10.3	27.2	0	0	0	2.1	100

	Mean	Std. Dev.	25th Percentile	50th Percentile	75th Percentile	80th Percentile	Max
Panel B: Corporate Accounts Data (Rs. 000)							
Total Assets	771,961	1,776,424	233,200	483,803	811,521	881,232	29,200,000
Equity	149,009	624,848	48,361	88,850	134,800	151,400	12,600,000
Capital Expenditure	67,877	197,970	3,082	14,243	57,324	77,552	1,975,730
Total Sales	976,818	1,523,457	371,453	642,600	1,083,500	1,306,460	16,500,000
Profits	27,122	224,832	-7,797	15,058	54,900	70,656	1,202,446

The total loans data in Panel A comprises all EFS firms, publicly listed and private. The corporate accounts data in Panel B comprises only publicly listed firms. Figures are in Rs. thousands (000) and correspond to firm-level observations in the pre-period (1998-99 to 2000-01).

Table IV
Are Yarn Firms Able to Substitute to Non-Program Loans?

	(1) Log of Total Loans	(2) Log of Total Loans	(3) Exit?
Yarn Dummy * Post	-0.117**		
	(0.046)		
Yarn Ratio * Post		-0.190**	0.096***
		(0.084)	(0.029)
Firm FEs	YES	YES	YES
Year FEs	YES	YES	YES
Observations	4299	4299	4890
R-squared	0.922	0.924	0.558

Robust standard errors, clustered at firm-level, are reported in parentheses.Yarn Ratio refers to the ratio of a firm's yarn exports to its total (yarn and non-yarn) exports in the pre-period under EFS. The pre-period consists of 3 years, 1998-99 to 2000-01, and the post-period consists of 2 years, 2001-02 and 2002-03. In Columns (1) and (2), data is restricted to intensive margin firms. Column (3) reports regression results on the entire sample, where Exit is a dummy=1 if a firm stops borrowing from banks in the post-period, and =0 otherwise.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table V
Effect of EFS Eligibility Change on Export Output

	(1) Log of Post Period Exports	(2) Log of Post Period Exports	(3) Log of Post Period Exports
Yarn Dummy	-0.164***		
	(0.049)		
Yarn Ratio		-0.315***	-0.297***
		(0.063)	(0.074)
Log of Pre Period Average Exports	0.956***	0.952***	0.956***
	(0.016)	(0.015)	(0.018)
Year FEs	YES	YES	YES
Observations	2240	2240	1803
R-squared	0.708	0.71	0.686

Robust standard errors, clustered at firm-level, are reported in parentheses. Yarn Ratio refers to the ratio of a firm's yarn exports to its total (yarn and non-yarn) exports in the pre-period under EFS. The pre-period consists of 3 years, 1998-99 to 2000-01, and the post-period consists of 2 years, 2001-02 and 2002-03. All loans in the pre-period (1998-99 to 2000-01) are averaged at the firm level. The regressions are run on all post periods (2001-02 and 2002-03), and include time dummies for the two post periods. In Column (3), data is restricted to intensive margin firms.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table VI
Comparing Publicly Listed and Private Firms

		(1) Mean	(2) Std. Dev.
Publicly Listed Firms			
Export Value	*(Rs. 000)*	176,145	312,627
EFS Loan Amount	*(Rs. 000)*	105,316	240,408
Total Loan Amount	*(Rs. 000)*	468,523	1,138,402
Default Rate	*(%)*	5.32	14.54
No. of Banks		7.68	7.12
Yarn Ratio		0.50	0.41
Yarn Ratio | Yarn		0.67	0.34
No. of Firms		158	
Private Firms			
Export Value	*(Rs. 000)*	45,474	101,251
EFS Loan Amount	*(Rs. 000)*	20,922	65,157
Total Loan Amount	*(Rs. 000)*	56,505	224,125
Default Rate	*(%)*	7.61	24.34
No. of Banks		2.19	2.67
Yarn Ratio		0.18	0.32
Yarn Ratio | Yarn		0.45	0.38
No. of Firms		820	

This table presents summary statistics separately for publicly listed firms and private firms. "Yarn Ratio | Yarn" refers to the average Yarn Ratio only for firms that export yarn; all non-yarn firms are excluded.

Table VII
Are Publicly Listed Firms Better Able to Deal with EFS Shock?

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Log of Total Loans				Log of Post Period Exports			
	Listed Firms	Private Firms	Listed Firms	Private Firms	Listed Firms	Private Firms	Listed Firms	Private Firms
Yarn Ratio					-0.040	-0.303***	0.015	-0.289***
					(0.148)	(0.091)	(0.145)	(0.096)
Yarn Ratio * Post	-0.079	-0.203*	-0.056	-0.198*				
	(0.122)	(0.120)	(0.127)	(0.118)				
Log of Pre Period Average Exports					0.995***	0.942***	0.996***	0.947***
					(0.039)	(0.022)	(0.040)	(0.024)
Firm FEs	YES	YES	YES	YES				
Year FEs	YES	YES	YES	YES	YES	YES	YES	YES
Firm Size Trends			YES	YES			YES	YES
Observations	720	3579	720	3579	305	1498	305	1498
R-squared	0.944	0.895	0.946	0.897	0.861	0.628	0.865	0.634

Robust standard errors, clustered at firm-level, are reported in parentheses. Yarn Ratio refers to the ratio of a firm's yarn exports to its total (yarn and non-yarn) exports in the pre-period under EFS. The pre-period consists of 3 years, 1998-99 to 2000-01, and the post-period consists of 2 years, 2001-02 and 2002-03. Total Loan regressions in Columns (1) - (4) are run on a panel of 5 years. For Export regressions in Columns (5) - (6), all loans in the pre-period (1998-99 to 2000-01) are averaged at the firm level and the regressions are run on all post periods (2001-02 and 2002-03). They include time dummies for the two post periods. Firm Size is proxied by the log of pre-period average total loans for each firm, and the controls for Firm Size Trends are introduced non-parametrically: the total loan regressions in Columns (3) and (4) include the interaction of each firm size decile dummy with Post, and the export regression in Columns (7) and (8) include all the firm size decile dummies. The sample in all columns is restricted to intensive margin firms.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table VIII
Are Private Group Firms Able to Cross Insure?

	(1)	(2)	(3)	(4)
	Log of Total Loans		Log of Post Period Exports	
	Private Group Firms	Private Non-Group Firms	Private Group Firms	Private Non-Group Firms
Yarn Ratio			-0.062	-0.329***
			(0.130)	(0.094)
Yarn Ratio * Post	-0.030	-0.239*		
	(0.236)	(0.145)		
Log of Pre Period Average Exports			0.993***	0.936***
			(0.036)	(0.026)
Firm FEs	YES	YES		
Year FEs	YES	YES	YES	YES
Observations	880	2699	370	1128
R-squared	0.907	0.883	0.712	0.605

Robust standard errors, clustered at firm-level, are reported in parentheses. Yarn Ratio refers to the ratio of a firm's yarn exports to its total (yarn and non-yarn) exports in the pre-period under EFS. The pre-period consists of 3 years, 1998-99 to 2000-01, and the post-period consists of 2 years, 2001-02 and 2002-03. Total Loan regressions in Columns (1) and (2) are run on a panel of 5 years. For Export regressions in Columns (3) and (4), all loans in the pre-period (1998-99 to 2000-01) are averaged at the firm level and the regressions are run on all post periods (2001-02 and 2002-03). They include time dummies for the two post periods. The sample in all columns is restricted to intensive margin private firms.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table IX
Balance Sheet and Capital Structure Changes for Publicly Listed Firms

	(1)	(2)	(3)	(4)	(5)	(6)
	Log of Fixed Assets	Log of Total Assets	CAPX	Equity	Log of Total Sales	Profits
Panel A: Balance Sheet Changes						
Yarn Ratio * Post	0.07	-0.094	-0.13	-0.081	-0.085	-0.171*
	(0.094)	(0.175)	(0.103)	(0.155)	(0.103)	(0.099)
Firm FEs	YES	YES	YES	YES	YES	YES
Year FEs	YES	YES	YES	YES	YES	YES
Assets * Post			YES	YES	YES	YES
Observations	691	691	383	691	691	691
R-squared	0.93	0.937	0.532	0.875	0.947	0.564

	(1)	(2)	(3)
	Equity Share	Trade Credit Share	Bank Debt Share
Panel B: Capital Structure Changes			
Yarn Ratio * Post	-0.025	0.013	0.038
	(0.036)	(0.037)	(0.035)
Firm FEs	YES	YES	YES
Year FEs	YES	YES	YES
Assets * Post	YES	YES	YES
Observations	691	227	691
R-squared	0.735	0.521	0.816

Robust standard errors, clustered at firm-level, are reported in parentheses. Yarn Ratio refers to the ratio of a firm's yarn exports to its total (yarn and non-yarn) exports in the pre-period under EFS. The pre-period consists of 3 years, 1998-99 to 2000-01, and the post-period consists of 2 years, 2001-02 and 2002-03. In Panel A, dependent variables in Columns (3), (4), and (6) are normalized by pre-period average total assets. In Panel B, Equity Share refers to the share of equity in total capital (equity + trade credit + bank debt). The same definition applies for Trade Credit Share and Bank Debt Share. Assets*Post is an interaction term between Log of Total Assets and the Post dummy. Data is for publicly listed firms only.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table X
Analysis of the Profit and Loss Account

		(1) Mean	(2) Std. Dev.	(3) Min	(4) Max
Panel A: Summary Statistics					
Manufacturing Costs	*(Rs. Millions)*	827.00	1200.00	5.51	14300.00
Financial Charges	*(Rs. Millions)*	72.50	210.00	0.06	3220.00
Administrative & Selling Expenses	*(Rs. Millions)*	45.50	97.30	0.03	1070.00
Taxes	*(Rs. Millions)*	11.30	17.90	0.07	149.00
Total Cost	*(Rs. Millions)*	841.00	1400.00	6.32	17500.00
Interest Exps / Total Cost		0.13	0.19	0.02	0.84
Total Sales	*(Rs. Millions)*	977.00	1520.00	6.66	16500.00
Net Profit	*(Rs. Millions)*	27.10	225.00	-8.13	1200.00

	(1) Log of Manf. Costs	(2) Log of Fin. Costs	(3) Log of Admin. Costs	(4) Log of Wages per Emp.
Panel B: Where is the Cost Adjustment Coming From?				
Yarn Ratio * Post	0.089	0.355*	-0.065	-0.052
	(0.117)	(0.210)	(0.104)	(0.170)
Firm FEs	YES	YES	YES	YES
Year FEs	YES	YES	YES	YES
Assets * Post	YES	YES	YES	YES
Observations	691	691	691	691
R-squared	0.947	0.885	0.972	0.795

Robust standard errors, clustered at firm-level, are reported in parentheses. Yarn Ratio refers to the ratio of a firm's yarn exports to its total (yarn and non-yarn) exports in the pre-period under EFS. The pre-period consists of 3 years, 1998-99 to 2000-01, and the post-period consists of 2 years, 2001-02 and 2002-03. In Panel B, Log of Financial Costs refers to the Log of interest expenses on bank debt. Assets*Post is an interaction term between Log of Total Assets and the Post dummy. Data is for publicly listed firms only.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table XI
Short-Term vs. Long-Term Impact for Publicly Listed Firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Log of Total Assets	Log of Fixed Assets	Long-Term Investments	Equity Issued	Dividends	Log of Total Sales	Profits
Yarn Ratio * Post1	-0.099	0.072	-0.038	0.04	-0.019	-0.062	-0.171*
	(0.173)	(0.099)	(0.024)	(0.081)	(0.045)	(0.105)	(0.096)
Yarn Ratio * Post2	-0.04	0.049	-0.01	0.089	0.004	-0.035	-0.133
	(0.231)	(0.244)	(0.075)	(0.129)	(0.057)	(0.182)	(0.114)
Firm FEs	YES	YES	YES	YES	YES	YES	YES
Year FEs	YES	YES	YES	YES	YES	YES	YES
Assets * Post1			YES	YES	YES	YES	YES
Assets * Post2			YES	YES	YES	YES	YES
Observations	871	871	209	871	338	871	871
R-squared	0.864	0.885	0.904	0.915	0.816	0.902	0.467

Robust standard errors, clustered at firm-level, are reported in parentheses. Yarn Ratio refers to the ratio of a firm's yarn exports to its total (yarn and non-yarn) exports in the pre-period under EFS. The pre-period consists of 3 years, 1998-99 to 2000-01, and the post-period consists of 4 years, 2001-02 to 2004-05. Post1 is a dummy=1 for only the two immediate post-periods, 2001-02 and 2002-3, and measures the *short-term impact*. Post2 is a dummy=1 for only the two final post periods, 2003-04 and 2004-05, and measures the *long-term impact*. Dependent variables in Columns (4), (5), and (7) are normalized by pre-period average total assets. Assets*Post1 is an interaction term between Log of Total Assets and the Post1 dummy. Assets*Post2 is an interaction term between Log of Total Assets and the Post2 dummy. Data is for publicly listed firms only.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table XII
Does Export Productivity Matter?

	(1)	(2)
	Listed Firms	Private Firms
Dependent Variable: Log of Total Loans		
Yarn Ratio * Post	-0.068	-0.200*
	(0.132)	(0.121)
Yarn Ratio * Productivity * Post	-0.016	-0.009
	(0.042)	(0.015)
Firm FEs	YES	YES
Year FEs	YES	YES
Observations	720	3579
R-squared	0.943	0.897
Dependent Variable: Log of Post Period Exports		
Yarn Ratio	-0.038	-0.303***
	(0.144)	(0.092)
Yarn Ratio * Productivity	-0.015	-0.003
	(0.068)	(0.015)
Log of Pre Period Average Exports	0.993***	0.940***
	(0.037)	(0.023)
Year FEs	YES	YES
Observations	305	1498
R-squared	0.862	0.629

Robust standard errors, clustered at firm-level, are reported in parentheses. Yarn Ratio refers to the ratio of a firm's yarn exports to its total (yarn and non-yarn) exports in the pre-period under EFS. The pre-period consists of 3 years, 1998-99 to 2000-01, and the post-period consists of 2 years, 2001-02 and 2002-03. Productivity is the ratio of EFS exports to working capital loans for each firm in the pre-period, and is de-meaned in all specifications. Total Loan regressions are run on a panel of 5 years and include Productivity * Post interactions. For Export regressions, all loans in the pre-period (1998-99 to 2000-01) are averaged at the firm level and the regressions are run on all post periods (2001-02 and 2002-03). Productivity is also included on the RHS. The sample is restricted to intensive margin firms.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table XIII
Is There Cross-Industry Redistribution of EFS Funds?

