

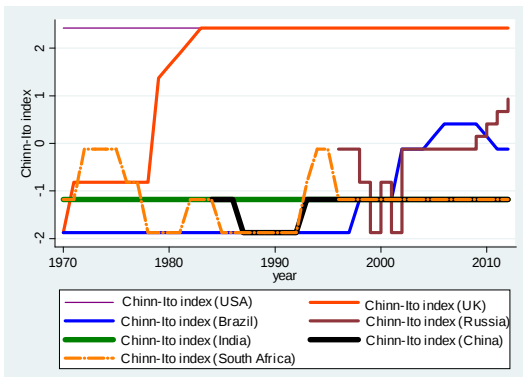
Does Easing Controls on External Commercial Borrowings boost Exporting Intensity of Indian Firms?

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Motivation

- Still many developing countries continue to maintain a closed capital account
- Angola, China, India, Russia, Sri Lanka, Tanzania and Tunisia had the most restricted capital accounts in 2005 (Schindler, 2009 IMF).
- Increasing use of capital controls to stem flows reduces (increases) financial openness (financial constraints)

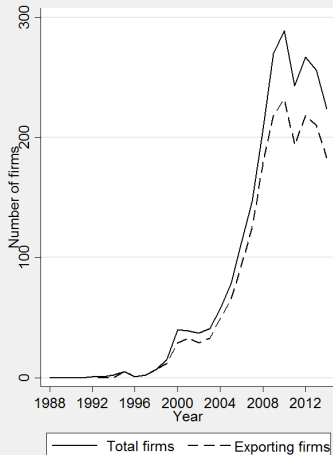
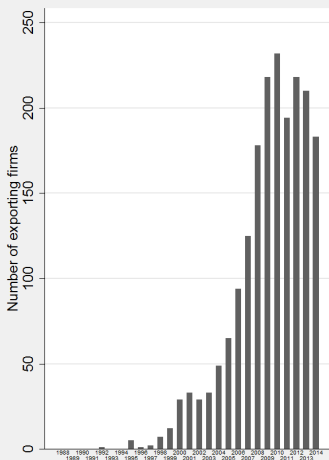


- In the presence of financial market imperfections, only those firms that can successfully overcome the financing of sunk entry costs, become exporters (Bernard and Wagner, 2001; Bernard and Jensen, 2004).
- Evidence shows that firms which are financially healthy have better access to external finance and are more likely to start exporting (Muûls, 2008; Berman and Héricourt, 2010; Bellone et al., 2010).
- Besides, access to trade finance remains costly and scarce in many developing countries which have the potential for trade expansion.

- The foreign exchange management act (FEMA), which came into being in 1999 (and became effectively operational starting 2000), was a policy shift.
- Patnaik et al. (2015) discusses the existing regulations including recent policy changes on capital controls for foreign currency borrowing by Indian firms.
- Earlier interest rates in India are higher than interest rates offshore which encourage Indian firms to borrow at a cheaper rate from overseas.
- However, there was a limit on the maximum amount of external borrowing. This limit was increased gradually since FEMA was introduced.
- This paper tries to capture the effects of such capital account policy liberalisation (for firms with debt market access) on the export market participation.

ECB and Exporting

Access to ECB



Objectives

- In addition to country and firm-level indicators previously considered, does the policy initiative have any impact on firms' export intensity?
- Is there a differential effect of the policy initiative on firms' which are recipients and non-recipients of grants and subsidies?
- What is the impact of the policy change on firms and industries facing different levels of volatility?

DD Model

- We look at the exporting decision of firms by considering the export intensity of firms.
- Export intensity of firms is measured by the share of exports in total sales (%).
- We observe a unique policy experiment, namely the FEMA act which is considered as the "*Treatment*".
- Treated group refers to Indian firms which have access to external commercial borrowing (ECB) and non-treated group are the firms with domestic financing.
- We use a non-parametric method – propensity score matching (PSM) to accommodate potential endogeneity.
- Matching is based on Leuven and Sianesi's (2003) PSM and three different matching techniques are used- kernel matching, radius matching and nearest neighbour matching.

