Does Easing Controls on External Commercial Borrowings boost Exporting Intensity of Indian Firms?

Udichibarna Bose[a], Sushanta Mallick[b], Serafeim Tsoukas[c]

[a] *Finance Subject Group, Essex Business School, University of Essex, Colchester CO4 3SQ, UK*

[b] *School of Business and Management, Queen Mary University of London, London E1 4NS, UK*

[c] *Economics Subject Group, Adam Smith Business School, University of Glasgow, Glasgow G12 8QQ, UK*

20th March 2017

Abstract

This paper focuses on the impact of the export-oriented policy initiative, namely foreign exchange management act (FEMA) in enabling greater globalisation of Indian firms and their access to external commercial borrowing (ECB), on firms' share of exports, using a rich dataset of 11,612 Indian firms over the period 1988-2014. Using a difference-in-differences approach, the results show a positive and significant effect of this policy initiative on firm-level exports. Further, we take into account firms which are recipients of government grants and subsidies and explore how the export share has diverged among these firms after the policy change. Finally, we focus on the sensitivity of exporting activities across financially vulnerable firms and industries. We conclude that firms with access to ECB have higher exporting activity compared to matched companies with only domestic sources of financing. Moreover, our results suggest that this effect is particularly stronger for firms which receive extra incentives in the form of grants and subsidies. Finally, we find that when financially constrained firms and firms operating in vulnerable industries gain access to foreign financing, they are able to increase their export participation.

Keywords: Exporting; Financing; Indian firms; FX market liberalization

JEL Classification Codes: F4, O4, H2

1. Introduction

It is already well established that access to financing is critical for firm growth (Rajan and Zingales, 1998; Demirgüç-Kunt and Maksimovic, 1998; Rahaman, 2011). But due to limited outward orientation on the flow of capital, lack of access to external financing became a major constraint for emerging market firms in the 1990s so as to help accelerate their exporting activity. Many governments in the developing world have been liberalising their capital account transactions namely external borrowings by firms in order to enable them to have better access to financing, which in turn will help them compete in the global market place and to expand their market share and thereby increase economic activity. In the context of India, the foreign exchange management act (FEMA), which came into being in 1999 (and became effectively operational starting 2000), was a policy shift that can help us analyse the effectiveness of such liberalisation in enabling firms to access funds from abroad and in achieving greater globalisation of Indian firms during the post-1991 reform period. Liberalising foreign exchange market rules and regulations to enable access to financing will likely facilitate trade flows and overseas flow of funds. This legislation replaced the earlier more rigid regulatory regime called foreign exchange regulation act (FERA) that remained in place since 1973. To test the impact of this international transaction liberalisation, this paper aims to capture the effect of this regulatory change on exporting activity at firm level in India.

In another strand of literature on exporting and firm performance, it has been established that exporting firms are different (see a recent survey paper with meta-analysis, Yang and Mallick, 2014) identifying the key determinants of the mixed evidence on learning-by-exporting hypothesis. Learning-by-exporting promotes firm-level productivity, and transfers information from international buyers and competitors that help improve the post-entry performance of exporters (Greenaway and Kneller, 2004; Yasar et al., 2006; Crespi et al.,

2008). In this literature, foreign financing has not been emphasised as a channel to improve exporting performance due to lack of evidence on such capital account liberalisation in the context of emerging market economies. Therefore, the key question that has been paid little attention in the literature is whether access to external trade financing makes a difference to the exporting activity. Paravisini et al. (2015) suggest that credit shortages can hamper exports as the variable cost of production increases rather than sunk entry costs.

The key contribution of this paper is to study whether access to foreign financing increases exporting activity. This idea of linking financing with exporting is less well researched in the literature (see Eck et al., 2015). Theoretically, Eck et al. (2015) show that internationally active firms intensively use cash-in-advance financing because it serves as a quality signal and reduces the high uncertainty related to international transactions. Such trade credits come from a foreign buyer to an exporter as small size advances rather than bigger loans from the international debt market that can help exporting firms to meet their expenses towards imported intermediate inputs and technology (machinery and equipment imports). Therefore the data we use in this paper to capture debt market access of exporting firms can provide better insights as to whether such capital account policy liberalisation for these outward-oriented firms can help increase their participation in the global market place. We find that firms with access to external commercial borrowing derive positive effects on their export intensity or exporting decision.

The hypotheses considered can display endogeneity where exporting status might influence financing or alternatively, financing could influence export intensity. It is for this reason we consider a non-parametric method – propensity score matching (hereafter PSM) – to accommodate potential endogeneity (see Rosenbaum and Rubin, 1983; Heckman et al., 1997, 1998; Yang and Mallick, 2010; Mallick and Yang, 2011, 2013). PSM technique enables ‘like-for-like’ comparison and is an appropriate method to examine the relationship

between foreign financing and exporting intensity through estimating how distinct the exporting firms are based on their ability to access external debt financing (i.e., those with foreign financing and those only with domestic financing). We follow Leuven and Sianesi's (2003) technique to isolate firms with foreign financing (treated firms) from the population of firms with domestic financing (non-treated firms), and then look for control firms that best match treated firms in multiple dimensions such as firm size, profit, profit squared, collateral, collateral squared, age, age squared and industry dummies before the treatment (FEMA policy).

Figure 1 graphs the trend of export intensity among Indian firms over the sample period of 1988-2014. Panel A shows an upward trend in the export share of firms after the FEMA policy became operational in 2000. Further, Panel B displays a graph which shows a rise in export share of treated firms after the policy in 2000, compared to control firms. This graph satisfies the parallel trends assumption of the model suggesting that in the absence of the reform both treated and control groups would have exhibited a similar growth trend in their export shares.

We also take into account firm-level heterogeneity by focusing on firms which have access to grants and subsidies. As firms which are involved in selling abroad involve sunk costs and only the most efficient and productive firms are able to overcome the entry barriers and export (Bernard and Jensen, 1999; Melitz, 2003). Görg et al. (2008) study the relationship between government grants and subsidies and exporting activity of firms. They find that if grants are large enough, then they can encourage already exporting firms to compete more effectively on the international market. In this paper, we further explore the role of grants and subsidies for firms which have access to foreign financing.

Further, we also focus on volatility at both firm and industry levels. There are not many empirical studies which study the link between volatility and export openness at the micro-level. However, some of the recent studies by Comin and Philippon (2005), Davis et al. (2006), Buch et al. (2009) study the evolution of firm-level volatility over time. Volatility can have an adverse impact on firms' profitability and access to external finance. Fazzari et al. (1988) highlight the importance of differences across firms in relation to financial constraints originating from the imperfections of capital market. Due to asymmetric information, firms facing higher costs of external finance are likely to be more financially constrained. In this paper, we argue that external financial constraints can act as a barrier to export participation as in Bellone et al. (2010). Better access to external finance can increase the probability to start exporting. Using data from Indian firms, this paper contributes to the literature by using PSM techniques in estimating the effects of differences in access to foreign financing on exporting intensity. We find that the exporting intensity of firms tends to be significantly higher for those who have access to foreign external financing due to liberalisation, relative to firms without any foreign borrowing. Moreover, our results also suggest that this effect is particularly stronger for firms which receive government incentives, face higher output volatility and operate in more vulnerable industries.

The paper is structured as follows. In section two we provide a brief review of the relevant literature. In section three, we describe the econometric modelling strategy. We present the data used in our empirical analysis along with summary statistics in section four, and we report the econometric results in section five. In section six we subject our main models to various robustness tests and finally, in section seven we provide the concluding remarks.

2. Background literature

Policy liberalisation on capital account flows can influence the financial constraint-export relationship in a temporal sense. Caggese and Cuñat (2013) found that financing constraints reduce the aggregate productivity gains induced by trade liberalization by 25 percent by distorting the incentives of the most productive firms to self-select into exporting. Although there are empirical studies reporting a positive link between export participation (extensive margin) and the share of exports in total sales (intensive margin) and the availability of different types of domestic financing (see Jinjarak and Wignaraja, 2016), there is little evidence in terms of whether regulatory policy shift matters in this relationship that would require separating the sample into firms with access to foreign financing and those who do not have such access, especially in countries like India and China where closed capital accounts still remain in place.

It is already well known that there are both static and dynamic gains from exporting – static gains resulting from access to larger external markets and dynamic gains in terms of learning from exporting and productivity gains. Cheaper imported inputs due to lower tariffs can raise productivity via learning, variety, and quality effects (see Amiti and Konings, 2007; Goldberg et al., 2009). For exporting to occur, cheaper imported inputs can be a key channel through which trade policy reforms and FDI inflows could influence firm-level productivity (see for example Topalova and Khandelwal, 2011). But trade financing remains an important constraint for these export oriented firms who need imported raw materials and technology to enhance their productivity. Firms with access to funds from overseas therefore may outperform those firms which are financially constrained. Bandyopadhyay et al (2015) provide evidence that there are there are increasing returns to foreign loans, while there are diminishing returns to foreign aid, using country-level data from 131 developing nations.