	(1)	(2)	(3)	(4)	(5)	(6)
	Log of EFS Loans			Log of EFS Exports		
	Non-Yarn Textile Firms	Non-Textile Firms	All Sample Firms	Non-Yarn Textile Firms	Non-Textile Firms	All Sample Firms
(NonTextile=1) * Post			0.234*			0.261**
			(0.126)			(0.127)
Post Dummy	0.042	0.242***		0.064	0.288***	
	(0.117)	(0.063)		(0.111)	(0.059)	
Firm FEs	YES	YES	YES	YES	YES	YES
Year FEs			YES			YES
Observations	1518	5170	6688	1518	5170	6688
R-squared	0.809	0.854	0.845	0.797	0.845	0.836

Robust standard errors, clustered at firm-level, are reported in parentheses. Data in all columns is restricted to non-textile firms and textile firms that are non-yarn (i.e. firms with yarn ratio =0). Columns 1 and 4 report results for non-yarn textile firms, while columns 2 and 5 report results for non-textile firms. (NonTextile=1) is a dummy =1 if the firm is non-textile, and is =0 if the firm is textile AND non-yarn. The pre-period consists of 3 years, 1998-99 to 2000-01, and the post-period consists of 2 years, 2001-02 and 2002-03.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table XIV
Balance Sheet Measures of Firm-Productivity for Publicly Listed Firms

	(1)	(2)	(3)	(4)
Dependent Variable: Log of Total Loans				
Yarn Ratio * Post	-0.093	-0.093	-0.066	-0.086
	(0.126)	(0.121)	(0.119)	(0.123)
Yarn Ratio * Post * ROA	0.015			
	(0.094)			
Yarn Ratio * Post * ROE		0.014		
		(0.075)		
Yarn Ratio * Post * Sales Over Assets			-0.028	
			(0.103)	
Yarn Ratio * Post * Net Margin				0.019
				(0.071)
Firm FEs	YES	YES	YES	YES
Year FEs	YES	YES	YES	YES
Observations	720	720	720	720
R-squared	0.946	0.947	0.945	0.945
Dependent Variable: Log of Post Period Exports				
Yarn Ratio	-0.045	-0.047	-0.034	-0.050
	(0.139)	(0.136)	(0.135)	(0.139)
Yarn Ratio * ROA	0.004			
	(0.115)			
Yarn Ratio * ROE		0.021		
		(0.106)		
Yarn Ratio * Sales Over Assets			-0.022	
			(0.110)	
Yarn Ratio * Net Margin				0.013
				(0.093)
Log of Pre Period Average Exports	0.995***	0.997***	0.993***	0.995***
	(0.044)	(0.042)	(0.039)	(0.041)
Year FEs	YES	YES	YES	YES
Observations	305	305	305	305
R-squared	0.864	0.865	0.863	0.864

Robust standard errors, clustered at firm-level, are reported in parentheses. Yarn Ratio refers to the ratio of a firm's yarn exports to its total (yarn and non-yarn) exports in the pre-period under EFS. The pre-period consists of 3 years, 1998-99 to 2000-01, and the post-period consists of 2 years, 2001-02 and 2002-03. ROA is Return on Assets, ROE is Return on Equity, Sales Over Assets is the ratio of Sales over Total Assets, and Net Margin is the ratio of Net Profits over Sales; these variables are de-meaned in all specifications. Total Loan regressions are run on a panel of 5 years and include all productivity variable interactions with the Post dummy. For Export regressions, all loans in the pre-period (1998-99 to 2000-01) are averaged at the firm level and the regressions are run on all post periods (2001-02 and 2002-03). All productivity variables are also included on the RHS. Data is for publicly listed firms only.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table XV
Do Banks Screen Out Defaulting Firms?

	(1)	(2)
	Listed Firms	Private Firms
Dependent Variable: Log of Total Loans		
Yarn Ratio * Post	-0.064	-0.179*
	(0.141)	(0.104)
Default * Post	-0.439***	-0.420***
	(0.121)	(0.105)
Yarn Ratio * Default * Post	0.012	0.080
	(0.266)	(0.303)
Firm FEs	YES	YES
Year FEs	YES	YES
Observations	720	3579
R-squared	0.947	0.898
Dependent Variable: Log of Post Period Exports		
Yarn Ratio	0.023	-0.258**
	(0.126)	(0.102)
Default	-0.477***	-0.463***
	(0.154)	(0.103)
Yarn Ratio * Default	0.092	0.108
	(0.289)	(0.262)
Log of Pre Period Average Exports	0.997***	0.927***
	(0.043)	(0.023)
Year FEs	YES	YES
Observations	305	1498
R-squared	0.865	0.634

Robust standard errors, clustered at firm-level, are reported in parentheses. Yarn Ratio refers to the ratio of a firm's yarn exports to its total (yarn and non-yarn) exports in the pre-period under EFS. The pre-period consists of 3 years, 1998-99 to 2000-01, and the post-period consists of 2 years, 2001-02 and 2002-03. Default is a dummy =1 if firms have outstanding non-payment on their loans for more than 90 days in the pre-period, and =0 otherwise. Total Loan regressions are run on a panel of 5 years. For Export regressions, all loans in the pre-period (1998-99 to 2000-01) are averaged at the firm level and the regressions are run on all post periods (2001-02 and 2002-03). The sampe is restricted to intensive margin firms.
* significant at 10%; ** significant at 5%; *** significant at 1%

CHAPTER TWO

Dollars Dollars Everywhere and Not a Dime to Lend?

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Summary 2

To what extent are banks successful in intermediating the supply of capital to firms? In this paper we exploit a large and unexpected liquidity upsurge in an emerging economy that led to a more than halving of domestic lending rates. Specifically, the events of 9/11 lead to a large inflow of capital into formal financial markets in Pakistan, both due to reverse capital flight and increased remittances, with deposits rates falling by a half in just over a year. At the same time Pakistan's position as a US ally and the removal of previous sanctions, lead to likely better prospects for firms. The question we ask is to what extent were banks able to take advantage of the lower cost of raising funds and increase lending to firms? The results are very stark. Despite such a large fall in cost of capital, we find that bank lending to firms did not increase. While large listed firms grew, their borrowing from banks actually decreased as they substituted towards equity. In contrast, private firms which did not have access to equity markets, were unable to increase their bank borrowing and in fact showed greater financial distress. The results suggest that banks may be limited in their ability to extend credit - despite a large and sudden drop in the cost of capital, bank lending shows little increase even several years after.

I. Introduction

To what extent are banks successful in intermediating the supply of capital to firms? Does a drop in the cost of capital ceteris paribus necessarily lead to an increase in lending to firms? The "Financing Gap" view, which has its foundations in the Harrod-Domar Model,[1] suggests that banks are constrained by the supply of liquidity in the economy and therefore are unable to fund profitable investment opportunities. Increasing the supply of liquidity and the ensuing drop in the cost of capital will therefore lead to large lending increases. In contrast, a large literature on credit constraints has documented how bank lending to firms is limited by agency problems (Bernanke and Gertler, 1989; Greenwald and Stiglitz, 1993; Kiyotaki and Moore, 1997). Under such a view spurring growth through increased bank financing to firms is by no means an immediate consequence of increased liquidity or lower cost of capital.

In this paper we exploit a unique natural experiment that decreased the cost of capital by more than half in an emerging economy. Moreover, detailed bank-firm level lending data for the universe of all loans made in the economy allow us to examine the impact of this positive shock at the firm level. Specifically, the events of 9/11 led to a large inflow of capital into formal financial markets in Pakistan, both due to reverse capital flight and increased remittances. At the same time Pakistan's position as a US ally and the removal of previous sanctions, lead to likely better prospects for firms. Thus the positive liquidity shock was likely accompanied by a positive demand shock for producers.

Our findings are very stark. Despite such a large fall in cost of capital, we find that bank lending to firms did not increase. While large listed firms grew, their borrowing from banks actually decreased as they substituted towards equity. In contrast, private firms which did not have access to equity markets, were unable to increase their bank borrowing and in fact showed greater financial distress. The results suggest that banks may be limited in their ability to extend credit - despite a large and sudden drop in the cost of capital, bank lending shows little increase even several years after.

Our results are consistent with a model where banks are unable to extend credit to firms unless they are offered sufficient collateral for their loans (Kiyotaki and Moore, 1997). Even with a

[1] The Harrod-Domar model follows from Domar (1946). The basic premise of the model is that external flows coming into a country are converted one-to-one into investment, and that there is a stable linear relationship between investment and GDP growth.

sharp drop in interest rates, banks likely could not extend credit to existing borrowers since their collateral requirements were strictly binding. The liquidity shock did not substantially change the amount of collateral firms could offer, and therefore their borrowing limits did not improve. Our results also show that while bank lending did not increase for existing customers, it did go up significantly for new borrowers and for consumer-finance customers. These findings further support a collateral-based lending environment, since new borrowers likely had fresh collateral to offer for their loans, and consumer credit was entirely asset-backed as these loans were given primarily for real-estate and home purchases.

As a direct test, we check whether at least banks generally lent where the money had the most value, that is, to industries with the highest Q values. We proxy Q by industry market-to-book, and find no significant relationship between loan growth and industry Q. Moreover, we do not find that banks increased their lending substantially to the private corporate sector. For the publicly listed firms, we find lending in fact decreased after 9/11. This is particularly surprising as these types of firms typically have better access to capital and can offer other forms of loan guarantees that private firms cannot. Although listed firms borrowed less after 9/11, we find that these firms expanded rapidly in real terms - their sales, assets, investments, and profits all increased significantly. Their equity issuances also increased sharply, which suggests that they took advantage of the booming stock market and actively substituted equity for debt in their capital structure.

Our results on publicly listed firms and changes in the equity market are also indicative of the inability of banks to transmit excess liquidity to the rest of the economy. With banks not being able to manage the liquidity upsurge despite the drop in the cost of capital, money likely flowed out of banks and into other markets such as equity and real-estate, pushing their prices up. It is not surprising, therefore, that although remittance transfers tripled in a two-year span after 9/11, deposits only increased by an average of 16%.

The findings of this paper strongly indicate the presence of severe credit market frictions, where banks are unable to increase lending to borrowers despite themselves being flush with relatively inexpensive capital. This paper adds to the growing body of research that emphasizes financial frictions and financial transmission channels in emerging markets. While the existing literature has focused primarily on the role of informational frictions in generating macroeconomic volatility (Bernanke and Gertler, 1989; Kiyotaki and Moore, 1997; Caballero

and Krishnamurthy, 2000), our paper studies such market imperfections from a more microeconomic perspective. Moreover, using a rich loan-level database allows us to conduct our analysis at the borrower level, and identify the implications of financial frictions on different types of borrowers.

The rest of the paper is organized as follows. The next section provides background information on the 9/11 liquidity shock, and describes the data. Section III presents bank lending results, and Section IV provides results for listed firms and the equity market. Section V performs the Q-test, and Section VI concludes.

II. Background and Data

A. The 9/11 Liquidity Surge

Following the events of 9/11, the Pakistan economy experienced a very large inflow of liquidity into its formal banking sector. A strict crackdown by the US government and its allies on informal money transfer agents, which were believed to be channeling terrorist funds, led to a surge in formal remittance transfers through commercial banks in Pakistan. In addition, there was significant reverse capital flight as many Pakistanis living abroad panicked and started sending money back home.[2] The real effects of this liquidity shock were substantial: the Central Bank's foreign exchange reserves reached an all-time high, the foreign currency black market premium disappeared, domestic interest rates halved, and the local equity and real-estate markets went into an extended boom.

Table 1 presents flow variables from Pakistan's current account and identifies worker remittances as the singular source of post-9/11 liquidity flows. While official sector transfers, foreign direct investment, and portfolio investment remained relatively constant after 9/11, worker remittances increased by almost 300% in a two-year span between June 2001 and June 2003. Figure 1(a) uses higher frequency flow data to plot these changes, and shows the persistent rise in remittances following 9/11. As a direct consequence of this liquidity shock, the foreign exchange reserves of the central bank, shown in Figure 1(b), increased dramatically and reached an all time high of $10 billion by December 2002 - an increase of over $7 billion in less than two

[2] There is a large body of anecdotal evidence, newspaper stories, and interview discussions that suggest that the size and scope of this reverse capital flow was quite substantial.

years. In addition, the kerb premium for informal currency markets (Figure 1(c)) was eliminated as foreign exchange was no longer in short supply.

At the commercial bank level, deposits saw a large expansion, as shown in Figure 2, recording an average yearly increase of 16% from December 2001 to December 2003 – the highest sustained growth in over ten years. Examining the pre-trend suggests that deposits in fact started growing one year prior to 9/11, but also that the growth was sustained and further increased in the post-9/11 period. Figure 3 plots domestic interest rates, which dropped precipitously after 9/11, falling from 11% in June 2001 to about 2.5% by June 2003. Hence, the post-9/11 supply surge constituted not only a quantity shock, but also a price shock.

On the demand side, there is evidence to suggest that firms in Pakistan experienced a simultaneous and positive demand shock. The cooperation of the Pakistani government with the US, especially in relation to the war in Afghanistan, led to a substantial removal of previous sanctions on the country's productive sectors. Direct evidence comes from looking at equity and real-estate markets, both of which experienced significant booms. Figure 4 plots the Karachi Stock Exchange price index for publicly listed firms, and shows a sharp and persistent rise in stock prices following 9/11. Real-estate prices also rose steeply, with land and house values in some sought-after urban areas increasing by more than 100%. Publicly listed firms actively issued new equity, and thus benefited from the increase in stock prices. These firms also showed significant real improvements with increases in total assets, sales, profits, and investment.

B. Data

The primary data in this paper comes from the Central Information Bureau (CIB) of the Central Bank of Pakistan which supervises and regulates all banking activity in the country. The data has half-yearly loan-level information on the entire universe of corporate bank loans outstanding in Pakistan between June 1996 and June 2003. It follows the history of each loan with information on the amount and type of loan outstanding, default amounts and duration. In addition, it also has information on the name, location and board of directors of the borrowing firm and its bank. We combine this data with annual balance sheet information on banks and publicly listed firms.

The bank balance sheets data comprises year-end annual reports for all commercial banks operating in Pakistan, and is also provided by the Central Bank. This paper supplements these datasets with corporate annual accounts data for publicly listed firms in Pakistan, which is

obtained directly from the Securities and Exchange Commission of Pakistan (SECP). This database consists of audited financial accounts for all publicly listed companies for a panel of over ten years, starting in 1990. These firms are required by law to file their annual reports with the SECP.

In terms of data quality, our personal examination of the collection and compilation procedures, as well as consistency checks on the data suggest that it is of very good quality. CIB was part of a large effort by the central bank to setup a reliable information sharing resource that all banks could access. Perhaps the most credible signal of data quality is the fact that all local and foreign banks refer to information in CIB on a daily basis to verify the credit history of prospective borrowers. For example, we checked with one of the largest and most profitable private banks in Pakistan and found that they use CIB information about prospective borrowers explicitly in their internal credit scoring models. We also ran several internal consistency tests on the data such as aggregation checks, and found the data to be of excellent quality. As a random check, we also confirmed the authenticity of the data from a bank branch by comparing it to the portfolio of that branch's loan officer.

