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Does Easing Financing Matter for Firm Performance?

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Abstract

Financial reforms have been found to be highly important in promoting aggregate productivity. Yet, the linkage between access to finance, firm-level productivity, and exporting performance has been overlooked in the literature. We fill this gap using a rich dataset of 11,612 Indian firms over the period 1988-2014 to study the impact of a unique financial policy intervention on firm performance. We document a significant effect of capital-account liberalization through the lens of an export-oriented policy initiative on firms' productivity and consequently on their exporting activity. Finally, the beneficial effect of the policy change is more pronounced for financially vulnerable firms, as measured by high debt dependence and low levels of liquidity.

JEL Classification Codes*:* F4, F1, G1
Keywords*:* Productivity; Exporting; Financing; FX market liberalization

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1. Introduction

It is well accepted that due to limited capital flows, lack of access to external financing became a major constraint for firms in emerging markets during the 1990s, hampering aggregate growth and acceleration of their exporting activities. Many governments in the developing world have liberalized their capital-account regulations, especially regarding restrictions on external borrowing, in order to enable better access to financing. Yet, although widespread, researchers rarely evaluate these programs using firm-level data, especially for developing economies. In this paper, we rely on a rich dataset and a unique financial policy intervention to fill this gap.

We use panel data for 11,612 Indian firms between 1988 and 2014 to analyze the firm-level response to the Foreign Exchange Management Act (FEMA), which the Indian government enacted in 1999 (it became effectively operational starting in 2000). Our empirical strategy analyses how well FEMA helps firms to access funds from abroad and achieve better performance during the post-2000 reform period. We thus aim to provide new evidence on how firm performance, in terms of productivity improvement, responds to international transaction liberalization with implications for the intensive margin of trade activity. In addition, we argue that although FEMA beneficiaries enjoy an improvement in their performance, the effect may be heterogeneous across firms. More specifically, we investigate how firms' productivity reacts to FEMA reform, and whether high-leverage firms and those with lower liquidity are more likely to benefit from the FEMA reform.

To answer these questions, we carry out a difference-in-differences analysis to estimate how the policy shift affects firm productivity and ultimately export intensity. Our dataset spans a pre-policy period (1988-1999) and a post-policy period (2000-2014). We identify two groups of firms: treated and control. The former group includes exporting firms with foreign financing under the external commercial borrowing (ECB) framework, which was introduced after the

FEMA reform. The latter group includes exporting firms with domestic financing only. The identifying assumption for the research design is that treated and control firms behave similarly in the absence of the policy change.

India provides an ideal laboratory for the empirical analysis for two main reasons. First, India is the fifth largest economy as per nominal GDP according to the International Monetary Fund (IMF). However, capital controls remain at elevated levels as shown in Figure A1. Dismantling capital controls can enable greater access to overseas borrowing that can meet firms' much-needed foreign financing to import capital goods, to setup new foreign projects, or to modernize or expand existing units. Second, financial liberalization is likely to spur productivity and innovation, especially in emerging economies (Shu and Steinwender, 2018). Besides, in the era of financial globalization, India is linked to other developed markets in terms of international policy spillovers from the US and Europe to emerging markets with implications for financial stability (Rajan, 2014). Examining the firm-level evidence in view of this FEMA policy experiment helps validate the role of overseas debt market access in a liberalized regime, thereby making a novel contribution to the literature.

Our baseline results, which survive several robustness tests, are summarized as follows. Firms that benefit from FEMA display higher productivity and consequently higher export intensity compared to firms with only domestic sources of financing. Moreover, our results suggest that firms increase their productivity following the policy change, but even more so if they are financially vulnerable, as measured by high levels of debt and low levels of liquidity. Our findings have an important policy implication —they make a case for easing capital controls to improve firm performance in other countries that maintain restrictive capital accounts.

Our paper contributes to the existing literature in two important ways. First, it adds to the literature on financial liberalization and firm performance (see, for instance, Bekaert et al.,

2005; Quinn and Toyoda, 2008). We extend this literature by analyzing the link between an underexplored but important financial reform and firms' productivity and exporting intensity. Exploiting India's foreign exchange liberalization, through the lens of FEMA, allows us to provide a systematic analysis of how (lowered) capital constraints affect productivity and the intensive margin of trade activity.

Second, this study takes its place in the burgeoning literature on firm heterogeneity and real activities (see Greenaway and Kneller, 2007; Melitz and Redding, 2014; Chen and Guariglia, 2013; Ferrando and Ruggieri, 2018). However, we focus on the interplay among FEMA reform and varying degrees of firm heterogeneity. Our study shows that firms which display higher levels of debt and lower liquidity can improve their performance in response to a policy shift that alters their ability to raise external funding. To the best of our knowledge, this channel has not been previously documented.

This paper is structured as follows. In section two, we provide the background for FEMA reform and develop our testable hypotheses thereafter. In section three, we describe the econometric modelling strategy. We present the data 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 models to various robustness tests, and finally, in section seven, we provide concluding remarks.

2. Background and hypotheses

2.1 The FEMA reform

During the past four decades, India has embarked on a journey of continuous changes in trade policy, removing anti-export and pro-import-substitution bias. The restrictive regime of the 1970s and the 1980s gave rise to pro-liberalization policies. This involved replacing the Foreign Exchange Regulation Act (FERA), in place since 1973, with the more market-friendly

Foreign Exchange Management Act (FEMA) in the winter session of parliament in 1999. The idea was to support foreign exchange transactions in both capital and current accounts to achieve greater trade and financial openness. FEMA's key objective is to facilitate foreign trade and payments involving foreign exchange, consistent with full current-account convertibility and progressive liberalization of capital-account transactions to promote orderly maintenance of the foreign exchange market.[1] In short, one of the key objectives of FEMA reform is to help Indian firms settle into foreign markets.

Historically, Indian interest rates have always been higher than interest rates offshore. That could encourage domestic firms to borrow at cheaper rates overseas. Before FEMA, however, firms needed to seek the Reserve Bank of India (RBI)'s permission to borrow from overseas debt markets, restricting them from exposure to foreign currency borrowing. FEMA removed the RBI preauthorization requirement, enabling firms to borrow up to a certain amount per year.[2] Under FEMA, the maximum amount of ECB an individual firm can raise increased gradually since the introduction of the regulatory framework (currently USD $750 million or equivalent during a financial year). The limit can mitigate systemic risk due to currency mismatch or excessive borrowing.

According to the information that we can glean from our data, after FEMA the ECB amount was six times higher. Average foreign borrowing before FEMA was USD $6.20 million (standard deviation = 146.71), but after FEMA it was USD $40.36 million (standard deviation = 536.75). Moreover, the difference between the means is statistically significant at the 1% level. This suggests that following FEMA, firms raise significantly more ECB. Hence, FEMA

[1] More specifically, FEMA was intended to grow India's exports and procurement of imported raw materials and capital goods needed for rapid industrial growth. 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.
[2] In a given year, the government also puts a ceiling for the total amount of ECBs that all Indian firms may obtain. This aggregate limit is currently USD $40 billion a year.

is likely to help all outward-oriented firms to raise the required foreign currency financing in order to boost their performance.

2.2 Development of hypotheses

2.2.1 Capital-account liberalization and firm performance

A large and growing body of research shows that capital account restrictions can affect several dimensions of real firm activity, such as investment and productivity. For example, Bekaert et al. (2005) and Quinn and Toyoda (2008) are among the first to show that capital account liberalization leads to higher economic growth. Further, cross-country studies show that financial openness affects growth primarily through higher productivity (Bekaert et al., 2011). Bai et al. (2018) support the view regarding the link between improvements in financial markets and economic growth and argue that increases in aggregate productivity play a key role in driving these gains.

More recent work focuses on micro data. Campello and Larrain (2016), for instance, study recent reforms across Eastern European countries and document that after the policy shifts, firms are given more flexibility and an enlarged contracting space to carry out credit transactions. Therefore, such reforms have the potential to trigger real economic responses. Larrain and Stumpner (2017) study how capital-account liberalization affects firm capital allocation and aggregate productivity in 10 Eastern European countries. Their findings suggest that the policy shift increases aggregate productivity through more efficient allocation of capital across firms. Importantly, they find that capital account openness, as measured by the Chinn-Ito index, is positively associated with financial development and negatively related to the cost of lending.

The above argument is well aligned with the case of India because Shu and Steinwender (2018) show that in emerging countries, trade liberalization appears to spur productivity and

innovation. In addition, Varela (2018) uses firm-level census data to study the impact of a financial reform in Hungary on aggregate productivity. The findings of this study suggest that the reform, which revoked capital controls previously imposed on international borrowing, leads to higher aggregate productivity.

In the context of FEMA in India, which aims to help firms access funds from abroad, such easing of financing access should encourage firms' investment in technology and improvement of productivity. This can be achieved through hiring higher skilled workers, adopting new technologies, and building better and high-quality products. The implication is that more productive firms following the FEMA reform should be able to attract a larger share of foreign buyers and improve their exporting status. Accordingly, there is a link between capital-account restrictions and firm performance. Hence, the first hypothesis in the empirical analysis is:

Hypothesis 1: *Following FEMA, treated firms are more likely to increase their productivity relative to control firms without any foreign borrowing and consequently improve their export intensity.*[3]

2.2.2 Financial vulnerability

The role of financial health in firms' performance is well established in the literature. Specifically, there is empirical evidence which shows that financial constraints affect firms' real activities by distorting the optimal allocation of production inputs (see, for instance, Almeida and Campello, 2007; Chava and Roberts, 2008; Campello and Chen, 2010). When financially vulnerable firms, for whom access to financial markets is prohibitively expensive, gain access to external borrowing, they are able to engage in productivity enhancing investment. For instance, Gatti and Love (2008) estimate the effects of access to credit on Total

[3] By treated we refer to exporting firms with foreign financing under the ECB framework.

Factor Productivity (TFP). They find access to credit to be positively and strongly associated with firm productivity. Aghion et al. (2010) show that firms associated with financial constraints forego long-term investment opportunities, which contribute more to productivity growth.

Other studies document that financial frictions can play an important role in firms' productivity. Chen and Guariglia (2013) show that Chinese firms' productivity is significantly and positively affected by the availability of internal finance. Ferrando et al. (2018) find a negative and significant estimate for the elasticity of TFP with financial constraints. Access to financing is also a well-established, critical factor in export activities (see, for example, Greenaway et al., 2007; Bellone et al., 2010; Amiti and Weinstein, 2011; Minetti and Zhu, 2011).[4] Motivated by this consideration, we examine how firm-level vulnerability affects productivity and exporting following the policy intervention. Overall, after the implementation of the financial reform, firms that are highly indebted should be able to improve their productivity. A positive association between debt and productivity may be explained by the bankruptcy argument: a high level of leverage increases moral hazard and thus the probability that the firm will go bankrupt. Therefore, managers have incentives to try and improve productivity to avoid firm closure (Chen and Guariglia, 2013). Moreover, Chen and Guariglia (2013) show that illiquid firms' productivity is severely constrained. Therefore, we should expect firms with low liquidity to improve their performance after the passage of the law compared to their more liquid counterparts. In turn, the second hypothesis is as follows:

[4] Recent empirical literature analyzes the impact of credit disruptions on trade, both at the extensive and the intensive margins (see Bricongne et al., 2012; Chor and Manova, 2012; Paravisini et al., 2015; Görg and Spaliara, 2018).

