Special Economic Zones and Firm Performance: Evidence from Vietnam

Thao Trang Nguyen* Karsten Mau† Tania Treibich†

*UNU-Merit
†Maastricht University, SBE

PIER Economic Seminar
Bank of Thailand, Bangkok

15 May 2025

Introduction

Industrial upgrading part of economic development process (Verhoogen, 2023)

- Typically through the adoption of existing knowledge and technologies; attraction of FDI and MNE activity central policy tool

Place-based policies increasingly popular in DCs and EMs

- Examples: Industrial parks, export processing zones, border-economic zones; summarized as Special Economic Zones (SEZs)
- Attract foreign firms through tax-incentives and infrastructure/administrative services
- Stimulate economic activity, agglomeration and eventually upgrading

Introduction

Industrial upgrading part of economic development process (Verhoogen, 2023)

- Typically through the adoption of existing knowledge and technologies; attraction of FDI and MNE activity central policy tool

Place-based policies increasingly popular in DCs and EMs

- Examples: Industrial parks, export processing zones, border-economic zones; summarized as Special Economic Zones (SEZs)
- Attract foreign firms through tax-incentives and infrastructure/administrative services
- Stimulate economic activity, agglomeration and eventually upgrading

Effectiveness debated and empirical evidence scarce/inconclusive

- Complicated mechanisms at play: learning from customers' preferences; worker mobility between local and foreign firms; process innovations; access to better inputs
- Data limitations make disentangling of channels challenging

This paper

Focus on SEZs in Vietnam and firm performance during 2007-2019

- Evaluate impact on local firms that operate either inside or nearby SEZs
- Document heterogeneous adjustments across firms
- Improve understanding of underlying mechanisms

This paper

Focus on SEZs in Vietnam and firm performance during 2007-2019

- Evaluate impact on local firms that operate either inside or nearby SEZs
- Document heterogeneous adjustments across firms
- Improve understanding of underlying mechanisms

Data and methods

- Construct firm-level panel with geo-coded location information; match with location of SEZs and timing of their operations
- Staggered diff-in-diff with FEs to evaluate causal impact on performance of firms inside and nearby SEZs

This paper

Focus on SEZs in Vietnam and firm performance during 2007-2019

- Evaluate impact on local firms that operate either inside or nearby SEZs
- Document heterogeneous adjustments across firms
- Improve understanding of underlying mechanisms

Data and methods

- Construct firm-level panel with geo-coded location information; match with location of SEZs and timing of their operations
- Staggered diff-in-diff with FEs to evaluate causal impact on performance of firms inside and nearby SEZs

Main findings

- Overall, positive impact on firms' employment, sales, and value-added per worker
- Significant positive spillovers on (local) firms located nearby SEZs
- Heterogeneous effects across firms based on size and ownership
- Mechanisms: some evidence that financial constraints, buyer-supplier linkages and technological distance matter

Related literature

Economic development effects of place-based policies; focus on SEZs

- Similar, but typically more aggregated: Wang (2013); Alkon (2018); Lu et al. (2019); Nguyen and Tien (2021); Galle et al. (2023); Brussevich (2024)
- Almost no firm-level studies: Görg and Mulyukova (2024)

→ *We present first firm-level study for Vietnam, a rapidly transforming economy*

Related literature

Economic development effects of place-based policies; focus on SEZs

- Similar, but typically more aggregated: Wang (2013); Alkon (2018); Lu et al. (2019); Nguyen and Tien (2021); Galle et al. (2023); Brussevich (2024)
- Almost no firm-level studies: Görg and Mulyukova (2024)

→ *We present first firm-level study for Vietnam, a rapidly transforming economy*

Supply-chain linkages and industrial upgrading

- Mostly focus on FDI in Europe: Javorcik, (2004); Ciani and Imbruno, (2017); Bajgar and Javorcik, (2020)
- or MNEs in LatAm: Alfaro-Urena et al., (2022)

→ *We observe firms' granular location and industry affiliation which supports empirical identification*

Related literature

Economic development effects of place-based policies; focus on SEZs

- Similar, but typically more aggregated: Wang (2013); Alkon (2018); Lu et al. (2019); Nguyen and Tien (2021); Galle et al. (2023); Brussevich (2024)
- Almost no firm-level studies: Görg and Mulyukova (2024)

→ *We present first firm-level study for Vietnam, a rapidly transforming economy*

Supply-chain linkages and industrial upgrading

- Mostly focus on FDI in Europe: Javorcik, (2004); Ciani and Imbruno, (2017); Bajgar and Javorcik, (2020)
- or MNEs in LatAm: Alfaro-Urena et al., (2022)

→ *We observe firms' granular location and industry affiliation which supports empirical identification*