Trade-related financial constraints can therefore reduce a firm's ability to finance the costs of maintaining its presence in a foreign market.

Focusing on firms rather than on country-level aggregates, Muûls (2008) analysed the interaction between credit constraints and export behaviour at firm-level. The results showed that chances of firms being exporters were more if they enjoyed lower credit constraints and higher productivity levels. Further, Bellone et al. (2010) analysed the relationship between financial constraints and firms' exports behaviour, and showed that firms which were financially healthy were more likely to become exporters, and financial constraints acted as barriers to export participation. Thus firms which had better access to external finance were more likely to start exporting.

Berman and Héricourt (2010) used a large cross-country and firm-level data of nine developing and emerging economies to study the effect of financial factors on firms' exporting decisions and exporting volumes. The results showed that firms' access to finance played an important role in their entry decision to enter the export market. However, better financial health does not increase the probability of a firm remaining in the exporting market. They further find that productivity is an important determinant of exporting decision of firms if firms have better access to external finance. Finally, they show that an improvement in a country's financial development has a positive impact on both number of exporters and exporters' selection process.

Manova et al. (2015) used Chinese exports data at firm-product-destination level to investigate how comparative advantage of firms reflected local credit constraints. They showed that foreign-owned firms and joint ventures displayed better export performance compared to private domestic firms, with a greater advantage in sectors with higher financial vulnerability. They further found that private Chinese firms were more successful exporters

than state-owned enterprises in financially dependent industries. Using Argentine exporters' sources of financing, Castagnino et al. (2013) show that firms with better access to foreign financing export a wide variety of products and serve more distant and developed markets.

The above studies provide a useful background to setup a linkage between financial constraints faced by firms and how it influences firms' exporting decisions. In this context, policy liberalisation allowing access to foreign credit can play a role that we intend to explore in this paper using Indian firm-level data. The pro-liberalisation policies of the Government of India in enacting FEMA in the winter session of parliament in 1999 (replacing FERA) were aimed to help support foreign exchange transactions in both capital account and current account transactions to achieve greater trade and financial openness. The key objective of the act was to facilitate foreign exchange payments and acquisition/holding of FX flows, consistent with full current account convertibility and progressive liberalisation of capital account transactions. Patnaik et al. (2015) provide a detailed account of the existing regulations including recent policy changes on capital controls for foreign currency borrowing by Indian firms. Historically, Indian interest rates have always been higher than interest rates offshore which will encourage Indian firms to borrow at a cheaper rate from overseas. However the maximum amount of ECB that can be raised without RBI approval has increased gradually since FEMA was introduced (USD 750mn or equivalent currently during a financial year). Such limit can prevent any emergence of systemic risk due to currency mismatch or excessive borrowing. Thus the policy shift since early 2000 could have made a difference to exporting activity of Indian firms that requires detailed empirical analysis in order to conclude whether progressive liberalisation of capital account transactions led to any beneficial effect on India's external trade via easing access to external debt market.

3. Empirical Methodology

We study the impact of FEMA act on firms' export share using difference-in-differences (DD) estimation method by comparing the export share of firms before and after the policy liberalisation across firms that had access to foreign financing (treated firms) and firms with domestic financing (non-treated group). We employ Leuven and Sianesi's (2003) PSM procedure and use three different matching techniques as implemented by Martincus and Carballo (2008) and Mallick and Yang (2013). These matching techniques are kernel matching (each treated firm is compared to all non-treated firms within an area around the propensity score inversely weighted by the difference between their propensity scores and that of the relevant treated firm), radius matching (each treated firm is compared to all firms within a certain radius around its propensity score) and nearest neighbour matching (each treated firm is compared to the most similar non-treated firm). The idea is to isolate the treated firms, and then from the population of non-treated firms, find observations that best match the treated firms on multiple dimensions. Matching is based on variables[1], such as firm size, profit, profit squared, collateral, collateral squared, age, age squared and industry dummies using the average pre-treatment values (years before the policy was introduced) to control for endogeneity as firm variables are likely to be endogenous to the financial choices made by firms.

3.1 Matching Technique

To apply the PSM technique, a logit model – where the dependent variable is a dummy for ECB financing and the regressors are firm characteristics – is estimated. The probability (propensity score) that each company uses foreign financing is derived and used to determine the matched treated (foreign financing) and non-treated (domestic financing) samples. Instead

[1] Matching variables include firm size calculated as natural logarithm of total real assets, profit is measured as the ratio of profit after tax to total assets, collateral is the ratio of net fixed assets to total assets and age refers to the number of years of establishment from the current year.

of regressing exporting on FEMA regulation enabling financing access in the whole sample, the average effect of the regulatory change with foreign financing on exporting in the matched samples (also known as the average treatment on treated effect; hereafter ATT) is estimated. The magnitude of difference in exporting pattern between the treatment (companies using foreign financing) and control groups (companies with domestic financing) is then derived. Across all the different matching methods, the average exporting performance differs between companies with foreign financing and firms without such financing is statistically significant. In Table 1 all the matching methods show that there is significant difference between companies with access to foreign borrowing and the ones with no foreign financing.

Quality of matching:

It is possible that the above results on matched firms could be biased if the quality of matching is poor. We therefore have conducted the tests on the quality of matching obtained. Propensity score test implemented in our analysis helps us find whether the firm characteristics are similar between matched treated and control groups, allowing an adequate `like-for-like' comparison between two groups. We test the equality of the given firm characteristics between matched treatment and control groups and confirm whether there is significant difference between these two groups in terms of their characteristics using t-tests after matching. The quality of matching appears good as the covariates are not significantly different between matches obtained, suggesting there is an adequate `like-for-like' comparison in the matching exercise, as the p-value of the difference between treatment and control is above 10% (see Table 2). In addition, we also plot the propensity score histogram of matched treated and control firms (see Figure 2), and it shows that there is a reasonably high rate of overlapped propensity scores between treated and control firms, as most control firms (with propensity score below 0.4) are able to find a matched treated firm having similar

propensity score. Also Figure 3 shows little bias for each explanatory variable in the matched samples relative to the raw (unmatched) sample, while Figure 4 shows the histogram of the biases across all variables, again showing little bias (in %) for the matched samples. Therefore, the quality of matching is appropriate to draw the conclusion that foreign financing is a key determinant of higher exporting activity – a result which remains robust in both parametric and non-parametric analysis.

3.2 Baseline Model

Following Martincus and Carballo (2008), the main results are based on the kernel matching method with a bandwidth of 0.04. The main concept of this method is that the control observations are assigned more weights if they are closer to the propensity score of a treated observation and lower weights on more distant observations (Caliendo and Kopeinig, 2008). The dependent variable of firm-level export share is measured by the ratio of exports to total sales (%) (Greenaway et al., 2010). We estimate the following baseline model:

$$Export/Sales_{it} = a_0 + a_1 Treat_i + a_2 FEMA_t + a_3\, Treat_i * FEMA_t + a_4 X_{it-1} + a_5 Z_{it} + e_{it} \qquad (1)$$

where i = 1, 2, …., N refers to the cross-section of units (firms in this case) for time period t = 1, 2, …., T. $Treat_i$ is a dummy which takes a value of one for the firms which have access to external commercial borrowing (ECB) in the period of 1988-2014. $FEMA_t$ is a time dummy which takes a value of one for the policy period during 2000-2014, and zero otherwise. The DD coefficient of $Treat_j * FEMA_t$ provides the policy effect. The point estimate measures the impact of the policy on the export share of firms with access to external borrowing in comparison to the firms with access to only domestic borrowing. The models are estimated with firm fixed effects to control for unobserved heterogeneity. In addition, the models include time dummies to control for cyclical factors originating from the business cycle. We also cluster standard errors at the firm level as the observations over time

might be correlated within firms. Finally, $\mathcal{X}$ and Z are vectors which include other explanatory variables at both firm and aggregate levels, respectively and e_{it} are the disturbance terms. All time-varying firm-level variables are lagged by one period to reduce possible simultaneity problems.

Vectors $\mathcal{X}$ and Z include various factors from the literature which are found to influence firm-level exports. Firms' decision to export is based on a combination of sunk cost and firm-level factors (Melitz, 2003). Exporting is associated with additional upfront expenditures that make production for foreign markets more dependent on external financing. Sunk costs of trade involve collecting information about the profitability of potential export markets, setting up and maintaining foreign distribution networks, making market-specific investments in capacity, product customization and regulatory compliance (Manova, 2013).

