Exchange Rates and Firm Exit : An Examination with Turkish Firm-Level Data

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Motivation

- Micro-level empirical research has begun to find important results on the effects of currency variations on firms' survival (Baggs et al. 2009; Baldwin and Yan, 2010).

- Recent research have documented heteregeneous reactions of firms to exchange rate variations depending on individual firms' productivity levels (Berman et al., 2012).
  Main findings:

- Appreciation of the real domestic currency reduces the probability of survival of firms.

- The effect of real domestic currency appreciation on firms' survival is larger for less productive firms.

Contribution of the Paper

- ▶ Adds to the literature on the impact of currency appreciation on firms' survival in the context of a developing country.
- ▶ Data – Firm level
- ▶ **New findings:**FX appreciation decreases firms' survival.Less productive firms are more affected by domestic currency appreciations.

Presentation Outline

Related Literature

- ▶ **Micro-level empirical research on exchange rates and firm survival:** Baggs et al. (2009), Baldwin and Yan (2010), Ekholm et al. (2012), Berman et al. (2012), Li et al. (2013),
- ▶ **Heterogenous Firm Models:** Melitz (2003), Chaney (2013).

Company Sector Accounts Database

Which Information is gathered in the Database?

- ▶ General Information (Sector, Legal Status, Employment)
- ▶ Balance Sheet
- ▶ Income Statement
- ▶ Composition of Assets and Liabilities
- ▶ Sources and Uses of Funds
- ▶ Standart Ratios (Liquidity Ratios, Ratios of Financial Position, Turnover, and Profitability Ratios)

Company Sector Accounts Database

- ▶ The data obtained either directly from the companies or from the financial institutions that have credit relationship with the companies.

- ▶ The study covers only the participating firms those submit their financial statements regularly. Any firm whose data of last three years is not available is kept out of the analysis, which means the results released may not represent sectors as a whole

- ▶ The data is annual.

- ▶ Starting from 2011, "Company Accounts" are prepared according to NACE Rev.2 economic activity classification updated by European Statistics Office (EUROSTAT) for assessing new and developing sectors and analyzing them in accordance with international standards.

- ▶ All data are checked for consistency by sector experts at CBRT.

TÜRKİYE CUMHURİYET
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The primary objective of the Bank shall be to achieve and maintain price stab

Price Stability | **Financial Stability** | **Monetary Policy** | **Publications** | **Data** | **Announcements** | **Remarks** | **Bank Profile**

Statistical Data – Exchange Rates – Financial Markets – Banking Data – Surveys – Periodic Data – Data Release Calendar

Data	**Company Accounts**

📄 Statistical Data
- Indicators of Foreign Exchange Positions of Private Companies on Their Quarterly Financial S

📄 Exchange Rates
 * Methodology

📄 Financial Markets
 * Excel (March 2006- December 2008)

Important Note!
Dear Users,
Please note that the the Government of the Republic of Turkey had decided to write
off 6 zeros from the Turkish Lira starting from the beginning of year 2005.
The 'Company Accounts' reports until 2006 (2003-2005) had had denominations
in terms of billion TL, in all the tables. From then on the currency units
of thousand TL. has been used. Therefore, there is **no need to convert
any numbers** in order to use them in your analyses, since billion
TL units in the tables before 2005 is exactly the same as thousand TL
from then on.

📄 Banking Data

📄 Surveys

📄 Periodic Data

📄 Data Release Calendar

- Company Accounts'2013 (2010 - 2012) (company2013.zip) ISBN 978-605-5758-94-3
- Company Accounts'2012 (2009 - 2011) (company2012.zip) ISBN 978-605-5758-72-1
- Company Accounts'2011 (2008 - 2010) (company2011.zip) ISBN 978-605-5758-60-8

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Exchange Rates and Firm Exit (EXE - 2007) (company2008.zip) ISBN 978-605-5758-19-7 32
May 2014