Table 2 presents summary statistics for the variables of interest for the CIB loan data-base and the bank and firm balance sheets. Since we are interested in analyzing changes at the firm level, we collapse the CIB data to the firm-period level, where each period refers to a 6-monthly interval from June 1996 to June 2003. Panel A of Table I gives summary statistics for the CIB variables. These include amount of loan outstanding and the rate of default, which are reported for all firms and then separately for publicly listed and private firms. The table shows that while less than 1 percent of firms in the economy are publicly listed, they receive more than 20 percent of overall lending both before and after the 9/11 shock.

Panel B reports some salient statistics from the listed firm balance sheets. Comparing mean values across time, the table shows that listed firms experience substantial growth in assets, equity, sales, and investment after the 9/11 shock, while their bank loans – as reported in panel A – actually decline.

Finally, Panel C presents summary statistics on bank-level deposits, advances, and government security investment. The sharp increase in deposits after 9/11 is indicative of the positive inflow of liquidity into Pakistani banks. Changes at the bank-level are what we first examine in the next section.

III. Results – Bank Lending

The sharp drop in the cost of capital, accompanied by a favorable demand shock to the economy suggests that the demand for bank loans by the corporate sector in Pakistan likely increased. This section explores changes in the level and composition of bank lending, and finds some very stark results.

Figure 5 presents the sector-wise growth rate of bank loans in Pakistan. Surprisingly, the amount of loans to the corporate sector did not increase proportionately after 9/11, and in fact decreased for the publicly listed firms. In contrast, consumer credit rose very sharply with the total outlay almost doubling in a two-year span following the liquidity shock. These findings highlight a failure at the bank level to transmit remittance flows to the productive sector, and moreover suggest that banks may be limited in their ability to extend credit to firms despite the sharp drop in the cost of capital.

What is particularly surprising about these results is that lending to publicly listed firms declined significantly more than the rest of the corporate sector. Table 3 presents within-firm regression analysis for the growth rate of loans. The regression specifications are the following:

$$Log(Total\ Loans)_{it} = \alpha_i + \beta_1.POST + \varepsilon_{it} \quad (1)$$

and

$$Log(Total\ Loans)_{it} = \alpha_i + \beta_1.POST + \beta_2.LISTED * POST + \varepsilon_{it} \quad (2)$$

where *POST* is a dummy = 1 for four 6-monthly periods post-9/11, *LISTED* is a dummy =1 for publicly listed firms, and α_i's are firm dummies representing firm fixed effects. All error terms are clustered at the firm level.

The results show that while total lending in the economy reported a meager growth rate of 1.5%, loans to publicly listed firms actually declined by 4%. If anything, publicly listed firms should have been borrowing more since informational rigidities are typically less severe for them. Publicly listed firms keep detailed corporate accounts, which banks rely on to evaluate credit risk. The importance of corporate accounts in lending relationships has been recognized by the macroeconomics literature on credit constraints. Bernanke and Gertler (1989) and Greenwald and Stiglitz (1993) develop business cycle models in which the condition of borrowers' balance

sheets affects the degree of information asymmetry between borrowers and lenders, and influences the amount of borrowing and investment. Access to audited balance sheets makes it easier for banks to monitor firm performance and effectively reduces the limit on the amount of loans available. Further, publicly listed firms are on average larger and more established than private firms, which enables them to offer greater collateral on their loans. One explanation for why loans to publicly listed firms declined is that their demand for loans went down - with the equity market booming, these firms may actively have been substituting equity for debt. We will explore this possibility in greater detail in the next section.

Focusing now on the private sector firms, Table 3 shows that not only was loan growth relatively flat for these firms, but also that their default rates increased significantly. Hence, private firms exhibited greater levels of financial distress after 9/11. We first explore whether borrower size played a role in lending patterns. Table 4 presents regression results for loan growth, split by firm size. Here again we find some surprising results. While the loan growth for medium and large firms remained relatively flat, it was positive and significant for small firms. Default rates, however, increased for all size categories in the same proportion - by about 2%. Hence, although lending did increase for the smallest firms, all private firms exhibited some degree of financial distress.

The small firm loan growth, coupled with the rapid increase in consumer financing, suggests that most of banks' new lending was focused on smaller borrowers. In addition, the composition of lending shifted substantially towards newer borrowers. Figure 6(a) plots the number of new borrowers entering loan relationships in each period, and shows a sharp upward trend after 9/11 both for consumers and private firms. Similarly, Figure 6(b) plots the growth rate in loan amounts to new borrowers and shows a similar upward trend, particularly for consumer loans. These findings strongly suggest that the increase in bank lending after 9/11 was focused primarily on either existing small firms or new borrowers. The Central Bank's own Annual Review of the Economy Report (2002-03) supports these findings:

> *"... the strong deposit growth together with the easy monetary stance of the SBP contributed to a sharp decline in domestic interest rates. This large reduction in interest rates initiated a resurgence of credit demand... evidence [for higher credit demand] clearly points to a strong contribution of new economic activity as well as the aggressive marketing of consumer credit by the banks."*

The results above are consistent with a banking sector facing severe agency problems in its lending decisions, and one in which banks are only able to offer collateralized loans. Kiyotaki and Moore (1997) construct a model of a dynamic economy in which lenders cannot force borrowers to repay their debts unless the debts are secured through collateral. Under such a setup, firm assets serve a dual purpose: that of productive activity and of loan collateral. Our finding that lending to medium and large private firms does not increase indicates that banks were already lending to these firms up to the limit prior to 9/11, as established by the level of information problems and collateral provision. The liquidity shock did not substantially change the amount of collateral firms could offer, and therefore their borrowing limits did not improve. In fact, their positions slightly worsened as default rates went up.

The result that lending does increase for small firms suggests that, prior to the liquidity shock, lending to these firms was limited not by the availability of collateral, but rather by bank-level liquidity constraints. That is, banks were likely not lending to these firms because they themselves were deposit-constrained. This is not an unexpected finding. Khwaja and Mian (2006) document the significant decline in banking sector liquidity following the nuclear tests conducted by Pakistan in May 1998 and the economic sanctions that ensued. Following the liquidity inflow from the 9/11 shock, banks no longer faced liquidity shortages and therefore were likely willing to extend credit to small firms.

The finding that banks significantly increased their lending to new private borrowers and consumers further supports the theory based on information problems and loan security. Having reached the lending capacity for existing borrowers, banks likely offered loans to new borrowers who could in turn offer fresh collateral for their loans. Consumer financing, also, was completely asset-backed as these loans were given primarily for real-estate and home purchases.

IV. Results – Listed Firms and the Equity Markets

In this section, we return to the analysis of publicly listed firms and explore the likely reasons why lending to these types of firms decreased after 9/11. First, we should point out that even under a model of fully-collateralized loans, lending to listed firms should have at least remained the same, if not increased since these firms are able to offer other forms of loan assurances such as audited balance sheets, that private firms cannot offer. Results in Table 3 also confirm that

loan default for listed firms did not increase after 9/11. Why then did borrowing for these firms decline significantly?

What makes this finding particularly stark is that even though listed firms borrowed less after 9/11, they in fact grew very fast in real terms. Table 5 presents regression results for several balance sheet variables of interest and shows that total investment, assets, and sales for these firms all increased by significant amounts after 9/11. Figure 7 plots the year-by-year coefficients for these regressions and shows a steep increase in slope for all real variables, and a negative change in slope for bank loans. The rapid growth of listed firms lends strong support to the notion that the 9/11 liquidity shock was accompanied by a positive demand shock to the economy.

The fundamental question that arises then is how were listed firms able to grow so fast, yet borrow less? The answer comes from looking at the equity market. Note first that we have already shown earlier in the paper (see Figure 4) that stock prices for listed firms were booming after 9/11. Second, the regression analysis in Table 5 shows that listed firms were actively issuing new equity. While bank loans declined by 6%, equity issuances increased by 13%. These findings suggest that firms were taking advantage of the booming stock market and actively substituting towards equity in their capital structure.

The fact that equity markets were booming after 9/11 may itself be indicative of a failure at the bank-level to transmit liquidity to the productive economy. As we have shown before, while remittance inflows increased by over 300%, bank deposits on average only increased by 16%, which is indicative of the inability of banks to sustain deposits. Money flowed out of the banking sector and into equity and real-estate sectors, likely leading to large speculative bubbles in both markets.[3] In sum, our results show that banks were mostly unable to carry out their function of transmitting excess liquidity to the rest of the economy despite a large drop in the cost of capital, which resulted in money flowing out of the banking sector and into other markets, such as equity and real-estate.

[3] Recent newspaper accounts suggest that the real-estate bubble eventually burst, as land prices began a downward trend around August 2004. Equity market prices also started trending downwards in the last quarter of 2003, as shown in Figure 4.

V. Results – Lending to the Highest Q?

The analysis in the previous sections suggests that banks are unable to extend lending to firms because of information asymmetry problems. One way to directly test this market imperfection hypothesis is to see whether at least banks generally lend where the money has the most value - i.e. to industries with the highest market-to-book values. We construct a test based on the Q-theory of investment, which suggests that under no market imperfections, new money flowing into the banking sector should first be lent to the highest Q sectors, and that the lending criteria for banks be dependent on Q.

Using detailed stock price data and balance sheets for all publicly listed firms in Pakistan, we construct measures of industry Q based on data prior to 9/11, after 911, and the difference in prices across 9/11. We then estimate the following industry-bank level specification for loans to private firms:

$$Log(Post\ 9/11\ Bank\ Loans) - Log(Pre\ 9/11\ Bank\ Loans) = \alpha + \beta_1.Log(Q) + \beta_2.X + \varepsilon_i \quad (3)$$

where β_1 represents the elasticity of loan growth with respect to different measures of industry Q, X is a vector of bank and industry level controls, α is a constant, and ε_i is the error term. Standard errors are clustered at the industry level.

The results of this regression analysis are presented in Table 6. We find that not only are the coefficients not significant, but also that they are very close to zero in terms of magnitude. Hence, we do not find any significant relationship between industry Q and bank lending after 9/11.

While the Q-test results support our earlier findings regarding the presence of severe lending rigidities, we should point out a limitation of our Q measure. Since we are using data from publicly listed firms to construct our measure of Q, the identification assumption we are making is that private sector Q within the same industry is correlated with the publicly listed Q. While we acknowledge that there are differences between listed and private firms, the 9/11 demand shock was likely not restricted to just the publicly listed firms. Moreover, it is very likely that the demand shock was correlated within the same industry across listed and private firms.

VI. Conclusion

This paper exploits a very large and exogenous liquidity shock to the financial sector in an emerging economy, and investigates changes in bank lending behavior as well as changes in firm-level realizations. Specifically, the events of 9/11 lead to a large inflow of capital into formal financial markets in Pakistan, both due to reverse capital flight and increased remittances, with deposits rates falling by a half in just over a year. Despite this sharp reduction in the cost of capital, we find that banks did not increase their lending substantially to the corporate sector, and rather focused more on extending loans to new borrowers or consumer-finance customers. Surprisingly, we find that lending to publicly listed firms in fact decreased after 9/11, and that these firms actively substituted towards equity in their capital structure. In real terms, the listed firms registered significant growth in their sales, investments, assets, and profits, while stock markets also boomed.

These results indicate severe lending rigidities in the banking sector and suggest that banks may be unable to transmit positive financial shocks to the rest of the economy despite large reductions in interest rates. Excess liquidity, therefore, flows out of the banking sector and into other markets such as equity and real-estate, where prices increase sharply. Firms that have access to such markets (i.e. the publicly listed firms) really benefit as they can substitute out of bank loans and into these other markets. Other firms that do not have access to such alternative markets (i.e. the private firms) fail to directly benefit from such large-scale liquidity shocks, and in fact exhibit greater financial distress.

These results present some stark implications of positive financial shocks in emerging markets. While those firms that have good access to alternative financial markets may benefit from bank-level frictions, other firms lose out. Unfortunately, the ratio of winners and losers is extremely uneven, as publicly listed firms typically comprise only a small fraction of the corporate sector in emerging economies.

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Figure 1(a): Pakistani Remittances