Hypothesis 2*: Following FEMA, financially vulnerable firms benefit more from access to foreign external finance and thus are more productive and show higher export intensity compared to their counterparts.*

3 Empirical methodology

3.1 Baseline model

We begin our empirical analysis by estimating how firms' productivity changes around FEMA reform. We estimate our productivity model using a difference-in-differences estimator. We then examine whether firms that experience an improvement in their productivity after FEMA enjoy higher export intensity. For the purpose of the exporting model, we follow Elsas and Florysiak (2015) and adopt a doubly censored Tobit estimator with censoring at 0 and 1. This estimator is unbiased and consistent using both an unbalanced dynamic panel with a fractional dependent variable and unobserved time-invariant firm heterogeneity.[5] This method is particularly suited for our purpose, given that export intensity is measured as the ratio of exports to total sales, which is bounded between 0 and 1.[6] We opt to estimate the model in a dynamic setting because we wish to ensure that the results are not attributable to the lack of controlling for state dependence in exporting.[7] The estimated models are:

$$TFP_{inst} = a_0 + a_1 Treat_i * FEMA_t + a_2 x_{inst-1} + \gamma_i + \tau_t + \delta_{nt} + \vartheta_{st} + \varepsilon_{inst} \quad (1)$$

$$E(EXP_{inst}|x_{inst-1}, EXP_{inst-1}, C_i) = \varphi(a_0 + a_1 \widehat{TFP_{inst}} * FEMA_t + a_2 \widehat{TFP_{inst}} + a_3 EXP_{inst-1} + a_4 x_{inst-1} + \tau_t + \delta_{nt} + \vartheta_{st} + C_i) \quad (2)$$

where i = 1, 2, …., N refers to firms in sector n in state (region) s for time period t. *TFP* stands for total factor productivity calculated using Levinsohn and Petrin's (2003)

[5] In unreported regressions we find that estimating the models with a static probit fractional model does not alter our results.

[6] In our sample, 48.9% of firms report zero exports. This figure is in line with Wagner (2001), in which observed zeros in exporting are 40.4% of the total sample. The author argues that firms opt for profit-maximizing volume of exports, which might be zero or a positive quantity.

[7] The lagged export share can be thought of as a proxy for sunk costs (see, for example, Meinen, 2015).

methodology. *Treat* is a dummy that equals 1 if the firm raises external currency borrowing (ECB) in 1988-2014, and 0 otherwise.[8] *FEMA* is a dummy that equals 1 for observations for the post-reform period of 2000-2014, and 0 otherwise. The coefficient of interest in equation (1) is a_1, which measures the difference in productivity between treated and control firms in the post-FEMA period. Put differently, the point estimate measures how the policy affects productivity of firms with access to ECB versus firms with access to only domestic borrowing.

Further, in equation (2), we incorporate the estimated *TFP* ($\widehat{TFP}$) from equation (1) to assess the response of export intensity (*EXP)* to changes in productivity after the start of FEMA. To avoid the generated regression problem since we do not observe but rather estimate TFP (see Pagan, 1984), the standard errors are obtained by using a bootstrap procedure. The coefficient of interest is a_1, which shows whether firms that enjoy higher productivity after FEMA are able to improve their export intensity relative to firms that are less productive. A positive coefficient for *Treat*FEMA* supports H1.

The models include additional controls: firm fixed effects (γ_i) to account for unobserved firm heterogeneity, year fixed effects (τ_t) to account for possible business cycle effects, as well as *year*industry* (δ_{nt}) and *year*state* fixed effects (ϑ_{st}) to control for other industry and time-varying shocks that could affect firms differently in the treated and control groups.[9] Following Papke and Wooldridge (2008), C_i is the unobserved effect which can be modelled by the time averages of $\bar{x}_i$. Finally, the standard errors are clustered at the firm level.

We add to the models various firm-specific characteristics (captured by vector *x* in equations (1) and (2)) as control variables that also help determine their productivity and

[8] We also use an alternative treated group of firms that do not have access to ECB in the pre-reform period but have access to ECB during the post-reform period. The results are qualitatively and quantitatively similar to those in our main models.

[9] Our models include various fixed effects to control for the possibility that firms may raise foreign currency borrowings for speculative purposes and maybe affected by other reforms such as industrial liberalization, FDI liberalization, and financial liberalization in the early and mid-1990s.

exporting performance. We lag all time-varying firm-specific variables by one period to reduce possible simultaneity problems (see Bernard and Jensen, 1999, 2004; Greenaway et al., 2007). We first introduce *Size*, measured as real total assets. Large firms cope well with financial constraints and have greater access to external financing, which is necessary to cover the sunk and fixed costs of exports (Bernard and Jensen, 1999 and Greenaway et al., 2007). Also, there is a significant firm size-productivity relationship as larger firms are more likely to engage in technological innovation resulting in improved productivity (Crespi and Zuniga, 2012). Therefore, we expect *Size* to be positively associated with productivity and export intensity.

Wage is measured by the total wage bill adjusted by GDP deflator. This variable controls for systematic differences between firms in terms of human capital (Bellone et al., 2010). A stylized fact in the trade literature is that foreign firms pay higher wages, but we also observe the opposite effect in determining the probability of entry into export markets (see Greenaway et al., 2007). We argue that this is an empirical issue determined by the data.

Finally, we consider two important aspects of firm financial health: leverage and liquidity (see Greenaway et al., 2007). *Debt* is the ratio of short-term debt to current assets and accounts for the firm's dependency primarily on bank debt. *Liquidity* is the ratio of current assets less current liabilities over total assets. Firms with less leverage and more liquidity are generally considered in better financial shape and should be more successful in exporting. Hence, we anticipate a positive (negative) relationship between *Liquidity* (*Debt*) and export intensity.

3.2 Accounting for financial vulnerability

In this subsection our main interest lies in examining whether firms facing different levels of financial vulnerability within the treated group exhibit different sensitivities in their productivity and exporting shares after FEMA, compared to firms in the control group. We focus on two dimensions of financial vulnerability: debt and liquidity. We augment equation

(1) with interactions between the policy effects and the indicators of firm-level vulnerability. This exercise is based on the consideration that when FEMA takes place, firms that are highly indebted or display lower levels of liquidity, should respond more strongly in terms of productivity compared to their counterparts. Formally, we estimate the following models:

$$TFP_{inst} = a_0 + a_1 Treat_i * FEMA_t * Finvar_{it} + a_2 Treat_i * FEMA_t + a_3 FEMA_t * Finvar_{it} + a_4 Treat_i * Finvar_{it} + a_5 Finvar_{it} + a_6 x_{inst-1} + \gamma_i + \tau_t + \delta_{nt} + \vartheta_{st} + \varepsilon_{inst} \quad (3)$$

$$E(EXP_{inst} | x_{inst-1}, EXP_{inst-1}, C_i) = \varphi(a_0 + a_1 \widehat{TFP_{inst}} * FEMA_t * Finvar_{it} + a_2 \widehat{TFP_{inst}} * FEMA_t + a_3 FEMA_t * Finvar_{it} + a_4 \widehat{TFP_{inst}} * Finvar_{it} + a_5 Finvar_{it} + a_6 \widehat{TFP_{inst}} + a_7 EXP_{inst-1} + a_8 x_{inst-1} + \tau_t + \delta_{nt} + \vartheta_{st} + C_i) \quad (4)$$

where *Finvar* is a dummy that equals 1 in a given year for firm *i* if debt (or liquidity) is in the top (bottom) 25% of the distribution of debt (or liquidity) for all firms in the same industry as firm *i* in that year, and 0 otherwise. The main term is the triple-interaction coefficient of *Treat*FEMA*Finvar*, which measures whether firms that rely on more debt financing or have lower liquidity improve their productivity following FEMA; this compares to firms with access only to domestic borrowing in the pre-FEMA period. A positive coefficient for *Treat*FEMA* and a positive coefficient for *Treat*FEMA*Finvar* support H2. The remaining control variables and fixed effects remain unchanged.

4 Data and summary statistics

4.1 The dataset

We construct our dataset from profit and loss and balance sheet data assembled by the Centre for Monitoring Indian Economy (CMIE) and its Prowess database. CMIE is a private research organization in India that collects data and makes it available through Prowess.[10] The Prowess

[10] See www.cmie.com for more information on the Prowess database, which is widely used in the literature for firm-level analysis on the capital structure of Indian firms (see, for example, Vig, 2013).

database covers large and medium-size Indian firms with detailed information on over 25,346 firms. The majority of the companies in the database are listed on the stock exchange.

Following normal selection criteria, we exclude firm-years with missing values for export sales and other control variables in the main models. In addition, we exclude observations in the 1% of the upper and lower tails of the distribution of all control variables to control for outliers. Finally, the panel has an unbalanced structure with 80,996 observations over the period 1988-2014. Our sampled firms operate in different sectors, such as manufacturing, utilities, resources, services and non-banking financial services.[11]

4.2 Summary statistics

To provide a simple visual account of the response of firms' productivity and exporting over the sample period, we present figures 1 and 2. Figure 1 graphs the evolution of TFP among Indian firms over the period 1988-2014, disentangling treated firms from control firms. The vertical line indicates the change in policy. It shows a rise in productivity of the first group of firms after the policy change in 2000, compared to the second group of firms. This picture is mirrored in figure 2, which depicts the share of exports, rising nearly continuously after FEMA took effect in 2000 only for the treated group. Both graphs support the model's parallel-trends assumption, suggesting that in the absence of the reform both the treated and control groups exhibit a similar growth trend in their productivity and export shares.

Table 1 reports descriptive statistics on the main variables of interest. We report means and standard deviations for the whole sample (column 1), treated and control groups before the FEMA reform (columns 2 and 3), and for the same groups of firms after the FEMA change

[11] Non-Banking Financial Companies (NBFC) are establishments that provide financial services and banking facilities without meeting the legal definition of a Bank. They are covered under the Banking regulations laid down by the Reserve Bank of India and provide banking services like loans, credit facilities, retirement planning, investing and stocking in money market. However, they are restricted from taking any form of deposits from the general public.

(columns 5 and 6).[12] We also report *p*-values for the test of equality of means between treated and control groups before and after FEMA reform (columns 4 and 7, respectively). To begin with TFP and export share, we observe that before FEMA, the difference in the means between treated and control groups is insignificant. However, post-FEMA, treated firms experience a significant increase in both TFP and export share, which is not the case for the control group.[13] With respect to firm-level variables before the policy, treated firms are larger, pay higher average wages, and display healthier balance sheets. Moving to columns 5 and 6, there is a significant difference in the mean values of all variables for treated and control groups.

Taken together, the preliminary statistics suggest that firms' performance may be related to the introduction of FEMA and that access to external borrowing is associated with differences in the balance sheet indicators. The following sections provide a formal regression analysis on the relationship between the policy initiative and firms' productivity and export share, paying attention to the role of firm-level financial vulnerability.

