Online Appendix: Trade Shocks and Credit Reallocation

Stefano Federico, Fadi Hassan, Veronica Rappoport

Table A.1 replicates the baseline specifications in equations (5) and (6) of the paper with the instrumental variable defined using only imports from the US, or only from Australia, New Zealand, and Japan.

Table A.2 replicates the baseline specifications in (5) and (6) with (1) the Bank Exposure measure defined leaving out the sector of operation of the corresponding firm $Exposure^{IT}_{-ib} = Exposure^{IT}_{-sb}$, (2) bank exposure using assets (rather than total credit) in the denominator of definition (2), (3) leaving out the 15 main 4-digit sectors in which Italy exports to China (those 15 sectors account for more than half of Italian exports to China in the 1998-2007 average), and (4) a measure of bank exposure that accounts for input-output linkages as described in section 6.2.

Table A.3 replicates the baseline specifications in (5) and (6) with alternative sets of controls and fixed effects.

Table A.4 replicates the baseline specifications in (5) and (6) with observations weighted by the log-employment of firms.

Table A.5 estimates a first-difference transformation of the baseline specifications in (5) and (6), where the dependent variable is the change in the log of outstanding credit between bank b and firm i between the average of 1998-2001 and that of 2002-2007.

Table A.6 reports shift-share IV coefficients that are obtained from a weighted IV regression at the industry level, as in Borusyak et al. (2021). Standard errors allow for clustering at four-digit-sector level and are valid in the framework of Adão et al. (2019).

Table A.7 shows the results of our baseline specification in (6), including interactions with quartile dummies in terms of firm exposure, TFP, and comparative advantage.

Table A.8 shows the results of a regression of loan applications on firm-level exposure as defined in equation (8).

Tables A.9 and A.10 replicate specifications (6) and (9) adding additional dimensions of firm heterogeneity.

Table A.11 shows the results of our baseline specification in (6), splitting the sample of

provinces above or below the median in terms of (i) the number of patents registered at the European Patent Office per 100,000 persons (i.e., innovation), (ii) the share of adults with at least a high school degree (i.e., skill), and (iii) industrial diversification defined according to a Herfindahl-Hirschman index.

Table A.12 replicates the specification (9) including the firm-time FE estimated in specification (5).

Table A.13 replicates specification in (9) including province-sector-time FE, rather than sector-time FE.

Table A.14 estimates a first-difference transmission of the specification in (9), where the dependent variable is the change in a given firm outcome between the average of 1998-2001 and that of 2002-2007.

Figure A.1 compares the patterns of exports and employment across groups of firms that are potential winners and losers from the China shock.

Figure A.2 shows the results of the dynamic difference-in-differences estimator of the specification in (11).

Figure A.3 shows the credit and employment shares by deciles of firm-exposure.

Subsection A.1 analyzes the OLS bias of the baseline estimation.

Subsection A.2 shows the computations and assumptions behind the figures in subsection 4.2 of the paper (Economic Relevance).

Table A.1: Robustness: Variations in the instrumental variable

Dep Var: $\ln C_{ibt}$	US		ANJ	
	(1)	(2)	(3)	(4)
$Exposure^{IT}_{-i,b} \times Post_t \times \ldots$	-0.0727***		-0.0759***	
	(0.00628)		(0.00634)	
$\ldots ManufHighHit_i$		-0.0704***		-0.0625***
		(0.0132)		(0.0138)
$\ldots ManufLowHit_i$		-0.0768***		-0.0870***
		(0.0103)		(0.0108)
$\ldots Services_i$		-0.0714***		-0.0766***
		(0.00841)		(0.00852)
Bank controls	✓	✓	✓	✓
Firm-time F.E.	✓	✓	✓	✓
Firm-bank F.E.	✓	✓	✓	✓
Observations	3499092	3499092	3499092	3499092
Adjusted R-squared	0.832	0.832	0.832	0.832

Note: 2SLS baseline specifications (5) and (6). In columns (1) and (2), the instrument $Exposure^{OC}_{-sb}$ defined in (4) uses US imports in the corresponding sector. In columns (3) and (4), it uses Australia, New Zealand, and Japan. Bank controls include bank characteristics pre-2000 interacted with a post-2001 dummy, these are log-assets, share of NPLs, core-funding ratio, the capital ratio, and bank specialization. All regressions include firm-year fixed effects and firm-bank dummies. Standard errors are clustered at the bank-sector level. ***significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table A.2: Robustness: Variations in bank exposure measure