Economic development in Vietnam

- Structural employment dynamics following trade liberalization: McCaig and Pavcnik (2018); McCaig et al. (2022); Sakakibara (2023)
- US-China disputes and trade diversion: Rotunno et al., (2023); Mayr-Dorn et al. (2023); Utar et al., (2023)

→ *Complementary to Tafese et al. (2025) on sectoral employment and (in)formal labor in SEZ regions*

Outline

Outline

Special Economic Zones in Vietnam

Special Economic Zones (SEZs): geographically confined areas in which firms can enjoy fiscal benefits and preferential access to infrastructure and/or administrative services

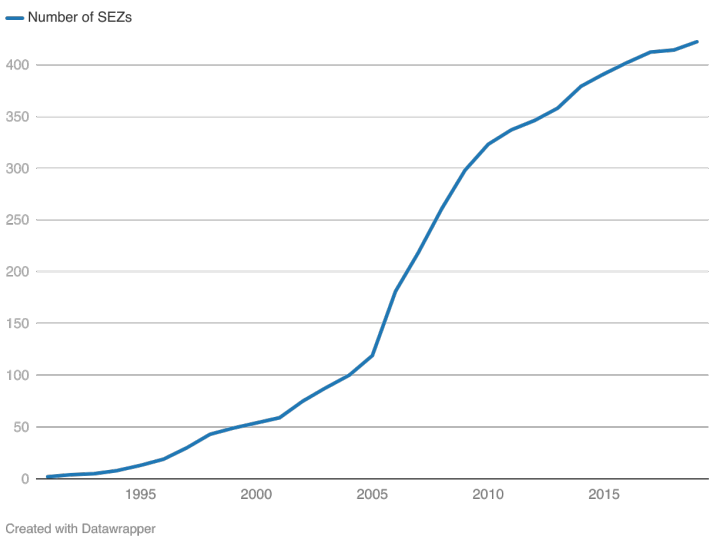
- Vietnam starts in 1991 with *Political Report of the 7th Congress* (5-year plan)
- First export processing zones and industrial parks, mainly in Hanoi and Ho Chi Minh City
- 1994: *Law on Domestic Investment Promotion*; 1992 and 1996: amendments to *Foreign Investment Law of 1987*

Special Economic Zones in Vietnam

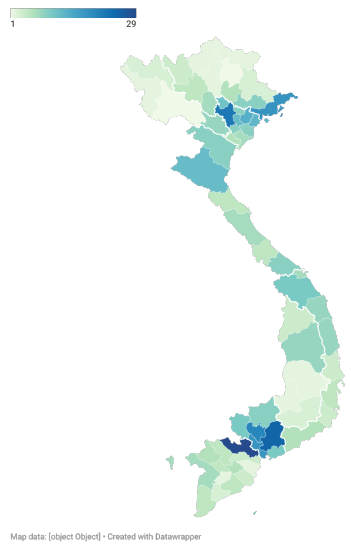
Special Economic Zones (SEZs): geographically confined areas in which firms can enjoy fiscal benefits and preferential access to infrastructure and/or administrative services

- Vietnam starts in 1991 with *Political Report of the 7th Congress* (5-year plan)
- First export processing zones and industrial parks, mainly in Hanoi and Ho Chi Minh City
- 1994: *Law on Domestic Investment Promotion*; 1992 and 1996: amendments to *Foreign Investment Law of 1987*

Total number of SEZs, 1991-2019



Spatial concentration of SEZs, 2019



Note: **Authors' calculations based on data from the Ministry of Foreign Investment and Planning of Vietnam, 2022.**

Special Economic Zones in Vietnam

Vietnam established 422 SEZs between 1991-2019 in 61 out of 63 provinces

- Different policy designs, depending on type of SEZs (industrial parks, processing zones, border economic zones, high-tech zones etc.)
- Benefits often to foreign firms: tax deductions, customs exemptions, land-rent exemptions; better access to loans; fiscal benefits also for employees

Special Economic Zones in Vietnam

Vietnam established 422 SEZs between 1991-2019 in 61 out of 63 provinces

- Different policy designs, depending on type of SEZs (industrial parks, processing zones, border economic zones, high-tech zones etc.)
- Benefits often to foreign firms: tax deductions, customs exemptions, land-rent exemptions; better access to loans; fiscal benefits also for employees

SEZs in other countries

- **High-income (USA)**: similar incentives, but mainly aimed at reducing regional inequalities (Neumark and Simpson, 2015)
- **China**: very similar to Vietnam (centrally planned, state-led land acquisition); SEZs often used as "test laboratories" for different policies; easier to control and evaluate than broader FDI liberalization (Lu et al., 2019)
- **India**: same objectives, but different approach and less effective; more decentralized administration and effectively license-based; private land-acquisition (if any); rent-seeking behavior (Görg and Mulyukova, 2023)