To begin with firm specific characteristics, *Firm size*, measured as real total assets, is an important determinant of exports. Firms which are larger in size are able to cope well with financial constraints and have greater access to external finance, which is necessary to finance the sunk and fixed costs of exports (Cheung and Sengupta, 2013). *Wages* are measured by the real wage bill. This variable controls for systematic differences between firms in terms of human capital (Bellone et al., 2010). *Total factor productivity (TFP)* of firms is included as the natural logarithm of TFP and is calculated using the Levinsohn and Petrin's (2003) methodology which is further developed by Petrin et al. (2004). TFP captures the efficiency of the firms. Efficient firms are more likely to handle unfavourable movements in exchange rates and output levels. Also, productivity of firms is one of the important determinants of export market decision as more productive firms are less likely to exit the market (Görg and Spaliara, 2013; Mallick and Yang, 2013). *GDP growth* is a proxy for the overall economic development of a country (Manova, 2013). Finally, *REER volatility* refers

to the exchange rate uncertainty at the macro-level. Using monthly real exchange rate series[2], a GARCH (1,1) model is implemented and the monthly measures are annualised to match the frequency of the panel data (Caglayan and Demir, 2014)[3]. Movements in exchange rate can affect the profits of firms and hence, firms are more likely to reduce exports in order to minimise the risk exposure in the absence of hedging incentives (Hooper and Kohlhagen, 1978; Kawai and Zilcha, 1986).

3.3 Access to grants and subsidies

In this sub-section we investigate the differential impact of government grants and subsidies on firms' export intensity. We explore whether firms which are recipients of governments' grants and subsidies[4] within the treated group behave differently in terms of their export market participation. We use a dummy '*Grant_recipient*' which takes value one for firms which have access to such grants and subsidies, and zero otherwise and then estimate the following model:

$$Export/Sales_{it} = a_0 + a_1 Treat_i + a_2 FEMA_t + a_3\, Grant\_recipient_{it} + a_4 Treat_i * FEMA_t * + a_5 Treat_i * FEMA_t * Grant\_recipient_{it} + a_6 FEMA_t * Grant\_recipient_{it} + a_7 Treat_i * Grant\_recipient_{it} + a_8 X_{it-1} + a_9 Z_{it} + e_{it} \quad (2)$$

where the main term is the triple interaction coefficient of $Treat_j * FEMA_t * Grant\_recipient_{it}$ which measures the impact of the policy on the export share of firms with access to government incentives in addition to foreign external borrowing with respect to the firms with access to only domestic borrowing. There is a considerable literature highlighting

[2] Real exchange rates are more accurate and superior indicators of changes in competitiveness which are calculated after correcting for the movements in nominal exchange rates for inflation differentials. Effective exchange rate changes are not measured against one particular currency, but instead use an average index of a whole basket of currencies, each weighted according to the issuing countries' respective importance as a trade partner (UNCTAD, 2012).

[3] This measure resembles the volatility clustering which is often found in high frequency financial series (Caglayan and Demir, 2014).

[4] In our dataset grants and subsidies are defined as "any assistance received by a company from the government in cash or kind for its compliance with certain conditions in the past, or its agreement to comply with certain conditions in the future. Government grants do not include those forms which cannot be reasonably valued, and which cannot be distinguished from the normal trading transactions of the enterprise."

the effectiveness of export subsidies in developing countries (Low, 1982; Arslan and Van Wijnbergen, 1993; Moreira and Figueiredo dos Santos, 2001). However, the results from these industry-level studies are conflicting and the overall verdict is negative. Studies on firm-level analysis of export subsidies are scarce for developed countries and almost non-existent for developing countries. Bernard and Jensen (2004) study the effect of export subsidies on exports of US firms. They find an insignificant impact of subsidies on exports. Recently, Görg et al. (2008) analysed a sample of 11,730 manufacturing firm-year observations in Ireland over the period 1983–2002 and concluded that grants aimed at increasing investment in technology, training, and physical capital, when large enough, are generally effective in increasing total exports of already exporting firms.

Studies such as Görg and Strobl (2007) and Girma et al. (2007) provide evidence that grants can be effective. Government grants which are directed towards technological enhancement can help to improve innovation activity of firms and also overall productivity. In this paper, we further argue that in addition to increased productivity and effectiveness of firms, government grants and subsidies can also encourage firms with foreign financing to remain in the exporting market as compared to firms without any government grants and subsidies. The government of India introduces different incentives to boost exports from time to time, when the country experiences decline in exports in the wake of sharp currency appreciation, in the form of interest subsidy on loans or export subsidy on shipments. Exporters can be given full or partial refund of any import duty, if they paid on imported materials used in the manufacture of exported product.

3.4 Accounting for financial vulnerability

In this sub-section we investigate the impact of policy on export intensity of financially constrained firms and firms those are affiliated with vulnerable industries with better access to foreign financing. We examine if firms and industries facing different levels of volatility

within the treated group exhibit different sensitivities to their exporting shares after the FEMA act was implemented as compared to control firms. We construct a *Cons* dummy and interact it with DD coefficient of '$Treat_j * FEMA_t$'. *Cons* dummy takes value one for volatile firms or industries if measures of volatility at firm- or industry-levels are above the 50th percentile of the distribution for all firms in the sample period, and zero otherwise. The following model is estimated:

$$Export/Sales_{it} = a_0 + a_1 Treat_i + a_2 FEMA_t + a_3 Cons_{it} + a_4 Treat_i * FEMA_t + + a_5 Treat_i * FEMA_t * Cons_{it} + a_6 FEMA_t * Cons_{it} + a_7 Treat_i * Cons_{it} + a_8 X_{it-1} + a_9 Z_{it} + e_{it} \quad (3)$$

where the main variable is the triple interaction coefficient of $Treat_j * FEMA_t * Cons_{it}$ which measures the impact of the policy on the export share of vulnerable firms or firms operating in vulnerable industries with access to foreign external borrowing compared to the firms with access to only domestic borrowing.

There is a large literature that establishes a link between firm-level output volatility and export openness (Comin, 2000; Campbell et al., 2001; Comin and Mulani, 2006). In particular, Buch et al. (2006) provided a theoretical model of trade openness and output volatility, highlighting that exporting firms are exposed to domestic and foreign demand shocks and the correlation between these demand shocks affects the exposure of firms which in turn affects output volatility. According to Manova et al. (2015), credit constraints restrict their product scope, number of trade partners and their trade volumes. They highlight that as MNC subsidiaries are able to secure additional funding from foreign capital markets, they are less credit constrained. As a result MNC firms have a comparative advantage over local firms and are also able to perform better in financially vulnerable industries.

In this paper, we argue in similar terms that when financially constrained firms and firms operating in vulnerable industries gain access to external borrowing, they are able to cover

the variable trade costs and expand their sales to foreign markets. Firm volatility is measured using the squared residual of a regression of sales growth on its own lagged values and a set of time fixed effects (Buch et al., 2009a)[5]. Industry volatility is measured using Braun (2005) and are based on data for all listed US-based companies from Compustat's annual industrial files. External finance dependence is the share of capital expenditures not financed with cash flows from operations and is averaged over 1988–2014 for the median firm in each industry. Rajan and Zingales (1998) and Braun (2005) argue that this measure captures a large technological component that is innate to the manufacturing process in a sector and are thus good proxies for ranking industries in all countries. Firms or industries are less (more) constrained if volatility at firm- or industry-levels is below (above) the 50th percentile of the distribution for all firms in the sample period. We consider volatility as a measure of credit constraints as firms or industries facing higher volatility are more risky, thus, they have difficulty in obtaining external finance at lower costs (García-Vega et al., 2012). Credit constraints distort the level of firm exports as firms lower their export quantities in order to reduce the amount of external capital they need for variable costs (Manova, 2013). Thus, volatility provides a source of variation that can be exploited to identify the impact of credit frictions on firms' exports.

4. Data and summary statistics

4.1 The dataset

We construct our dataset from profit and loss and balance sheet data assembled by Centre for Monitoring Indian Economy (CMIE) in their Prowess database. CMIE is a private research organisation in India which collects data and makes it available through Prowess.

[5] These regressions help to avoid growth rates from autocorrelation dynamics and from macroeconomic development affecting all firms uniformly. Thus, this measure gives a 'conditional' idiosyncratic volatility of output growth.

The Prowess database covers large and medium-sized Indian firms with detailed information on over 25,346 firms. The majority of the companies incorporated in the database are listed on stock Exchanges[6]. In addition, data for the macroeconomic variables are drawn from the World Bank database.

Following normal selection criteria, firm-years with missing values for export sales and other control variables in the main models are excluded from the data. In addition, observations in the 1% from upper and lower tails of the distribution of the financial variables are excluded to control for outliers. Finally, the panel has an unbalanced structure with 80,996 observations and a matched sample of 50,779 observations for the period of 1988-2014 from three broad industries such as non-finance companies, non-banking finance companies and banking companies.