5 Empirical results

5.1 The baseline models

We begin our analysis by examining how the policy change affects productivity. We then examine the impact of the estimated productivity, after FEMA started, on export share. Table 2, panel A shows the results from the estimation of equation (1). We present estimation results in subsequent columns to include different fixed effects that can help us strengthen our identification. We report coefficient estimates and *t*-statistics with standard errors clustered by

[12] We report the correlation matrix among all variables used in the paper in table A1 in the appendix.
[13] We decompose the export share to gauge the evolution of the numerator and the denominator separately. We find that a decline in sales does not drive the increase in export share. In table A2 in the appendix we show that both exports and sales rise significantly after FEMA.

firm. The general finding is that FEMA positively and significantly, both statistically and economically, affects firm productivity.

Our key variable of interest is the interaction between the firm-level *Treat* dummy and the policy dummy *FEMA* (*Treat*FEMA*). This shows the impact of the policy change in 2000 on TFP.[14] Controlling for firm characteristics and macroeconomic shocks, FEMA's impact is substantial for treated firms, as demonstrated by the positive coefficient on the interaction term in column 1 of table 2. Following FEMA, firms with access to ECB improve their productivity compared to firms only with access to domestic borrowing. Hence, easing financing helps firms to increase their productivity. The results show qualitatively and quantitatively significant effects. Based on the estimates of column 1, treated firms increase productivity by 15.5 percentage points after the financial reform. Moving to the following columns of table 2, we re-run the same regressions and find that the main result persists even after controlling for other industry and time-varying shocks that could affect firms differently in the treated and control group.

In Panel B of Table 2, we present estimates of equation (2) taking into account the estimated TFP from equation (1). We report marginal effects and *z*-statistics with standard errors clustered by firm. Note that in all models, we add time averages of firm-level variables to allow for time-constant unobserved effects that are correlated with our explanatory variables (Papke and Wooldridge, 2008). The coefficients on the double interaction $\widehat{TFP}$**FEMA* are positive and highly significant in all three specifications. The total effect of FEMA is given by the sum of the marginal effect of $\widehat{TFP}$ plus the $\widehat{TFP}$**FEMA* interaction marginal effect multiplied by the standard deviation of $\widehat{TFP}$. Focusing on the estimates in column 1 of panel B, a one-

[14] Our findings are robust to using labor productivity instead of TFP. In addition, our results hold when the TFP models are estimated in a dynamic setting (see tables A3 and A4 in the appendix).

standard-deviation rise in $\widehat{TFP}$ would significantly raise export intensity by 4 percentage points.[15]

This finding implies that firms that enjoy higher productivity after the introduction of FEMA increase their export intensity relative to firms that are less productive. Our results are valuable in light of previous studies, as we suggest that firms with access to foreign borrowing under the ECB framework are more likely to face lower financial constraints, are subject to fewer distortions, and hence are able to build better- and high-quality products. In this sense firms can attract foreign consumers and thus expand further in terms of global sales. Therefore, our findings provide strong support for our first hypothesis that firms tapping foreign currency financing increase their productivity and consequently their export share relative to firms without any foreign borrowing.

Coming to our control variables, the coefficient on *Size* is positive and significant at the 1% level. This is in line with previous studies suggesting that export intensity and productivity increase with firm size as larger firms have better access to external finance and tend to be more innovative. The results further illustrate that lagged export status is positive and highly significant in the export-intensity equation, indicating the importance of sunk costs in exporting. In addition, we find that the export-to-sales ratio decreases with the lagged wage per employee (a puzzling finding also in Greenaway et al., 2007) when controlling for firm size. In terms of financial indicators, highly indebted firms face higher credit risk and display a lower export intensity. This reverses when we consider the coefficients on liquidity, which are positive and highly significant across all specifications. Hence, as Greenaway et al. (2007) suggest, financial health is an important determinant of exporting.

[15] The overall effect is calculated as follows: marginal effect of $\widehat{TFP}$ (0.11) + marginal effect of $\widehat{TFP}$*$FEMA$ (0.17) *standard deviation of $\widehat{TFP}$ (0.17) = 0.040.

5.2 The role of financial vulnerability

In this section, we focus on how access to foreign financing affects the level of productivity for different types of firms, namely those that rely more on debt or are less liquid. The results for debt as an indicator for financial vulnerability are given in table 3. Panel A reports results for productivity, followed by export intensity in panel B.

We pay attention to the sign and significance of the triple-interaction term (*Treat*FEMA*Finvar*) which reveals whether firms that are more financially vulnerable, are likely to improve their productivity compared to their counterparts in the pre-FEMA period. We find that, following the FEMA reform, *TFP* is more sensitive for financially vulnerable firms that use more debt and it is less sensitive for less indebted firms. In particular, considering the double-interaction term *Treat*FEMA*, we find a positive and highly significant coefficient, which implies that treated firms increase their productivity after FEMA by 21.8 percentage points. Importantly, the increase in productivity is even more prevalent for financially vulnerable firms by 4.5 percentage points, as shown in the triple-interaction term *Treat*FEMA*Finvar*.

In panel B of table 3 we present the impact of the estimated TFP after FEMA on exporting. In particular, considering the double-interaction term $\widehat{TFP}$**FEMA*, we find a positive and highly significant coefficient, which implies that high-productivity firms increase their export intensity after FEMA by 1.2 percentage points. Importantly, the increase in export intensity is even more prevalent for firms with higher levels of debt, as shown in the triple-interaction term $\widehat{TFP}$**FEMA*Finvar*. A one-standard-deviation rise in the estimated TFP would significantly raise export intensity by 1.8 percentage points. The findings point to a strong link between productivity, firms' debt exposure and export intensity. This novel finding also highlights the link between productivity and financial reforms. A priori, we expect improvements in firms' access to foreign financing to help them diversify their sources of financing and the associated

risks. This additional source of income provides greater assurance to lenders regarding the firms' financial health and relaxes their liquidity constraints. When a financial reform such as FEMA takes place, we find that financially vulnerable firms improve their productivity and then their export performance. As far as we are aware, this is the first paper to make this point, and we document the amplification channel through which more indebted firms enjoy higher productivity and better export performance compared to their counterparts.

Next, we move to liquidity as an alternative indicator of firms' financial vulnerability as shown in table 4. The estimation results in panel A show that when firms with low liquidity receive foreign financing, they can expand their productivity compared to firms within the control group. This finding is robust across various specifications. Notably, this effect is magnified by 8.3 percentage points if a firm is financially vulnerable. In panel B the marginal estimates imply that modifying a firm's sources of external financing can raise exporting intensity by 1.6 percentage points if they are less liquid and enjoy high productivity. Last, the pattern in the point estimates for our control variables is similar as before.

In summary, our results provide strong empirical support for H2 and H3 because we find that financially vulnerable firms respond more strongly the policy reform. They demonstrate a higher degree of informational asymmetry and hence are more subject to financial constraints. Thus, when they gain access to foreign currency borrowing, they are able to meet higher trade or productivity costs and improve their performance.

6 Robustness tests

6.1 Different time windows

It is likely that contemporaneous economic and financial events occurring during the 28-year sample period affect the treated and control firms.[16] The difference-in-differences setting partly resolves this potential concern with various fixed effects to shut down channels that may influence firms in a different way during the sample period. However, to ensure our results are not affected by pre- or post-reform confounding shocks, we perform an additional analysis by considering shorter time windows. In particular, we limit our analysis to five years before the reform and five years after the reform to obtain a symmetric time window.[17]

We report the results in table 5. We confirm that firms improve their productivity after FEMA with implications for their export share. We further corroborate that the policy initiative is more potent for firms that can raise higher levels of debt and are less liquid. Thus, limiting the sample period to five years around FEMA does not affect our results.

6.2 Placebo test

We also test whether pre-policy trends that may have a bearing on our identification strategy influence our results.[18] In the budget of 1997-1998, the government proposed to replace FERA-1973 with FEMA, which the parliament approved in 1999. The Act came into force on June 1, 2000. To verify if this underlying trend affects our results, we conduct a difference-in-differences estimation assuming that the policy change took place in 1997.[19] If any pre-policy trends affect our results, we should see a positive impact on productivity and then on export

[16] For example, India initiated its economic liberalization policy in 1991-1993 and reduced tariff and interest rates, ended public monopolies, and allowed automatic approval of FDI. Export-import (Exim) policy was introduced in 1992-1997, which eliminated the system of licenses and quantitative restrictions to reduce the scope of public-sector monopoly sharply for most export items and a good number of import items. The second phase of economic liberalization was during 1998-1999, and there was a global financial crisis in 2007-2009.

[17] The choice of the time window is robust to modifications.

[18] We employ a different quantitative test for pre-trends by using lags/leads. The results remain unchanged to this modification.

[19] In other words, these time periods are chosen at random owing to the government's proposal and the true effect for these years is zero. We perform difference-in-differences tests for 1996 and 1997. The results show almost similar results both quantitatively and qualitatively to the 1997-1999 reform period. For details on this approach, see Imberman and Kugler (2012) and Bose et al. (2019).

share. Failing to recognize any significant effects for these placebo time periods supports the reliability of the chosen treatment period.

Table 6 shows results for the placebo time periods. They show, consistently across all model estimates, FEMA's insignificant effect on productivity and export share. We do not find any differential effect for firms that are more indebted or less liquid. All in all, this test confirms the validity of our identification strategy.

6.3 Alternative definition of the treated group

In our main models, treated firms raise ECB anytime during 1988-2014. In this section, we define the treated group of firms according to their industrial affiliations.[20] Therefore, the treated group includes firms that raise ECB, but the control group includes firms that are eligible but do not raise ECB during the sample period.

Table 7 shows the results. We find that the policy change has a significant effect on the productivity of firms with foreign financing. Further, we find that firms that improve their productivity after FEMA can boost their export share. Finally, we find that firms which are more indebted and have lower liquidity benefit from the policy compared to their counterparts with domestic financing. Thus, our results are robust to an alternative definition of the treated group.

6.4 Addressing endogeneity concerns

We carry out an additional sensitivity test aimed at dealing with potential endogenous variables in our regression models as variables such as size, wage, debt, liquidity, and exporting are all

[20] The list of entities eligible to raise ECB includes companies in the manufacturing and software development sectors, shipping and airlines companies, companies in the infrastructure sector, nonbanking financial companies, holding companies and core investment companies, real estate investment trusts and infrastructure investment trusts, microfinance institutions, companies engaged in miscellaneous services viz. research and development (R&D), training (other than educational institutes), companies supporting infrastructure, and companies providing logistics services. Finally, we include companies engaged in maintenance, repair, overhaul, and freight forwarding.

likely to be endogenous. We estimate our models with a System-Generalized Method of Moments (GMM) estimator that combines in one system the relevant equation in first differences and in levels (Arellano and Bover, 1995 and Blundell and Bond, 1998).[21] Instruments include all firm-specific variables lagged three times or more in the productivity and exporting models.

In panel A of table 8, we find evidence in support of the view that productivity rises after FEMA. Therefore, we concur with our main findings that a firm with access to foreign currency borrowing is likely to increase productivity that further results in higher export intensity. In panel B we further confirm the importance of the policy for firms with higher debt and lower liquidity. At the bottom of each panel, we report p-values for two diagnostic tests: the Hansen test of over-identifying restrictions, and the serial correlation tests. Overall, the statistics show that the instruments are valid and that there is no sign of misspecification in the model.