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CBRT Company Accounts
- AGGREGATED ANNUAL ACCOUNTS
  - Foreword
  - Introductory Notes
  - Sectors
    - All Companies
    - MANUFACTURING SECTORS
      - C - Manufacturing
        - Total
          - General Information
          - Balance Sheet
          - Income Statement
          - Composition of Assets & Liabilities
          - Sources & Uses of Funds
        - Size Classes
          - **Small Companies**
            - General Information
            - Balance Sheet
            - Income Statement
            - Composition of Assets & Liabilities
            - Sources & Uses of Funds
          - Medium Companies
          - Large Companies
          - Manufacture of Food Products

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Size Classification

- The size classification is made on the basis of net sales criterion of BACH (The Bank of Harmonized Data on Company Accounts), which functions under the General Directorate of the Economic and Financial Affairs of the European Commission, and the total assets criterion of the European Union.

- In Construction and Activities of Holding Companies -where annual net sales figures erratically change from year to year- the total assets criterion, while in other sectors, the net sales criterion is used for scale classification.

Size Classification

Net Sales	
Small	≤ EUR 10 Million
Medium	EUR 10 Million < NS < EUR 50 Million
Large	≥ EUR 50 Million
Asset Total	
Small	≤ EUR 10 Million
Medium	EUR 10 Million < Asset < EUR 43 Million
Large	≥ EUR 43 Million
Employees	
Small	< 50 Employees
Medium	50 Emp. ≤ # of Emp. ≤ 500 Emp.
Large	> 500 Employees

Sectoral Coverage

Nace Rev. 1.1

Company Accounts

A	AGRICULTURE, HUNTING AND FORESTRY
B	FISHING
C	MINING AND QUARRYING
CA	MINING AND QUARRYING OF ENERGY PRODUCING MATERIALS
CB	MINING AND QUARRYING EXCEPT ENERGY PRODUCING MATERIALS
D	MANUFACTURING
DA	MANUFACTURE OF FOOD PRODUCTS; BEVERAGES AND TOBACCO
DB	MANUFACTURE OF TEXTILES AND TEXTILE PRODUCTS
DC	MANUFACTURE OF LEATHER AND LEATHER PRODUCTS
DD	MANUFACTURE OF WOOD AND WOOD PRODUCTS
DE	MANUFACTURE OF PULP, PAPER AND PAPER PRODUCTS; PUBLISHING AND PRINTING
DF	MANUFACTURE OF COKE, REFINED PETROLEUMPRODUCTS AND NUCLEAR FUEL
DG	MANUFACTURE OF CHEMICALS, CHEMICAL PRODUCTS AND MAN-MADE FIBRES
DH	MANUFACTURE OF RUBBER AND PLASTIC PRODUCTS
DI	MANUFACTURE OF OTHER NON-METALLIC MINERAL PRODUCTS
DJ	MANUFACTURE OF BASIC METALS AND FABRICATED METAL PRODUCTS
DK	MANUFACTURE OF MACHINERY AND EQUIPMENT N.E.C.
DL	MANUFACTURE OF ELECTRICAL AND OPTICAL EQUIPMENT
DM	MANUFACTURE OF TRANSPORT EQUIPMENT
DN	MANUFACTURING N.E.C.
E	ELECTRICITY, GAS AND WATER SUPPLY
F	CONSTRUCTION
G	WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES, MOTORCYCLES AND
H	HOTELS AND RESTAURANTS
I	TRANSPORT, STORAGE AND COMMUNICATION
J	FINANCIAL INTERMEDIATION
K	REAL ESTATE, RENTING AND BUSINESS ACTIVITIES
L	PUBLIC ADMINISTRATION AND DEFENCE; COMPULSORY SOCIAL SECURITY
M	EDUCATION
N	HEALTH AND SOCIAL WORK
O	OTHER COMMUNITY,SOCIALAND PERSONAL SERVICE ACTIVITIES
P	PRIVATE HOUSEHOLDS WITH EMPLOYED PERSONS
Q	EXTRA-TERRITORIAL ORGANIZATIONS AND BODIES