4.2 Summary statistics

Table 3 provides the summary statistics for all the variables, distinguishing between treated and control groups, as well as before and after the introduction of the FEMA policy liberalisation on capital account transactions. We report values for the whole sample (column 1); treated, control and non-treated groups (columns 2, 3 and 5); after and before the policy initiative (columns 6 and 7). We also report p-values for the test of equality of means between treated and control groups (column 4) and before and after FEMA (column 8). We begin by analysing the level of export share in the two groups across different time periods. We find that the level of export share is much higher amongst the treated firms compared to the control firms. Further, the export share has increased in the post-FEMA policy period or after the policy was initiated. With respect to firm-level variables, treated firms are larger in size, pay higher average wage, have more profits and greater productivity. Moving to

[6] See www.cmie.com for more information on the Prowess database, which has been widely used in several studies such as Majumdar and Sen (2010) and Mallick and Yang (2013).

columns 6 and 7, there is a significant difference in the mean values of all variables before and after the policy was introduced at the 1% level.

Taken together, three main points can be highlighted from the summary statistics. First, the export share has increased after the introduction of the FEMA policy. Second, treated firms enjoy a greater export share compared to control firms. Third, firms with access to external borrowing (treated firms) are financially healthy and more productive compared to firms with access to domestic credit only (control firms). The following sections provide formal regression tests on the relationship between the policy initiative and firms' export share.

5. Empirical results

5.1 Baseline model

Table 4 provides the results of the baseline model using difference-in-differences with firm fixed effects. The main variable of interest is *Treat*Fema*, which captures the impact of the policy on the treated firms as compared to control firms. This variable shows a positive and significant coefficient which means that after the introduction of the FEMA policy, firms with access to ECB were able to expand their exporting intensity as compared to firms with access to domestic borrowing only (control firms). We calculate the magnitude of this DD coefficient in percentages by dividing the coefficient value (marginal effect) with the predicted probability of the model. We find that the introduction of the policy increased the firm-level exports within the treated group by 24.56%[7]. This finding suggests that firms which have access to foreign borrowing are likely to face lower financial constraints, are less subject to distortions and hence are able to expand further in terms of global sales. This

[7] This is calculated as follows: dividing the coefficient of 3.614 with the predicted probability of this model (14.71) implies an increase of 24.56%.

finding is supported by the evidence shown in Manova et al. (2015) which argue that MNC firms have better export performance than private domestic firms due to access to funding from foreign capital markets. Further, real wage shows a positive and significant effect on export share which implies that firms which are intensive in human capital are more likely to go abroad (Bellone et al., 2010). Finally, all other control variables show an insignificant effect on export share.

5.2 Access to grants and subsidies

In this section, we focus on the impact of access to foreign financing on the level of exports for the recipients of grants and subsidies. The results are reported in Table 5. The estimation results of the main variable of interest '$Treat_j * FEMA_t * Grant\_recipient_{it}$' show that firms which receive grants and subsidies within the treated group (i.e they have access to foreign financing) are able to significantly increase their export share compared to similar firms in the control group[8]. In economic terms, after the introduction of the policy, firms which received grants in the treated group were able to increase their export share by 65.25%. This is a novel finding in the context of the Indian economy which highlights the importance of export promotion policies. These results are in line with Görg et al. (2008) which show that if grants received from governments are large enough then they can encourage already exporting firms to compete more effectively in the international market. Further, all other control variables behave as conjectured.

5.3 Accounting for financial vulnerability

In this section, we take into account financial vulnerability at the firm and industry level. The results are reported in Table 6. Column 1 reports results for firm-level volatility, followed by column 2 for industry-level volatility. The estimation results in column 1 show

[8] The interaction term of Treat*FEMA are dropped from these regressions due to high correlation with the main variable Treat*FEMA*Grant_recipeint.

that when firms facing higher volatility receive foreign financing, they are able to expand their exports share as compared to similar firms within the control group. Further, estimation results in column 2 indicate that firms operating in more risky (or highly volatile) industries perform better in terms of exports share when they gain access to external finance, compared to control firms. These results are in line with earlier studies which show that firms which have access to external financing benefit more compared to other firms. Manova et al. (2015) highlight that foreign affiliated firms are able to outperform the domestic firms specifically when those domestic firms face higher trading costs. They also show that firms with foreign affiliations have better export performance in financially vulnerable industries as they have access to foreign capital markets. Thus, availability of outside capital plays an important role when markets face higher trade costs and exporters require more external finance to meet these costs.

In economic terms, we find that higher volatile firms with greater access to foreign financing are able to increase their export share by 25.36% after the introduction of FEMA. Further, when firms operating in more volatile industries gain access to external financing, they are able to expand their exporting intensity by 15.41%. Further, all other control variables behave as conjectured.

6. Robustness tests

6.1 Endogeneity concerns

This section considers an instrumental variable method (two-stage least squares 2SLS) to deal with the potential endogeneity of our explanatory variables and the policy initiative. The identification of the policy initiative requires an exogenous variable which is correlated with the policy of FEMA but does not directly impact firms' export share. Following Bose et al. (2017), as plausible exogenous instrument for the policy initiative, the "Entente Alliances"

index is used. This index takes a value of 0 or 1 whenever two countries are common members of, or signatories to, an entente or alliance in any given time period. The motivation is that a country is more likely to adopt reform policies when political allies have already successfully implemented similar policies (Tressel and Detragiache, 2008)[9].

In addition, we also assumed that all firm-level variables used in the model are potentially endogenous and they are instrumented using their own values lagged twice. The validity and relevance of the instruments for both the policy and other control variables are verified using a number a diagnostic tests. The results for these tests are reported at the bottom of the Table[10].

Table 7 reports the results of the 2SLS model. The results validate a significant and positive impact of the FEMA policy on the export share of firms. Further, the results show firms with access to grants and subsidies are able to reap the benefits of foreign financing more on their export share compared to firms with only domestic financing. Finally, the results show more volatile firms and firms operating in volatile industries benefit more from foreign financing in terms of their export share. Overall, the diagnostic tests do not indicate any problems regarding the choice and the relevance of our instruments. In sum, we conclude that our findings are robust to endogenous regressors.

6.2 Alternative matching estimation

In this section we use a different matching technique namely radius matching. One could argue that the matching is poor as the closest neighbour may be too far. To deal with these concerns one can impose a propensity score caliper requirement. The caliper draws the maximum distance between the matched firms in treated and control groups that is closest in

[9] The index is from Rajan and Subramanian (2005) and the original source is the Correlates of War Database.
[10] In addition to the reported statistics, we also employed the Anderson Rubin chi-square test and obtained identical p-values as with the Anderson Rubin F-test.

terms of the propensity score. Following Mallick and Yang (2013), caliper is done with radius matching to avoid bad matching. Radius matching uses not only the nearest neighbour within each caliper but all the comparison members within the caliper, and it allows for usage of extra (fewer) units when good matches are not available (Caliendo and Kopeinig, 2008). Matching is done on the pre-treatment values of firm size, profit, profit squared, collateral, collateral squared, age, age squared and industry dummies, with caliper of 0.04 (Martincus and Carballo, 2008).

The results are given in Table 8 and are in line with the main results. We find that the FEMA policy had a positive impact on the export share of firms with access to foreign borrowing as compared to the firms with domestic financing. Next, we find that firms which are recipients of grants and subsidies within the treated group are able to increase their export share after the policy initiative. Finally, we find that when financially vulnerable firms and firms within vulnerable industries achieve access to external financing, they benefit by increasing their participation in the exporting market. Thus, we confirm that our results are robust to an alternative matching technique, which also indicates the validity of the treated and control groups in our main models.

7. Conclusion

Using a non-parametric matching analysis, this paper has shown that firms with foreign financing tend to have higher exporting activity relative to firms with only domestic sources of financing. There has been limited focus on this dimension in the literature. It is likely that firms with foreign financing tend to have better production and innovation networks with overseas market participants, which explains why these firms do better in their exporting activity.

The paper therefore extended this literature on the relationship between exporting and the external financing access in the context of a large emerging market economy using a dataset comprising 11,612 firms from India over a longer time period. The results show that firms which had access to foreign credit after the introduction of FEMA were able to increase their export share. We also find that this relationship is more sensitive for firms that receive government grants and subsidies. Further, we explore that financially vulnerable firms are able to benefit more from foreign financing compared to less vulnerable firms during the FEMA regime. The policy paradigm shift in the early 1990s from a controlled regime of import substitution, and the subsequent gradual liberalisation of capital account transactions in the early 2000s towards private debt flows have indeed been effective in enabling access to the much-needed overseas financing in order to make Indian exporters gain competitive advantage in increasing their export intensity.