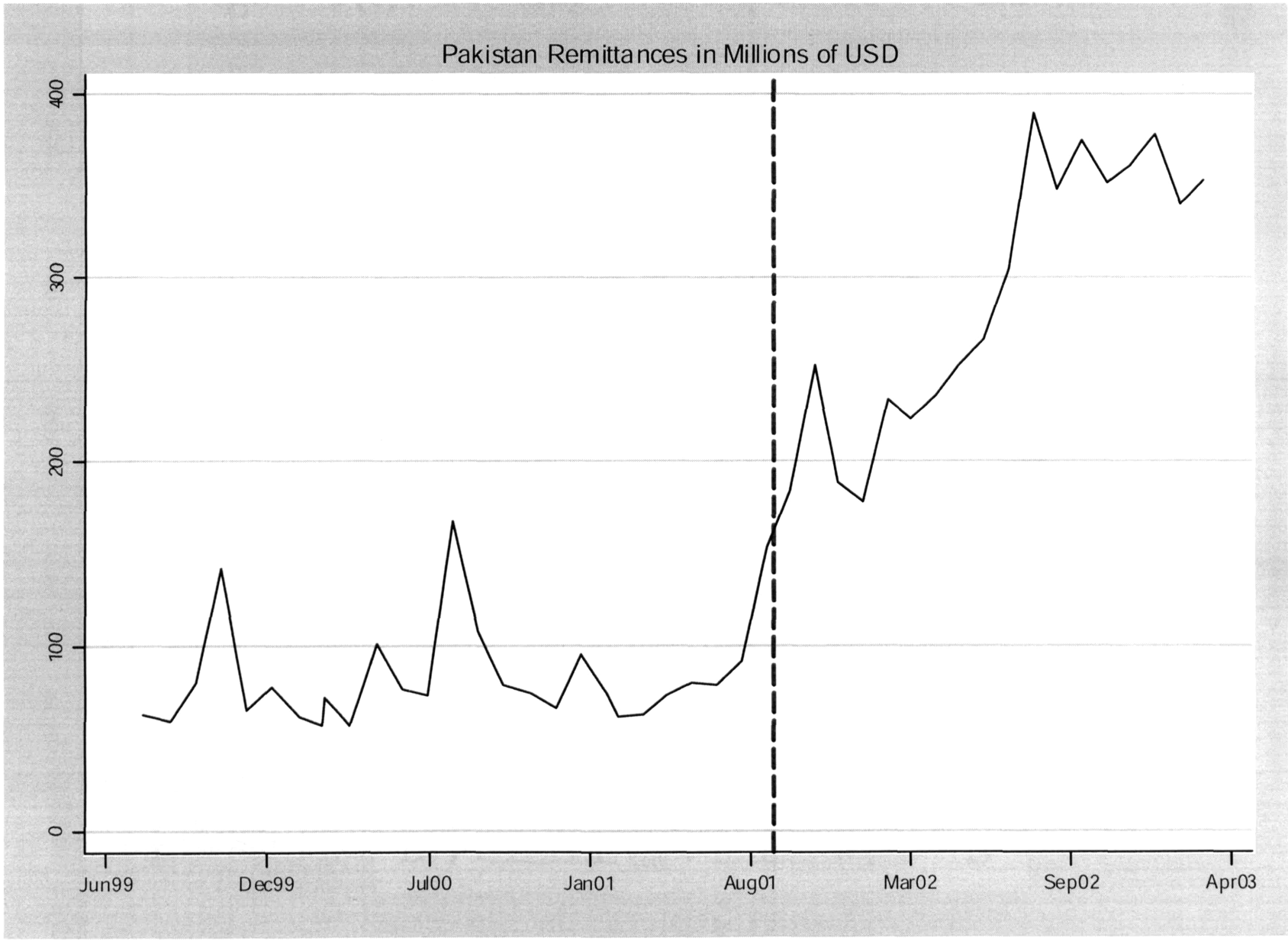

Figure 1(b): Pakistani Foreign Exchange Reserves

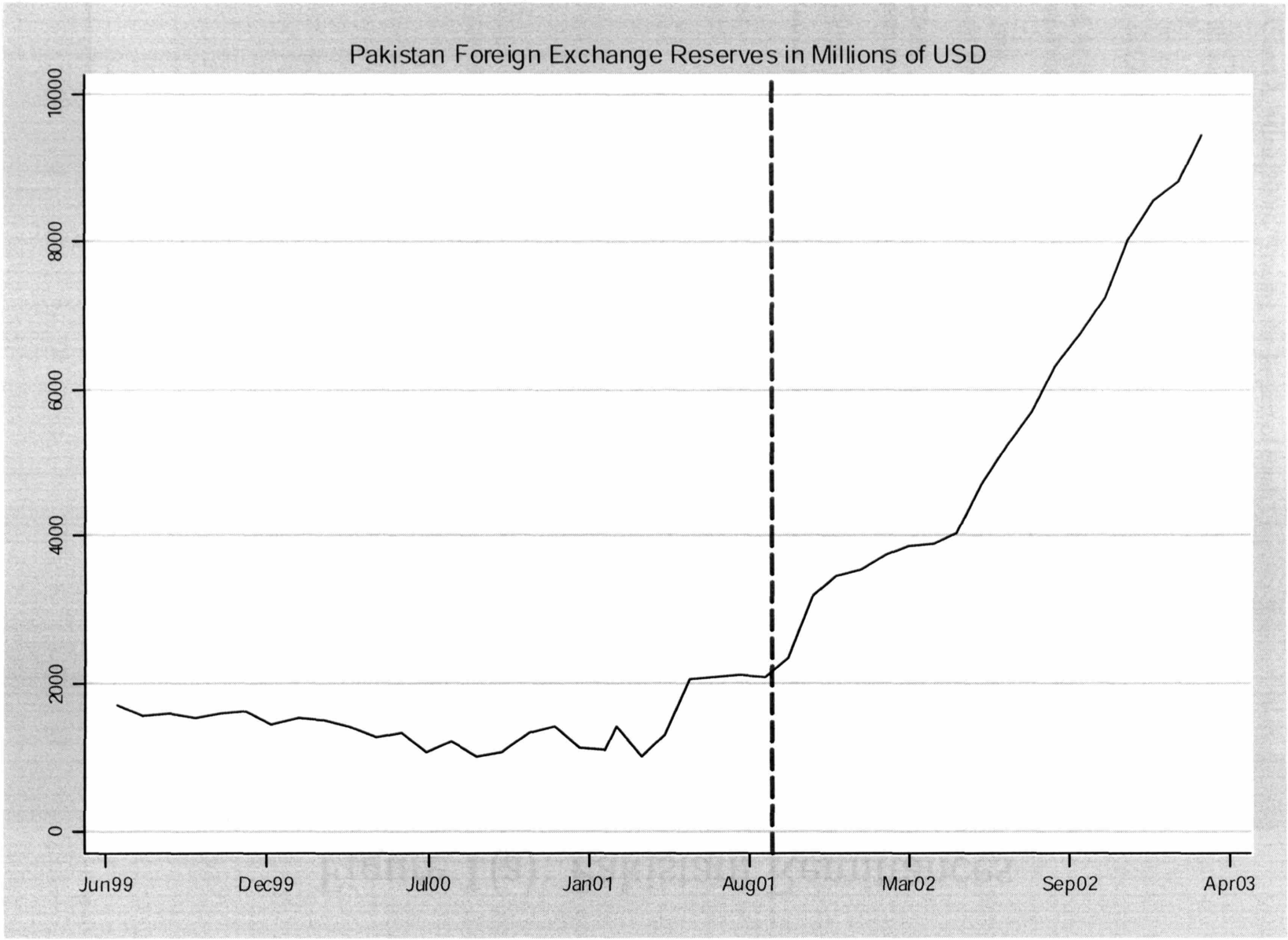

Figure 1(c): Official vs. Kerb Rates in Pakistan

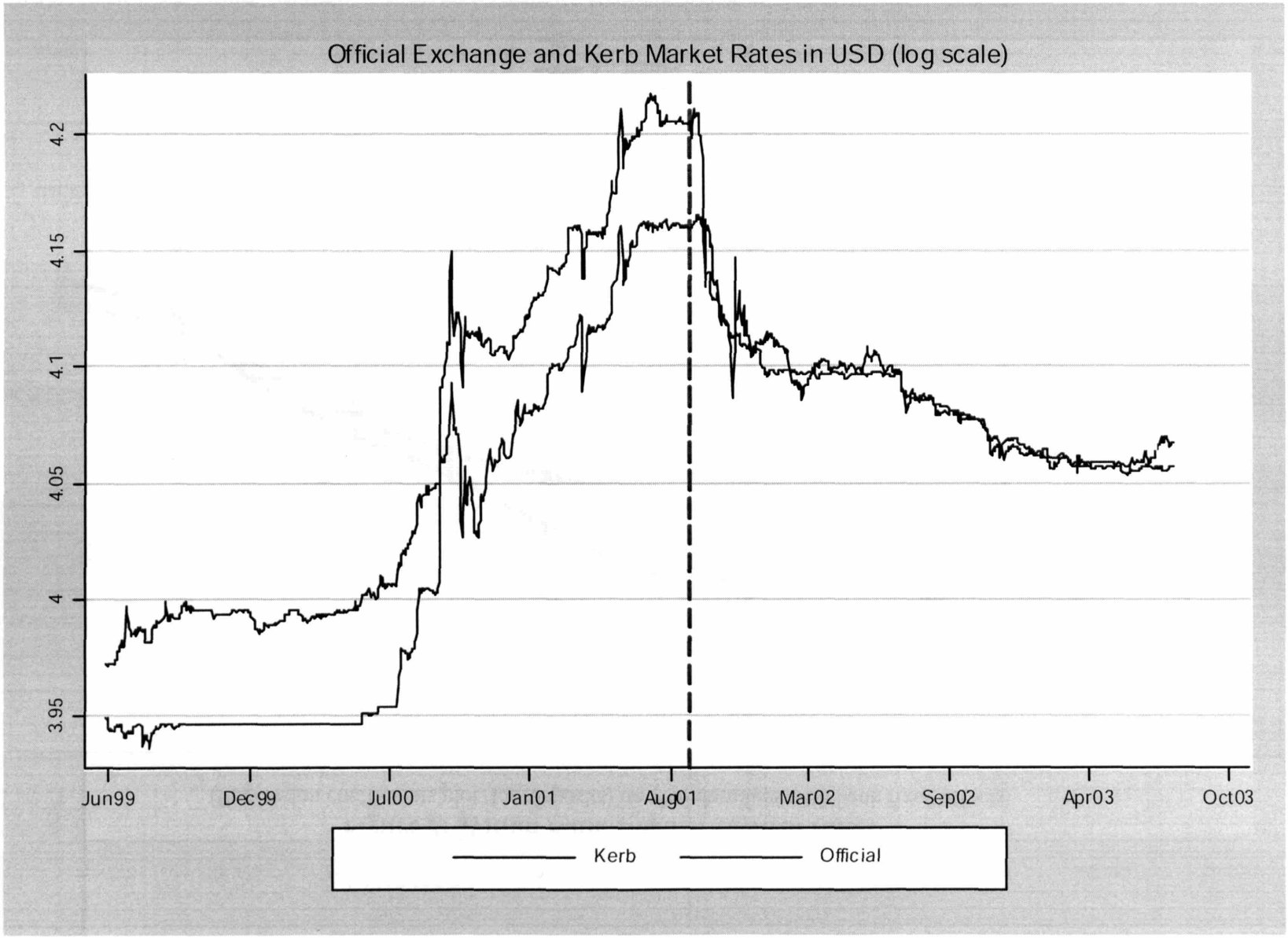

Figure 2: Within Bank Deposit Growth Rates

(Regression coefficients plot: log(deposits) on year dummies with bank fixed effects)