6.5 Additional productivity channels

In this sub-section we isolate two channels through which firms can improve their productivity after FEMA. In particular, we focus on staff training and technological sophistication. For the former indicator, we rely on firms' expenses on staff training, while for the latter variable we distinguish whether firms belong to a high-technology sector or not.[22] The intuition behind these additional tests is as follows. Firms which spend resources on staff training can enhance

[21] A way to check whether the First-Differenced GMM estimator is affected by the finite sample bias is to compare the estimate of the coefficient on the lagged dependent variable obtained from the latter estimator with those obtained from the OLS and the Within Groups (WG) estimators (see Bond et al., 2001). Table A5 reports the coefficients on the lagged exporting intensity obtained from the above mentioned estimators. We find that GMM estimates of the coefficient on lagged exporting intensity fall close or below the corresponding estimate obtained using the WG estimator. We can conclude that the First-Differenced GMM estimator is subject to serious finite sample bias, thus, we opt for estimating the models using the System-GMM.

[22] Staff training expenses are measured as the expenditure on staff welfare and training as a proportion of total compensation to employees. High technology sectors contain high technology manufacturing industries, medium-high technology manufacturing industries and knowledge intensive service sectors. See Eurostat (2011) and Mallick and Yang (2013) for more details on these sectors.

their productivity as employees gain knowledge and/or capabilities that they can use to improve their tasks (Barrett and O'Connell, 2001; Van de Wiele, 2010). Also, firms in high-tech industries have the highest degree of sophistication, technological content, and R&D intensity and are more likely to achieve competitive gains in the exporting market (Minetti et al., 2015).

Table 9 shows the results. We continue to observe that following the FEMA reform, firms that invest in human capital and those that belong to high-tech industries are more likely to improve their productivity leading to an increase in their export intensity compared to their counterparts.

6.6 Additional tests for financial vulnerability

In our main empirical results, we partition firms according to their financial vulnerability if debt (or liquidity) is in the top (bottom) 25% of the distribution of debt (or liquidity) for all firms in the same industry as firm *i* in that year. In order to ensure that our results are not due to the way that we divide our sample, we carry out three additional tests. First, we use the 50th percentile as an alternative cut-off point for both criteria. Second, given that the majority of our sample firms are listed on the stock exchange, we define financially vulnerable firms using the volatility of their return on equity, calculated as the standard deviation of return on equity. This is measured over a rolling window of five years. Finally, we focus on two more dimensions of financial vulnerability: size and the degree to which firms can pledge collateral.[23]

We then re-estimate the models from tables 3-4 and report the results in tables 10 and 11. We continue to observe that following the FEMA reform, financially vulnerable firms, irrespective of the definition used, are more likely to improve their productivity leading to an

[23] Hadlock and Pierce (2010) provide evidence that firm size is a particularly useful predictor of financial constraints. In addition, Manova (2008) shows that entrepreneurs can raise external financing easier if they pledge collateral; lack of collateral makes it costlier for exporters to obtain external financing.

increase in their export intensity compared to their counterparts. In summary, our main empirical results are robust to alternative cut-off values and definitions of financial vulnerability.

7 Conclusion

Despite greater globalization of Indian firms in the last two decades, their access to international debt markets remains largely restricted. There has been limited focus on how this affects firm performance. One argument is that firms with foreign financing have better production and innovation networks with overseas market participants, which could boost their performance and exporting intensity. Using a rich panel dataset for India, this paper shows that firms with foreign financing display higher productivity relative to firms with only domestic sources of financing. We also find this effect has implications for firms' exporting intensity. Finally, we document that this relationship is more sensitive for financially vulnerable firms after the FEMA reform.

Our study is policy relevant. Countries that maintain restrictive capital accounts can improve their performance by gradually easing capital controls. The development of diversified sources of external finance should become a priority in the national governments' agenda. This will help to facilitate the development of a balanced economy and to create appropriate conditions that will enhance companies' competitive advantages in increasing their productivity and ultimately their export intensity. We suggest that policies aimed at making foreign currency borrowing readily available to financially vulnerable firms would improve their performance.

Given our finding of a favourable impact of relaxing capital controls, capital flight is unlikely to be a concern; instead greater foreign exchange inflows on the back of higher export intensity could support the currency value. Only most productive firms on the back of better

foreign financing access are gaining improvement in their exporting intensity; such access to foreign currency financing leads to better access to technology and improvement in skills, which help those exporting firms in improving their productivity and thereby their exporting performance.

The cost of borrowing could be different for firms those who rely on foreign currency financing relative to domestic sources of financing. The ones who rely on foreign financing could be less exposed to foreign currency risk as there is no currency mismatch for these firms (their borrowing currency and earning currency remain the same), relative to firms who rely on domestic sources of financing as domestic currency appreciation can reduce the value of their foreign exchange earnings, reducing their ability to repay debt in domestic currency.

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Figure 1: Total Factor Productivity for treated and control groups

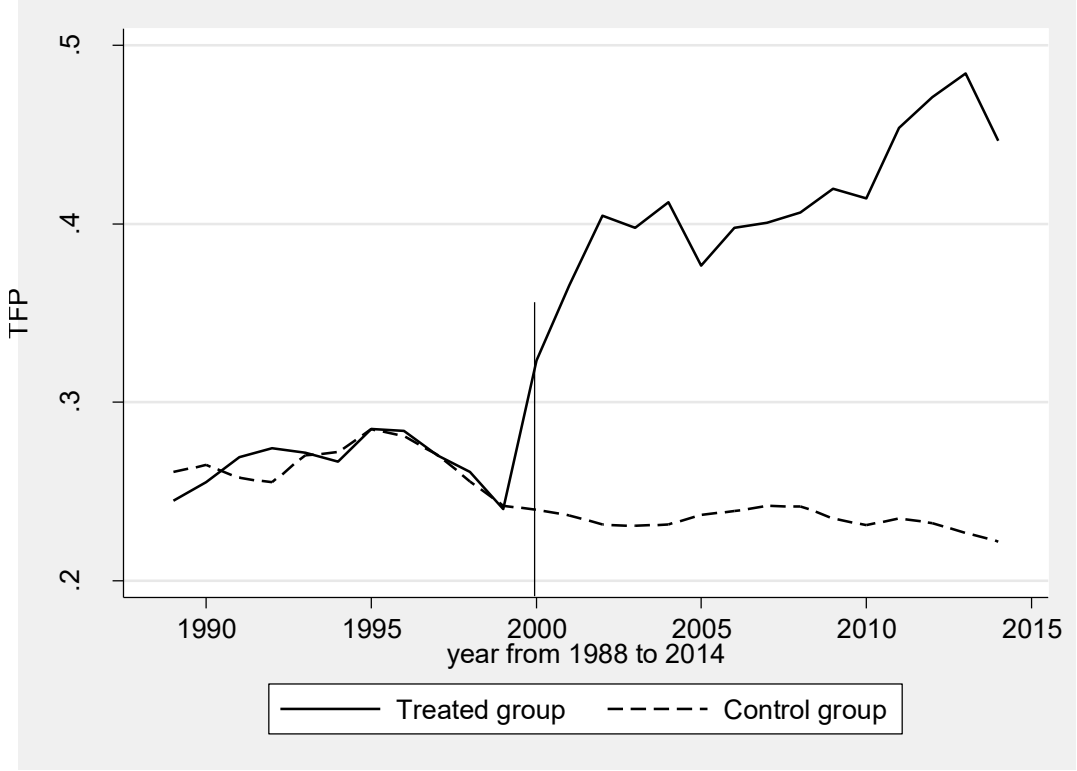

Figure 2: Export share for treated and control groups

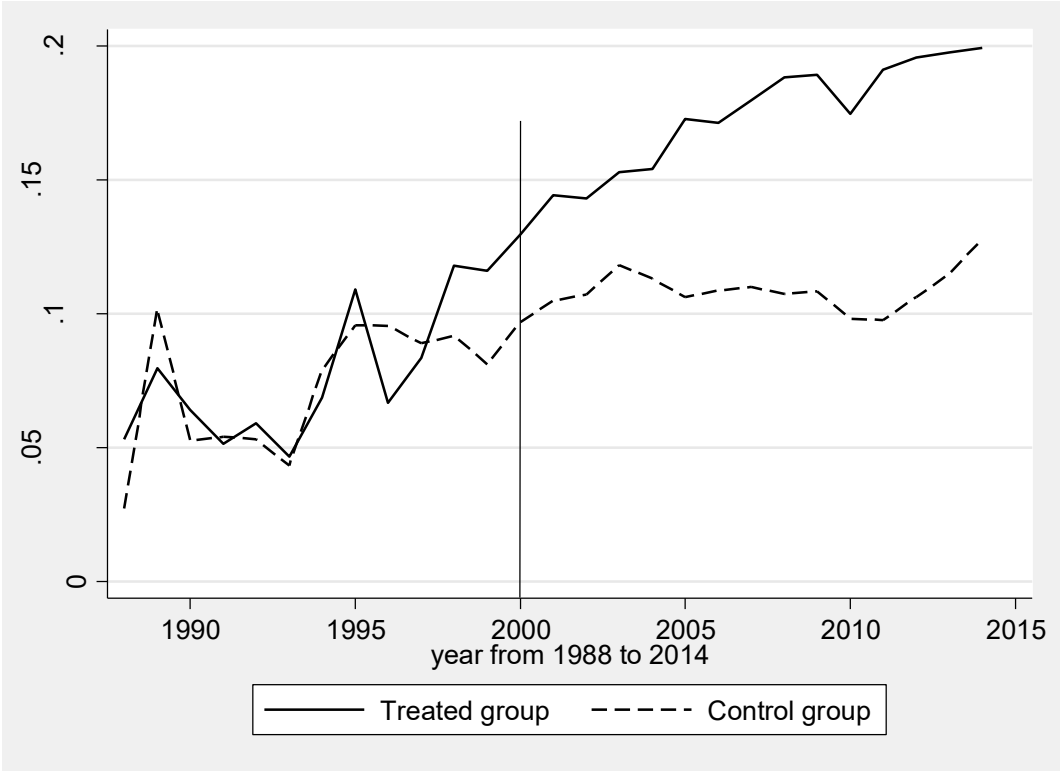

Table 1: Summary statistics

		FEMA=0			FEMA=1		
	Whole sample	Treat	Control	p-value	Treat	Control	p-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
TFP	0.24	0.26	0.26	0.201	0.43	0.23	0.000
	(0.04)	(0.03)	(0.02)		(0.16)	(0.01)	
EXP	0.12	0.08	0.08	0.949	0.17	0.11	0.000
	(0.22)	(0.17)	(0.19)		(0.24)	(0.22)	
Size	29.02	71.30	16.04	0.000	84.48	20.66	0.000
	(71.96)	(148.26)	(59.40)		(134.62)	(50.80)	
Wage	1.18	2.28	0.62	0.000	2.91	0.92	0.000
	(2.34)	(3.29)	(1.62)		(3.56)	(1.96)	
Debt	0.42	0.36	0.45	0.011	0.45	0.43	0.000
	(0.51)	(0.36)	(0.51)		(0.48)	(0.51)	
Liquidity	0.15	0.13	0.15	0.087	0.12	0.15	0.000
	(0.19)	(0.15)	(0.18)		(0.17)	(0.19)	
N	61,851	272	1,891		8,013	51,675	

Notes: The table presents sample means with standard deviations in parentheses. In columns 4 and 7 we report the *p*-values of tests of equalities of means between treated and control firms. *Treat* is a dummy that equals 1 if the firm raises ECB over the period 1988-2014, and 0 otherwise. *FEMA* is a dummy that equals 1 if the observation occurs in the post-reform period of 2000-2014, and 0 otherwise. *TFP* is total factor productivity calculated using the Levinsohn and Petrin (2003) method adjusted by GDP deflator. *EXP* is the ratio of total exports to total sales. *Size* equals real total assets. *Wage* equals real total wage bill. *Debt* is short-term debt to current assets. *Liquidity* is current assets less current liabilities over total assets. Variables are measured in millions of Indian Rupees.