Special Economic Zones in Vietnam

Aim: attract FDI, boost economic growth and structural transformation

- Learning from foreign firms through observations, buyer-supplier relationships
- Fiscal and infrastructure benefits for firms inside (but not outside SEZs)
- Potentially competitive effects in product and labor markets

Table 1: Industry structure within SEZs vs. the rest of Vietnam, 2019

	(1)	(2)	(3)	(4)
	% of Firms		% Foreign Firms	
Sector	SEZs	Rest of VNM	SEZs	Rest of VNM
Agriculture, Forestry, and Fishing	0.73	2.33	0.06	0.02
Mining and Quarrying	0.73	0.65	0.07	0.004
Manufacturing, total	65.09	14.59	37.29	1.09
Within manufacturing (%)				
Food, Beverages, and Tobacco	*9.9*	*13.0*	*5.5*	*3.7*
Textiles, Apparel, and Leather	*15.6*	*16.3*	*18.8*	*19.3*
Wood and Wood Products	*10.0*	*19.2*	*5.8*	*4.6*
Coke, Rubber, and Chemicals	*19.3*	*11.3*	*19.6*	*9.2*
Metals	*17.3*	*20.2*	*16.0*	*5.5*
Machinery	*27.9*	*20.0*	*34.4*	*15.6*
Services	27.67	68.33	2.86	1.31
Others	5.78	14.1	0.49	0.12
All	100	100	25.09	1.07

Note: **Author's calculations based on data from VES**

Location and operational status of SEZs

1. Manually collect information on SEZs at *commune*-level, 1991-2019
   - Annual reports by *Ministry of Foreign Investment and Planning of Vietnam*
   - Government laws and regulations and additional news sources
   - *Commues* denote third layer in in Vietnam's adminisrative division: Provinces $\rightarrow$ Districts $\rightarrow$ Wards/Communes $\rightarrow$ Villages

Location and operational status of SEZs

1. Manually collect information on SEZs at *commune*-level, 1991-2019
   - Annual reports by *Ministry of Foreign Investment and Planning of Vietnam*
   - Government laws and regulations and additional news sources
   - *Commues* denote third layer in in Vietnam's adminisrative division: Provinces $\rightarrow$ Districts $\rightarrow$ Wards/Communes $\rightarrow$ Villages

2. Confirm operational status and date of establishment: two-step process

2.1. Imagery inspection via Google Earth History; similar to Tafese et al. (2025)
   - Manually reviewed historical satellite images, search for infrastructure development
   - First year with visible buildings, roads, or industrial facilities determines start of operations

Location and operational status of SEZs

1. Manually collect information on SEZs at *commune*-level, 1991-2019
   - Annual reports by *Ministry of Foreign Investment and Planning of Vietnam*
   - Government laws and regulations and additional news sources
   - *Commues* denote third layer in in Vietnam's adminisrative division: Provinces $\rightarrow$ Districts $\rightarrow$ Wards/Communes $\rightarrow$ Villages

2. Confirm operational status and date of establishment: two-step process

2.1. Imagery inspection via Google Earth History; similar to Tafese et al. (2025)
   - Manually reviewed historical satellite images, search for infrastructure development
   - First year with visible buildings, roads, or industrial facilities determines start of operations

2.2. Consult official government records and publications
   - Whenever satellite data incomplete or unavailable (esp. in early years)
   - Rely on official government designations, land allocation, and SEZ approval documents

Location and operational status of SEZs

1. Manually collect information on SEZs at *commune*-level, 1991-2019
   - Annual reports by *Ministry of Foreign Investment and Planning of Vietnam*
   - Government laws and regulations and additional news sources
   - *Commues* denote third layer in in Vietnam's adminisrative division: Provinces $\rightarrow$ Districts $\rightarrow$ Wards/Communes $\rightarrow$ Villages

2. Confirm operational status and date of establishment: two-step process

2.1. Imagery inspection via Google Earth History; similar to Tafese et al. (2025)
   - Manually reviewed historical satellite images, search for infrastructure development
   - First year with visible buildings, roads, or industrial facilities determines start of operations

2.2. Consult official government records and publications
   - Whenever satellite data incomplete or unavailable (esp. in early years)
   - Rely on official government designations, land allocation, and SEZ approval documents

Overall, about 300 SEZs in our sample; number of canceled SEZs much smaller
   - Some *communes* have several SEZs, especially in/around larger cities

Firms level data and location

Annual enterprise survey (VES) conducted by the General Statistics Office (GSO) of Vietnam, 2007-2019

- All enterprises in Vietnam with at least 10 employees (yet many report < 10
- Info on **firm type**, (state-owned, foreign, private domestic), **industry** (5-digit VSIC codes), **tax-ID** (enables following firms over time), **address** information (in most years)
- **Residence inside** SEZ is self reported; can be inferred/confirmed with address