References

Amiti, M. & Konings, J., 2007. Trade liberalization, intermediate inputs, and productivity: Evidence from Indonesia, *American Economic Review* 97(5), 1611-1638.

Arslan, I., Van Wijnbergen, S., 1993. Export Incentives, Exchange Rate Policy and Export Growth in Turkey, *Review of Economics and Statistics* 75(1), pp. 128–33.

Bandyopadhyay, S., Lahiri, S., Younas, J., 2015. Financing growth through foreign aid and private foreign loans: Nonlinearities and complementarities, *Journal of International Money and Finance*, 56, pp. 75-96.

Bellone, F., Musso, P., Nesta, L., Schiavo, S., 2010. Financial Constraints and Firm Export Behaviour, *World Economy* 33(3), pp. 347-373.

Berman, N., Héricourt, J., 2010. Financial Factors and the Margins of Trade: Evidence from Cross-Country Firm-Level Data, *Journal of Development Economics* 93(2), pp. 206–217.

Bernard, A., Jensen, J., 1999. Exceptional Exporter Performance: Cause, Effect, or Both?, *Journal of International Economics* 47(1), pp. 1-25.

Bernard, A. Jensen, B., 2004. Why Some Firms Export, *Review of Economics and Statistics* 86(2), pp. 561–9.

Bose, U., MacDonald, R., Tsoukas, S., 2017. Policy Initiatives and Firms' Access to External Finance: Evidence from a Panel of Emerging Asian Economies, Forthcoming in *Journal of Corporate Finance*.

Braun, M., 2005. Financial Contractibility and Asset Hardness, mimeo: University of California - Los Angeles. Avilable at: http://dx.doi.org/10.2139/ssrn.2522890.

Buch, C. M., Döpke, J., Stahn, K., 2009. Great Moderation at the Firm Level? Unconditional Vs. Conditional Output Volatility, *The B.E. Journal of Economic Analysis & Policy* 9(1), pp. 1935-1682.

Buch, C. M., Döpke, J., Strotmann, H., 2006. Does Export Openness Increase Firm-level Volatility?, *Deutsche Bundesbank Discussion Paper* 40/2006.

Buch, C. M., Döpke, J., Strotmann, H., 2009a. Does Export Openness Increase Firm-level Output Volatility, *The World Economy* 32(4), pp. 531-551.

Caggese, A., Cuñat, V., 2013. Financing constraints, firm dynamics, export decisions, and aggregate productivity, *Review of Economic Dynamics*, 16 (1): 177-193.

Caglayan, M., Demir, F., 2014. Firm Productivity, Exchange Rate Movements, Sources of Finance, and Export Orientation, *World Development* 54, pp. 204–219.

Caliendo, M., Kopeinig, S., 2008. Some Practical Guidance for the Implementation of Propensity Score Matching, *Journal of Economic Surveys* 22, pp. 31–72.

Campbell, J. Y., Lettau, M., Malkiel, B., Xu, Y., 2001. Have Individual Stocks Become More Volatile? An Empirical Exploration of Idiosyncratic Risk, *Journal of Finance* 56(l), pp. l-43.

Castagnino, T., D'Amato, L., Sangiácomo, M., 2013. How Do Firms in Argentina Get Financing to Export? *ECB Working Paper Series* No 1601, November.

Cheung, Y-W., Sengupta, R., 2013. Impact of Exchange Rate Movements on Exports: An analysis of Indian Non-financial Sector Firms, *Journal of International Money and Finance* 39, pp. 231–245.

Comin, D., 2000. An Uncertainty-Driven Theory of the Productivity Slowdown, Harvard University, unpublished thesis.

Comin, D., Mulani, S., 2006. Diverging Trends in Macro and Micro Volatility: Facts, *Review of Economics and Statistics* 88(2), pp. 374-383.

Comin, D., Philippon, T., 2005. The Rise in Firm-Level Volatility: Causes and Consequences, *NBER Working Paper* 11388.

Crespi, G., Criscuolo, C., Haskel, J., 2008. Productivity, Exporting and the Learning by-Exporting Hypothesis: Direct Evidence from UK Firms', *Canadian Journal of Economics* 41 (2), pp. 619–38.

Davis, S., Haltiwanger, J., Jarmin, R., Miranda, J., 2006. Volatility and Dispersion in Business Growth Rates: Publicly Traded Versus Privately Held Firms, *NBER Working Paper* 12354.

Demirgüç-Kunt, A., Maksimovic, V., 1998. Law, Finance, and Firm Growth, *Journal of*

Finance 53 (6), pp. 2107-2137.

Eck, K., Engemann, M., Schnitzer, M., 2015. How trade credits foster exporting, *Review of World Economics*, 151 (1): 73-101.

Fazzari, S., Hubbard, G., Petersen, B., 1988. Finance Constraints and Corporate Investment, *Brookings Papers on Economic Activity* 1, pp. 141–195.

Garcia-Vega, M., Guariglia, A., Spaliara, M.-E., 2012. Volatility, Financial Constraints, and Trade, *International Review of Economics and Finance* 21(1), pp. 57–76.

Girma, S., Görg, H., Strobl, E., 2007. The Effect of Government Grants on Plant Level Productivity, *Economics Letters* 94(3), pp. 439–444.

Goldberg, P., Khandelwal, A., Pavcnik, N. & Topalova, P., 2009. Trade liberalization and new imported inputs, *American Economic Review* 99(2), 494-500.

Görg, H., Henry, M., Strobl, E., 2008. Grant Support and Exporting Activity, *Review of Economics and Statistics* 90(1), pp.168-174.

Görg, H., Spaliara, M-E., 2013. Export Market Exit, Financial Pressure and the Crisis, *CESifo Working Paper Series* No. 4363.

Görg, H., Strobl, E., 2007. The Effect of R&D Subsidies on Private R&D, *Economica* 74(294), pp. 215-234.

Greenaway, D., Kneller, R., 2004. Exporting and Productivity in the United Kingdom, *Oxford Review of Economic Policy* 20(3), pp. 358–71.

Greenaway, D., Kneller, R., Zhang, X., 2010. Exchange Rate Uncertainty and Export Decisions in the UK, *Journal of Economic Integration* 25(4), pp. 734-753.

Heckman, J., Ichimura, H., Todd, P., 1997. Matching as an Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Programme, *Review of Economic Studies* 64 (4), pp. 605–654.

Heckman, J., Ichimura, H., Todd, P., 1988. Matching as an Econometric Evaluation Estimator, *Review of Economic Studies* 65 (2), pp. 261–294.

Hooper, P., Kohlhagen, S., 1978. The Effect of Exchange Rate Uncertainty on the Prices and Volumes of International Trade, *Journal of International Economics* 8, pp. 483–511.

Jinjarak, Y., Wignaraja, G., 2016. An Empirical Assessment of the Export-Financial Constraint Relationship: How Different are Small and Medium Enterprises? *World Development*, 79: 152-163.

Kawai, M., Zilcha, I., 1986. International Trade with Forward-futures Markets under Exchange Rate and Price Uncertainty, *Journal of International Economics* 20(1), pp. 83–98.

Leuven, E., Sianesi, B., 2003. Psmatch2: Stata Module to Perform Full Mahalanobis and Propensity Score Matching, Common Support Graphing, and Covariate Imbalance Testing, *Statistical Software Components.*

Levinsohn, J., Petrin, A., 2003. Estimating Production Functions using Inputs to Control for Unobservables, *Review of Economic Studies* 70, pp. 317–342.

Low, P., 1982. Export Subsidies and Trade Policy: The Experience of Kenya, *World Development* 10(4), pp. 293–304.

Majumdar, S., Sen, K., 2010. Corporate Borrowing and Profitability in India, *Managerial and Decision Economics* 31, pp. 33–45.

Mallick, S., Yang, Y. 2011. Sources of Financing, Profitability and Productivity: First Evidence from Matched Firms, *Financial Markets, Institutions and Instruments*, 20(5), pp. 221–252.

Mallick, S., Yang, Y., 2013. Productivity Performance of Export Market Entry and Exit: Evidence from Indian Firms, *Review of International Economics* 21(4), pp. 809–824.

Manova, K., 2013. Credit Constraints, Heterogeneous Firms, and International Trade, *Review of Economic Studies* 80, pp. 711–744.

Manova, K., Wei, S-J., Zhang, Z., 2015. Firm Exports and Multinational Activity under Credit Constraints, *Review of Economics and Statistics* 97(3), pp. 574-588.

Martincus, C. V., Carballo, J., 2008. Is Export Promotion Effective in Developing Countries? Firm-Level Evidence on the Intensive and the Extensive Margins of Exports, *Journal of International Economics* 76, pp. 89–106.