Matching techniques

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

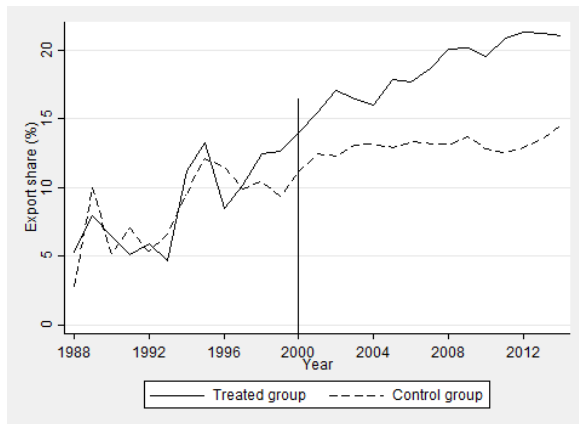
After Kernel matching

Table 2: Balancing properties of matched firms

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

Quality of Matching

The **parallel trends assumption** is supported by the graphical evidence, suggesting that in the absence of the policy change the two groups would have continued to track each other.



Data Sources

- *Prowess Database*- Profit and loss and balance sheet data of large and medium Indian firms assembled by Centre for Monitoring Indian Economy (CMIE).
- *World Bank database* - GDP growth rate
- *Bank for International Settlements Statistics*- Real Effective Exchange Rate (REER)

Data Coverage

- Final data covers an unbalanced panel of 80,996 observations with 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.

Baseline Model

- We estimate a baseline model of the following kind:

$$\frac{Export_{it}}{Sales_{it}} = \alpha_0 + \alpha_1 Treat_i + \alpha_2 FEMA_t + \alpha_3 Treat_i * FEMA_t + \alpha_4 X_{it-1} + \alpha_5 Z_{it} + e_{ijt}$$

- Export intensity is measured by the ratio of exports to total sales (Greenaway et al., 2010)
- $Treat_i$ is a dummy which takes a value of one for the firms which have access to external commercial borrowing (ECB) over the entire sample period.
- $FEMA_t$ is a time dummy which takes a value of one for the policy period during 2000-2014, and zero otherwise.
- Estimations include firm fixed effects with time dummies, industry dummies, and clustered standard errors by firms.

Control variables

The set of control variables which are included in the model:

- *Firm size* measured as real total assets.
- *Total factor productivity (TFP)* of firms is calculated using the Levinsohn and Petrin's (2003) methodology which is further developed by Petrin et al. (2004).
- *Wages* are measured by the real wage bill.
- Economic factors such as *GDP growth rate* and *REER volatility*.
- All time-varying firm-level variables are lagged by one period to reduce possible simultaneity problems.

Access to grants and subsidies

- We explore whether firms which are recipients and non-recipients of governments' grants and subsidies 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:

$$\frac{Export_{it}}{Sales_{it}} = \alpha_0 + \alpha_1 Treat_i + \alpha_2 FEMA_t + \alpha_3 Grant_recipient_{it} + \alpha_4 Treat_i * FEMA_t + \alpha_5 Treat_i * FEMA_t * Grant_recipient_{it} + \alpha_6 FEMA_t * Grant_recipient_{it} + \alpha_7 Treat_i * Grant_recipient_{it} + \alpha_8 X_{it-1} + \alpha_9 Z_{it} + e_{ijt}$$

- '*Treat_i * FEMA_t * Grant_recipient_{it}*' 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 control group.

Accounting for financial vulnerability

- We examine if firms and industries facing different levels of volatility within the treated group exhibit different sensitivities to their exporting shares.
- 'Cons' 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:

$$\frac{Export_{it}}{Sales_{it}} = \alpha_0 + \alpha_1 Treat_i + \alpha_2 FEMA_t + \alpha_3 Cons_{it} + \alpha_4 Treat_i * FEMA_t + \alpha_5 Treat_i * FEMA_t * Cons_{it} + \alpha_6 FEMA_t * Cons + \alpha_7 Treat_i * Cons_{it} + \alpha_8 X_{it-1} + \alpha_9 Z_{it} + e_{ijt}$$

- 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., 2009).
- Industry volatility is measured using Braun (2005) and are based on external finance data for all listed US-based companies from Compustat's annual industrial files.