Firms level data and location

Annual enterprise survey (VES) conducted by the General Statistics Office (GSO) of Vietnam, 2007-2019

- All enterprises in Vietnam with at least 10 employees (yet many report < 10
- Info on **firm type**, (state-owned, foreign, private domestic), **industry** (5-digit VSIC codes), **tax-ID** (enables following firms over time), **address** information (in most years)
- **Residence inside** SEZ is self reported; can be inferred/confirmed with address

Obtain firm-level panel that includes info on location inside or outside of SEZs, within the same or neighboring commune

Firms level data and location

Annual enterprise survey (VES) conducted by the General Statistics Office (GSO) of Vietnam, 2007-2019

- All enterprises in Vietnam with at least 10 employees (yet many report < 10
- Info on **firm type**, (state-owned, foreign, private domestic), **industry** (5-digit VSIC codes), **tax-ID** (enables following firms over time), **address** information (in most years)
- **Residence inside** SEZ is self reported; can be inferred/confirmed with address

Obtain firm-level panel that includes info on location inside or outside of SEZs, within the same or neighboring commune

Based on the above, firms can be exposed to SEZs in three ways

1. **Direct treatment**: a firm from commune c is found inside of an SEZ in that same commune, after it became operational
2. **Indirect treatment**: a firm from commune c remains outside of an SEZ in that same commune, after it became operational
3. **No treatment**: a firm in commune c' is neither exposed to direct nor indirect treatment

Firms level data and location

Annual enterprise survey (VES) conducted by the General Statistics Office (GSO) of Vietnam, 2007-2019

- All enterprises in Vietnam with at least 10 employees (yet many report < 10
- Info on **firm type**, (state-owned, foreign, private domestic), **industry** (5-digit VSIC codes), **tax-ID** (enables following firms over time), **address** information (in most years)
- **Residence inside** SEZ is self reported; can be inferred/confirmed with address

Obtain firm-level panel that includes info on location inside or outside of SEZs, within the same or neighboring commune

Based on the above, firms can be exposed to SEZs in three ways

1. **Direct treatment**: a firm from commune c is found inside of an SEZ in that same commune, after it became operational
2. **Indirect treatment**: a firm from commune c remains outside of an SEZ in that same commune, after it became operational
3. **No treatment**: a firm in commune c' is neither exposed to direct nor indirect treatment

Potential endogeneity as well as gradual rollout of SEZ program to be taken into account in econometric analysis

Outline

Empirical strategy

Understand whether and how SEZs have an impact on firm performance

- Dependent variables: log employment, sale, value added per worker
- Main variable of interest: SEZ treatment (direct or indirect) vs. no treatment

Empirical strategy

Understand whether and how SEZs have an impact on firm performance

- Dependent variables: log employment, sale, value added per worker
- Main variable of interest: SEZ treatment (direct or indirect) vs. no treatment

Two major challenges for identification:

- Endogeneity of SEZ locations ⏩ Sample size ⏩ Firm stats
  $\rightarrow$ canceled SEZs as control group (Greenstone et al., 2010); propensity score matching (PSM); pre-trend diagnostics

Empirical strategy

Understand whether and how SEZs have an impact on firm performance

- Dependent variables: log employment, sale, value added per worker
- Main variable of interest: SEZ treatment (direct or indirect) vs. no treatment

Two major challenges for identification:

- Endogeneity of SEZ locations ⏩ Sample size ⏩ Firm stats
  → canceled SEZs as control group (Greenstone et al., 2010); propensity score matching (PSM); pre-trend diagnostics
- Non-simultaneuous treatment
  → employ staggered DiD estimator (Callaway & Sant'Anna 2021; Wooldridge 2023)

Empirical strategy

Understand whether and how SEZs have an impact on firm performance

- Dependent variables: log employment, sale, value added per worker
- Main variable of interest: SEZ treatment (direct or indirect) vs. no treatment

Two major challenges for identification:

- Endogeneity of SEZ locations ⏩ Sample size ⏩ Firm stats
  → canceled SEZs as control group (Greenstone et al., 2010); propensity score matching (PSM); pre-trend diagnostics
- Non-simultaneuous treatment
  → employ staggered DiD estimator (Callaway & Sant'Anna 2021; Wooldridge 2023)

$$Y_{i,t} = \alpha + \sum_{g \in G} \sum_{t=t_0}^{g-1} \theta^{\text{pre}}_{g,t} D_{i,g,t} + \sum_{g \in G} \sum_{t=g}^{T} \theta^{\text{post}}_{g,t} D_{i,g,t} + \xi_i + \xi_t + \varepsilon_c \qquad (1)$$

- i = firm; t = year; g = treatment group; G = treatment year
- $D_{igt} = 1$ if firm is in treatment group g at time t; 0 otherwise
- ξ_i and ξ_t = firm and year fixed effects; ε_c = error term, clustered at commune c