Melitz, M., 2003. The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity, *Econometrica* 71, pp. 1695-725.

Moreira, S. V., Figueiredo dos Santos, A., 2001. Políticas Públicas de Exportção: o caso do PROEX, *Texto para Discussão* No. 836, IPEA.

Muûls, M., 2008. Exporters and Credit Constraints: A Firm Level Approach, *National Bank of Belgium Working Paper Research* No. 139.

Patnaik, I., Shah, A., Singh, N., 2015. Foreign Currency Borrowing by Indian Firms: Towards a New Policy Framework, *IGC Working Paper*, September.

Paravisini, D., Rappoport, V., Schnabl, P., Wolfenzon, D., 2015. Dissecting the Effect of Credit Supply on Trade: Evidence from Matched Credit-Export Data, *Review of Economic Studies* 82, pp. 333–359.

Petrin, A., Poi, B., Levinsohn, J., 2004. Production Function Estimation in Stata using Inputs to Control for Unobservables, *The Stata Journal* 4, pp. 113–23.

Rajan, R., Subramanian, A., 2005. Aid and Growth: What Does Cross-Country Evidence Really Show?, NBER Working Paper No. 11657.

Rajan, R., Zingales, L., 1998. Financial Dependence and Growth, *American Economic Review* 88(3), pp. 559-586.
Rahaman, M., 2011. Access to Financing and Firm Growth, *Journal of Banking and Finance* 35(3), pp. 709-723.

Rosenbaum, P., Rubin, D., 1983. The Central Role of the Propensity Score in Observational Studies for Causal Effects, *Biometrika* 70, pp. 41–55.

Topalova, P. & Khandelwal, A., 2011. Trade liberalization and firm productivity: The case of India, *Review of Economics and Statistics* 93(3), 995-1009.

Tressel, T., Detragiache, E., 2008. Do Financial Sector Reforms Lead to Financial Development? Evidence from a New Dataset, IMF Working Paper WP/08/265.

Yang, Y., Mallick, S., 2010. Export Premium, Self-selection and Learning-by-Exporting: Evidence from Chinese Matched Firms, *The World Economy* 33, pp. 1218–1240.

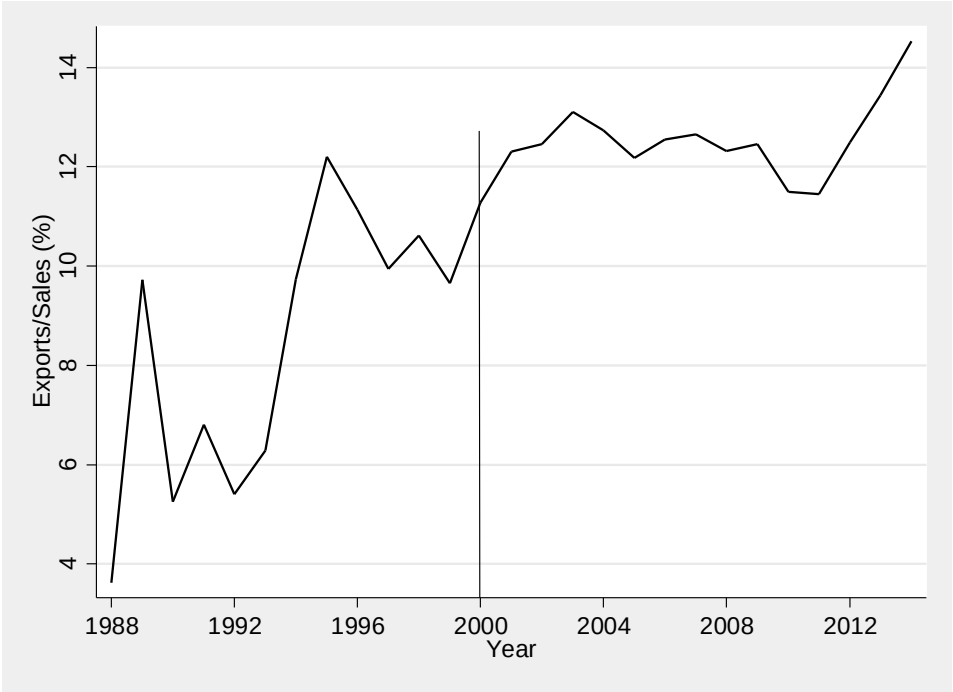
Yang, Y., Mallick, S., 2014. Explaining cross-country differences in exporting performance: The Role of Country-Level Macroeconomic Environment, *International Business Review* 23(1), pp. 246–259.

Yasar, M., Nelson, C. H., Rejesus, R. M., 2006. Productivity and Exporting Status of Manufacturing Firms: Evidence from Quantile Regression, *Review of World Economics /Weltwirtschaftliches Archiv* 142(4), pp. 675–94.

Figures

Figure 1:

(a) Share of exports (%) for the period of 1988-2014



(b) Export share (%) of treated and control firms

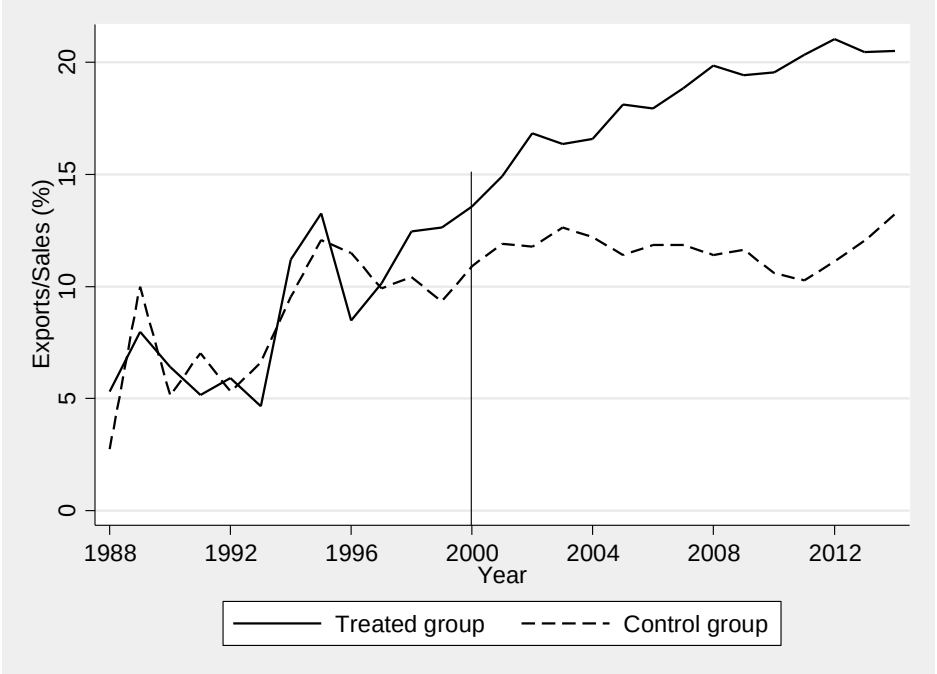
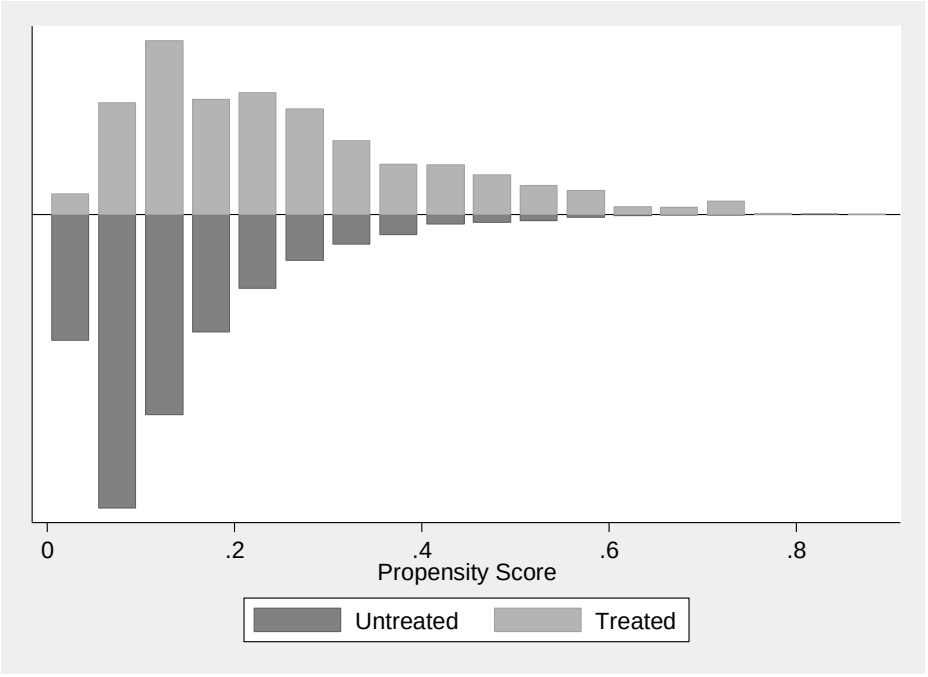


Figure 2: The propensity score histogram of matched firms



Notes: Matching method used is kernel. `Non-treated' and `Treated' are firms in the control group and treatment group, respectively. Exporters with foreign financing are in the treatment group, while exporting firms with domestic financing are in the control group.