Dep. Variable: $\ln C_{ibt}$	Firm-Sector Out		Bank Assets		Export-Sector Out		Upstream Links	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Exposure^{IT}_{-ib} \times Post_t$	-0.0781***		-0.0436***		-0.0764***		-0.0748***	
	(0.00616)		(0.00845)		(0.00633)		(0.00607)	
$... \times Man\ HighHit_i$		-0.0742***		-0.0420**		-0.0882***		-0.642***
		(0.0134)		(0.0178)		(0.0138)		(0.0129)
$... \times Man\ LowHit_i$		-0.0825***		-0.0715***		-0.0778***		-0.0824***
		(0.00963)		(0.0144)		(0.0100)		(0.0099)
$... \times Services_i$		-0.0774***		-0.0316***		-0.0700***		-0.0762***
		(0.00788)		(0.0107)		(0.00825)		(0.00809)
Bank controls	✓	✓	✓	✓	✓	✓	✓	✓
Firm-time F.E.	✓	✓	✓	✓	✓	✓	✓	✓
Firm-bank F.E.	✓	✓	✓	✓	✓	✓	✓	✓
Observations	3473687	3473687	3499092	3499092	3252970	3252970	3499092	3499092
Adjusted R-squared	0.832	0.832	0.832	0.832	0.835	0.835	0.832	0.832

Note: 2SLS baseline specifications (5) and (6). In columns (1) and (2), the independent variable is defined leaving out firm-i's sector of operation. In columns (3) and (4), it is defined using bank's total assets as denominator. The corresponding changes are also in the instrument $Exposure^{OC}_{-sb}$ defined in equation (4). In columns (5) and (6), the estimation excludes the main export sectors towards China. In columns (7) and (8) the definition of bank exposure considers not only the direct exposure of a given industry to imports from China, but also the effects on upstream sectors. Bank controls include bank characteristics pre-2000 interacted with a post-2001 dummy, namely, log-assets, share of NPLs, core-funding ratio, the capital ratio, and bank specialization. All regressions include firm-year fixed effects and firm-bank dummies. Standard errors are clustered at the bank-sector level. ***significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table A.3: Baseline with alternative sets of fixed effects

Dep. Variable: $\ln C_{ibt}$	(1)	(2)	(3)	(4)
	Panel 1: Average effects			
$Exposure^{IT}_{-ib} \times Post_t$	-0.0359***	-0.0591***	-0.0561***	-0.0735***
	(0.00527)	(0.00658)	(0.00601)	(0.00620)
	Panel 2: Heterogeneous effects			
$Exposure^{IT}_{-ib} \times Post_t$				
$... \times ManufHighHit_i$	-0.0478***	-0.0724***	-0.0728***	-0.0683***
	(0.00740)	(0.00871)	(0.00853)	(0.0131)
$... \times ManufLowHit_i$	-0.0353***	-0.0524***	-0.0631***	-0.0795***
	(0.00679)	(0.00760)	(0.00752)	(0.0102)
$... \times Services_i$	-0.0296***	-0.0550***	-0.0398***	-0.0728***
	(0.00628)	(0.00711)	(0.00710)	(0.00836)
Firm F.E.	YES	YES		
Bank F.E.	YES	YES		
Time F.E.	YES	YES	YES	
Bank controls		YES	YES	YES
Firm-bank F.E.			YES	YES
Firm-time F.E.				YES
Observations	3499092	3499092	3499092	3499092
Adjusted R-squared	0.644	0.644	0.821	0.832

Note: 2SLS specifications (5) (Panel 1) and (6) (Panel 2) with alternative sets of controls. Column (4) shows the baseline results, with the complete sets of controls. Standard errors are double clustered at the bank-sector level. ***significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table A.4: Baseline with weighted least squares

Dep. Variable: $\ln C_{ibt}$	Obs. weighted by firm size	
	(1)	(2)
$Exposure^{IT}_{-i,b} \times Post_t \times \ldots$	-0.0882***	
	(0.00852)	
$\ldots ManufHighHit_i$		-0.0854***
		(0.0162)
$\ldots ManufLowHit_i$		-0.0881***
		(0.0134)
$\ldots Services_i$		-0.0902***
		(0.0122)
Bank controls	✓	✓
Firm-time F.E.	✓	✓
Firm-bank F.E.	✓	✓
Observations	3499092	3499092
Adjusted R-squared	0.840	0.840

Note: 2SLS specifications (5) and (6) with observations weighted by the log-employment of firms. Bank controls include bank characteristics pre-2000 interacted with a post-2001 dummy, namely, log-assets, share of NPLs, core-funding ratio, the capital ratio, and bank specialization. All regressions include firm-year fixed effects and firm-bank dummies. Standard errors are clustered at the bank-sector level. ***significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table A.5: Baseline with first differences