Baseline results

Table 1: Main results

Dep var:	**Number of employees**	**Sales**	**Labor productivity**
Effect	Direct	Direct	Direct
	(1)	(3)	(5)
Panel A. Control group is never-treated firms in the canceled SEZs			
SEZ	0.183**	0.553***	0.259**
	(0.073)	(0.128)	(0.106)
Obs	21,962	21,947	18,072
Panel B. Control group is never-treated firms in non-neighboring communes			
SEZ	0.162**	0.494***	0.245**
	(0.065)	(0.113)	(0.095)
Obs	3,608,392	3,603,769	3,054,861

- Substantial direct effects on sales, more moderate increases in employment and labor productivity

Baseline results

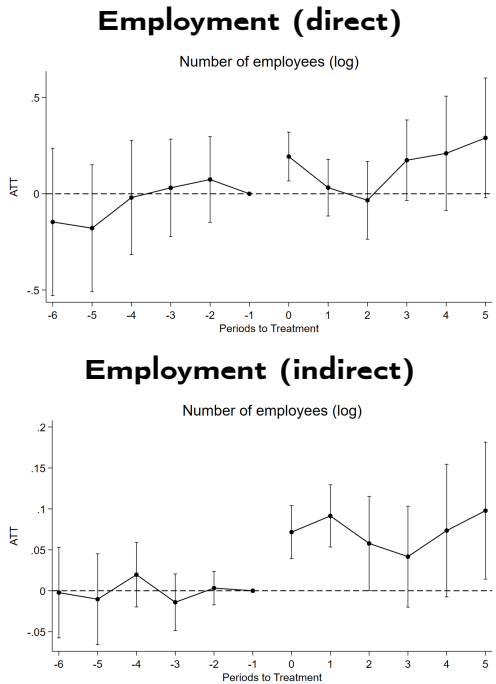
Table 2: Main results

Dep var:	**Number of employees**		**Sales**		**Labor productivity**	
Effect	Direct	Indirect	Direct	Indirect	Direct	Indirect
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Control group is never-treated firms in the canceled SEZs						
SEZ	0.183**	0.071**	0.553***	0.292***	0.259**	0.085**
	(0.073)	(0.026)	(0.128)	(0.035)	(0.106)	(0.041)
Obs	21,962	146,800	21,947	146,681	18,072	118,377
Panel B. Control group is never-treated firms in non-neighboring communes						
SEZ	0.162**	0.074***	0.494***	0.339***	0.245**	0.138***
	(0.065)	(0.011)	(0.113)	(0.024)	(0.095)	(0.029)
Obs	3,608,392	3,611,910	3,603,769	3,607,242	3,054,861	3,048,655