Table 2: Baseline model

Panel A: Dependent variable		**TFP**	
	(1)	(2)	(3)
Treat*FEMA	0.155***	0.157***	0.151***
	(3.04)	(3.06)	(2.95)
Size	0.001***	0.001***	0.001***
	(5.09)	(5.26)	(5.21)
N	61,851	61,851	61,851
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	No	Yes	Yes
Year*State FE	No	No	Yes
Panel B: Dependent variable		**EXP**	
$\widehat{\textbf{TFP}}$***FEMA**	0.171***	0.169***	0.154***
	(5.51)	(3.93)	(4.81)
$\widehat{\textbf{TFP}}$	0.011***	0.011***	0.009***
	(7.35)	(6.88)	(8.24)
EXP (lag 1)	0.333***	0.333***	0.333***
	(36.33)	(8.76)	(48.67)
Size	0.005***	0.006***	0.006***
	(7.89)	(5.45)	(7.91)
Wage	-0.001*	-0.001***	-0.001***
	(-1.85)	(-3.19)	(-6.12)
Debt	-0.002***	-0.002**	-0.002***
	(-18.48)	(-2.32)	(-3.45)
Liquidity	0.008***	0.008*	0.008***
	(4.45)	(1.75)	(21.01)
N	61,769	61,769	61,769
Time averages of firm variables	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	No	Yes	Yes
Year*State FE	No	No	Yes

Notes: All specifications in Panel A are estimated using a difference-in-difference estimator and by dynamic Tobit models introduced by Elsas and Florysiak (2015) in Panel B. The dependent variables are TFP (Panel A) and exporting intensity (Panel B). *Treat* is a dummy that equals 1 if the firm raises external currency borrowing (ECB) over the period of 1988-2014, and 0 otherwise. *FEMA* is a dummy that equals 1 if the observation occurs in the post-reform period of 2000-2014, and 0 otherwise. *Size* equals real total assets. *Wage* equals real total wage bill. *Debt* is short-term debt to current assets. *Liquidity* is current assets less current liabilities over total assets. We lag all firm-level variables by one time-period except for $\widehat{TFP}$. Robust *t*- and *z*-statistics are reported in the parentheses. Standard errors are clustered at the firm level. In Panel B standard errors are bootstrapped. Statistical significance is denoted at 1% (***), 5% (**), and 10% (*).

Table 3: Accounting for financial vulnerability: Debt

Panel A: Dependent variable	**TFP**		
	(1)	(2)	(3)
		Finvar = Debt	
Treat*FEMA*Finvar	0.045***	0.039**	0.039**
	(2.74)	(2.43)	(2.42)
Treat*FEMA	0.218***	0.223***	0.213***
	(3.86)	(3.97)	(3.81)
Treat*Finvar	0.044**	0.039**	0.041**
	(2.29)	(2.02)	(2.17)
FEMA*Finvar	-0.099***	-0.095***	-0.094***
	(-11.24)	(-10.84)	(-10.81)
Finvar	-0.117***	-0.114***	-0.115***
	(-13.20)	(-13.02)	(-13.12)
Size	0.001***	0.001***	0.001***
	(3.65)	(3.96)	(3.90)
N	61,851	61,851	61,851
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	No	Yes	Yes
Year*State FE	No	No	Yes
Panel B: Dependent variable		**EXP**	
$\widehat{\overline{TFP}}$***FEMA*Finvar**	0.013***	0.009**	0.009***
	(3.70)	(2.21)	(3.44)
$\widehat{\overline{TFP}}$***FEMA**	0.012***	0.013***	0.015**
	(3.18)	(15.05)	(2.53)
$\widehat{\overline{TFP}}$***Finvar**	-0.003	-0.003	-0.004
	(-0.82)	(-0.81)	(-0.59)
FEMA*Finvar	-0.027***	-0.022*	-0.024***
	(-7.56)	(-1.78)	(-5.54)
Finvar	0.011	0.011	0.012
	(1.42)	(1.30)	(1.08)
$\widehat{\overline{TFP}}$	-0.003	0.001***	-0.001
	(-0.10)	(3.75)	(-0.22)
EXP (lag 1)	0.336***	0.337***	0.337***
	(69.74)	(25.64)	(24.68)
Size	0.005***	0.005***	0.005***
	(5.94)	(4.99)	(4.64)
Wage	-0.001***	-0.001***	-0.001***
	(-24.33)	(-4.84)	(-5.27)
Debt	-0.003***	-0.003**	-0.003**
	(-10.77)	(-2.11)	(-2.29)
Liquidity	0.006**	0.007***	0.007***
	(2.43)	(17.88)	(2.98)
N	61,769	61,769	61,769
Time averages of firm variables	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	No	Yes	Yes
Year*State FE	No	No	Yes

Notes: All specifications in Panel A are estimated using a difference-in-difference estimator and by dynamic Tobit models introduced by Elsas and Florysiak (2015) in Panel B. The dependent variables are TFP (Panel A) and exporting intensity (Panel B). *Treat* is a dummy that equals 1 if the firm raises ECB over the period of 1988-2014, and 0 otherwise. *FEMA* is a dummy that equals 1 if the observation occurs in the post-reform period of 2000-2014, and 0 otherwise. *Finvar* is a dummy that equals 1 in a given year for firm *i* if debt is in the top 25% of the distribution of debt for all firms in the same industry as firm *i* in that year, and 0 otherwise. *Size* equals real total assets. *Wage* equals real total wage bill. *Debt* is short-term debt to current assets. *Liquidity* is current assets less current liabilities over total assets. We lag all firm-level variables by one time-period except for $\widehat{\overline{TFP}}$. Robust *t*- and *z*-statistics are reported in the parentheses. Standard errors are clustered at the firm level. In Panel B standard errors are bootstrapped. Statistical significance is denoted at 1% (***), 5% (**), and 10% (*).

Table 4: Accounting for financial vulnerability: Liquidity

Panel A: Dependent variable	**TFP**		
	(1)	(2)	(3)
		Finvar = Liquid	
Treat*FEMA*Finvar	0.083***	0.077***	0.077***
	(3.65)	(3.40)	(3.45)
Treat*FEMA	0.204***	0.207***	0.197***
	(3.61)	(3.72)	(3.58)
Treat*Finvar	0.026	0.020	0.018
	(1.24)	(0.97)	(0.86)
FEMA*Finvar	-0.090***	-0.093***	-0.093***
	(-8.73)	(-8.99)	(-8.95)
Finvar	-0.161***	-0.161***	-0.161***
	(-15.69)	(-15.89)	(-15.88)
Size	0.001***	0.001***	0.001***
	(2.92)	(3.28)	(3.23)
N	61,851	61,851	61,851
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	No	Yes	Yes
Year*State FE	No	No	Yes
Panel B: Dependent variable		**EXP**	
$\widehat{\overline{TFP}}$***FEMA*Finvar**	0.006***	0.014**	0.011***
	(3.78)	(2.18)	(3.96)
$\widehat{\overline{TFP}}$***FEMA**	0.013***	0.005***	0.010***
	(4.66)	(6.58)	(3.52)
$\widehat{\overline{TFP}}$***Finvar**	-0.004	-0.009	-0.007
	(-1.45)	(-1.23)	(-1.34)
FEMA*Finvar	-0.003	-0.018**	-0.019
	(-0.10)	(-2.52)	(-0.68)
Finvar	0.001	0.015	0.010
	(1.51)	(1.46)	(1.57)
$\widehat{\overline{TFP}}$	0.001	0.010***	0.009***
	(0.81)	(2.62)	(3.58)
EXP (lag 1)	0.332***	0.334***	0.334***
	(50.98)	(43.56)	(95.62)
Size	0.005***	0.005***	0.005***
	(12.30)	(8.51)	(10.89)
Wage	-0.001**	-0.001***	-0.001***
	(-114.97)	(-7.08)	(-9.59)
Debt	-0.002	-0.001**	-0.001**
	(-1.13)	(-2.00)	(-2.04)
Liquidity	0.001***	0.003**	0.003***
	(5.53)	(2.20)	(10.85)
N	61,769	61,769	61,769
Time averages of firm variables	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	No	Yes	Yes
Year*State FE	No	No	Yes

Notes: All specifications in Panel A are estimated using a difference-in-difference estimator and by dynamic Tobit models introduced by Elsas and Florysiak (2015) in Panel B. The dependent variables are TFP (Panel A) and exporting intensity (Panel B). *Treat* is a dummy that equals 1 if the firm raises ECB over the period of 1988-2014, and 0 otherwise. *FEMA* is a dummy that equals 1 if the observation occurs in the post-reform period of 2000-2014, and 0 otherwise. *Finvar* is a dummy that equals 1 in a given year for firm *i* if liquidity is in the bottom 25% of the distribution of liquidity for all firms in the same industry as firm *i* in that year, and 0 otherwise. *Size* equals real total assets. *Wage* equals real total wage bill. *Debt* is short-term debt to current assets. *Liquidity* is current assets less current liabilities over total assets. We lag all firm-level variables by one time-period except for $\widehat{\overline{TFP}}$. Robust *t*- and *z*-statistics are reported in the parentheses. Standard errors are clustered at the firm level. In Panel B standard errors are bootstrapped. Statistical significance is denoted at 1% (***), 5% (**), and 10% (*).