Dep. Variable: $\Delta \ln C_{ib}$	First difference	
	(1)	(2)
$Exposure^{IT}_{-i,b} \times \ldots$	-0.0652***	
	(0.00702)	
$\ldots ManufHighHit_i$		-0.0594***
		(0.0139)
$\ldots ManufLowHit_i$		-0.0837***
		(0.0128)
$\ldots Services_i$		-0.0573***
		(0.0095)
Bank controls	✓	✓
Firm F.E.	✓	✓
Observations	330874	330874
Adjusted R-squared	0.197	0.197

Note: 2SLS of a first-difference transformation of specifications (5) and (6). The dependent variable is the change in the log of outstanding credit between bank b and firm i between the average of 1998-2001 and that of 2002-2007. Standard errors are clustered at the bank-sector level. ***significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table A.6: Baseline with shift-share clustering

Dep Var: $\ln C_{ibt}$	Full sample (1)	High-Hit (2)	Low-Hit (3)	Services (4)
$Exposure_b^{IT} \times Post_t$	-0.0740***	-0.0768***	-0.0767***	-0.0593***
	(0.0181)	(0.0256)	(0.0254)	(0.0160)
Observations	5220	5220	5220	5220
Adjusted R-squared	0.836	0.836	0.836	0.836

Note: Shift-share 2SLS coefficients from equivalent industry-level regressions (as in Borusyak et al., 2021). Standard errors allow for clustering at the 4-digit-sector level, and are valid in the framework of Adão et al. (2019). Differently from baseline estimates, bank exposure is computed without leaving out firm i from credit weights. Outcome and treatment residuals are obtained from specifications that include bank characteristics pre-2000 interacted with a post-2001 dummy (log-assets, share of NPLs, core-funding ratio, capital ratio, and specialization), firm-year fixed effects, and firm-bank dummies. ***significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table A.7: Baseline with heterogeneous effects: Quartiles

Dep. Variable: $\ln C_{ibt}$	$Exposure^{IT}_{-i,b} \times Post_t \times \ldots$		
	$\times Hit_q$	$\times LowHit\ TFP_q$	$\times LowHit\ CompAdv_q$
	(1)	(2)	(3)
$Q1$	-0.0837***	-0.104***	-0.110***
	(0.0143)	(0.0215)	(0.0356)
$Q2$	-0.0761***	-0.0877***	-0.128***
	(0.0149)	(0.0208)	(0.0293)
$Q3$	-0.0617***	-0.120***	-0.0555***
	(0.0174)	(0.0232)	(0.0182)
$Q4$	-0.0790***	-0.0656***	-0.104***
	(0.0196)	(0.0235)	(0.0209)
Bank controls	✓	✓	✓
Firm-time F.E.	✓	✓	✓
Firm-bank F.E.	✓	✓	✓
Observations	3499092	1315718	1720591
Adjusted R-squared	0.832	0.831	0.836

Note: 2SLS specifications (6) with interactions with quartile dummies in terms of firm exposure as defined in equation 1 (column 1), as well as TFP and comparative advantage within low-hit sectors (columns 2 and 3). Bank controls include bank characteristics pre-2000 interacted with a post-2001 dummy, namely, log-assets, share of NPLs, core-funding ratio, capital ratio, and bank specialization. All regressions include firm-year fixed effects and firm-bank dummies. Standard errors are clustered at the bank-sector level. ***significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table A.8: Loan applications

Dep. Variable: $\ln Applications_{i\tau}$	Applications to all banks (1)	Applications to less exposed banks (2)	Applications to more exposed banks (3)
$FirmLevelExposure_i \times Post_\tau$	-0.00907	0.109***	-0.0300**
	(0.0118)	(0.0175)	(0.0129)
Firm F.E.	✓	✓	✓
Period F.E.	✓	✓	✓
Observations	276988	88972	250594
Adj. R^2	0.419	0.289	0.377

Note: Loan applications come from the so-called "*richiesta di prima informazione*," which is an enquiry that a bank makes to the Bank of Italy to obtain information on the credit position of potential borrowers. These enquiries can be made by a bank only after it receives a formal application and if the applicant is a new client (not currently borrowing from the bank). Hence, it can be used a proxy for loan applications. An important caveat is that we cannot account for applications that are rejected without going through the "*richiesta di prima informazione*" or rejections resulting from preliminary discussions between firms and banks (i.e., without a formal application being made). With these caveats in mind, the table shows the results of the following 2SLS regression: $\ln Applications_{i\tau} = \beta_1\ Firm\ Level\ Exposure_i \times Post_\tau + \gamma_i + \delta_\tau + \epsilon_{i\tau}$, where we use our usual instrument. Firm-level exposure is defined in equation (8), and γ_i and δ_τ are firm and period fixed effects, respectively. We run this regression for the full sample of firms and banks (column 1) and then splitting loan applications between low- and high-exposed banks (column 2 and 3). Note the sum of observations in column (2) and (3) is higher than the observations in column (1) because firms can apply to banks in both groups. Standard errors are clustered at the firm level. ***significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table A.9: Baseline: Additional dimensions of heterogeneity