- Direct effects are stronger than indirect effects

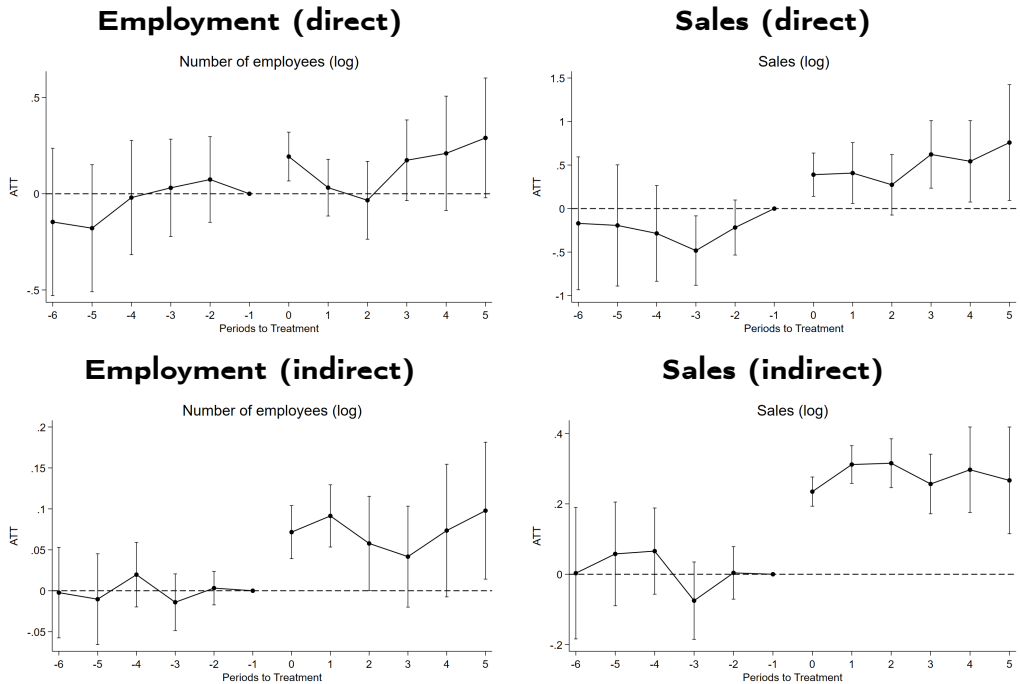
Robustness checks

1. Event study diagrams



Robustness checks

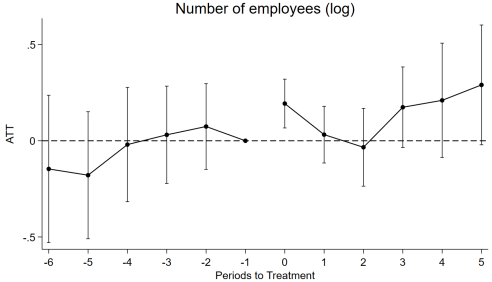
1. Event study diagrams



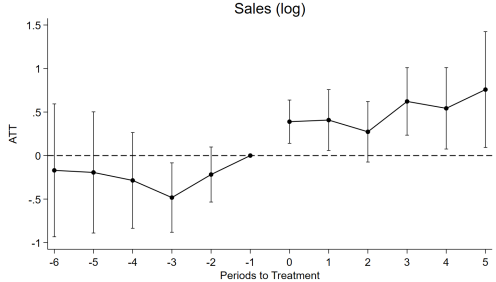
Robustness checks

1. Event study diagrams

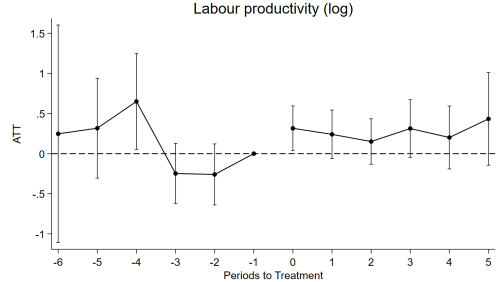
Employment (direct)



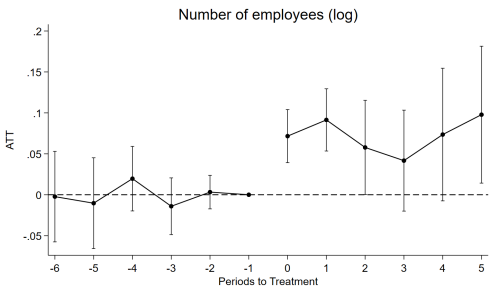
Sales (direct)



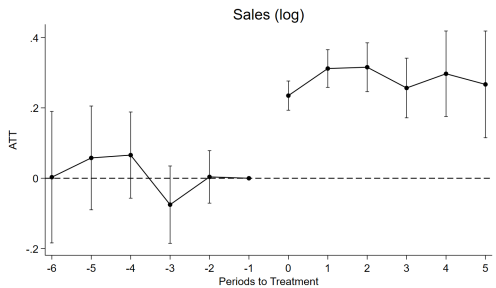
VA per worker (direct)



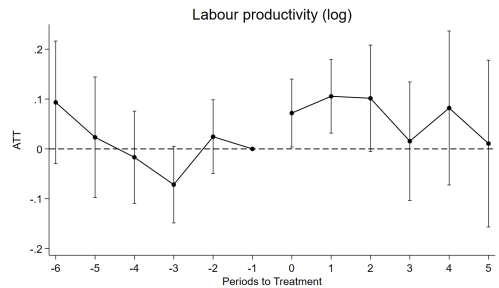
Employment (indirect)



Sales (indirect)