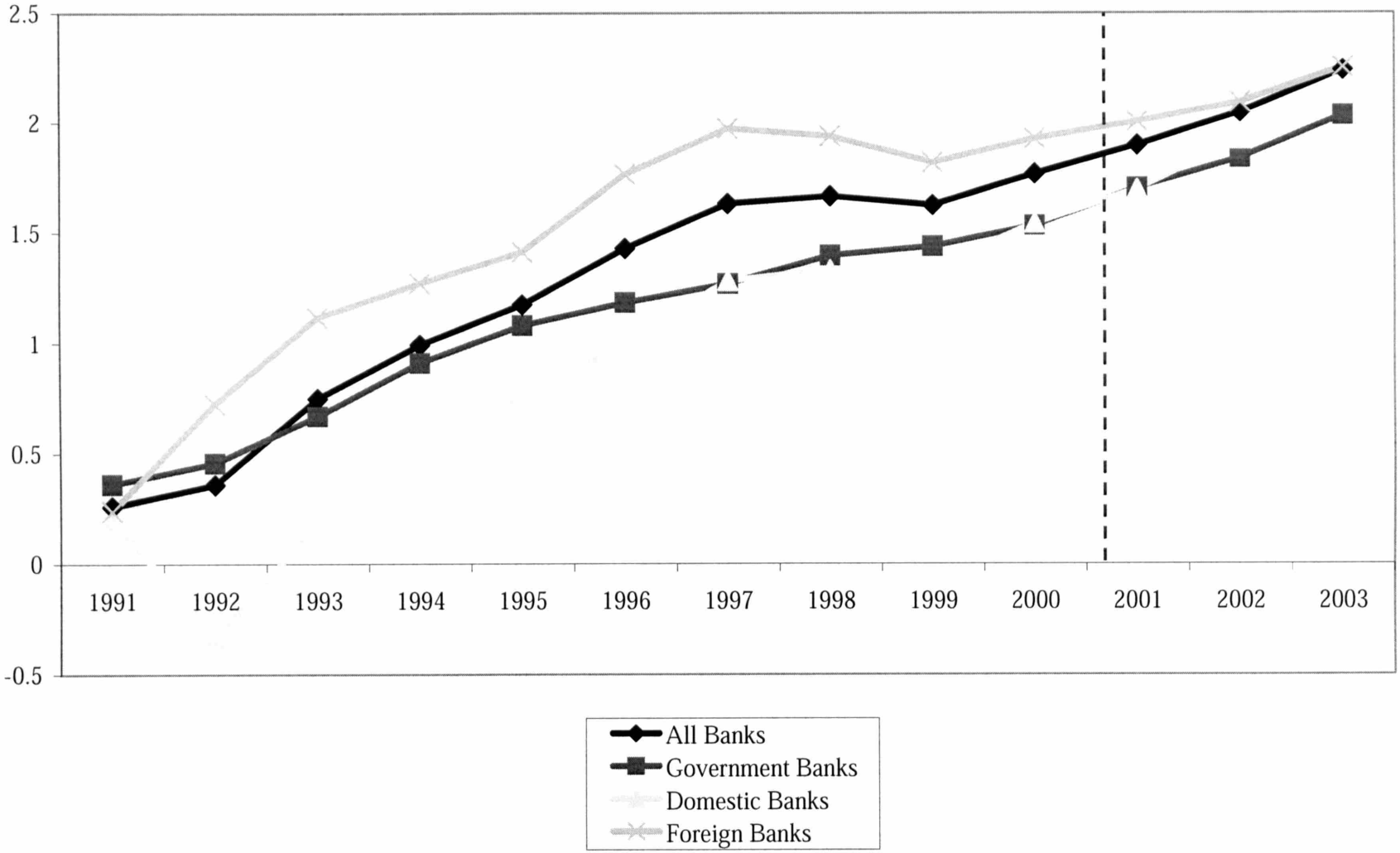

Figure 3: Domestic Interest Rate in Pakistan

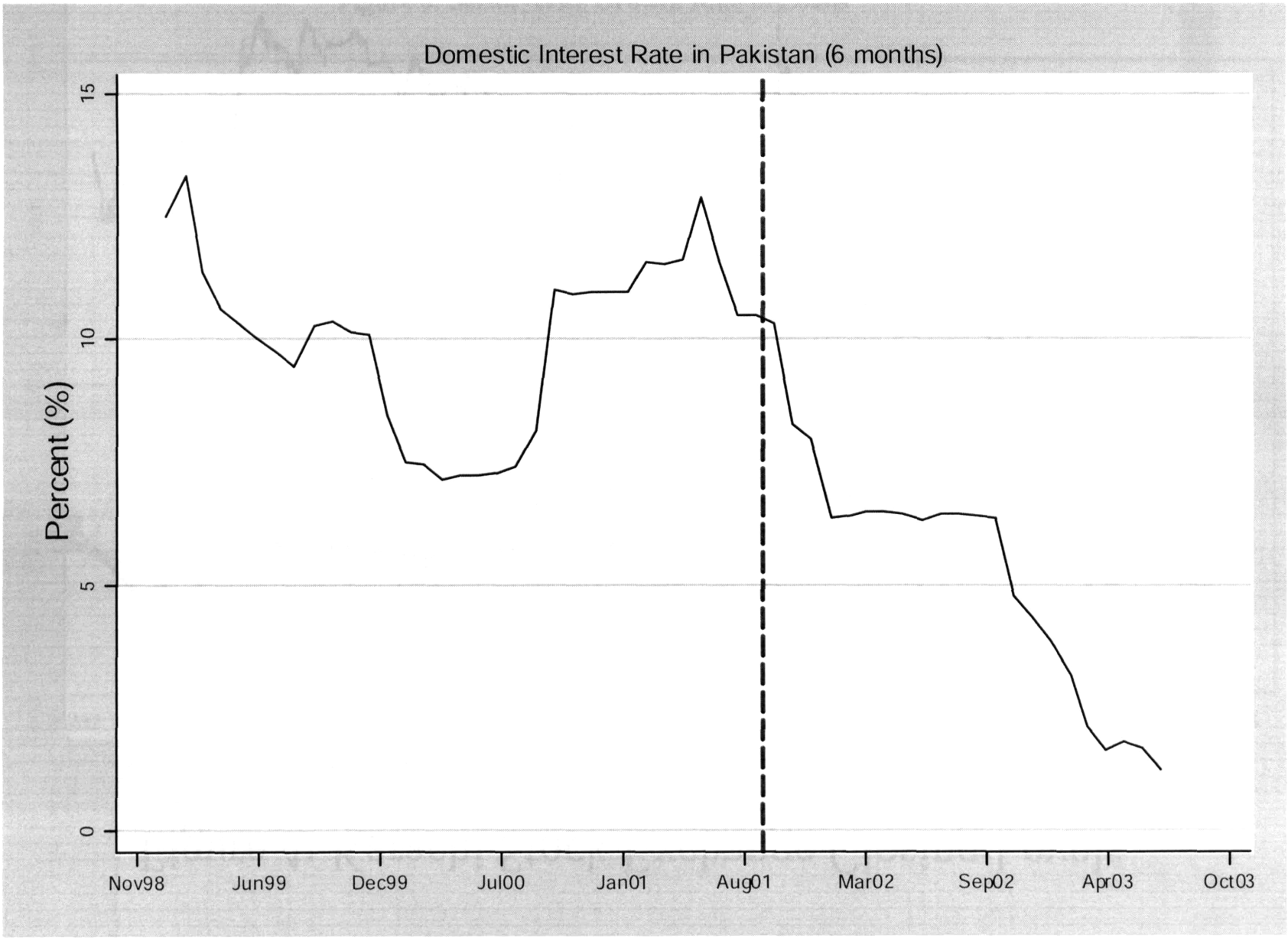

Figure 4: Karachi Stock Exchange Closing Levels

Figure 5: Sector-Wise Growth Rate of Loans

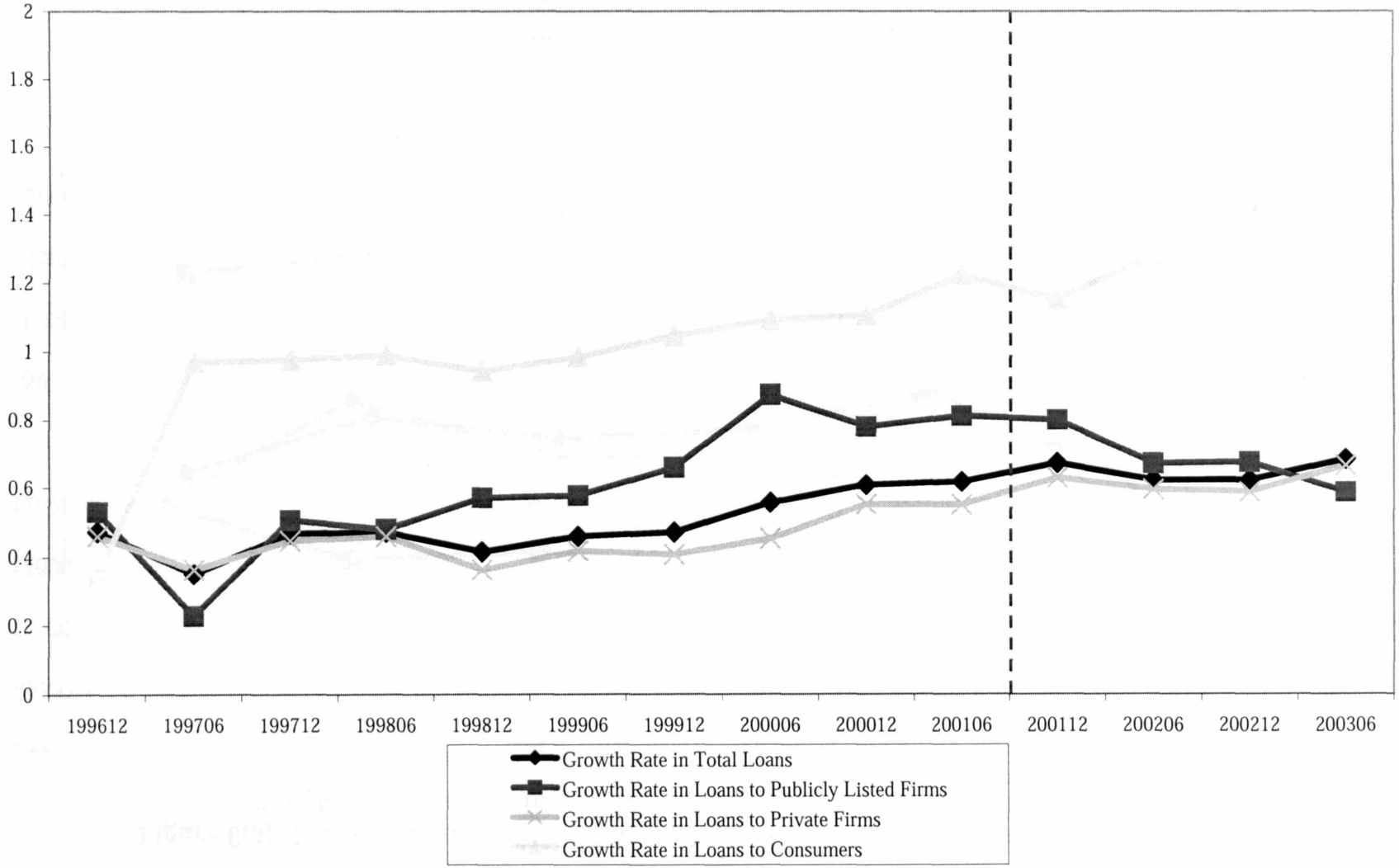

Figure 6(a): Entry - Number of New Borrowers Entering Loan Relationships Per Period

(Sample excludes private firm borrowers that only appear in the dataset for one period)

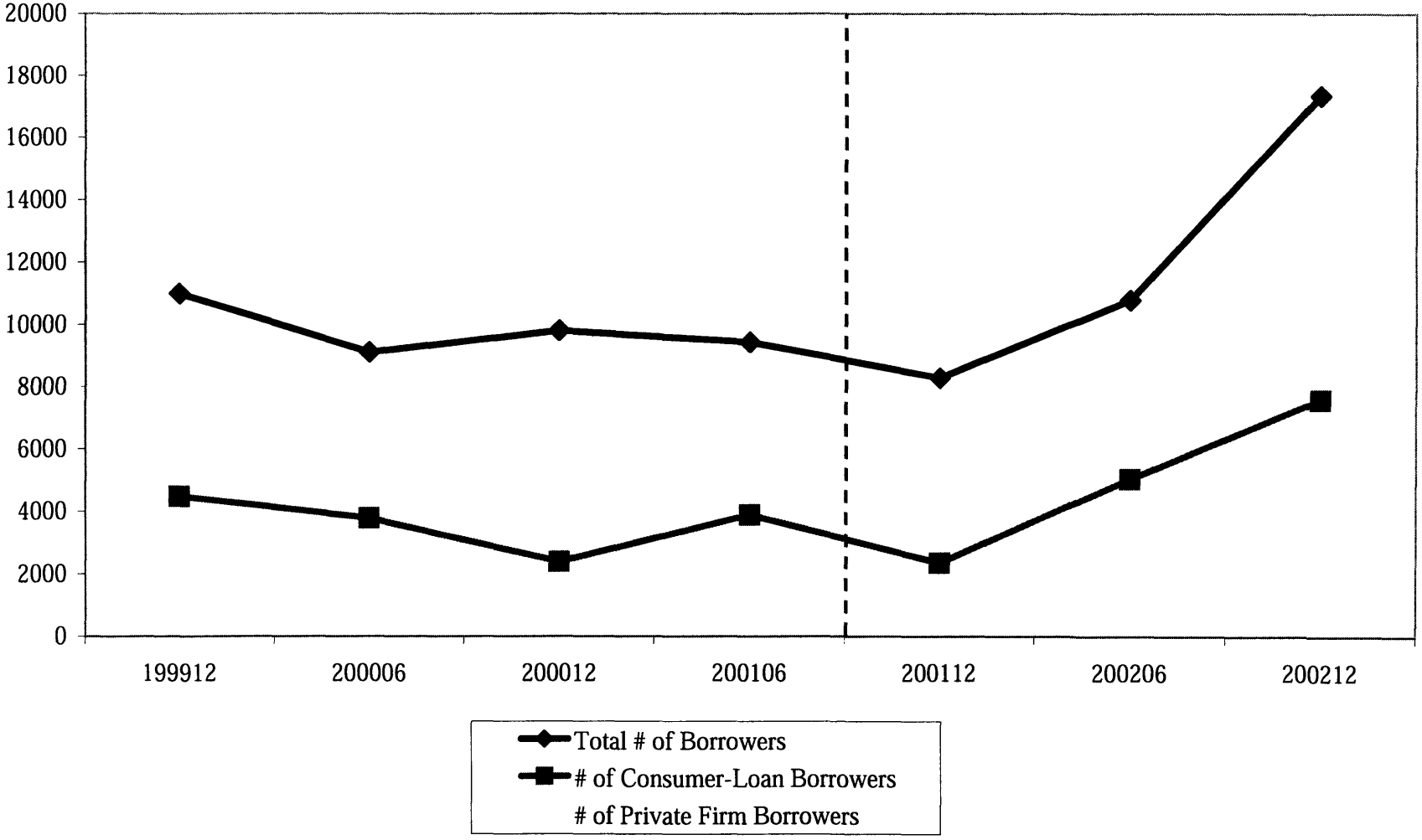

Figure 6(b): Growth Rate in Loans to New Borrowers

(Growth rate in total loan value)

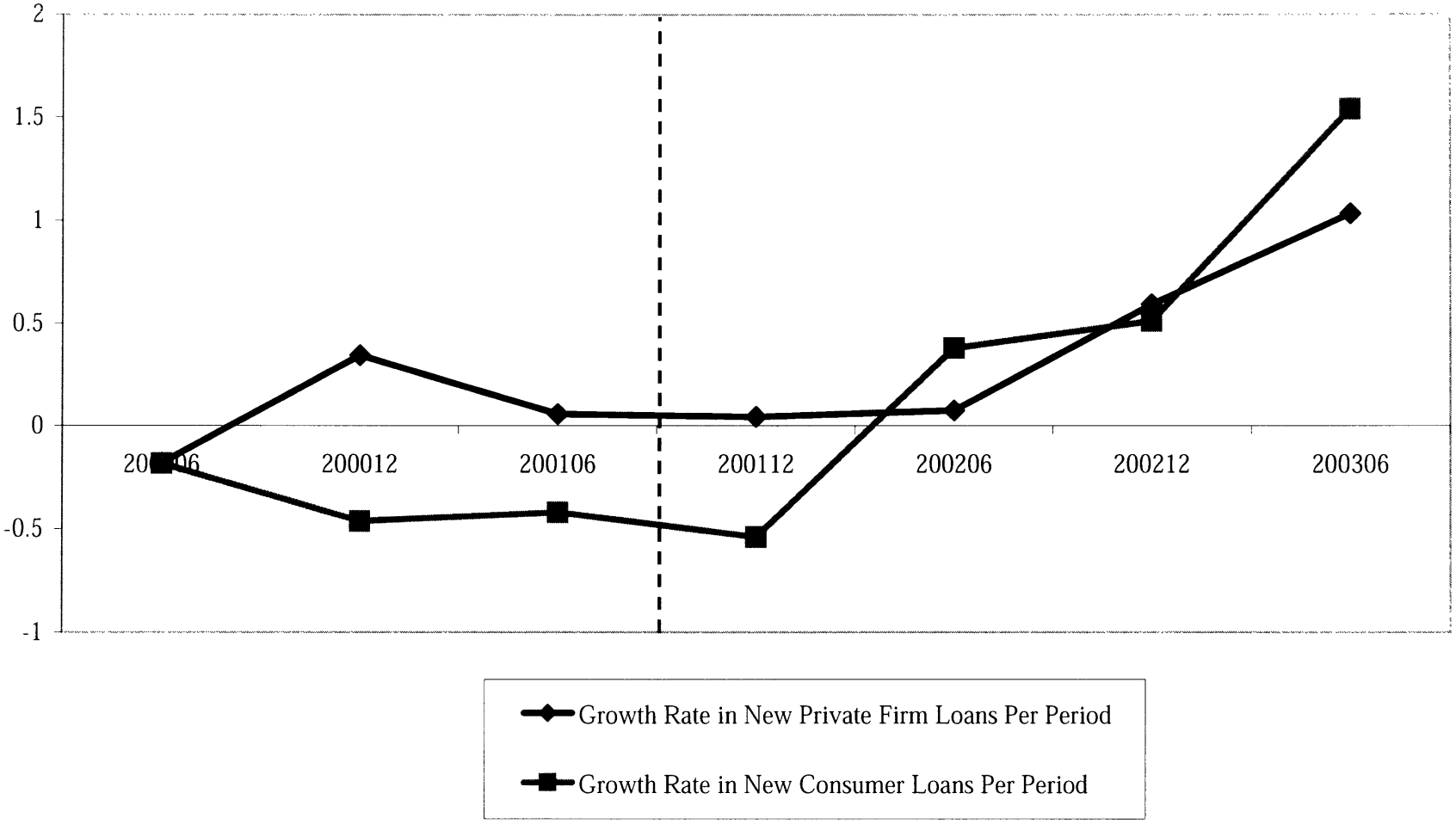

Figure 7: Listed Firm Regression Coefficient Plots

Coefficients from regression of log of each variable on time dummies, with firm fixed effects