Dependent Variable:	$\ln C_{ibt}$		
	(1)	(2)	(3)
$Exposure^{IT}_{-i,b} \times Post_t \times \ldots$			
$\ldots \times CompAdv\ LowHit_i$	-0.0783***		
	(0.0140)		
$\ldots \times CompAdv\ HighHit_i$	-0.0784***		
	(0.0144)		
$\ldots \times NonCompAdv_i$	-0.0961***		
	(0.0174)		
$\ldots \times HighProd\ LowHit_i$		-0.0866***	
		(0.0178)	
$\ldots \times HighProd\ HighHit_i$		-0.0667***	
		(0.0211)	
$\ldots \times LowProd_i$		-0.0847***	
		(0.00937)	
$\ldots \times Downstream\ LowHit_i$			-0.0870***
			(0.0304)
$\ldots \times NonDownstream\ LowHit_i$			-0.0892***
			(0.0114)
$\ldots \times HighHit_i$			-0.073***
			(0.0114)
Bank controls	✓	✓	✓
Firm-time F.E.	✓	✓	✓
Firm-bank F.E.	✓	✓	✓
Observations	1754920	1907568	1923473
Adj. R^2	0.831	0.829	0.830

Note: The table reports the results of specification (6). $Exposure^{IT}_{-i,b}$ defined in equation (1) is instrumented with (3). The estimation is based on manufacturing low-hit sectors with export comparative advantages, high-productivity, and downstream relative to the high-hit sectors. Standard errors are clustered at the bank-sector level. ***significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table A.10: Firm-level outcomes: Additional dimensions of heterogeneity

Dependent Variable	$\ln Empl_{it}$ (1)	$\ln Inv_{it}$ (2)	$\ln Rev_{it}$ (3)
Independent Variable: $FirmLevelExposure_i \times Post_t$			
a. Comparative Adv. Low-Hit	-0.0566***	-0.0515**	-0.0512***
	(0.0167)	(0.0238)	(0.0183)
b. High productivity Low-Hit	-0.119***	-0.141***	-0.153***
	(0.0130)	(0.0180)	(0.0150)
c. Downstream Low-Hit	-0.0725***	-0.0517**	-0.0586***
	(0.0182)	(0.0253)	(0.0212)
Firm F.E.	✓	✓	✓
Sector-time F.E.	✓	✓	✓
Bank Controls	✓	✓	✓

Note: The table reports the results of specification (9). The explanatory variable $FirmLevelExposure_i$, defined in equation (8), instrumented using $Exposure^{OC}_{(-i),b}$. The dependent variable is (log of) employment in column (1), investment in (2), revenues in (3). The estimation is based on low-hit manufacturing sectors with export comparative advantages (row a), high-productivity (row b), and downstream relative to the high-hit sectors. Standard errors are clustered at the sector-main-bank level. ***significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table A.11: Baseline: Geographical heterogeneity

Dependent variable:	$\ln C_{ibt}$	
	coeff	std
Characteristic of firm's province		
a) Innovation (patents per person)		
High innovation	-0.0903***	(0.00816)
Low innovation	-0.0605***	(0.00891)
b) Education (share adults with high-school)		
High skilled	-0.0843***	(0.00799)
Low skilled	-0.0638***	(0.00889)
c) Industrial diversification (HHI)		
High diversification	-0.0824***	(0.00809)
Low diversification	-0.0674***	(0.00951)

Note: Baseline specification (5), splitting the sample of provinces above or below the median in terms of (i) the number of patents registered at the European Patent Office per 100,000 persons ISTAT, (ii) the share of adults with at least a high-school degree ISTAT, Census (2001), and (iii) industrial diversification defined according to a Herfindahl-Hirschman index on revenues, with data from CERVED (1998-2007). The source for each of these variables is Italy's National Statistical Institute. Bank controls include bank characteristics pre-2001 interacted with a post-2001 dummy, namely, log-assets, share of NPLs, core-funding ratio, capital ratio, and bank-firm specialization. All regressions include firm-year fixed effects and firm-bank dummies. Standard errors are clustered at the sector-bank level. ***significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table A.12: Robustness: Effect on firms' outcomes (2SLS)