Figure 3: Dot chart showing standardised % bias for each covariate before and after matching

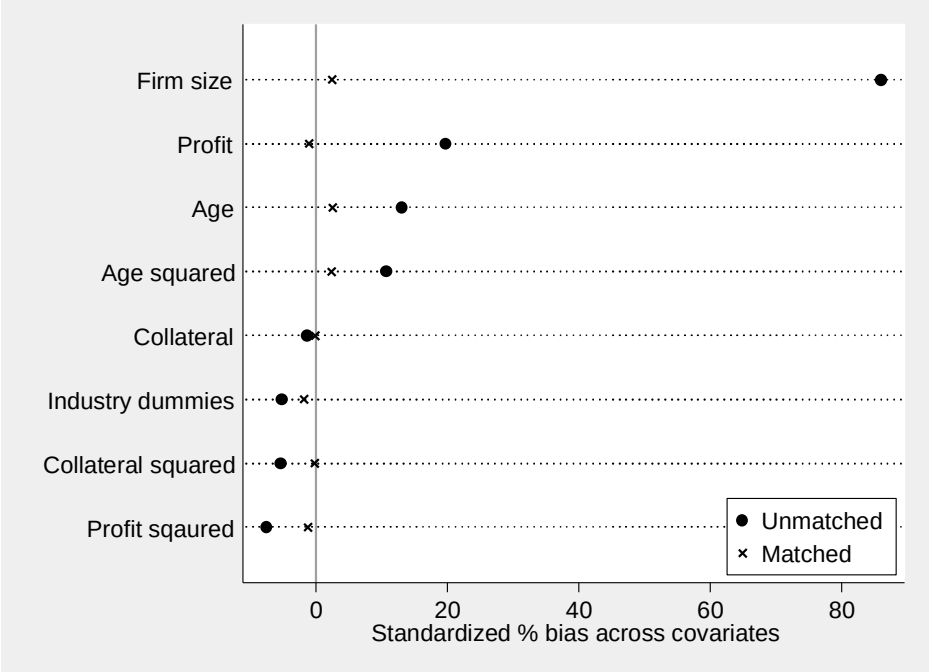
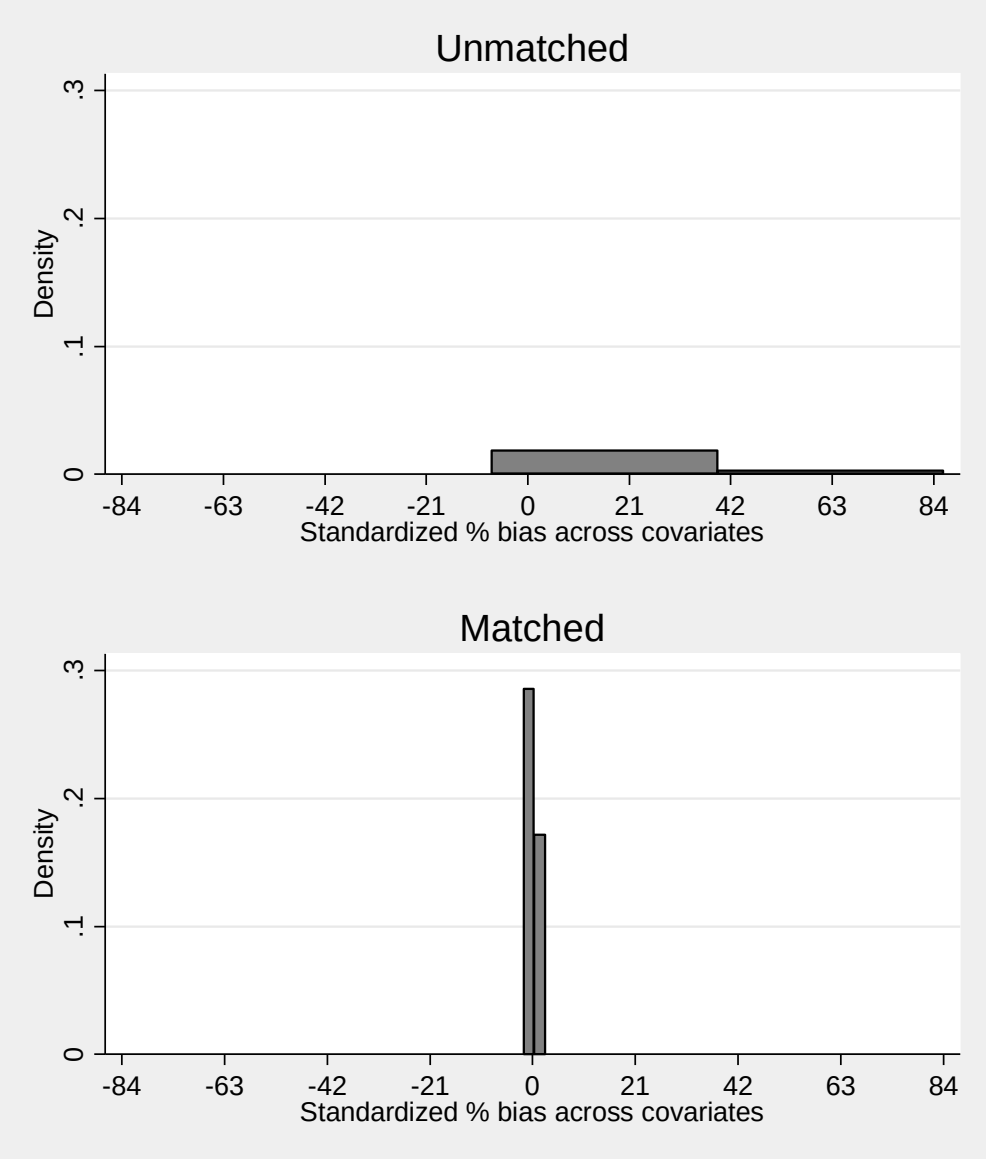


Figure 4: Histogram showing distribution of standardised % bias before and after matching



Tables

Table 1: Exporters' Foreign financing versus Domestic Financing

	Unmatched Difference	**ATT Difference**	**T-statistic (ATT)**	**N(treated)**	**N(control)**
Kernel matching	5.254	3.706	10.57	8,102	42,677
Radius matching	5.254	3.774	10.79	8,102	42,677
One nearest neighbor matching	5.254	3.774	10.79	8,102	42,677
Two nearest neighbor matching	5.254	3.774	10.79	8,102	42,677
Three nearest neighbor matching	5.254	3.774	10.79	8,102	42,677
Four nearest neighbor matching	5.254	3.774	10.79	8,102	42,677
Five nearest neighbor matching	5.254	3.774	10.79	8,102	42,677

Notes: The results are based on three different matching methods, including kernel matching, radius matching and nearest neighbors matching. `ATT' refers to the average treatment effect for the treated in terms of outcome variables, namely exports to sales ratio. `t-stat (ATT)' is the t-ratios of the average treatment effect. `Treated' and `Control' are the number of firms in the treated (exporters with foreign financing) group and matched control (exporters with domestic sources of financing) group, respectively.

Table 2: Balancing properties of matched firms

	Mean		**T-test**	
Variable	**Treated**	**Control**	**t**	**p>t**
Profit	0.033	0.033	-0.75	0.452
Profit squared	0.006	0.006	-1.01	0.314
Collateral	15.731	15.742	-0.09	0.927
Collateral squared	303.01	303.66	-0.15	0.883
Age	38.405	37.963	1.60	0.110
Age squared	1787	1745.7	1.49	0.137
Size	2.636	2.599	1.51	0.132
Industry dummies	24.798	25.038	-1.20	0.232

Notes: Matching method: kernel `t-test' is the t-test to the equality of given firm characteristics between treated (exporters with foreign borrowing) and control (exporters with domestic borrowing only) firms.