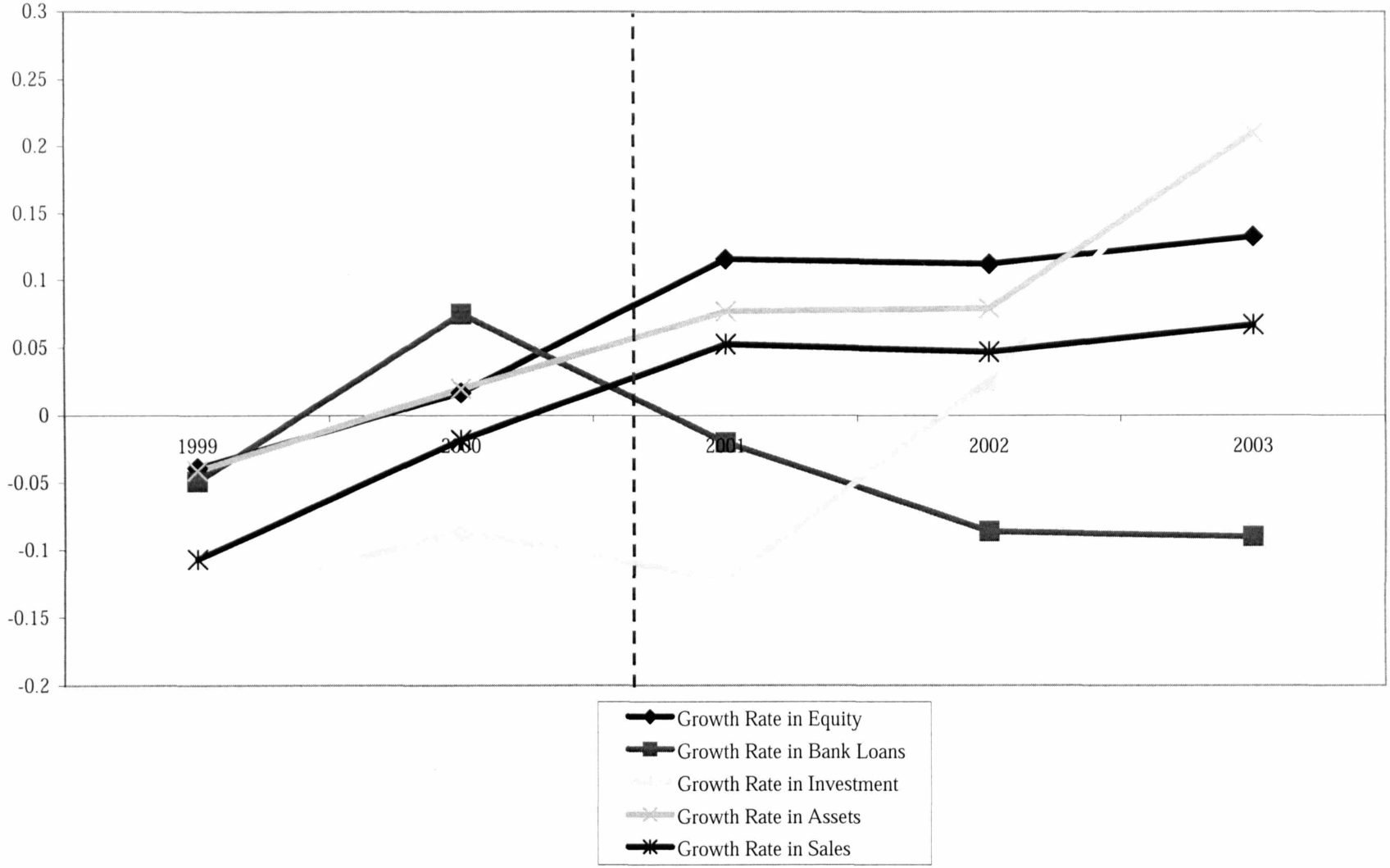

Table 1: Pakistan Balance of Payments Flow Data

Million US $	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
Unrequited Transfers:											
Net Private Transfers:	2390	2437	2378	2958	3210	2274	3063	3898	4249	5737	6110
Workers' Remittances							983	1087	2389	4237	3871
FCA (Residents)							322	534	285	-12	367
Direct Kerb Purchase by SBP							1634	2157	1376	0	0
Other (Unknown)							124	120	199	1512	1872
Net Official Transfers	314	321	227	289	220	194	926	839	1495	1000	574
LT Loans - Official Sector:											
Loans Drawn	2156	2238	2350	1991	2568	2658	1305	1463	1416	1344	
Loans Repaid	1293	1455	1503	1592	1724	2038	1967	1795	1513	2419	
Net Loans Drawn	863	783	847	399	844	620	-662	-332	-97	-1075	
ST Loans - Official Sector:											
Loans Drawn	1677	1756	1617	1364	1601	211	118	762	825	187	
Loans Repaid	1255	1487	1276	1810	1211	1074	338	331	1159	367	
Net Loans Drawn	422	269	341	-446	390	-863	-220	431	-334	-180	
Direct Investment in Pakistan:											
FDI In	354	442	1102	682	601	472	472	323	485	798	
FDI Out	0	0	0	0	0	0	0	0	0	0	
FDI Net	354	442	1102	682	601	472	472	323	485	798	
Portfolio Investment In	339	1280	159	677	34	142	0	0	0	0	
Portfolio Investment Out	0	0	0	0	0	0	549	140	491	239	
Portfolio Investment Net	339	1280	159	677	34	142	-549	-140	-491	-239	

NOTES:

Net private transfers is broken up in the above catergories, where FCA accounts are foreign currency accounts opened up by Pakistanis, direct kerb purchase is SBP's direct purchase of $ from the kerb, and the balance is unknown. LT loans and ST loans are foreign donor and institutional loans

Table 2: Summary Statistics

PANEL A: CIB DATA

	Pre-9/11		Post-9/11	
	Mean	Std. Dev.	Mean	Std. Dev.
All Firms:				
Loan Size (000's of Pak Rs.)	23,429	334,829	21,244	338,350
Default Rate (%)	22.91%	38.37%	22.35%	37.87%
Listed Firms:				
Loan Size (000's of Pak Rs.)	708,496	2,278,864	630,012	1,691,467
Default Rate (%)	16.79%	32.34%	19.07%	34.62%
Private Firms:				
Loan Size (000's of Pak Rs.)	17,860	258,819	17,030	304,791
Default Rate (%)	22.96%	38.41%	22.38%	37.89%

	Percent of Total Firms		Percent of Total Lending	
	Pre-9/11	Post-9/11	Pre-9/11	Post-9/11
Listed Firms	0.6%	0.5%	24.4%	20.4%
Private Firms	99.4%	99.5%	75.6%	79.6%

PANEL B: LISTED FIRM BALANCE SHEETS

	Pre-9/11		Post-9/11	
	Mean	Std. Dev.	Mean	Std. Dev.
(000's of Pak Rs.)				
Total Assets	1,761,778	8,036,083	2,006,133	7,620,650
Total Equity	356,670	2,527,458	415,098	2,538,362
Total Sales	1,666,840	6,223,278	2,506,027	10,081,970
Total Investment	60,843	243,620	123,019	478,375
Total Profits (Before Tax)	72,099	1,076,198	98,139	1,555,288

PANEL C: BANK BALANCE SHEETS

	Pre-9/11		Post-9/11	
	Mean	Std. Dev.	Mean	Std. Dev.
(000's of Pak Rs.)				
Total Deposits	32,732,060	64,855,090	44,245,760	81,118,340
Total Advances	20,832,410	38,252,930	28,920,390	45,905,210
Total Government Security Investment	8,652,366	15,988,000	12,840,870	26,582,790

NOTES:

The Pre-9/11 CIB statistics represent 4 half-yearly periods December 1999 - June 2001

The Post-9/11 CIB statistics represent 4 half-yearly periods December 2001 - June 2003

The Pre-9/11 Balance Sheet statistics represent 3 years December 1998 - December 2000

The Post-9/11 Balance Sheet statistics represent 3 years December 2001 - December 2003

Table 3: Growth Rate of Borrower-Level Loans and Default

	(1)	(2)	(3)	(4)
	Log (Total Loans)	Log (Total Loans)	Default Rate	Default Rate
Post	0.015***	0.015***	0.022***	0.022***
	(0.003)	(0.003)	(0.001)	(0.001)
Listed * Post		-0.055**		-0.020***
		(0.026)		(0.002)
Firm FEs	YES	YES	YES	YES
Observations	193600	193600	122579	122579
R-squared	0.942	0.942	0.536	0.536

NOTES:

Data restricted to firms that borrow both before and after the 9/11 shock.

The default rate regressions only include firms that had zero default prior to the 9/11 shock.

Pre-period consists of 4 6-monthly observations per firm Dec 1999 - Jun 2001

Post-period consists of 4 6-monthly observations per firm Dec 2001 - Jun 2003

Default Rate is the ratio of stock of overdue loans / stock of total outstanding loans per borrower, for each period

Robust standard errors in brackets, clustered at borrower level

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4: Loan Growth for Private Sector Firms

	(1)	(2)	(3)	(4)	(5)	(6)
	Log (Total Loans)	Log (Total Loans)	Log (Total Loans)	Default Rate	Default Rate	Default Rate
Post	0.015***	0.057***		0.022***	0.025***	
	(0.003)	(0.004)		(0.001)	(0.002)	
Large * Post		-0.078***	-0.020***		-0.004	0.021***
		(0.007)	(0.006)		(0.003)	(0.002)
Medium * Post		-0.061***	-0.003		-0.003	0.022***
		(0.006)	(0.004)		(0.002)	(0.002)
Small * Post			0.057***			0.025***
			(0.004)			(0.002)
Firm FEs	YES	YES	YES	YES	YES	YES
Observations	190471	190471	190471	120997	120997	120997
R-squared	0.936	0.945	0.945	0.536	0.536	0.536

NOTES:

Data restricted to private (non-listed) firms that borrow both before and after the 9/11 shock.

The default rate regressions only include firms that had zero default prior to the 9/11 shock.

Pre-period consists of 4 6-monthly observations per firm Dec 1999 - Jun 2001

Post-period consists of 4 6-monthly observations per firm Dec 2001 - Jun 2003

Default rate is the ratio of stock of overdue loans / stock of total outstanding loans per borrower, for each period

Firm size is measured as the average log(loan_size) in the pre-period

"Large" = 1 for firms larger than the 70th percentile in size

"Medium" = 1 for firms between the 30th and 70th percentiles in size

"Small" = 1 for firms smaller than the 30th percentile in size

The regressions have controls for pre-9/11 loan growth trend

Robust standard errors in brackets, clustered at borrower level

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5: Balance Sheet Changes for Listed Firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Log (Equity)		Log (Bank Loans)		Log (Investment)		Log (Total Assets)		Log (Sales)	
Post	0.127***	0.120***	-0.057**	-0.060**	0.140**	0.039	0.117***	0.090***	0.094**	0.041
	(0.028)	(0.029)	(0.028)	(0.030)	(0.066)	(0.074)	(0.025)	(0.026)	(0.041)	(0.046)
Post * KSE100		0.06		0.022		0.490***		0.214***		0.371***
		(0.092)		(0.082)		(0.162)		(0.076)		(0.079)
Firm FEs	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	2514	2514	2185	2185	1177	1177	2564	2564	2316	2316
R-squared	0.915	0.915	0.907	0.907	0.892	0.893	0.95	0.95	0.906	0.907

NOTES:

Pre-period consists of 3 yearly observations per firm Dec 1998 - Dec 2000
Post-period consists of 3 yearly observations per firm Dec 2001 - Dec 2003
KSE100 is a dummy = 1 for firms that are part of the Karachi Stock Exchange 100 Index

Robust standard errors in brackets, clustered at the firm level
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6: Q Test

	-1	-2	-3	-4	-5	-6	-7	-8	-9
Dep Var: Log(Post 9/11 Loans) - Log (Pre 9/11 Loans)									
Log (Pre 9/11 Q)	0.007	0.007	0.005						
	(0.029)	(0.029)	(0.028)						
Log (Post 9/11 Q)				0.015	0.023	0.02			
				(0.032)	(0.035)	(0.034)			
Change in Log Q (post - pre) at Industry Level							0.009	0.02	0.018
							(0.053)	(0.050)	(0.049)
CONTROLS: INDUSTRY		YES			YES			YES	
CONTROLS: INDUSTRY AND BANK			YES			YES			YES
Constant	0.068	0.148	-0.570*	0.034	0.227	-0.473	0.078	0.223	-0.483
	(0.075)	(0.281)	(0.334)	(0.104)	(0.292)	(0.319)	(0.048)	(0.279)	(0.309)
Observations	2094	2094	2093	2037	2037	2037	2037	2037	2037
R-squared	0	0.001	0.008	0	0.001	0.009	0	0.001	0.008

NOTES:

The difference in log loans is calculated using loans to private-sector firms only. That is, loans to listed firms are omitted. Q is the ratio of maket value to book value, averaged at the industry level.

Robust standard errors in brackets, clustered at the industry level

* significant at 10%; ** significant at 5%; *** significant at 1%

CHAPTER THREE:

Access to Finance and Industrial Composition in Emerging Markets

Summary 3

Does access to financial services affect the composition of industries in emerging markets? Is the ownership structure of firms affected by the level and ease of obtaining outside financing? In this paper, I combine a sector-specific and exogenous financial shock to Pakistan's textile industry with detailed data on the board of directors of all firms in Pakistan to address these questions. Specifically, the paper focuses on the expansion of business groups and studies whether private firms that are adversely affected by the financial shock are more likely to have group-affiliated directors take positions on their boards. I find that such firms are 14% more likely to accept a group director from within the textile industry onto their boards, and that such directors acquire substantial equity in the firm. In addition, I find that private firms that do not get a group director are significantly likely to acquire cross-holdings in other private firms, thus integrating horizontally. Interestingly, these results do not hold for firms that are hit by a positive financial shock – group directors are not more likely to assume board positions in such firms. These results suggest that the expansion of corporate groups in emerging economies is directly influenced by the ability of firms to obtain access to external finance.

I. Introduction

Does access to financial services affect the composition of industries in emerging markets? Is the ownership structure of firms affected by the level and ease of obtaining outside financing? Answers to these questions can provide insight into the dynamics of firm formation and growth, especially in context of economies where access to outside finance is fairly restricted.

This paper addresses these questions by studying the expansion of Pakistani business groups amongst firms that experience a substantial and exogenous financial shock. While the existing literature has closely examined the role of business groups in emerging markets (Berglof and Perotti 1994, Chang and Choi 1998, Hoshi et al. 1991, Khanna et. al. 1998, 1999, 2000, 2001), the lack of good data has generally restricted such analysis only to a small fraction of firms in the economy, normally the large publicly listed ones and their affiliates.

This paper exploits a new dataset that provides detailed director ownership information for the entire universe of firms borrowing from any lending institution in Pakistan for a panel of 5 years, 1999-2003. The dataset also contains information on business group affiliations at the director level, which makes it possible to identify "group" and "non-group" directors across firms and over time. The financial shock studied here is the removal of subsidized credit for a specific corporate sector in Pakistan, as described in detail in Zia (2006). The Central Bank of Pakistan provides subsidized loans through the commercial banking sector to domestic firms that export an eligible set of commodities. I exploit an exogenous change in eligibility that resulted in the subsidies being discontinued for a specific commodity (*i.e.,* cotton yarn), and compare outcomes before and after the policy change for yarn and non-yarn textile firms. The results in Zia (2006) show heterogeneous effects with exports and loans of private stand-alone firms being the most significantly affected. This paper restricts the sample only to these private firms (both yarn and non-yarn) and studies changes to their board of directors after the financial shock.

There are several reasons why private firms that are hit by the financial shock may benefit from joining a business group. First, being affiliated with a business group can help firms overcome credit market failures, which are common in emerging economies. Private firms can benefit from being part of a large diversified business group that can act as an intermediary between individual firms and imperfect markets. For instance, groups can use their past record and reputation in their established lines of business to gain credibility with formal lending institutions. In addition, as Khanna and Palepu (2000b) argue, the scale and scope of groups can

allow business groups to internally replicate the functions provided by financial institutions, and firms affiliated with such groups can, therefore, overcome their external financial constraints by accessing internal group funds.