Table 5: Robustness: Implementing different time windows

Panel A: Dependent variable		**TFP**	
	(1)	(2)	(3)
		Finvar = Debt	**Finvar = Liquid**
Treat*FEMA	0.090**	0.142***	0.142***
	(2.08)	(2.87)	(2.82)
Treat*FEMA*Finvar	-	0.063**	0.077**
		(2.28)	(2.16)
Treat*Finvar	-	0.053***	0.002
		(2.85)	(0.06)
FEMA*Finvar	-	-0.127***	-0.099***
		(-7.96)	(-5.37)
Finvar	-	-0.153***	-0.184***
		(-9.67)	(-10.78)
Size	0.002***	0.001***	0.001***
	(5.05)	(4.03)	(4.12)
N	21,757	21,757	21,757
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	Yes	Yes	Yes
Year*State FE	Yes	Yes	Yes
Panel B: Dependent variable		**EXP**	
$\widehat{\textbf{TFP}}$***FEMA**	0.378***	0.027***	0.030***
	(2.92)	(7.82)	(3.08)
$\widehat{\textbf{TFP}}$***FEMA*Finvar**	-	0.008***	0.012***
		(2.99)	(3.11)
$\widehat{\textbf{TFP}}$***Finvar**	-	0.006***	0.001
		(6.96)	(0.89)
FEMA*Finvar	-	-0.018	-0.020
		(-1.21)	(-0.36)
Finvar	-	-0.018***	-0.009
		(-5.62)	(-1.43)
$\widehat{\textbf{TFP}}$	0.010***	-0.007	-0.004
	(12.63)	(-1.56)	(-0.70)
EXP (lag 1)	0.386***	0.386***	0.386***
	(64.10)	(93.49)	(69.51)
Size	0.003***	0.003***	0.003***
	(6.40)	(28.05)	(3.97)
Wage	-0.002***	-0.002***	-0.002***
	(-28.65)	(-3.06)	(-18.58)
Debt	-0.002***	-0.004***	-0.002
	(-18.25)	(-20.03)	(-0.41)
Liquidity	0.008***	0.005***	0.002
	(7.72)	(15.14)	(1.55)
N	21,725	21,725	21,725
Time averages of firm variables	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	Yes	Yes	Yes
Year*State FE	Yes	Yes	Yes

Notes: All specifications in Panel A are estimated using a difference-in-difference estimator and by dynamic Tobit models introduced by Elsas and Florysiak (2015) in Panel B. The dependent variables are TFP (Panel A) and exporting intensity (Panel B). *Treat* is a dummy that equals 1 for firms that raise ECB in 1995-2005, and 0 otherwise. *FEMA* equals 1 for observations for the post-reform period of 2000-2005, and 0 otherwise. *Finvar* is a dummy that equals 1 in a given year for firm *i* if debt (or liquidity) is in the top (bottom) 25% of the distribution of the debt (or liquidity) for all firms in the same industry as firm *i* in that year, and 0 otherwise. *Debt* is calculated as short-term debt to current assets. *Liquidity* is measured as current assets less current liabilities over total assets. We lag all firm-level variables by one time-period except for $\widehat{TFP}$. Standard errors are clustered at the firm level. In Panel B standard errors are bootstrapped. Statistical significance is denoted at 1% (***), 5% (**), and 10% (*).

Table 6: Robustness: Placebo tests

Panel A: Dependent variable		**TFP**	
	(1)	(2)	(3)
		Finvar = Debt	**Finvar = Liquid**
Treat*FEMA	-0.083	-0.109	0.036
	(-0.56)	(-0.77)	(0.23)
Treat*FEMA*Finvar	-	0.318	-0.410
		(0.89)	(-1.51)
Treat*Finvar	-	-0.006	0.159
		(-0.03)	(0.60)
FEMA*Finvar	-	0.028	0.003
		(0.25)	(0.02)
Finvar	-	0.049	0.081
		(0.68)	(0.98)
Size	0.005**	0.005**	0.005**
	(2.43)	(2.48)	(2.31)
N	4,667	4,667	4,667
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	Yes	Yes	Yes
Year*State FE	Yes	Yes	Yes
Panel B: Dependent variable		**EXP**	
$\widehat{\textbf{TFP}}$***FEMA**	-0.130	-0.007	-0.006
	(-0.89)	(-0.70)	(-1.53)
$\widehat{\textbf{TFP}}$***FEMA*Finvar**	-	0.010	0.005
		(1.29)	(0.63)
$\widehat{\textbf{TFP}}$***Finvar**	-	-0.004	-0.006
		(-0.77)	(-1.01)
FEMA*Finvar	-	-0.015	-0.007
		(-1.16)	(-0.48)
Finvar	-	0.010	-0.008
		(1.08)	(0.77)
$\widehat{\textbf{TFP}}$	0.003	0.002	0.005
	(0.33)	(0.22)	(0.51)
EXP (lag 1)	0.187***	0.341***	0.341***
	(19.01)	(48.70)	(49.03)
Size	-0.001	0.006***	0.007***
	(-0.88)	(3.49)	(3.65)
Wage	0.001	-0.001	-0.001
	(1.33)	(-0.89)	(-0.99)
Debt	-0.004	-0.004	-0.001
	(-0.90)	(-0.78)	(-0.20)
Liquidity	0.012	0.006	-0.011
	(1.05)	(0.45)	(-0.81)
N	2,163	2,163	2,163
Time averages of firm variables	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	Yes	Yes	Yes
Year*State FE	Yes	Yes	Yes

Notes: All specifications in Panel A are estimated using a difference-in-difference estimator and by dynamic Tobit models introduced by Elsas and Florysiak (2015) in Panel B. The dependent variables are TFP (Panel A) and exporting intensity (Panel B). *Treat* is a dummy that equals 1 if the firm raises ECB in the period of 1988-1999, and 0 otherwise. *FEMA* is a dummy that equals 1 if the observation occurs in the post-reform period of 1997-1999, and 0 otherwise. *Finvar* is a dummy that equals 1 in a given year for firm *i* if debt (or liquidity) is in the top (bottom) 25% of the distribution of the debt (or liquidity) for all firms in the same industry as firm *i* in that year, and 0 otherwise. *Debt* is calculated as short-term debt to current assets. *Liquidity* is measured as current assets less current liabilities over total assets. We lag all firm-level variables by one time-period except for $\widehat{TFP}$. Robust *t*- and *z*-statistics are reported in the parentheses. Standard errors are clustered at the firm level. In Panel B standard errors are bootstrapped. Statistical significance is denoted at 1% (***), 5% (**), and 10% (*).

Table 7: Robustness: Alternative treatment group

Panel A: Dependent variable		**TFP**	
	(1)	(2)	(3)
		Finvar = Debt	**Finvar = Liquid**
Treat*FEMA	0.142***	0.204***	0.187***
	(2.79)	(3.66)	(3.39)
Treat*FEMA*Finvar	-	0.038**	0.083***
		(2.38)	(3.83)
Treat*Finvar	-	0.033*	0.018
		(1.31)	(0.85)
FEMA*Finvar	-	-0.095***	-0.091***
		(-10.82)	(-8.72)
Finvar	-	-0.119***	-0.158***
		(-13.42)	(-15.50)
Size	0.001***	0.001***	0.001***
	(5.18)	(4.06)	(3.41)
N	60,069	60,069	60,069
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	Yes	Yes	Yes
Year*State FE	Yes	Yes	Yes
Panel B: Dependent variable		**EXP**	
$\widehat{\textbf{TFP}}$***FEMA**	0.142***	0.017***	0.012***
	(3.99)	(7.69)	(2.81)
$\widehat{\textbf{TFP}}$***FEMA*Finvar**	-	0.010***	0.013***
		(2.99)	(4.25)
$\widehat{\textbf{TFP}}$***Finvar**	-	-0.004	-0.011
		(-1.16)	(-0.31)
FEMA*Finvar	-	-0.025*	-0.025***
		(-1.88)	(-18.80)
Finvar	-	0.011	0.021
		(0.94)	(0.98)
$\widehat{\textbf{TFP}}$	0.007***	-0.004	0.008**
	(7.52)	(-0.85)	(2.33)
EXP (lag 1)	0.335***	0.338***	0.335***
	(23.46)	(32.29)	(120.43)
Size	0.006***	0.006***	0.006***
	(8.20)	(12.45)	(13.59)
Wage	-0.001***	-0.001***	-0.001***
	(-11.94)	(-15.23)	(-7.57)
Debt	-0.002***	-0.004	-0.002***
	(-3.74)	(-1.43)	(-7.17)
Liquidity	0.007***	0.006**	0.002
	(3.34)	(2.49)	(0.32)
N	60,010	60,010	60,010
Time averages of firm variables	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	Yes	Yes	Yes
Year*State FE	Yes	Yes	Yes

Notes: All specifications in Panel A are estimated using a difference-in-difference estimator and by dynamic Tobit models introduced by Elsas and Florysiak (2015) in Panel B. The dependent variables are TFP (Panel A) and exporting intensity (Panel B). *Treat* is a dummy that equals 1 if the firm raises ECB in 1988-2014, and 0 for firms that are eligible but did not raise ECB during the sample. *FEMA* is a dummy that equals 1 if the observation occurs in the post-reform period of 2000-2014, and 0 otherwise. *Finvar* is a dummy that equals 1 in a given year for firm *i* if debt (or liquidity) is in the top (bottom) 25% of the distribution of the debt (or liquidity) for all firms in the same industry as firm *i* in that year, and 0 otherwise. *Debt* is calculated as short-term debt to current assets. *Liquidity* is measured as current assets less current liabilities over total assets. We lag all firm-level variables by one time-period except for $\widehat{TFP}$. Robust *t*- and *z*-statistics are reported in the parentheses. Standard errors are clustered at the firm level. In Panel B standard errors are bootstrapped. Statistical significance is denoted at 1% (***), 5% (**), and 10% (*).

Table 8: Robustness: GMM estimations

Panel A: Dependent variable		**TFP**	
	(1)	(2)	(3)
		Finvar = Debt	**Finvar = Liquid**
Treat*FEMA	0.364**	0.527**	0.521**
	(1.98)	(2.16)	(2.10)
Treat*FEMA*Finvar	-	0.217***	0.243***
		(2.84)	(2.62)
Treat*Finvar	-	-0.075	-0.046
		(-0.25)	(-0.19)
FEMA*Finvar	-	-0.103	-0.173**
		(-1.63)	(-2.39)
Finvar	-	-0.287	-0.518**
		(-1.07)	(-2.43)
Treat	0.836**	0.005	0.072
	(2.30)	(0.03)	(0.27)
Size	0.001***	0.002***	0.002***
	(2.62)	(4.03)	(3.96)
N	61,851	61,851	61,851
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	Yes	Yes	Yes
Year*State FE	Yes	Yes	Yes
AR(1) (p-value)	0.000	0.016	0.034
AR(2) (p-value)	0.000	0.000	0.000
AR(3) (p-value)	0.953	0.741	0.265
Hansen (p-value)	0.339	0.060	0.093
Panel B: Dependent variable		**EXP**	
$\widehat{\textbf{TFP}}$***FEMA**	0.797**	0.072**	0.028**
	(2.11)	(2.14)	(2.51)
$\widehat{\textbf{TFP}}$***FEMA*Finvar**	-	0.013**	0.019**
		(1.98)	(2.02)
$\widehat{\textbf{TFP}}$***Finvar**	-	-0.005	-0.021
		(-0.71)	(-0.88)
FEMA*Finvar	-	-0.001	-0.003
		(-0.09)	(-0.78)
Finvar	-	-0.003	0.015
		(-0.26)	(0.26)
$\widehat{\textbf{TFP}}$	-0.002	0.005	0.002
	(-0.22)	(0.19)	(0.15)
EXP (lag 1)	0.777***	0.771***	0.929***
	(28.92)	(27.63)	(79.83)
Size	0.004***	-0.001	0.002**
	(3.38)	(-0.45)	(2.07)
Wage	0.001	0.002	-0.001*
	(0.45)	(1.04)	(-1.68)
Debt	-0.007*	-0.010*	-0.002
	(-1.89)	(-1.80)	(-0.70)
Liquidity	0.058***	0.070***	0.011
	(3.08)	(3.35)	(0.58)
N	61,769	61,769	61,769
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	Yes	Yes	Yes
Year*State FE	Yes	Yes	Yes
AR(1) (p-value)	0.000	0.000	0.000
AR(2) (p-value)	0.317	0.374	0.229
Hansen (p-value)	0.367	0.804	0.999

Notes: All specifications are estimated using a System-GMM estimator. The dependent variables are TFP (Panel A) and export intensity (Panel B). *Treat* is a dummy that equals 1 if the firm raises ECB in the period of 1988-2014, and 0 otherwise. *FEMA* is a dummy that equals 1 if the

observation occurs in the post-reform period of 2000-2014, and 0 otherwise. *Finvar* is a dummy that equals 1 in a given year for firm *i* if debt (or liquidity) is in the top (bottom) 25% of the distribution of the debt (or liquidity) for all firms in the same industry as firm *i* in that year, and 0 otherwise. *Debt* is calculated as short-term debt to current assets. *Liquidity* is measured as current assets less current liabilities over total assets. In panels A and B, instruments include the firm-specific regressors lagged three times or more. Hansen is a test of over-identifying restrictions, distributed as chi-square under the null of instrument validity. AR(1), AR(2) and AR(3) are test statistics for the null hypothesis that there is no serial correlation of orders 1, 2, and 3 in the first-difference residuals. We lag all firm-level variables by one time-period except for $\widehat{TFP}$. *t*-statistics that are asymptotically robust to heteroskedasticity are reported in the parentheses. Standard errors are clustered at the firm level. Statistical significance is denoted at 1% (***), 5% (**), and 10% (*).