- There is a considerable increase in the the export share after the introduction of the FEMA policy.
- Treated firms enjoy a greater export share compared to control firms.
- 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).

Summary Statistics

		FEMA=0			FEMA=1		
Explanatory Variables	Whole sample	Treated	Control	p-value	Treated	Control	p-value
	(1)	(2)	(3)	(4)	(6)	(7)	(8)
Export/ Sales (%)	12.27 (24.89)	11.10 (22.68)	9.99 (23.18)	0.295	18.30 (28.81)	11.57 (24.45)	0.000
Firm Size	26.52 (69.97)	66.93 (149.40)	13.58 (48.87)	0.000	81.78 (135.61)	19.26 (50.17)	0.000
Real wage	1.05 (2.21)	2.09 (3.29)	0.54 (1.46)	0.000	2.78 (3.55)	0.83 (1.86)	0.000
Total Factor Productivity	1.57 (1.08)	1.98 (1.03)	1.85 (1.05)	0.005	1.56 (1.16)	1.54 (1.07)	0.199
GDP growth	7.24 (2.20)	6.94 (1.64)	7.00 (1.63)	0.406	7.11 (2.20)	7.27 (2.24)	0.000
REER volatility	21.20 (21.47)	17.22 (10.35)	17.55 (10.03)	0.498	20.25 (21.30)	21.58 (22.02)	0.000
Grant recipient	0.23 (0.42)	0.28 (0.45)	0.29 (0.46)	0.499	0.25 (0.43)	0.22 (0.42)	0.000
Firm volatility	0.22 (1.24)	0.07 (0.12)	0.29 (1.01)	0.086	0.14 (0.94)	0.23 (1.28)	0.000
Industry volatility	12.90 (11.21)	13.52 (11.94)	11.99 (10.11)	0.002	12.72 (10.24)	12.98 (11.40)	0.045
Number of Observations	80,996	530	4,284		9,385	66,797	

Results- Baseline Model

- The main variable of interest is the DD coefficient, $Treat_j * FEMA_t$, captures the impact of the policy on the treated firms as compared to control firms.
- We find that the introduction of the policy increased the firm-level exports within the treated group by 24.56%.
- Hence, firms which have access to foreign borrowing are less credit constrained and hence are less subject to distortions and are able to expand further in terms of global sales.

Results- Baseline Model

Table 4: Baseline model

<i>Dependent variable = Export/ Sales (%)</i>	
	(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

Results-Access to grants and subsidies

- The results show that firms which receive grants and subsidies within the treated group (access to foreign financing) are able to significantly increase their export share compared to similar firms in control group.
- 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 which are in line with Görg et al. (2008).

Results-Access to grants and subsidies

Table 5: Access to grants and subsidies

<i>Dependent variable = Export/ Sales (%)</i>	
	(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

Results- Accounting for financial vulnerability

- Results show 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.
- Also, 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.
- In economic terms, 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%.

Results- Accounting for financial vulnerability

Table 6: Accounting for vulnerability

<i>Dependent variable = Export/ Sales (%)</i>		
	Firm volatility	Industry volatility
	(1)	(2)
Treat*FEMA*Cons	4.093** (2.11)	2.378* (1.66)
Treat*Cons	-4.364** (-2.35)	-
FEMA*Cons	-0.734 (-0.75)	-1.447 (-0.68)
Cons	0.733 (0.77)	1.270 (0.79)
FEMA	0.041 (0.03)	3.571 (0.32)
Lagged Firm Size	0.003 (0.75)	0.003 (0.80)
Lagged Wage	0.273* (1.81)	0.283* (1.87)
Lagged Total Factor Productivity	0.360 (0.48)	0.368 (0.50)
GDP growth	0.067 (0.10)	0.059 (0.09)
REER volatility	-0.054 (-0.50)	-0.053 (-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

Robustness- Placebo test for any underlying trends

- Possibility of biased results due to some pre-policy trends since 1997.
- To verify we conduct a DD technique for the pre-policy period of 1988–1999 and assuming that the policy took place in 1997 (or 1996 or 1998).