Alternatively, there are several reasons why the costs of group affiliation may exceed the potential benefits. Conflicts of interest may arise in a diversified organization between the group ownership and minority shareholders, which may result in a misallocation of capital with the cash flow generated by profitable group firms being invested in unprofitable projects (Khanna and Rivkin, 2001). Bertrand, et. al. (2002) find evidence of significant tunneling of resources from minority firms back to the central group ownership. Similarly, Johnson et al. (1999) show evidence of managerial stealing among East Asian groups during poor economic times. Such problems may be exacerbated in an emerging market context because of generally weak disclosure requirements and ineffective corporate governance mechanisms (La Porta et. al., 1998).

Given these contrasting views on business groups, the issue of whether group affiliation is beneficial for private firms is not clear cut. In context of this paper, private firms for whom financial subsidies are removed may be able to regain access to finance by joining a business group, but at the same time may be reluctant to do so, given the negative effects outlined above. The empirical analysis of this paper shows that yarn firms are more likely than non-yarn firms to accept a director with group affiliations (henceforth a group director) on their board after the subsidy removal. However, this effect is statistically significant only when the sample is restricted to directors from within the textile industry – a yarn firm is 14% more likely than a non-yarn firm to accept a group director from within the textile industry. This result suggests that the expansion of business groups is concentrated among firms within the same industry, where the preferences of individual private firms are likely better aligned with the overall objectives of the group.

This paper also shows that the expansion of groups is driven largely by privately held groups. That is, yarn firms are more likely to accept group directors that belong to privately held firms as compared to those that have affiliations with publicly listed firms. Publicly listed firms in this sample are on average much larger than the private firms, and also have much greater ownership stakes in the groups that they belong to. A likely interpretation of the result presented above is that private firms are more likely to join groups where the ownership stakes are more evenly

divided, and not concentrated in the hands of one large firm, where the threat of expropriation of minority shareholders may be greater.

In addition, the finding that private firms accept group directors significantly more when they are hit by an adverse financial shock suggests that, independent of the shock, becoming part of a group is somehow privately inefficient for these firms. Moreover, if becoming part of a group was an efficient outcome for firms, then they would have joined business groups even before the financial shock. This line of reasoning suggests that being an independent enterprise likely accrues private rents for the firm managers, and that they are likely to resist group ownership structures, where managerial decisions are often made by the central group leadership rather than by individual member firms (Khanna and Rivkin, 2001). Further, this view suggests that a negative financial shock likely forces private firms to accept group managers as they have no other financing options available. The results presented in Zia (2006) already show that private firms for whom subsidies are removed are significantly credit constrained. Hence, it seems likely that the private rents to firm managers from independent ownership are likely outweighed due to severe financial constraints.

Interestingly, the business group effects identified above for an adverse financial shock do not hold when private firms experience a positive financial shock. As described in Zia (2006), while yarn firms in the textile industry experienced a cessation of their subsidized financing, the amount of subsidies were simultaneously increased for firms in the computer/IT, electronics, and surgical equipment industries. Yet, this paper finds that these firms are not more likely to accept group directors on their boards, as compared to firms for whom the subsidies remain constant. These results further support the arguments made in the previous paragraph. Moreover, the finding that private firms are more likely to join business groups when they are hit by a negative financial shock and not so when they are hit by a positive shock, points to some inefficiencies of group ownership from the perspective of the private firms.

These findings are consistent with the view that it is likely inefficient for firms to join business groups, but that they have no choice but to accept group directors when they are hit by a negative shock as they are otherwise severely financially constrained. Further, the results discussed earlier show that private firms are selective in the type of groups they become part of, and are more likely to join groups within their industry and groups that are privately held.

Overall, these findings suggest that the expansion of corporate groups is directly influenced by the ability of firms to obtain financial access.

This paper is organized as follows. The next section provides a summary description of the export subsidy scheme in Pakistan, its institutional environment, and the policy change. Section III explains the data and methodology, and Sections IV-VII present the analysis and results. Section VIII concludes.

II. Institutional Setting and Policy Change Details – A Brief Summary[1]

The exporting sector of Pakistan is dominated by the textile industry, which is also the main beneficiary of the government sponsored subsidized credit scheme, namely the Export Finance Scheme (EFS). This scheme is supervised by the State Bank of Pakistan (SBP), which is the central bank of the country, and is implemented entirely through the commercial banking sector.

The EFS is a non-conventional subsidy program in the sense that all of the credit risk is borne by the commercial banks, and therefore the banks themselves are responsible for borrower selection and screening. In return, they earn a spread from the central bank, which is fixed at 1.5% of the value of the loan. The size of the EFS subsidy on average is 6 percentage points (*i.e.*, market rate - EFS rate = 6%), though in recent years it has been much lower. This subsidized rate of interest, by EFS rules, is consistent across all banks and firms.

Access to EFS loans is not open to all firms. Specifically, SBP maintains a *negative list* of products not eligible for subsidized loans. A major change in the EFS eligibility criteria was announced by SBP in late 2000 and came into effect in June, 2001. Specifically, in an attempt to focus more on value-added goods, the SBP decided to exclude the export of cotton yarn from EFS and added it to the negative list. At the time of the policy change, yarn spinners occupied a very large fraction of the EFS-supported textile industry – pre-period loans to yarn spinners comprised on average 30% of all EFS loans to the textile sector. Analysis presented in Zia (2006) shows that this policy change was uncorrelated with the prior export performance of yarn firms. Moreover, the growth trend of yarn exports prior to the policy change was very similar to that of non-yarn exports.

[1] This section is a condensed version of what appears in Zia (2006). For more details on the institutional environment and EFS policies, please refer to the aforementioned paper.

III. Data and Methodology

This paper supplements the data on EFS export loans used in Zia (2006) with detailed directorship data for all firms in the Pakistani Economy for the period 1999-2003. This dataset was provided by the Central Information Bureau (CIB) of the State Bank of Pakistan.

The directorship data contains detailed information on the board of directors of all firms borrowing at any given period from any formal lending institution in Pakistan. It is compiled at 6-monthly intervals, resulting in eight periods of observations per firm from June 1999 to June 2003. The database provides the full name, national identification card (NIC) number and full father's name for every board of director of the firm, which allows for the unique identification of directors over time. In addition, the database provides information on the percentage of firm equity the directors' own.

The dataset also provides information on group affiliation at the firm level, which allows for the identification of "group" directors and "non-group" or "private" directors. A director is identified as a group director if he or she sits on the board of any group firm in the pre-period. Conversely, a private director is identified as one who only sits on the board(s) of private firm(s) in the pre-period.[2]

The full directorship dataset provides information for over 100,000 unique firms and more than 250,000 unique directors. For the purposes of this paper, I have restricted the sample only to private, stand-alone (*i.e.* not group-affiliated) firms in the textile industry that were part of the Export Finance Scheme in the pre-period. Within this sample, the analysis of this paper exploits the variation in director movement across yarn and non-yarn firms before and after the EFS policy change. This restricted sample contains 754 firms, 2,654 directors, and a total of 13,247 observations over the entire panel.

Table 1 presents summary statistics for this data. The sample is divided into four 6-monthly pre-periods from December 1999 – June 2001, and four 6-monthly post-periods from December 2001 – June 2003. While the average per-director ownership remains relatively stable for private directors, the firm-level share of private director ownership declines in firms that get a group director in the post-period and increases in firms that do not get a group director in the post-period. At the same time, group directors that do take up positions in private firms in the post-

[2] This methodology for identifying group directors results in some cases (very few) where a "group" director also sits on the board of a "private" firm (*i.e.* a firm that has not been identified as a group firm in the database). For consistency, these types of firms have been excluded from the analysis that follows.

period do buy ownership stakes as well, owning on average 40% of the firm. The analysis that follows explores these preliminary findings in greater detail.

IV. Results – Director Level Analysis

The institutional policy change describe above, combined with the rich director-level database provides the opportunity to explore changes in industry structure in emerging markets. The analysis presented in this section investigates whether private yarn firms are more likely than private non-yarn firms to acquire group directors after their subsidies are removed. This difference-in-difference strategy identifies the *differential* effects for yarn firms.

The regression specification is the following:

$$GroupDirector_{ijt} = \alpha_j + \delta_t + \beta_1.(YarnRatio^* Post)_{ijt} + \varepsilon_{ijt} \quad (1)$$

Where $GroupDirector_{ijt}$ is a dummy = 1 if director i in firm j in period t is a group director, and = 0 for private directors. Yarn Ratio is a continuous variable = 1 for yarn-only firms, = 0 for non-yarn firms, and ranges between 0 and 1 for diversified firms depending on the ratio of their yarn to total exports in the pre-period.[3] β_1 is the coefficient of interest and represents the probability that a yarn firm accepts a group director as compared to a non-yarn firm after the subsidy shock. α_j and δ_t represent firm and period dummies, respectively, and ε_{ijt} is the error term. Standard errors are clustered at the firm level.

The regression results are presented in Table 2. While the regression coefficient in column (1) is positive, it is not statistically significant. However, if the sample is restricted to directors that belong to the textile industry, I find that yarn firms are 14% more likely than non-yarn firms to accept group directors on their boards. This result is significant at the 1% level. These results suggest that a reduction in access to finance does result in a change in industrial composition, and also importantly, that this change is systematic and identifiable. Private firms that experience a reduction in their financial access are much more likely to join corporate groups within their own industry.

[3] See Zia (2006) for further details on how Yarn Ratio is constructed.

This result is consistent with the view that private firms are likely reluctant to join groups outside their industry as the chance of being expropriated as minority shareholders is much greater in a diversified group where the group ownership is concentrated in other industries. At the same time, these firms are willing to be part of groups within their industry as their individual objectives are likely better aligned with those of the group ownership.

V. Results – Variation Across Different Types of Directors

Table 3 investigates whether there is variation in the group director effect based on director attributes. Specifically, I examine whether affiliations with publicly listed firms and multi-director firms changes the results presented in the previous section. This table, therefore, tests whether group expansion involves the publicly listed sector or whether such changes are only concentrated among privately held groups. The results show that the group-director movement is driven almost entirely by the private groups. That is, yarn firms are significantly more likely than non-yarn firms to accept group directors that belong to privately held firms, and are not more likely to accept group directors that belong to publicly listed firms. The interaction effect, presented in column 2, is significant at the 5% level.

Table 4 investigates whether there is cross-integration amongst private firms that are not absorbed by corporate groups. Restricting the sample to those firms that never receive a group director, the results show that the number of director cross-holdings does increase by 3% more for yarn firms as compared to non-yarn firms. This result is significant at the 5% level. Hence, even among the private, stand-alone firms, there is some evidence of horizontal integration.

These results suggest that while a reduction in financial access does lead to a change in industrial composition, private firms that are affected by the financial shock are selective in the type of groups they become a part of. That is, private firms are more likely to join groups within their own industries, and also groups that constitute only privately held firms. Further, the results suggest that the lack of financial access encourages even the private stand-alone firms to merge amongst themselves in order to form larger entities, which likely improves their chances of obtaining bank loans and other forms of financing.

VI. Results – Transfer of Ownership Rights

So far, the analysis has shown that yarn firms are significantly more likely to accept group directors onto their boards as compared to non-yarn firms. This section explores whether group directors that acquire board positions in private firms also buy ownership stakes in these firms.

Figure 1 plots the time-series of the average percentage shareholding per director for both private and group directors. While the shareholding per private director declines slightly in each period following the EFS policy change, the shareholding per group director increases in each period. Figure 2 presents the same graph with ownership aggregated at the firm level. Private-director ownership of firms declines sharply after the policy change, while it increases in every period for group directors. These results suggest that group directors that become part of private firms do buy ownership stakes in these firms, and that at the same time, the ownership shares of existing private directors decline.

Table 5 presents regression analysis results for private directors and tests whether their total ownership at the firm-level declines. The results show that the shareholding of private directors in yarn firms does decline by 11% relative to non-yarn firms, which again suggests a partial substitution of ownership rights between private and group directors.

Hence, private firms for whom group directors assume positions on their board also experience a significant change in their ownership structure. These results strongly suggest that the movement of group directors into private firms after an adverse financial shock is indicative of an expansion of the corporate group, since ownership rights are also transferred along with a seat on the board.

VII. Do Group Directors Respond to Positive Shocks to Private Firms?

The results presented thus far show that private firms that are hit by an adverse financial shock accept group directors onto their boards. It is natural to ask whether the same pattern is observed in private firms that receive a *positive* financial shock. The institutional setting and EFS policy change is such that it is possible to ask precisely the above-mentioned question. The results in Zia (2006) show that while EFS funding was removed for yarn firms in the textile industry, it was simultaneously and significantly increased for firms in a handful of other industries, namely the computer/IT, electronics, and surgical equipment industries. Since I have detailed directorship data for the entire universe of firms in Pakistan, I can test whether firms in these

industries are more likely to accept group directors as compared to firms in industries in which EFS funding remains relatively unchanged.

The regression specification used for this test is the following:

$$GroupDirector_{ijt} = \alpha_j + \delta_t + \beta_1.(NonTextiles = 1 * Post)_{ijt} + \varepsilon_{ijt} \quad (2)$$

Where the regression sample is limited to firms in the computer, electronics, and surgical equipment industries, as well as firms in the textile industry that were entirely non-yarn exporters. Hence, (*NonTextiles=1*) is a dummy =1 for firms in the non-textile industries, and = 0 for the non-yarn firms in the textile industry. All other variables in this regression are the same as in specification (1).

The results of this regression analysis are presented in Table 6. The coefficients are not significant in any of the columns, which suggest that firms hit by a positive financial shock are not more likely to accept group directors on their boards.

VIII. Conclusion

This paper uses a unique director-level panel dataset from Pakistan to investigate whether firms that are hit by an adverse financial shock are more likely to accept group directors onto their boards, as compared to firms for whom financial access remains unchanged. The results show that adversely affected firms are significantly more likely to accept group directors from within their industry and from privately held groups. In addition, group directors acquire substantial equity in the private firms they join. Interestingly, these results do not hold for firms that are simultaneously hit by a positive financial shock.

The results presented in Zia (2006) already show that private firms for whom subsidies are removed are significantly credit constrained. Hence, it is likely the case that private firms are forced to accept group directors when they are hit by a negative shock as they have no other financing options available. The results presented in this paper show that private firms are selective in the type of groups they become part of, and are more likely to join groups within their industry and groups that are privately held. Overall, these findings suggest that the expansion of corporate groups is directly influenced by the ability of firms to obtain financial access.