Table 9: Robustness: Alternative channels

Panel A: Dependent variable	**TFP**	
	(1)	(2)
	Var = Staff training	**Var = High-tech**
Treat*FEMA*Var	0.298*	0.172*
	(1.71)	(1.93)
Treat*FEMA	0.186***	0.119**
	(3.23)	(2.11)
Treat*Var	-0.487	-
	(-1.56)	
FEMA*Var	0.439	-0.243***
	(1.31)	(-3.03)
Var	0.665*	-
	(1.93)	
Size	0.001***	0.001***
	(5.27)	(2.98)
N	61,848	61,851
Firm FE	Yes	Yes
Year FE	Yes	Yes
Year*Industry FE	Yes	Yes
Year*State FE	Yes	Yes
Panel B: Dependent variable	**EXP**	
$\widehat{\mathbf{TFP}}$***FEMA**	0.016***	0.004***
	(3.88)	(5.67)
$\widehat{\mathbf{TFP}}$***FEMA*Var**	0.022**	0.007**
	(2.47)	(1.97)
$\widehat{\mathbf{TFP}}$***Var**	-0.007	-0.011
	(-1.41)	(-1.01)
FEMA*Var	-0.059***	-0.016
	(-89.39)	(-0.08)
Var	0.363***	0.045*
	(13.87)	(1.95)
$\widehat{\mathbf{TFP}}$	0.015**	0.009
	(2.18)	(0.33)
EXP (lag 1)	0.322***	0.323***
	(26.36)	(65.54)
Size	0.001***	0.001***
	(30.96)	(75.09)
Wage	-0.001***	-0.001***
	(-3.22)	(-8.77)
Debt	-0.002***	-0.002***
	(-3.32)	(-3.43)
Liquidity	0.017***	0.016***
	(31.83)	(40.76)
N	61,767	61,769
Time averages of firm variables	Yes	Yes
Year FE	Yes	Yes
Year*Industry FE	Yes	Yes
Year*State FE	Yes	Yes

Notes: All specifications in Panel A are estimated using a difference-in-difference estimator and by dynamic Tobit models introduced by Elsas and Florysiak (2015) in Panel B. The dependent variables are TFP (Panel A) and exporting intensity (Panel B). *Treat* is a dummy that equals 1 if the firm raises ECB in the period of 1988-2014, and 0 otherwise. *FEMA* is a dummy that equals 1 if the observation occurs in the post-reform period of 2000-2014, and 0 otherwise. *Var* represents, in turn, staff training and high-tech sectors. *Staff training is* measured as the expenditure on staff welfare and training as a proportion of total compensation to employees. *High-tech* is a dummy that equals one for firms that belong to the high technology manufacturing industries, medium-high technology manufacturing industries and knowledge intensive service sectors, and 0 otherwise. We lag all firm-level variables by one time-period except for $\widehat{TFP}$. Robust *t*- and *z*-statistics are reported in the parentheses. Standard errors are clustered at the firm level. In Panel B standard errors are bootstrapped. Statistical significance is denoted at 1% (***), 5% (**), and 10% (*).

Table 10: Robustness: Alternative cut-off points for financial vulnerability

Panel A: Dependent variable	**TFP**	
	(1)	(2)
	Finvar = Debt	**Finvar = Liquid**
Treat*FEMA*Finvar	0.038**	0.052***
	(2.11)	(2.90)
Treat*FEMA	0.199***	0.196***
	(3.52)	(3.50)
Treat*Finvar	-0.033	-0.001
	(-1.61)	(-0.01)
FEMA*Finvar	-0.066**	-0.081***
	(-2.39)	(-10.37)
Finvar	-0.007	-0.110***
	(-0.18)	(-14.41)
Size	0.001***	0.001***
	(5.53)	(3.36)
N	61,851	61,851
Firm FE	Yes	Yes
Year FE	Yes	Yes
Year*Industry FE	Yes	Yes
Year*State FE	Yes	Yes
Panel B: Dependent variable	**EXP**	
$\widehat{\overline{TFP}}$***FEMA**	0.016**	0.008***
	(2.27)	(4.16)
$\widehat{\overline{TFP}}$***FEMA*Finvar**	0.008**	0.011**
	(2.50)	(2.35)
$\widehat{\overline{TFP}}$***Finvar**	-0.004	-0.009
	(-0.36)	(-0.57)
FEMA*Finvar	-0.020	-0.024
	(-0.23)	(-0.84)
Finvar	0.012	0.017
	(0.54)	(0.41)
$\widehat{\overline{TFP}}$	-0.001	0.006***
	(-0.06)	(5.19)
EXP (lag 1)	0.337***	0.334***
	(104.39)	(104.60)
Size	0.005***	0.006***
	(25.54)	(11.23)
Wage	-0.001***	-0.001***
	(-2.60)	(-17.91)
Debt	-0.003***	-0.001***
	(-4.10)	(-4.81)
Liquidity	0.006***	0.002***
	(6.94)	(10.51)
N	61,769	61,769
Time averages of firm variables	Yes	Yes
Year FE	Yes	Yes
Year*Industry FE	Yes	Yes
Year*State FE	Yes	Yes

Notes: All specifications in Panel A are estimated using a difference-in-difference estimator and by dynamic Tobit models introduced by Elsas and Florysiak (2015) in Panel B. The dependent variables are TFP (Panel A) and exporting intensity (Panel B). *Treat* is a dummy that equals 1 if the firm raises ECB over the period of 1988-2014, and 0 otherwise. *FEMA* is a dummy that equals 1 if the observation occurs in the post-reform period of 2000-2014, and 0 otherwise. *Finvar* is a dummy that equals 1 in a given year for firm *i* if debt (or liquidity) is in the top (bottom) 50% of the distribution of the debt (or liquidity) for all firms in the same industry as firm *i* in that year, and 0 otherwise. *Debt* is calculated as short-term debt to current assets. *Liquidity* is measured as current assets less current liabilities over total assets. We lag all firm-level variables by one time-period except for $\overline{TFP}$. Robust *t*- and *z*-statistics are reported in the parentheses. Standard errors are clustered at the firm level. In Panel B standard errors are bootstrapped. Statistical significance is denoted at 1% (***), 5% (**), and 10% (*).

Table 11: Robustness: Alternative definition of financial vulnerability

Panel A: Dependent variable	**TFP**		
	(1)	(2)	(3)
	Finvar = Vol	**Finvar = Size**	**Finvar = Collateral**
Treat*FEMA*Finvar	0.034**	0.026***	0.042*
	(2.45)	(2.95)	(1.80)
Treat*FEMA	0.116**	0.145**	0.154***
	(2.27)	(2.32)	(3.02)
Treat*Finvar	0.006	0.020	0.026
	(1.52)	(0.76)	(1.02)
FEMA*Finvar	-0.036***	-0.016***	-0.078***
	(-2.66)	(-11.73)	(-8.73)
Finvar	-0.021	-0.117***	-0.084***
	(-0.31)	(-7.01)	(-9.88)
Size	0.001***	0.001**	0.001***
	(5.28)	(2.55)	(2.64)
N	61,851	61,851	61,851
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	Yes	Yes	Yes
Year*State FE	Yes	Yes	Yes
Panel B: Dependent variable		**EXP**	
$\widehat{\textbf{TFP}}$***FEMA*Finvar**	0.005***	0.014***	0.003**
	(79.71)	(4.06)	(2.01)
$\widehat{\textbf{TFP}}$***FEMA**	0.008***	0.011*	0.007***
	(8.02)	(1.88)	(4.21)
$\widehat{\textbf{TFP}}$***Finvar**	0.002	-0.020	-0.001
	(1.01)	(-0.30)	(-0.41)
FEMA*Finvar	-0.006***	-0.026	-0.014
	(-57.61)	(-0.21)	(-0.72)
Finvar	-0.003	0.033	0.004
	(-1.12)	(1.14)	(0.28)
$\widehat{\textbf{TFP}}$	0.002	-0.002	-0.002
	(0.50)	(-1.09)	(-1.02)
EXP (lag 1)	0.333***	0.431***	0.333***
	(104.68)	(121.92)	(106.98)
Size	0.006***	0.001***	0.006***
	(7.48)	(16.37)	(3.01)
Wage	-0.007***	-0.002***	-0.001***
	(-2.72)	(-4.32)	(-12.53)
Debt	-0.002**	-0.003***	-0.002***
	(-2.41)	(-4.53)	(-3.37)
Liquidity	0.007**	0.004***	0.007***
	(2.25)	(4.29)	(3.12)
N	61,769	61,769	61,769
Time averages of firm variables	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	Yes	Yes	Yes
Year*State FE	Yes	Yes	Yes

Notes: All specifications in Panel A are estimated using a difference-in-difference estimator and by dynamic Tobit models introduced by Elsas and Florysiak (2015) in Panel B. The dependent variables are TFP (Panel A) and exporting intensity (Panel B). *Treat* is a dummy that equals 1 if the firm raises ECB over the period of 1988-2014, and 0 otherwise. *FEMA* is a dummy that equals 1 if the observation occurs in the post-reform period of 2000-2014, and 0 otherwise. *Finvar* equals 1 in a given year for firm i if the volatility of return on equity (or size and collateral) is in the top (or bottom) 25% of the distribution of volatility of return on equity (or size and collateral) for all firms in the same industry as firm i in that year, and zero otherwise. Volatility of return on equity (*Vol*) is calculated as the standard deviation of the firm's return on equity, measured over a rolling five-year window. *Size* equals real total assets. *Collateral* is measured as the ratio of tangible assets to total assets. We lag all firm-level variables by one time-period except for $\widehat{TFP}$. Robust *t*- and *z*-statistics are reported in the parentheses. Standard errors are clustered at the firm level. In Panel B standard errors are bootstrapped. Statistical significance is denoted at 1% (***), 5% (**), and 10% (*).