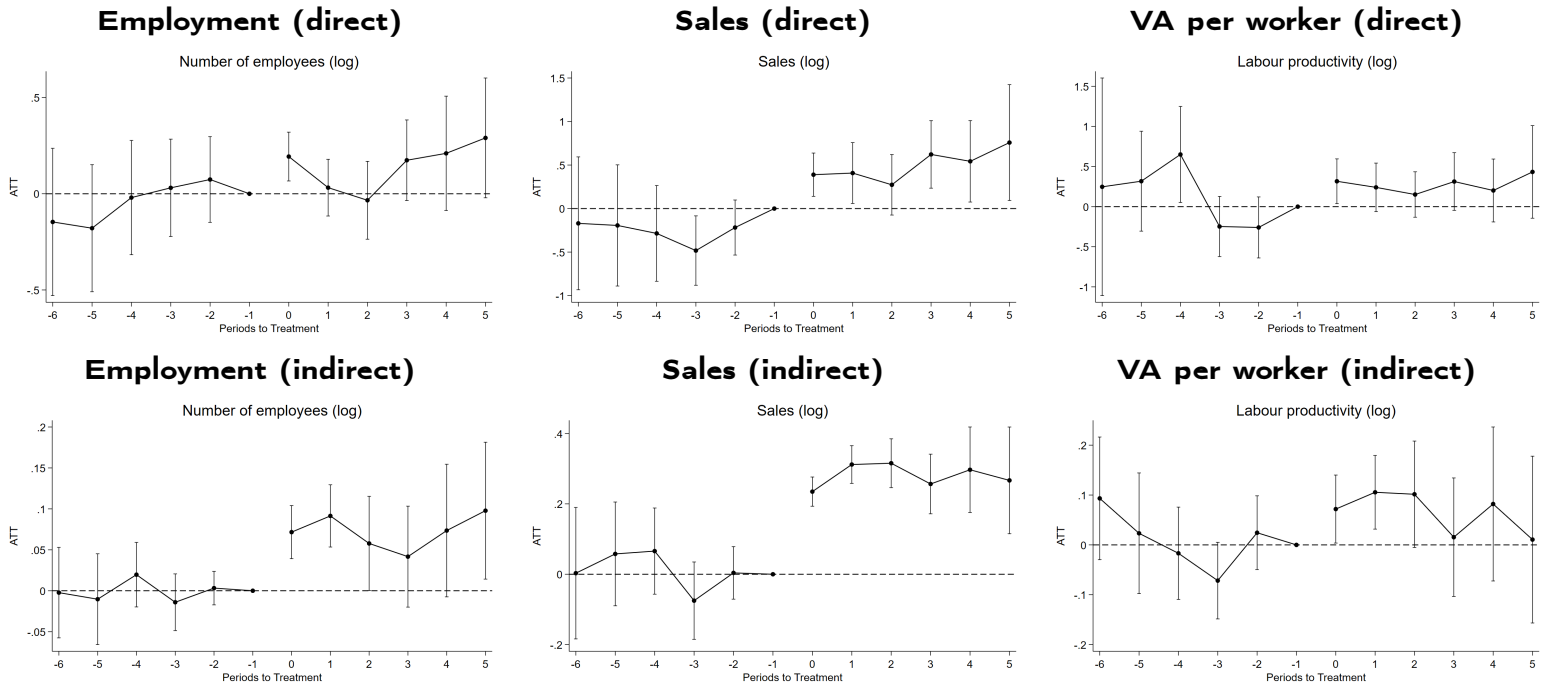


VA per worker (indirect)