Number of Companies
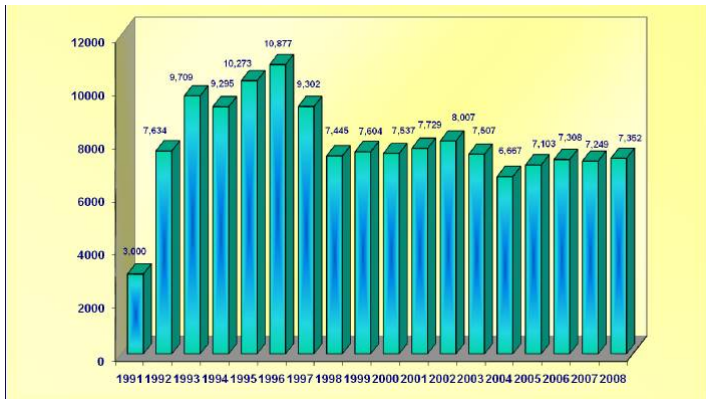
Our Data

- Central Bank of Turkey – Company Sector Database
- Annual data for the period 2002-2009
- 616 firms belonging to 15 industries.
- All the real values are deflated using the sectoral-level PPI
- Real bilateral exchange rate data between U.S. dollar and Turkish Lira obtained from IMF.
- Weighted average of OECD countries's GDPs (constant prices)
- Domestic GDP
- Three-months deposit rate

Our Data

- ▶ Additional data from the Central Bank that contains information on the identity numbers of exited firms but not the exact date of the exit.

- ▶ In our analysis we do not take into consideration firms with incomplete employment data as we will rely on this variable when calculating labour productivity for each firm.

Firm Survival

We classify firms into two groups:

- ▶ Exiters from export markets (plants that export at the beginning of a period, but do not export at the end of the period).

- ▶ Continuing exporters (plants that export at both the beginning and the end of a period).

Descriptive Statistics

Sample	Variable	mean	N
Survivors	Age	30.3	4680
	Employment	399.6	4680
	Labour Productivity	37.7	4680
	Export Share	0.31	4680
	Real Assets	1150000	4680
Exiters	Age	31.4	141
	Employment	241.3	141
	Labour Productivity	35	141
	Export Share	0.27	141
	Real Assets	637981	141
Whole Sample	Age	30.3	4821
	Employment	395	4821
	Labour Productivity	37.7	4821
	Export Share	0.31	4821
	Real Assets	1140000	4821

Number of Firms and Exit Year

Industry	Nace Rev.1.1. Code	Number of Firms								Exit Rate
		2002	2003	2004	2005	2006	2007	2007	2009	
Food products and beverages	15	116	116	116	116	114	114	112	112	0.03
Tobacco products	16	5	5	5	4	4	4	4	4	0.20
Textiles	17	109	109	108	106	105	105	104	102	0.06
Wearing apparel	18	45	45	44	43	42	42	41	41	0.09
Wood and of products of wood	20	10	10	10	9	9	9	9	9	0.10
Publishing printing and reproduction of recorded media	22	9	9	9	9	9	9	9	8	0.11
Chemicals and chemical products	24	70	70	70	69	69	68	68	68	0.03
Rubber and plastic products	25	38	38	37	37	37	37	37	37	0.03
Other non-metallic mineral products	26	57	57	57	56	55	55	54	54	0.05
Fabricated metal products except machinery and equipment	28	38	38	38	38	38	38	38	37	0.03
Machinery and equipment n.e.c.	29	48	48	48	48	48	47	47	47	0.02
Electrical machinery and apparatus n.e.c.	31	26	26	26	26	25	25	24	24	0.08
Medical precision and optical instruments	33	4	4	4	4	4	4	4	3	0.25
Motor vehicles trailers and semi-trailers	34	41	41	41	41	40	39	39	39	0.05
Sum		616	616	613	606	600	596	589	586	0.05

Questions

- ▶ Does exchange rate appreciation have any effect on firm survival?
- ▶ Does exchange rate appreciation have lower impact (on survival) for more productive firms?