On-line Appendix

Figure A1: Chinn-Ito Financial Openness Index

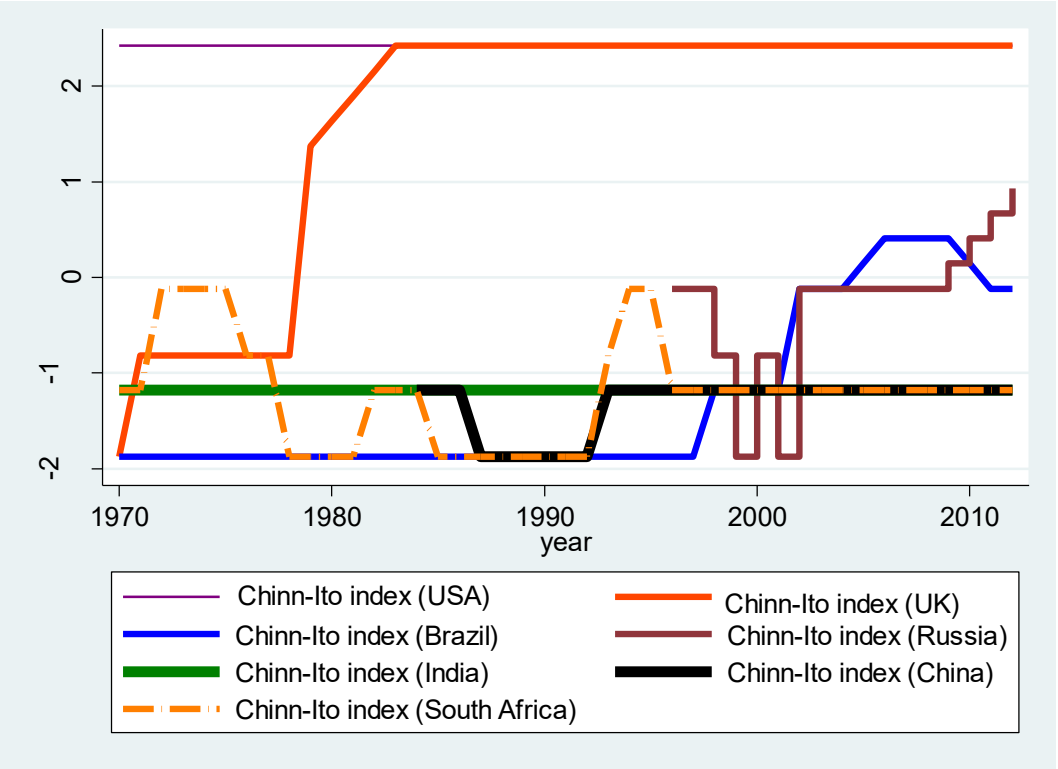

Table A1: Correlation matrix

	Size	Wage	TFP	Debt	Liquidity
Size	1.000				
Wage	0.601	1.000			
TFP	0.125	0.154	1.000		
Debt	0.069	-0.022	-0.082	1.000	
Liquidity	-0.086	-0.106	0.016	-0.156	1.000

Notes: The Table shows the correlation matrix among all variables used in the paper. *Size* equals real total assets. *Wage* equals real total wage bill. *TFP* is total factor productivity calculated using the Levinsohn and Petrin (2003) method adjusted by GDP deflator. *Debt* is short-term debt to current assets. *Liquidity* is current assets less current liabilities over total assets.

Table A2: Summary statistics for exports and sales

	FEMA=1	FEMA=0	p-value
	(1)	(2)	(3)
Exports	336.18	63.39	0.000
	(1731.93)	(294.84)	
Sales	2406.93	781.30	0.000
	(6867.55)	(2288.96)	

Table A3: Robustness: Alternative definition of productivity

Panel A: Dependent variable	**Labor productivity**		
	(1)	(2)	(3)
		Finvar = Debt	**Finvar = Liquid**
Treat*FEMA	0.612***	0.445***	0.396***
	(3.87)	(2.58)	(2.73)
Treat*FEMA*Finvar	-	0.153**	0.467***
		(2.01)	(2.70)
Treat*Finvar	-	0.063	0.076
		(0.99)	(1.16)
FEMA*Finvar	-	-0.074	-0.437**
		(-0.95)	(-2.25)
Finvar	-	0.030	-0.096
		(0.39)	(-1.42)
Size	0.001***	0.003***	0.003***
	(4.95)	(4.93)	(4.92)
N	60,995	60,995	60,995
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	Yes	Yes	Yes
Year*State FE	Yes	Yes	Yes
Panel B: Dependent variable		**EXP**	
$\widehat{\textbf{TFP}}$***FEMA**	0.143***	0.003***	0.017***
	(3.63)	(2.60)	(3.64)
$\widehat{\textbf{TFP}}$***FEMA*Finvar**	-	0.012***	0.009***
		(2.74)	(7.10)
$\widehat{\textbf{TFP}}$***Finvar**	-	-0.001	-0.001
		(-0.58)	(-0.78)
FEMA*Finvar	-	-0.028	-0.011***
		(-1.38)	(-50.06)
Finvar	-	0.003	-0.009**
		(0.21)	(-2.47)
$\widehat{\textbf{TFP}}$	0.007***	0.004***	0.004
	(4.35)	(16.67)	(0.78)
EXP (lag 1)	0.333***	0.332***	0.333***
	(84.36)	(109.58)	(118.46)
Size	0.006***	0.006***	0.006***
	(8.90)	(14.33)	(13.98)
Wage	-0.002***	-0.001***	-0.001***
	(-5.89)	(-6.87)	(-4.54)
Debt	-0.002**	-0.003***	-0.001*
	(-2.53)	(-10.53)	(-1.79)
Liquidity	0.007***	0.006***	0.002***
	(3.16)	(2.65)	(3.51)
N	60,912	60,912	60,912
Time averages of firm variables	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	Yes	Yes	Yes
Year*State FE	Yes	Yes	Yes

Notes: All specifications in Panel A are estimated using a difference-in-difference estimator and by dynamic Tobit models introduced by Elsas and Florysiak (2015) in Panel B. The dependent variables are labor productivity (Panel A) and exporting intensity (Panel B). *Treat* is a dummy that equals 1 if the firm raises ECB in the period of 1988-2014, and 0 otherwise. *FEMA* is a dummy that equals 1 if the observation occurs in the post-reform period of 2000-2014, and 0 otherwise. *Finvar* is a dummy that equals 1 in a given year for firm *i* if debt (or liquidity) is in the top (bottom) 25% of the distribution of the debt (or liquidity) of for all firms in the same industry as firm *i* in that year, and 0 otherwise. *Debt* is calculated as short-term debt to current assets. *Liquidity* is measured as current assets less current liabilities over total assets. We lag all firm-level variables by one time-period except for $\widehat{TFP}$. Robust *t*- and *z*-statistics are reported in the parentheses. Standard errors are clustered at the firm level. In Panel B standard errors are bootstrapped. Statistical significance is denoted at 1% (***), 5% (**), and 10% (*).

Table A4: Robustness: Dynamic productivity estimation

Panel A: Dependent variable		**TFP**	
	(1)	(2)	(3)
		Finvar = Debt	**Finvar = Liquid**
Treat*FEMA	0.090***	0.122***	0.110***
	(3.06)	(3.71)	(3.43)
Treat*FEMA*Finvar	-	0.040***	0.042**
		(3.05)	(2.44)
Treat*Finvar	-	-0.008	-0.010
		(-0.85)	(-0.84)
FEMA*Finvar	-	-0.001	-0.009
		(-0.01)	(-0.88)
Finvar	-	-0.109***	-0.208***
		(-3.36)	(-6.28)
Size	0.001**	0.001	0.001
	(2.08)	(0.05)	(0.93)
TFP (lag 1)	0.563***	0.561***	0.556***
	(55.23)	(55.15)	(54.89)
N	61,851	61,851	61,851
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	Yes	Yes	Yes
Year*State FE	Yes	Yes	Yes
Panel B: Dependent variable		**EXP**	
$\widehat{\mathbf{TFP}}$***FEMA**	0.170***	0.003***	0.002***
	(4.70)	(3.03)	(3.51)
$\widehat{\mathbf{TFP}}$***FEMA*Finvar**	-	0.003***	0.009***
		(4.09)	(15.57)
$\widehat{\mathbf{TFP}}$***Finvar**	-	0.006**	0.003***
		(2.11)	(2.78)
FEMA*Finvar	-	-0.008***	-0.014***
		(-2.97)	(-3.05)
Finvar	-	-0.011**	-0.016***
		(-2.27)	(-3.58)
$\widehat{\mathbf{TFP}}$	0.005***	0.002	0.002***
	(3.09)	(0.08)	(3.20)
EXP (lag 1)	0.333***	0.331***	0.333***
	(110.43)	(123.93)	(123.84)
Size	0.006***	0.005***	0.006***
	(18.07)	(35.89)	(5.90)
Wage	-0.001***	-0.001***	-0.001***
	(-7.28)	(-7.66)	(-3.66)
Debt	-0.002***	-0.002***	-0.001*
	(-7.28)	(-5.65)	(-1.84)
Liquidity	0.006***	0.005***	0.003
	(83.76)	(14.42)	(0.60)
N	61,769	61,769	61,769
Time averages of firm variables	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Year*Industry FE	Yes	Yes	Yes
Year*State FE	Yes	Yes	Yes

Notes: All specifications in Panel A are estimated using a difference-in-difference estimator and by dynamic Tobit models introduced by Elsas and Florysiak (2015) in Panel B. The dependent variables are TFP (Panel A) and exporting intensity (Panel B). *Treat* is a dummy that equals 1 if the firm raises ECB over the period of 1988-2014, and 0 otherwise. *FEMA* is a dummy that equals 1 if the observation occurs in the post-reform period of 2000-2014, and 0 otherwise. *Finvar* is a dummy that equals 1 in a given year for firm *i* if debt (or liquidity) is in the top (bottom) 25% of the distribution of the debt (or liquidity) of for all firms in the same industry as firm *i* in that year, and 0 otherwise. *Debt* is calculated as short-term debt to current assets. *Liquidity* is measured as current assets less current liabilities over total assets. We lag all firm-level variables by one time-period except for $\widehat{TFP}$. Robust t- and z-statistics are reported in the parentheses. Standard errors are clustered at the firm level. In Panel B standard errors are bootstrapped. Statistical significance is denoted at 1% (***), 5% (**), and 10% (*).

Table A5: Robustness: Estimation of lagged dependent variables

Dependent variable:	**EXP**		
	(1) **OLS**	(2) **WG**	(3) **Diff-GMM**
Panel A:			
EXP (lag 1)	0.907***	0.519***	0.256**
	(292.45)	(41.29)	(2.30)
N	61,769	61,769	48,052
Panel B:	**Finvar = Debt**		
EXP (lag 1)	0.907***	0.519***	0.412**
	(283.33)	(39.72)	(3.47)
N	61,769	61,769	48,052
Panel C:	**Finvar = Liquid**		
EXP (lag 1)	0.907***	0.519***	0.361***
	(290.52)	(41.26)	(2.90)
N	61,769	61,769	48,052

Notes: The table presents estimates of lagged dependent variables with robust statistics in parentheses from the exporting intensity (EXP) model using Ordinary Least Squares (OLS), Within Groups (WG) and First-Differenced GMM (Diff-GMM).