	$\ln C_{it}$		$\ln Emp_{it}$		$\ln Inv_{it}$		$\ln Rev_{it}$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$FirmExp_i \times Post_t$	-0.0559***		-0.0460***		-0.0629***		-0.0649***	
	(0.0108)		(0.0131)		(0.0180)		(0.0133)	
$FirmExp_i \times Post_t \times HighHit_i$		-0.0683***		-0.0937***		-0.108***		-0.112***
		(0.0141)		(0.0172)		(0.0231)		(0.0179)
$FirmExp_i \times Post_t \times LowHit_i$		-0.0589***		-0.0535***		-0.0526**		-0.0479**
		(0.0126)		(0.0151)		(0.0211)		(0.0163)
$FirmExp_i \times Post_t \times Services_i$		-0.0481***		-0.0257*		-0.0484**		-0.0533***
		(0.0114)		(0.0141)		(0.0195)		(0.0139)
Firm F.E.	✓	✓	✓	✓	✓	✓	✓	✓
Sector-time F.E.	✓	✓	✓	✓	✓	✓	✓	✓
Bank Controls	✓	✓	✓	✓	✓	✓	✓	✓
Firm-time F.E. from (5)	✓	✓	✓	✓	✓	✓	✓	✓
Observations	793968	793968	793968	793968	793968	793968	793968	793968
Adj. R^2	0.953	0.953	0.923	0.923	0.922	0.922	0.919	0.919

Note: The table reports the coefficients of the specification in equation (9). The dependent variable is the log of total outstanding credit of firm i in year t in columns (1)-(2), log of employment in (3)-(4), log of investment in (5)-(6) and log of revenues in (7)-(8). $FirmExp_i$ is defined in equation (8), instrumented using $Exposure^{OC}_{(-i),b}$. In addition to firm FE, sector-time FE, and a vector of weighted average lender characteristics pre-2000 (log-assets, share of NPLs, core-funding ratio, and the capital ratio), this specification also includes the firm-time FE estimated in equation 5. Standard errors are clustered at the sector-main-bank level. ***significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table A.13: Robustness: Real effects on firms (2SLS)

Dependent Variable	$\ln Empl_{it}$ (1)	$\ln Inv_{it}$ (2)	$\ln Rev_{it}$ (3)
Independent Variable	$FirmLevelExposure_i \times Post_t$		
a. Full sample	-0.0489***	-0.0706***	-0.0679***
	(0.0177)	(0.0260)	(0.0184)
b. High-Hit manuf.	-0.0930***	-0.107***	-0.101***
	(0.0213)	(0.0287)	(0.0218)
c. Low-Hit manuf.	-0.0623***	-0.0658**	-0.0610***
	(0.0188)	(0.0277)	(0.0199)
d. Services	-0.0306*	-0.0628**	-0.0592***
	(0.0184)	(0.0275)	(0.0189)
e. Comp. Adv. Low-Hit	-0.0468***	-0.0321	-0.0379**
	(0.0187)	(0.0271)	(0.0193)
f. High Prod. Low-Hit	-0.120***	-0.118***	-0.121***
	(0.0133)	(0.0187)	(0.0138)
g. Downstream Low-Hit	-0.0760***	-0.0598**	-0.0630***
	(0.0215)	(0.0305)	(0.0228)
Firm F.E.	✓	✓	✓
Sector-province-time F.E.	✓	✓	✓
Bank Controls	✓	✓	✓

Note: The table reports the results of specification (9). The explanatory variable $FirmLevelExposure_i$, defined in equation (8), captures the weighted average of the exposure of banks a firm was borrowing from; it is instrumented using $Exposure^{OC}_{(-i),b}$. The dependent variable is (log of) employment in column (1), investment in 2, revenues in 3. The estimation is based on the full sample of firms (row a), decomposition of the full sample in low-hit and high-hit manufacturing sectors, and services (rows b, c, d), and within manufacturing low-hit sectors, firms in sectors with export comparative advantages (row e), high-productivity (row f), and downstream relative to the high-hit sectors. All regressions include firm FE, sector-province-time FE, and a vector of weighted average lender characteristics pre-2000 (log-assets, share of NPLs, core-funding ratio, and capital ratio). Standard errors are clustered at the sector-main-bank level. ***significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

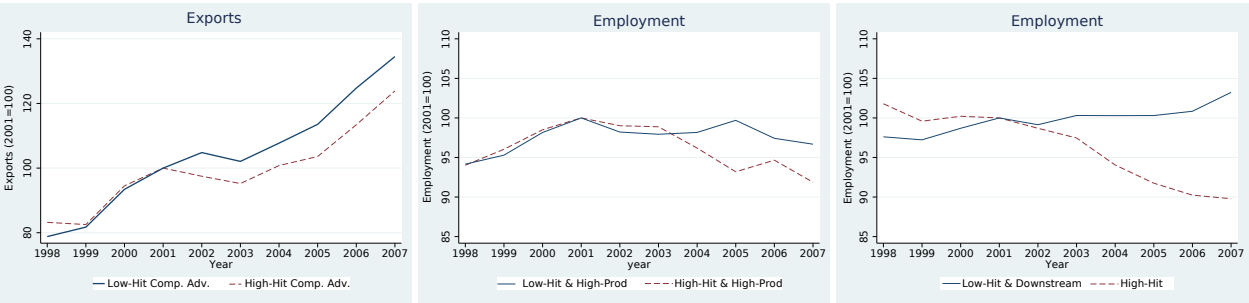
Table A.14: Effect on firms' outcomes (2SLS) - First differences