Empirical Methodology

Question 1: Does exchange rate appreciate have any effect on firm survival? We follow Baggs et al.(2009)'s methodology to investigate the firms' survival behavior as a result of exchange rate movements

- ▶ Probit Estimation:

$$P(Surv_{it}) = \phi(\beta_1 Q_t + \beta_2 P_{it} + \beta_3 GDP^f_{\ t} + \beta_4 GDP^d_{\ t} + \\ \beta_5 r_t + \beta_6 AGE_{it} + \beta_7 EMP_{it} + \beta_8 t + \epsilon_{it}) \quad (1)$$

- ▶ Linear Probability Model:

$$Y_{it} = \alpha_1 Q_t + \alpha_2 P_{it} + \alpha_3 GDP^f_{\ t} + \alpha_4 GDP^d_{\ t} + \alpha_5 r_t + \\ \alpha_6 AGE_{it} + \alpha_7 EMP_{it} + \alpha_8 t + \epsilon_{it} \quad (2)$$

Probit Estimation

Dependent variable: $= 1$ if survives to end of year t; 0 otherwise.

	(1) Pooled Probit	(2) Marginal Effect	(3) Model with Interaction	(4) Marginal Effect
Real exchange rate	5.689* (2.592)	0.042* (0.017)	5.084* (2.562)	0.040* (0.018)
Labour productivity	0.213** (0.072)	0.002** (0.001)		
Foreign GDP growth rate	0.018 (0.275)	0.000 (0.002)	0.006 (0.275)	0.000 (0.002)
Domestic GDP growth rate	-0.039 (0.203)	-0.000 (0.002)	-0.020 (0.203)	-0.000 (0.002)
Interest rate	-0.004 (0.040)	-0.000 (0.000)	0.002 (0.040)	0.000 (0.000)
Age	-0.517* (0.204)	-0.004* (0.002)	-0.506* (0.203)	-0.004* (0.002)
Employment	0.198*** (0.053)	0.001** (0.000)	0.210*** (0.055)	0.002*** (0.000)
Time trend	0.452 (0.295)	0.003 (0.002)	0.468 (0.292)	0.004 (0.002)
Dummy for high-productivity firms			0.013 (0.281)	0.000 (0.002)
Real Exchange Rate× Dummy for high-productivity firms			0.872 (0.849)	0.007 (0.006)
Observations	4821	4821	4821	4821
Log lik.	-164.478	-164.478	-166.970	-166.970
Chi-squared	58.141	58.141	52.021	52.021
Pseudo R-squared	0.122	0.122	0.109	0.109

Marginal effects are calculated at the mean.
Standard errors in parentheses.
Real exchange rate, labour productivity, age, and employment are in logarithmic form.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Linear Probability Model

Dependent variable: $= 1$ if survives to end of year t; 0 otherwise.

	(1) LPM	(2) Model with Interaction	(3) LPM - FE	(4) Model with Interaction	(5) LPM - Firm FE	(6) Model with Interaction
Real Exchange Rate	0.069*	0.068	0.069*	0.068	0.051	0.061*
	(0.035)	(0.036)	(0.035)	(0.036)	(0.028)	(0.030)
Labour productivity	0.004*		0.004*		0.017**	
	(0.002)		(0.002)		(0.006)	
Foreign GDP growth rate	0.004	0.004	0.004	0.004	0.002	0.003
	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)
Domestic GDP growth rate	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Interest rate	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Age	-0.009*	-0.008*	-0.009*	-0.009*	0.046	0.050
	(0.004)	(0.004)	(0.004)	(0.004)	(0.036)	(0.038)
Employment	0.004**	0.004**	0.004**	0.004**	0.016**	0.009**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.005)	(0.004)
Time trend	0.002	0.002	0.002	0.003	-0.004	-0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
Dummy for high-productivity firms		0.004		0.002		0.009
		(0.004)		(0.004)		(0.006)
Real Exchange Rate× Dummy for high productivity firms		0.002		0.002		-0.012
		(0.008)		(0.009)		(0.011)
Observations	4821	4821	4821	4821	4821	4821
R-squared	0.009	0.007	0.011	0.010	0.264	0.259