Table 3: Summary statistics for other explanatory variables

Explanatory Variables	Whole sample	Treated	Control	p-value	Non-treated	FEMA=1	FEMA=0	p-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Export/ Sales (%)	12.27 (24.89)	17.84 (27.18)	12.58 (25.17)	0.000	10.32 (23.56)	12.40 (24.99)	10.11 (23.12)	0.000
Firm Size	26.52 (69.97)	87.51 (141.81)	20.68 (50.15)	0.000	18.41 (55.38)	26.96 (69.96)	19.45 (69.70)	0.000
Real wage	1.05 (2.21)	3.03 (3.71)	0.99 (2.08)	0.000	0.60 (1.47)	1.07 (2.24)	0.71 (1.82)	0.000
Total Factor Productivity	1.57 (1.08)	1.60 (1.17)	1.54 (1.07)	0.000	1.59 (1.08)	1.55 (1.08)	1.86 (1.05)	0.000
GDP growth	7.24 (2.20)	6.99 (2.18)	6.96 (2.21)	0.089	7.69 (2.13)	7.25 (2.23)	6.99 (1.63)	0.000
REER volatility	21.20 (21.47)	19.15 (20.37)	18.41 (19.75)	0.002	25.66 (23.26)	21.41 (21.94)	17.51 (10.06)	0.000
Number of Observations	80,996	8,102	42,677		30,217	76,182	4,814	

Notes: The table presents sample means with standard deviations in parentheses. The p-values of test of equalities of means are reported. Treated firms are the ones which have access to external commercial borrowing (ECB) in the period of 1988-2014. Control firms are the matched firms using the Kernel matching technique. Non-treated firms are all other firms in the sample. FEMA is a time dummy that takes value one for the reform period from 2000-2014 and zero otherwise. Firm size: Natural logarithm of real total assets. Wages: Natural logarithm of total wage bill. Profit: Profit after tax/ Total assets. Total factor productivity (TFP): Natural logarithm of TFP measured by the detailed specification introduced by Levinsohn and Petrin (2003). GDP growth: Annual percentage growth rate of GDP at market prices based on constant local currency. REER volatility: Exchange rate uncertainty calculated by monthly real exchange rate series using a GARCH (1,1) model.

Table 4: Baseline model

Dependent variable = Export/ Sales (%)	
	(1)
FEMA	-0.610
	(-0.35)
Treat*FEMA	3.614**
	(2.09)
Lagged Firm Size	0.003
	(0.76)
Lagged Wage	0.275*
	(1.82)
Lagged Total Factor Productivity	0.354
	(0.47)
GDP growth	0.060
	(0.09)
REER volatility	-0.053
	(-0.49)
Predicted probability	14.71
N	42,123
R^2	0.009
Number of firms	5,145

*Notes: All specifications are estimated using the difference-in-differences estimator with firm fixed effects. Treated firms are the ones which have access to external commercial borrowing during the reform period of 2000-2014. Control firms are the matched firms using the Leuven and Sianesi's (2003) propensity score kernel matching technique. The matching covariates are firm size, profit, profit squared, collateral, collateral squared, age, age squared and industry dummies (pre-treatment values). The dependent variable is the ratio of export to sales ratio (%). Treat*FEMA measures the policy liberalisation effect. All regressions include firm fixed effects. Time dummies are included in the models with standard errors clustered at the firm-level. Robust t-statistics are reported in the parentheses. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).*

Table 5: Access to grants and subsidies

Dependent variable = Export/ Sales (%)	
	(1)
Treat*FEMA*Grant recipient	10.544**
	(2.38)
Treat*Grant recipient	-11.178**
	(-2.55)
FEMA*Grant recipient	1.113
	(0.89)
Grant recipient	-1.838
	(-1.47)
FEMA	-1.053
	(-0.59)
Lagged Firm Size	0.002
	(0.62)
Lagged Wage	0.297**
	(1.99)
Lagged Total Factor Productivity	0.331
	(0.44)
GDP growth	0.036
	(0.05)
REER volatility	-0.051
	(-0.46)
Predicted probability	16.16
N	42,123
R^2	0.012
Number of firms	5,145

*Notes: All specifications are estimated using the difference-in-differences estimator with firm fixed effects. The dependent variable is the ratio of export to sales ratio (%). Treat*FEMA measures the policy liberalisation effect. Grant_recipeints is a dummy which takes value one for the firms which are recipients of governments' grants and subsidies, and zero otherwise. All regressions include firm fixed effects. Time dummies are included in the models with standard errors clustered at the firm-level. Robust t-statistics are reported in the parentheses. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*) Also, see notes to Table 4.*

Table 6: Accounting for vulnerability

Dependent variable = Export/ Sales (%)		
	Firm volatility	**Industry volatility**
	(1)	(2)
Treat*FEMA*Cons	4.093**	2.378*
	(2.11)	(1.66)
Treat*Cons	-4.364**	-
	(-2.35)	
FEMA*Cons	-0.734	-1.447
	(-0.75)	(-0.68)
Cons	0.733	1.270
	(0.77)	(0.79)
FEMA	0.041	3.571
	(0.03)	(0.32)
Lagged Firm Size	0.003	0.003
	(0.75)	(0.80)
Lagged Wage	0.273*	0.283*
	(1.81)	(1.87)
Lagged Total Factor Productivity	0.360	0.368
	(0.48)	(0.50)
GDP growth	0.067	0.059
	(0.10)	(0.09)
REER volatility	-0.054	-0.053
	(-0.50)	(-0.49)
Predicted probability	16.14	15.43
N	42,123	42,123
R^2	0.009	0.009
Number of firms	5,145	5,145

*Notes: All specifications are estimated using the difference-in-differences estimator with firm fixed effects. The dependent variable is the ratio of export to sales ratio (%). Treat*FEMA measures the policy liberalisation effect. Cons is a dummy which takes value one for volatile firms or industries if measures of volatility at firm- or industry-levels are above the 50th percentile of the distribution for all firms in the sample period, and zero otherwise. All regressions include firm fixed effects. Time dummies are included in the models with standard errors clustered at the firm-level. Robust t-statistics are reported in the parentheses. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*). Also, see notes to Table 4.*

Table 7: Robustness: IV estimations

Dependent variable = Export/ Sales (%)		
Panel 1:		
Treat*FEMA	7.128*	
	(1.85)	
N	36,271	
R^2	0.005	
Kleibergen-Paap	0.000	
Anderson-Rubin	0.000	
Stock-Wright	0.000	
Hansen J	0.348	
Panel 2:		
Treat*FEMA*Grant recipient	12.631**	
	(2.06)	
N	37,661	
R^2	0.009	
Kleibergen-Paap	0.000	
Anderson-Rubin	0.000	
Stock-Wright	0.000	
Hansen J	0.488	
Panel 3:		
	Firm volatility	**Industry volatility**
	(1)	(2)
Treat*FEMA*Cons	10.788*	7.285*
	(1.82)	(1.83)
N	36,270	36,270
R^2	-0.698	0.005
Kleibergen-Paap	0.000	0.000
Anderson-Rubin	0.000	0.000
Stock-Wright	0.000	0.000
Hansen J	0.886	0.336

*Notes: All specifications are estimated using the Instrumental Variables (2SLS) estimator. All firm-level variables are instrumented using their lagged levels in t-2. The policy effect (Treat*After) is instrumented using the "Entente Alliances" index. The dependent variable is the ratio of export to sales ratio (%). All regressions include firm fixed effects. The Kleibergen-Paap is a test of under-identification distributed as chi-square under the null of under-identification. The Anderson Rubin and Stock-Wright LM S statistic are weak-instrument-robust inference tests, which are distributed as F-test and chi-square respectively, under the null that coefficients of the endogenous regressors in the structural equation are jointly equal to zero, and the over-identifying restrictions are valid. The Hansen J statistic is a test of the over-identifying restrictions, distributed as chi-square under the null of instrument validity. Time dummies are included in the models with standard errors clustered at the firm-level. Robust t-statistics are reported in the parentheses. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*). Also, see notes to Table 4.*

Table 8: Robustness: Alternative matching techniques

Dependent variable = Export/ Sales (%)		
Panel 1:		
Treat*FEMA	3.646**	
	(2.11)	
N	42,123	
R^2	0.009	
Panel 2:		
Treat*FEMA*Grant recipient	10.593**	
	(2.39)	
N	42,123	
R^2	0.012	
Panel 3:		
	Firm volatility	**Industry volatility**
	(1)	(2)
Treat*FEMA*Cons	4.126**	2.414*
	(2.13)	(1.69)
N	42,123	42,213
R^2	0.009	0.008

*Notes: All specifications are estimated using the difference-in-differences matching estimator. The dependent variable is the ratio of export to sales ratio (%). Treat*FEMA measures the policy liberalisation effect. All regressions include firm fixed effects. Time dummies are included in the models with standard errors clustered at the firm-level. Robust t-statistics are reported in the parentheses. The remaining specifications, which are not reported for brevity, are identical to those in Tables 4-6. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).*