	$\ln C_{it}$		$\ln Emp_{it}$		$\ln Inv_{it}$		$\ln Rev_{it}$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$FirmExp_i$	-0.0467***		-0.0377***		-0.0572***		-0.0549**	
	(0.0127)		(0.0125)		(0.0169)		(0.0126)	
$FirmExp_i \times HighHit_i$		-0.0590***		-0.0831***		-0.0951***		-0.0883***
		(0.0198)		(0.0207)		(0.0273)		(0.0216)
$FirmExp_i \times LowHit_i$		-0.0557***		-0.0602***		-0.0342***		-0.0388**
		(0.0183)		(0.0182)		(0.0245)		(0.0195)
$FirmExp_i \times Services_i$		-0.0339**		-0.0101		-0.0494**		-0.0466***
		(0.0158)		(0.0157)		(0.0212)		(0.0152)
Sector F.E.	✓	✓	✓	✓	✓	✓	✓	✓
Bank controls	✓	✓	✓	✓	✓	✓	✓	✓
Observations	99382	99382	99382	99382	99382	99382	99382	99382
Adj. R^2	0.031	0.031	0.026	0.026	0.032	0.032	0.041	0.041

Note: The table reports the results of a first-difference transformation of specification (9). The dependent variable is the change in the log of total outstanding credit of firm i between the average of 1998-2001 and that of 2002-2007 in columns (1)-(2), log of employment in (3)-(4), log of investment in (5)-(6) and log of revenues in (7)-(8). $FirmExp_i$ is defined in equation(8), instrumented using $Exposure^{OC}_{(-i),b}$ in (8). All regressions include sector FE and a vector of weighted average lender characteristics pre-2000 (log-assets, share of NPLs, core-funding ratio, and capital ratio). Standard errors are clustered at the sector-main-bank level. ***significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Figure A.1: Exports and employment by groups of firms

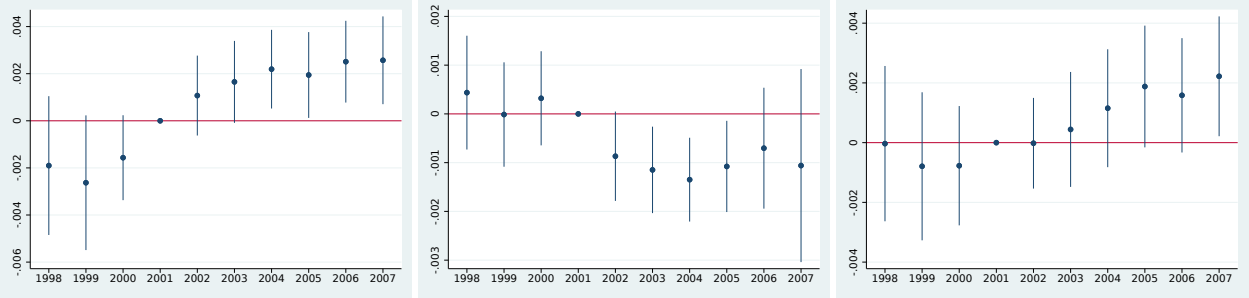
(a) Comparative advantage (b) Productivity (c) Downstream



Note: Panel (a) shows the evolution of exports for firms in sectors with comparative advantage before China's entrance into the WTO (defined through a Balassa index), distinguishing between those that are low- and high-hit sectors by import competition from China (2001=100). Panel (b) shows the evolution of employment for high-productivity firms distinguishing between those that are low- and high-hit sectors by import competition from China. Panel (c) shows the evolution of employment for low-hit firms in downstream sectors relative to high-hit firms. Data on exports from panel A are from **?** and data on employment for panel B and C are from Eurostat, Structural Business Statistics