Column (1) is linear probability model with no fixed effects (FE).
Column (3) is linear probability model with industry fixed effects (FE).
Column (5) is linear probability model with firm fixed effects (FE).
Marginal effects are calculated at the mean.
Standard errors in parentheses.
Real exchange rate, labour productivity, age, and employment are in logarithmic form.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Empirical Methodology

Question 2: Does exchange rate appreciation have lower impact (on survival) for more productive firms?

- Linear Probability Model:

$$Y_{it} = \alpha_1 Q_t + \alpha_2 GDP^f{}_t + \alpha_3 GDP^d{}_t + \alpha_4 r_t +$$
$$\alpha_5 D^H + \alpha_6(D^H * Q_t) + \alpha_7 EMP_{it} + \alpha_8 t + \epsilon_{it}$$

- The coefficient of the interaction term tells the DIFFERENCE between high and low productivity firms in the effect of the exchange rate on survival.

Linear Probability Model

Dependent variable: $= 1$ if survives to end of year t; 0 otherwise.

	(1) LPM	(2) Model with Interaction	(3) LPM - FE	(4) Model with Interaction	(5) LPM - Firm FE	(6) Model with Interaction
Real Exchange Rate	0.069*	0.068	0.069*	0.068	0.051	0.061*
	(0.035)	(0.036)	(0.035)	(0.036)	(0.028)	(0.030)
Labour productivity	0.004*		0.004*		0.017**	
	(0.002)		(0.002)		(0.006)	
Foreign GDP growth rate	0.004	0.004	0.004	0.004	0.002	0.003
	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)
Domestic GDP growth rate	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Interest rate	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Age	-0.009*	-0.008*	-0.009*	-0.009*	0.046	0.050
	(0.004)	(0.004)	(0.004)	(0.004)	(0.036)	(0.038)
Employment	0.004**	0.004**	0.004**	0.004**	0.016**	0.009**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.005)	(0.004)
Time trend	0.002	0.002	0.002	0.003	-0.004	-0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
Dummy for high-productivity firms		0.004		0.002		0.009
		(0.004)		(0.004)		(0.006)
Real Exchange Rate× Dummy for high productivity firms		0.002		0.002		-0.012
		(0.008)		(0.009)		(0.011)
Observations	4821	4821	4821	4821	4821	4821
R-squared	0.009	0.007	0.011	0.010	0.264	0.259

Column (1) is linear probability model with no fixed effects (FE).
Column (3) is linear probability model with industry fixed effects (FE).
Column (5) is linear probability model with firm fixed effects (FE).
Marginal effects are calculated at the mean.
Standard errors in parentheses.
Real exchange rate, labour productivity, age, and employment are in logarithmic form.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Empirical Methodology

Question 2: Does exchange rate appreciation have lower impact (on survival) for more productive firms?

- Probit:

$$P(Surv_{it}) = \phi(\beta_1 Q_t + \beta_2 GDP^f{}_t + \beta_3 GDP^d{}_t + \beta_4 r_t +$$
$$\beta_5 D^H + \beta_6(D^H * Q_t) + \beta_7 AGE_{it} + \beta_8 EMP_{it} + \beta_9 t + \epsilon_{it})$$

$$\frac{\partial^2 F/\partial P}{\triangle D^H} = (\beta_1 + \beta_6)[\Phi'(\beta_1 Q_t + \beta_5 + \beta_6 Q_t + X\beta) -$$
$$\Phi'(\beta_1 Q_t + X\beta)] \neq \beta_6$$

where

$$X\beta = \beta_2 GDP^f{}_t + \beta_3 GDP^d{}_t + \beta_4 r_t + \beta_7 AGE_{it} + \beta_8 EMP_{it} + \beta_9 t + \epsilon_{it}$$