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Figure 1: Time-Series of Average Percentage Shareholdings Per Director

Sample restricted to private firms in the textile industry that do not have a group director in the pre-period, but get at least one in the post-period

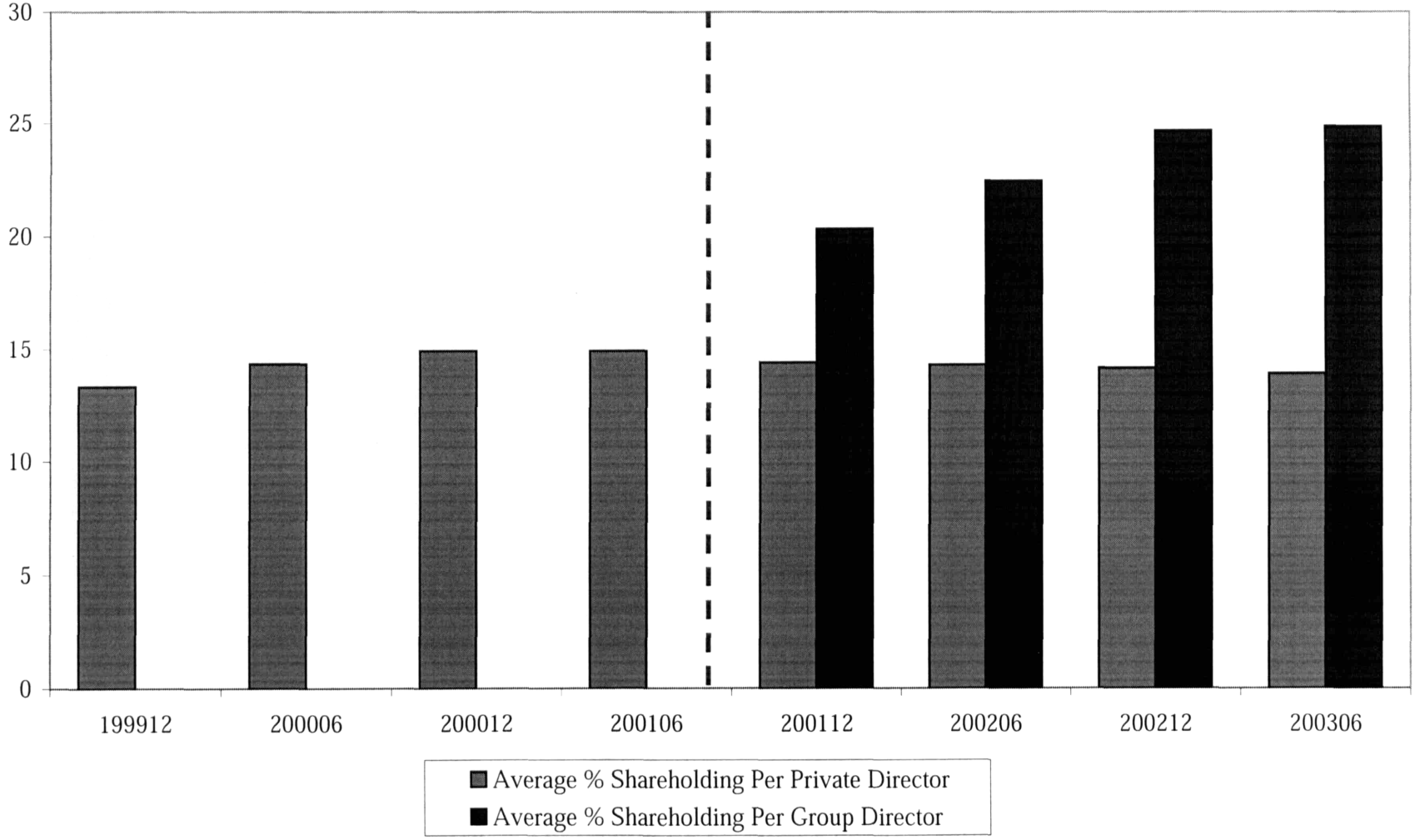

Figure 2: Time-Series of Average Percentage Shareholdings Per Firm

Sample restricted to private firms in the textile industry that do not have a group director in the pre-period, but get at least one in the post-period

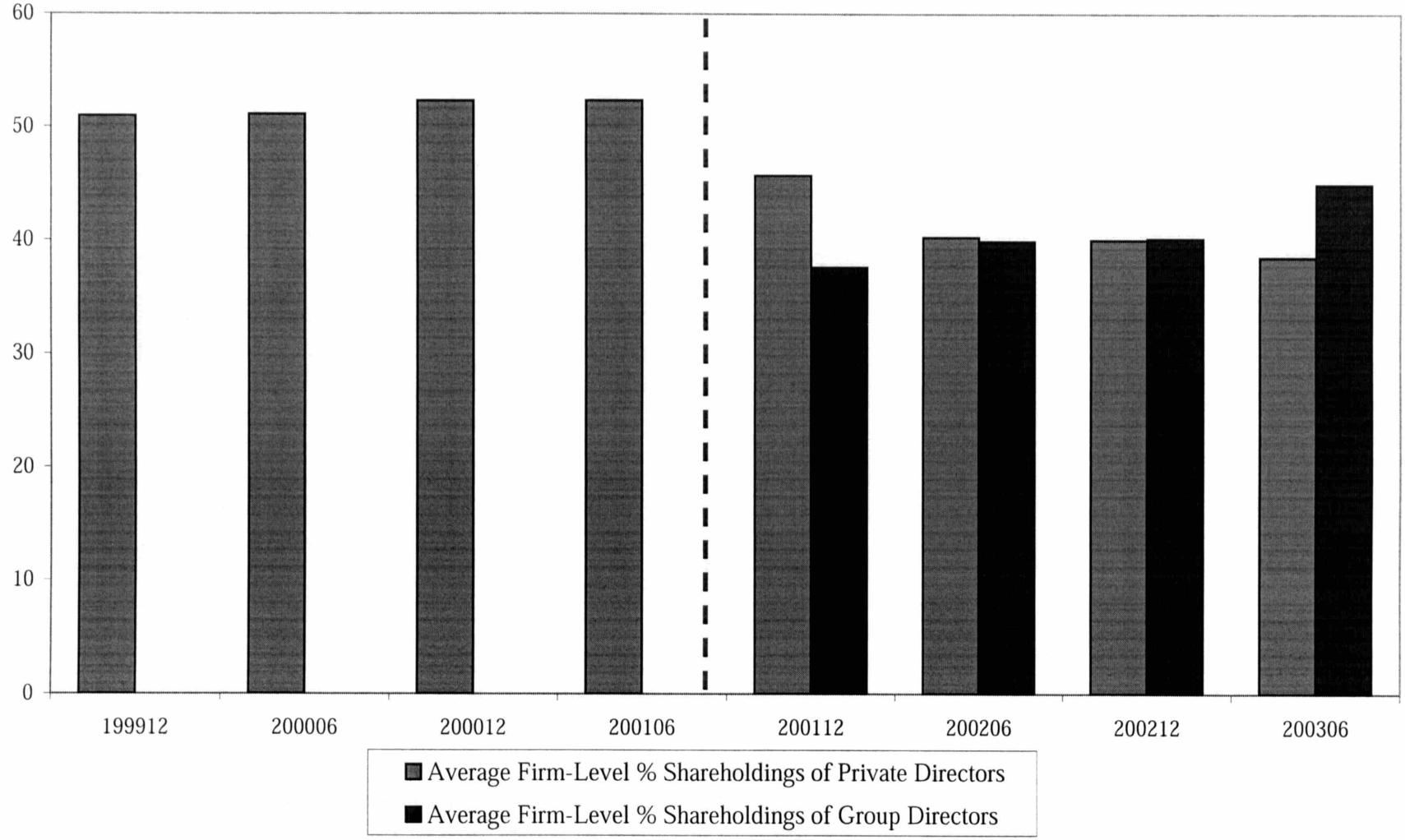

Table 1: Summary Statistics

PANEL A: SAMPLE ATTRIBUTES

	Total Number of Firms		Total Number of Directors	
	Get a Group Director	Do Not Get a Group Director	In Group Director Firms	In Non-Group Director Firms
	120	634	394 non-grp dirs; 303 grp dirs	1957

PANEL B: PRIVATE FIRMS THAT GET A GROUP DIRECTOR IN THE POST-PERIOD

	Pre-Period		Post-Period	
	Mean	Std. Dev.	Mean	Std. Dev.
DIRECTOR LEVEL:				
Private Director % Shareholding (Per Director)	14.72	21.09	14.11	26.75
Group Director % Shareholding (Per Director)	--	--	23.99	31.56
FIRM LEVEL:				
Private Director % Shareholding (Per Firm)	54.93	37.08	41.12	40.94
Group Director % Shareholding (Per Firm)	--	--	40.63	43.24
Number of Directors (Per Firm)	5.09	4.14	5.43	4.78

PANEL C: PRIVATE FIRMS THAT DO NOT GET A GROUP DIRECTOR IN THE POST-PERIOD

	Pre-Period		Post-Period	
	Mean	Std. Dev.	Mean	Std. Dev.
DIRECTOR LEVEL:				
Private Director % Shareholding (Per Director)	35.66	33.92	35.41	38.31
FIRM LEVEL:				
Private Director % Shareholding (Per Firm)	59.95	41.32	62.75	48.38
Number of Directors (Per Firm)	2.61	2.14	2.71	2.22

The summary statistics are for private stand-alone firms in the textile industry that were part of the Export Finance Scheme
The sample in Panel B is restricted to firms that receive a group director in the post-period
The sample in Panel C is restricted to firms that do not receive a group director in the post-period
The pre-period consists of 4 6-monthly periods from Dec 1999 - June 2001
The post-period consists of 4 6-monthly periods from Dec 2001 - June 2003

Table 2: Do Private Firms Accept Group Directors after an Adverse Financial Shock?

	(1)	(2)
	Group Director?	Group Director?
Yarn Ratio * Post	0.057	0.144***
	(0.045)	(0.052)
Firm FEs	YES	YES
Year FEs	YES	YES
Sample	All Directors	Textile Industry Directors Only
Observations	13247	12145
R-squared	0.590	0.579

The regression is run at the director-firm-period level where period refers to 6-month intervals

The sample in Column 2 is restricted to textile industry directors

The pre-period consists of 4 6-monthly periods from Dec 1999 - June 2001

The post-period consists of 4 6-monthly periods from Dec 2001 - June 2003

Group director = 1 if director is part of a corporate group in the pre-period

Textile industry group director is = 1 if director is part of a group and sits on the BOD of a textile industry firm in the pre-period

Robust standard errors in brackets, clustered at the firm level

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3: Variation Based on Director Attributes

	(1)	(2)	(3)
	Group Director?	Group Director?	Group Director?
Yarn Ratio * Post	0.144***	0.148***	0.150***
	(0.052)	(0.051)	(0.048)
Listed Director * Yarn Ratio * Post		-0.137**	
		(0.063)	
Multi-Firm Director * Yarn Ratio * Post			-0.016
			(0.062)
Listed Director?		0.492***	
		(0.119)	
Multi-Firm Director?			0.297***
			(0.035)
Firm FEs	YES	YES	YES
Year FEs	YES	YES	YES
Sample	Textile Industry Directors Only	Textile Industry Directors Only	Textile Industry Directors Only
Observations	12145	12145	12145
R-squared	0.579	0.625	0.579

The regression is run at the director-firm-period level where period refers to 6-month intervals

The sample in the table is restricted to textile industry directors

The pre-period consists of 4 6-monthly periods from Dec 1999 - June 2001

The post-period consists of 4 6-monthly periods from Dec 2001 - June 2003

Textile industry group director is = 1 if director is part of a group and sits on the BOD of a textile industry firm in the pre-period

Listed Firm director = 1 if Textile industry group director =1 AND the director has affiliations with at least one publicly listed firm in the pre-period

Multi-Firm director = 1 if Textile industry group director is =1 AND the director has affiliations with multple group firms in the pre-period

Robust standard errors in brackets, clustered at the firm level

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4: Horizontal Integration Amongst Privately Held Firms?

	(1)
	Number of Director Cross-Holdings
Yarn Ratio * Post	0.029**
	(0.012)
Firm FEs	YES
Year FEs	YES
Observations	10066
R-squared	0.422

The regression is run at the director-firm-period level where period refers to 6-month intervals

The sample is restricted to firms that only have private directors on their BODs throughout the sample period

The pre-period consists of 4 6-monthly periods from Dec 1999 - June 2001

The post-period consists of 4 6-monthly periods from Dec 2001 - June 2003

Number of Director Cross-Holdings refers to the number of firms in which the same director holds directorship positions

Robust standard errors in brackets, clustered at the firm level

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5: Do Group Directors Acquire Ownership Stakes in Private Firms?

	(1)
	Onwership % of Private Directors
Yarn Ratio * Post	-10.834***
	(3.157)
Firm FEs	YES
Year FEs	YES
Observations	4316
R-squared	0.7034

The regression is run at the firm-period level where period refers to 6-month intervals
The pre-period consists of 4 6-monthly periods from Dec 1999 - June 2001
The post-period consists of 4 6-monthly periods from Dec 2001 - June 2003
A private director refers to a director that does not have any group affiliation in the pre-period
The dependent variable is: Sum(ownership shares of private directors) / Sum(ownership shares of all directors), evaluated for each firm in each time period

Robust standard errors in brackets, clustered at the firm level
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6: Do Firms That are Hit by a Positive Financial Shock Accept Group Directors?

	(1)	(2)	(3)	(4)
	Group Director?	Group Director?	Group Director?	Group Director?
(Non-Textiles = 1) * Post	0.059	0.062	0.064	0.049
	(0.113)	(0.077)	(0.081)	(0.079)
Listed Director * (Non-Textiles = 1) * Post			-0.007	
			(0.074)	
Multi-Firm Director * (Non-Textiles = 1) * Post				0.015
				(0.076)
Firm FEs	YES	YES	YES	YES
Year FEs	YES	YES	YES	YES
Sample	All Directors	Within-Industry Directors Only	Within-Industry Directors Only	Within-Industry Directors Only
Observations	17353	16734	16734	16734
R-squared	0.606	0.594	0.596	0.592

The regression is run at the director-firm-period level where period refers to 6-month intervals

The treatment sample in Columns 2, 3, and 4 is restricted to directors within the electronics, computer, and surgical equipment industries.

The pre-period consists of 4 6-monthly periods from Dec 1999 - June 2001

The post-period consists of 4 6-monthly periods from Dec 2001 - June 2003

(Non-Textiles = 1) is a dummy =1 if the firm is outside the textile industry, and = 0 if the firm is within the textile industry AND is non-yarn

Group director = 1 if director is part of a corporate group in the pre-period

Listed Firm director = 1 if Group director =1 AND the director has affiliations with at least one publicly listed firm in the pre-period

Private Firm director = 1 if Group director =1 AND the director has affiliations only with privately owned firms in the pre-period

Specifications (3) and (4) also include "Listed Director?" and "Multi-Firm Director?" binary variables on the RHS, respectively.

Robust standard errors in brackets, clustered at the firm level

* significant at 10%; ** significant at 5%; *** significant at 1%