Figure A.2: Dynamic diff-in-diffs (95% CI) on banks' balance sheet

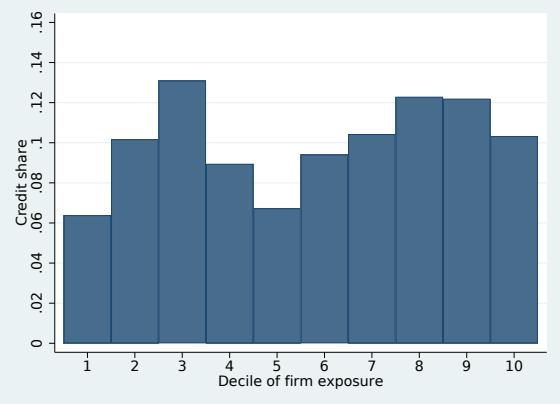
(a) NPLs (b) Tier 1 (c) Provisions



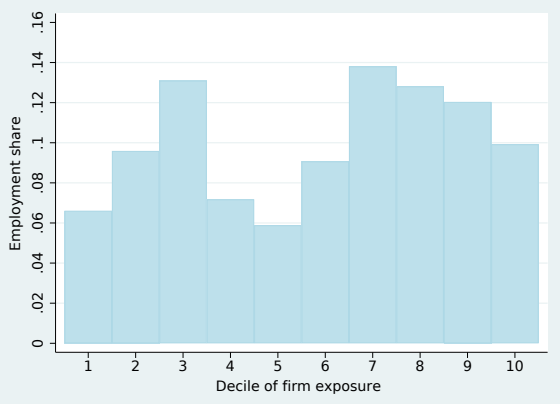
Note: The figure reports the coefficients, with 95% confidence interval of the variable $Exposure_b^{IT}$, instrumented with the variable $Exposure_{i,b}^{OC}$, coming from the dynamic diff-in-diffs regression of specification (11).

Figure A.3: Firm-level exposure, credit, and employment shares by decile

(a) Credit share

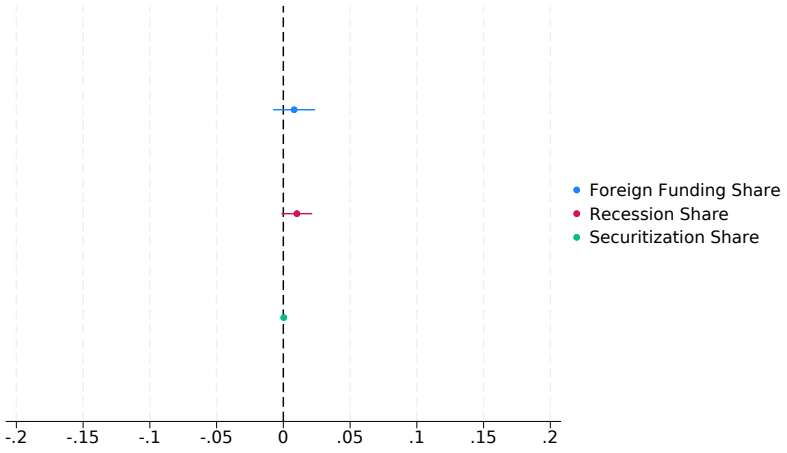


(b) Employment share



Note: This figure reports the credit and employment shares by deciles of firm exposure as defined in equation (8)

Figure A.4: Balancing test on additional bank characteristics



Note: This figure reports the results of regressions on the (non-leave-out version of the) shift-share instrument of bank shares related to three additional bank characteristics: (a) share of foreign liabilities in the 1998-2001 period as a measure of banks' exposure to capital inflows (following Cingano and Hassan (2022)); (b) share of loans to sectors that experienced a decrease in revenues in the 2002-2003 relative to 2000-2001 periods as a measure of pro-cyclicality of loan portfolio; (c) share of securitized lending by banks in the years 1998-2000. Following Borusyak et al. (2021), the regressions are implemented at the shock level to obtain exposure-robust standard errors.

A.1 OLS Bias

We are interested in the following model of supply-induced variation in bank credit:

$$\ln C_{ibt} = \alpha_{ib} + \alpha_{it} + \beta\, IM^S_{bt} + \epsilon_{bit},$$

where IM^S_{bt} corresponds to shocks to bank b derived from the increase of imports supply from China into Italy across sectors (weighted by bank-b's portfolio shares in each sector).

We do not observe IM^S_{bt}. Instead, we observe total change in imports from China into Italy, which is driven by supply and demand factors:

$$IM_{bt} = IM^D_{bt} + IM^S_{bt}$$

The OLS regression estimates β_{OLS} using IM_{bt} as the explanatory variable:

$$\ln C_{ibt} = \alpha_{ib} + \alpha_{it} + \beta_{OLS}\, IM_{bt} + \epsilon_{bit}.$$

The OLS estimate is therefore a weighted average of our coefficient of interest (i.e., the effect of the *supply-driven* rise in imports) and the effect of demand-driven factors:

$$\beta_{OLS} = \beta_{IV} \frac{\sigma^2_S}{\sigma^2_S + \sigma^2_D} + \beta_D \frac{\sigma^2_D}{\sigma^2_S + \sigma^2_D},$$

where the weights depend on σ^2_S and σ^2_D, which correspond to the volatility of the supply and demand factors in overall import volatility.