Interaction Term

$$\frac{\partial^2 F/\partial P}{\triangle D^H} = (\beta_1 + \beta_6)[\Phi^{'}(\beta_1 Q_t + \beta_5 + \beta_6 Q_t + X\beta) -$$
$$\Phi^{'}(\beta_1 Q_t + X\beta)] \neq \beta_6$$

where

$$X\beta = \beta_2 GDP^f{}_t + \beta_3 GDP^d{}_t + \beta_4 r_t + \beta_7 AGE_{it} + \beta_8 EMP_{it} + \beta_9 t + \epsilon_{it}$$

As it has been pointed out by Ai and Norton (2003):

▶ The interaction effect could be nonzero, even if $\beta_6 = 0$

▶ The interaction effect is conditional on the independent variables,

▶ The interaction effect may have different signs for different values of covariates. Therefore, the sign of β_6 does not necessarily indicate the sign of the interaction effect.

Probit Estimation

Dependent variable: = 1 if survives to end of year t; 0 otherwise.

|	(1) Pooled Probit	(2) Marginal Effect	(3) Model with Interaction	(4) Marginal Effect
Real exchange rate	5.689*	0.042*	5.084*	0.040*
	(2.592)	(0.017)	(2.562)	(0.018)
Labour productivity	0.213**	0.002**		
	(0.072)	(0.001)		
Foreign GDP growth rate	0.018	0.000	0.006	0.000
	(0.275)	(0.002)	(0.275)	(0.002)
Domestic GDP growth rate	-0.039	-0.000	-0.020	-0.000
	(0.203)	(0.002)	(0.203)	(0.002)
Interest rate	-0.004	-0.000	0.002	0.000
	(0.040)	(0.000)	(0.040)	(0.000)
Age	-0.517*	-0.004*	-0.506*	-0.004*
	(0.204)	(0.002)	(0.203)	(0.002)
Employment	0.198***	0.001**	0.210***	0.002***
	(0.053)	(0.000)	(0.055)	(0.000)
Time trend	0.452	0.003	0.468	0.004
	(0.295)	(0.002)	(0.292)	(0.002)
Dummy for high-productivity firms			0.013	0.000
			(0.281)	(0.002)
Real Exchange Rate× Dummy for high-productivity firms			0.872	0.007
			(0.849)	(0.006)
Observations	4821	4821	4821	4821
Log lik.	-164.478	-164.478	-166.970	-166.970
Chi-squared	58.141	58.141	52.021	52.021
Pseudo R-squared	0.122	0.122	0.109	0.109

Marginal effects are calculated at the mean.
Standard errors in parentheses.
Real exchange rate, labour productivity, age, and employment are in logarithmic form.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Probit Estimation
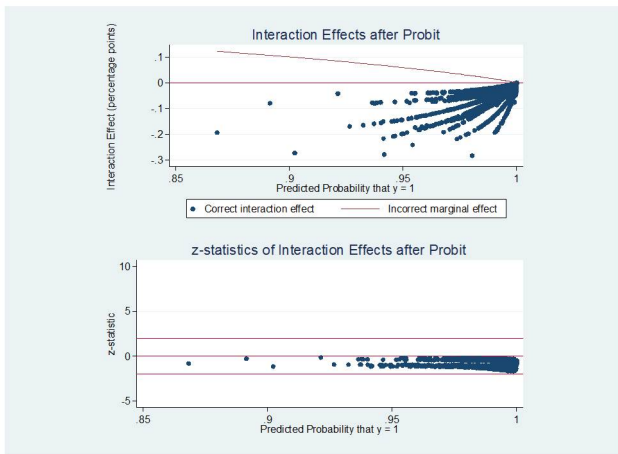
Dependent variable: $= 1$ if survives to end of year t; 0 otherwise.

High Productivity Firms

Dependent variable: = 1 if survives to end of year t; 0 otherwise.