Table 7: Robustness: Placebo tests

<i>Dependent variable = Export/ Sales (%)</i>		
Panel 1:		
Treat*FEMA	1.389	
	(0.73)	
N	2,103	
R ²	0.021	
Panel 2:		
Treat*FEMA*Grant recipient	-0.097	
	(-0.07)	
N	2,103	
R ²	0.022	
Panel 3:		
	Firm volatility	Industry volatility
	(1)	(2)
Treat*FEMA*Cons	1.582	3.544
	(0.60)	(1.41)
N	2,103	2,103
R ²	0.022	0.050

Robustness- Controlling for contemporaneous events

- Results are likely to be affected by the contemporaneous economic and financial events that occurred during the sample period of 28 years.
- Controlling for liberalisation policy of 1991-1993, second phase of liberalisation 1998–1999 and global crisis of 2007-2009, interacted with treat dummy.

Table 8: Robustness: Controlling for contemporaneous events

Dependent variable = Export/ Sales (%)		
Panel 1:		
Treat*FEMA	5.321** (1.97)	
N	42,123	
R ²	0.009	
Panel 2:		
Treat*FEMA*Grant recipient	11.750** (2.29)	
N	42,123	
R ²	0.012	
Panel 3:		
	Firm volatility	Industry volatility
	(1)	(2)
Treat*FEMA*Cons	5.616** (2.06)	2.149 (1.28)
N	42,123	42,123
R ²	0.009	0.008

Robustness- Alternative treated group

- As a robustness measure, we define treated firms as per the eligibility of firms to use ECB.
- Treated group here includes firms that are eligible and have used ECB, while the control group includes firms that are eligible but do not use ECB during the sample period

Table 9: Robustness: Alternative treated group

Dependent variable = Export/ Sales (%)		
Panel 1:		
Treat*FEMA	2.578** (2.09)	
N	41,103	
R ²	0.011	
Panel 2:		
Treat*FEMA*Grant recipient	6.566*** (2.79)	
N	41,103	
R ²	0.014	
Panel 3:		
	Firm volatility	Industry volatility
	(1)	(2)
Treat*FEMA*Cons	2.831** (2.09)	2.213 (1.57)
N	41,103	41,103
R ²	0.012	0.011

Robustness- Controlling endogeneity

- To control for simultaneity bias, we take the average of pre-treatment characteristics and allow them to flexibly vary through time. These firm-level averages are then interacted with time trends to allow for proper pre-treatment controls that are not absorbed by firm fixed effects.

Table 10: Robustness: Endogeneity concerns

<i>Dependent variable = Export/ Sales (%)</i>		
Panel 1:		
Treat*FEMA		2.962** (2.34)
N		22,033
R ²		0.017
Panel 2:		
Treat*FEMA*Grant recipient		8.387*** (2.91)
N		22,033
R ²		0.021
Panel 3:		
	Firm volatility	Industry volatility
	(1)	(2)
Treat*FEMA*Cons	3.704** (2.60)	3.196** (2.24)
N	22,033	22,033
R ²	0.012	0.011

Robustness- Alternative matching technique

- We use a different matching technique namely radius matching.

Table 11: Robustness: Alternative matching techniques

<i>Dependent variable = Export/ Sales (%)</i>		
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

Robustness- Alternative measures of financial vulnerability

- Firm-level constraints are measured by *firm size* and *import intensity* and *inventory-to-sales ratio* as a different measure of industry-level volatility.

Table 12: Robustness: Different measures of financial vulnerability

Dependent variable = Export/ Sales (%)

Panel 3:	Smaller firms	High import intensity	High inventory-to-sales ratio
	(1)	(2)	(3)
Treat*FEMA*Cons	7.220** (2.31)	4.008** (2.42)	3.159* (1.72)
Observations	42,123	42,123	42,123
Number of id	5,145	5,145	5,145
R-squared	0.011	0.010	0.009
II			

Conclusion

- The paper extended the literature on access to trade finance for emerging markets where it remains costly and limited.
- Based on difference-in-differences model using 11,612 Indian firms, we find that firms which have 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 and industries are able to benefit more from foreign financing compared to control firms during the FEMA regime.
- Therefore, this paper suggests that countries that maintain a restrictive capital account can improve their exporting activity by easing capital controls.