We use IM^{OC}_{bt} (i.e., bank exposure computed using imports from China by other countries) as an instrument for IM^S_{bt}. The instrument IM^{OC}_{bt} is itself given by supply and demand factors in other countries. Our assumption is that demand factors in other countries (e.g., Australia, Japan, New Zealand, and the US) are not correlated with demand factors in Italy. From Table 2 we get: $\beta_{OLS} = -0.068$ and $\beta_{IV} = -0.074$.

In the extreme case in which IM^{OC}_{bt} captures *all* supply-driven forces of Italian imports from China, the residual of the first stage in Table 2 would be driven by demand-side forces. We therefore use this residual to instrument for demand-driven changes in

imports, IM_{bt}^{D}, in our baseline regression. Under this assumption, the estimated $\beta_D = -0.062$ captures the effect of bank exposure to cross-sectoral demand-driven changes in imports from China. In this case, the implied supply-driven volatility would account for around 50% of the total cross-sector volatility of imports from China into Italy (weighted by the bank's portfolio shares), which is similar to the estimates of Autor et al. (2013).

However, this estimate represents a lower-bound, because we do not expect our instrument to capture all supply-driven imports. So, in the other extreme case in which the increase in imports from China is (in expectation) supply driven, although not entirely captured by our instrument, the coefficient β_D would be zero. The difference between the OLS and IV estimates would then be given by the classic attenuation bias. In this upper-bound case, our instrument IM_{bt}^{OC} would be capturing around 90% of the total cross-sector volatility of imports from China into Italy (weighted by bank's portfolio shares).

Overall, we conclude our instrument is capturing at least half, and up to 90%, of the volatility of bank exposure to import from China. The volatility of bank exposure to import from China is therefore mostly driven by the irruption of China into world markets and not by Italian changes in demand for imports.

A.2 Aggregate Effects

In subsection 4.2, we present the additive effect of the lending channel on credit and employment. This is a *partial-equilibrium aggregation* similar to the one in Chodorow-Reich (2014). It relies on two main caveats.

First, all the results are relative to the firms in the bottom decile of the distribution of firm-level exposure as defined in (8). This procedure is equivalent to assuming these firms did not suffer changes in their access to credit in 2002-2007.

Second, we do not incorporate general-equilibrium effects; the results shown in subsection 4.2 correspond to the sum of the direct effects of the lending-channel on credit and employment across all firms above the 10-percentile. Intuitively, the computation here corresponds to the *shift* of the curve (demand shift in the case of employment, sup-

ply shift in the case of firm credit) and not the resulting equilibrium quantities.

We define the counterfactual growth rate g^Y of outcome Y ($\Delta \ln Y$) for firms in the bottom 10% of exposure distribution:

$$g^Y = \alpha^Y + \beta^Y E[Exposure_i | Exposure_i < Exposure_{P10}].$$

Let $\overline{X} \equiv E[Exposure_i | Exposure_i < Exposure_{P10}]$. Then, for all firms with $Exposure_i > Exposure_{P10}$, the effect of the lending channel, relative to this group of firms, is

$$\begin{aligned} \ln Y_{iPost} - \ln Y_{iPre} &= \alpha^Y + \beta^Y Exposure_i \\ &= g^Y + \beta^Y \ (Exposure_i - \overline{X}). \end{aligned}$$

Given our definition of *partial-equilibrium aggregate*, the percentage change in aggregate output $Y = \sum_i Y_i$ is the weighted sum of growth rates across all firms in the economy: $\Delta \ln Y = \sum_i \Delta \ln Y_i \omega_i^Y$, where ω_i^Y is firm-i's share of output Y. Then,

$$\Delta \ln Y = g^Y + \beta^Y \sum_i (Exposure_i - \overline{X}) \cdot \omega_i^Y.$$

We perform a change in variables. Let $\omega^Y(x)$ be the share of output Y by all firms i with $Exposure_i = x$ (the shares of credit and employment by firm exposure are shown in Figure A.3). Then,

$$\Delta \ln Y = g^Y + \beta^Y \sum_x (x - \overline{X}) \cdot \omega^Y(x).$$

The first term corresponds to the counterfactual growth rate if all firms grew at the rate of the benchmark firms. The second effect corresponds to the deviation implied by the lending-channel effect.

Notice our counterfactual is not meant to capture a scenario without the China shock. It captures the effect of the China shock absent the endogenous contraction in credit supply. In other words, it isolates the role of the lending-channel: how banks amplified the original shock to firms already hit by import competition, and how they transmitted it to expanding sectors.

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