	(1) Pooled Probit	(2) Marginal Effect	(3) LPM - No Fixed Effect	(4) LPM - Industry FE	(5) LPM - Firm FE
Real Exchange Rate	3.578	0.009	0.018	0.017	0.002
	(3.654)	(0.008)	(0.043)	(0.043)	(0.037)
Foreign GDP growth rate	0.369	0.001	0.002	0.002	0.001
	(0.515)	(0.001)	(0.005)	(0.005)	(0.005)
Domestic GDP growth rate	-0.541	-0.001	-0.003	-0.003	-0.002
	(0.510)	(0.002)	(0.003)	(0.003)	(0.003)
Interest rate	-0.056	-0.000	-0.000	-0.000	-0.000
	(0.095)	(0.000)	(0.001)	(0.001)	(0.001)
Age	-0.317	-0.001	-0.004	-0.003	0.040
	(0.324)	(0.001)	(0.004)	(0.004)	(0.051)
Employment	0.161	0.000	0.002	0.003	0.007
	(0.091)	(0.001)	(0.001)	(0.001)	(0.005)
Time trend	-0.604	-0.001	-0.003	-0.003	-0.007
	(0.822)	(0.002)	(0.002)	(0.002)	(0.004)
Observations	2534	2534	2534	2534	2534
Log lik.	-67.788	-67.788	3198.224	3203.088	3657.442
Chi-squared	295.620	295.620			
Pseudo R-squared	0.110	0.110			

Column (3) is linear probability model with no fixed effects (FE).
Column (4) is linear probability model with industry fixed effects (FE).
Column (5) is linear probability model with firm fixed effects (FE).
Marginal effects are calculated at the mean.
Standard errors in parentheses.
Real exchange rate, labour productivity, age, and employment are in logarithmic form.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Low Productivity Firms

Dependent variable: $= 1$ if survives to end of year t; 0 otherwise.

	(1) Pooled Probit	(2) Marginal Effect	(3) LPM - No Fixed Effect	(4) LPM - Industry FE	(5) LPM - Firm FE
Real Exchange Rate	9.199	0.087*	0.133*	0.130*	0.094*
	(4.828)	(0.038)	(0.056)	(0.055)	(0.046)
Foreign GDP growth rate	0.238	0.002	0.007	0.007	0.003
	(0.440)	(0.004)	(0.007)	(0.007)	(0.006)
Domestic GDP growth rate	-0.061	-0.001	-0.003	-0.003	-0.002
	(0.272)	(0.003)	(0.005)	(0.005)	(0.004)
Interest rate	-0.008	-0.000	-0.000	-0.000	0.000
	(0.057)	(0.001)	(0.001)	(0.001)	(0.001)
Age	-0.617*	-0.006	-0.012	-0.014	0.122*
	(0.256)	(0.003)	(0.007)	(0.008)	(0.061)
Employment	0.243***	0.002**	0.005*	0.005*	0.017*
	(0.068)	(0.001)	(0.002)	(0.002)	(0.008)
Time trend	0.795*	0.008*	0.009	0.008	0.000
	(0.340)	(0.003)	(0.007)	(0.007)	(0.006)
Observations	2287	2287	2287	2287	2287
Log lik.	-95.943	-95.943	2254.888	2264.308	2722.581
Chi-squared	74.123	74.123			
Pseudo R-squared	0.127	0.127			

Column (3) is linear probability model with no fixed effects (FE).
Column (4) is linear probability model with industry fixed effects (FE).
Column (5) is linear probability model with firm fixed effects (FE).
Marginal effects are calculated at the mean.
Standard errors in parentheses.
Real exchange rate, labour productivity, age, and employment are in logarithmic form.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Conclusion

- ► The results suggest that real exchange rate appreciation decreases the probability of survival in traded industries.
- ► High(low) productivity firms have higher(lower) probability of survival than low(high) productivity firms in traded industries in the presence of exchange rate variation.