Robustness checks

1. Event study diagrams

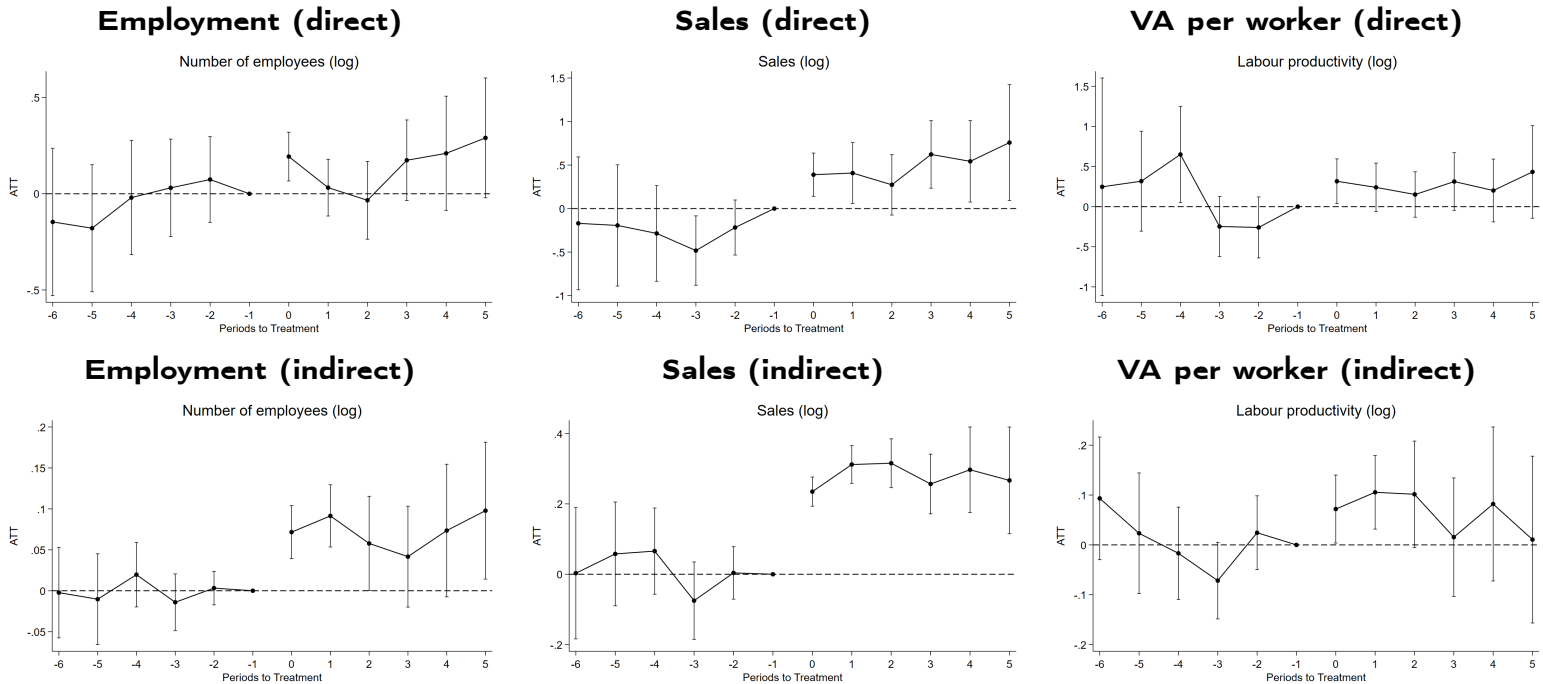


2. Propensity score matching (PSM)

- Estimate ATT, using ETWFE (Wooldridge, 2023) ⇒ very robust Show

Robustness checks

1. Event study diagrams



2. Propensity score matching (PSM)
   - Estimate ATT, using ETWFE (Wooldridge, 2023) ⇒ very robust ⏩ Show
3. Subsamples and alternative specifications
   - Remove Hanoi and Ho-Chi-Minh City ⇒ employment effects ↓ ⏩ Show
   - Alternative specifications (provinces × year FEs; no controls) ⇒ direct productivity effect ↓ ⏩ Show

Outline

Heterogeneous effects

1. By types of SEZs ⏩ Show
   - Industrial zones → Strongest for sales & productivity, benefiting from sector-specific infrastructure?

Heterogeneous effects

1. By types of SEZs ⏩ Show
   - Industrial zones → Strongest for sales & productivity, benefiting from sector-specific infrastructure?

2. By firm size ⏩ Show
   - SMEs benefit most from SEZ job creation and productivity spillovers
   - Large firms increase sales and productivity, but do not expand employment much

Heterogeneous effects

1. By types of SEZs ⏩ Show
   - Industrial zones → Strongest for sales & productivity, benefiting from sector-specific infrastructure?

2. By firm size ⏩ Show
   - SMEs benefit most from SEZ job creation and productivity spillovers
   - Large firms increase sales and productivity, but do not expand employment much

3. By types of firm (foreign-owned/domestic) ⏩ Show
   - Foreign firms gain the most inside of SEZs; private domestic firms gain also through indirect effects
   - State firms → output expands, but no increase in employment and productivity

Heterogeneous effects

1. By types of SEZs ⏩ Show
   - Industrial zones → Strongest for sales & productivity, benefiting from sector-specific infrastructure?

2. By firm size ⏩ Show
   - SMEs benefit most from SEZ job creation and productivity spillovers
   - Large firms increase sales and productivity, but do not expand employment much

3. By types of firm (foreign-owned/domestic) ⏩ Show
   - Foreign firms gain the most inside of SEZs; private domestic firms gain also through indirect effects
   - State firms → output expands, but no increase in employment and productivity

4. By industry (Pavitt's taxonomy) ⏩ Show
   - Science-based firms → Highest direct benefits, but minimal spillovers
   - Supplier-dominated firms → Benefit most from spillovers – strong local linkages?

Mechanisms - Input-Output Linkages

Can buyer-supplier relationships explain positive effects on employment and sales?

Mechanisms - Input-Output Linkages

Can buyer-supplier relationships explain positive effects on employment and sales?

- Combine firms' industry affiliation with 2007 Input-output tables to capture SEZ's "demand" for upstream products
- Does SEZ have significantly different impact on firms that operate upstream?

Mechanisms - Input-Output Linkages

Can buyer-supplier relationships explain positive effects on employment and sales?

- Combine firms' industry affiliation with 2007 Input-output tables to capture SEZ's "demand" for upstream products
- Does SEZ have significantly different impact on firms that operate upstream?

Compute

$$\text{SEZ}_{st} = \sum_i w^U_{ss'} \times w^m_{s't}$$

- $w^U_{ss'}$ = Input coefficient; measures share of s in production of s'
- $w^m_{s't}$ = SEZ sector weight; share of SEZ production in total production of s'

Mechanisms - Input-Output Linkage

Table 3: Mechanism - Input-Output Linkages

	(1)	(2)	(3)	(4)
Dep var:	**Number of employees**		**Sales**	
Effect	Direct	Indirect	Direct	Indirect
Panel A. High input demand				
SEZ	0.408**	0.361***	1.043**	0.543***
	(0.194)	(0.088)	(0.404)	(0.149)
Obs	1,884	3,336	1,859	3,330
Panel B. Low input demand				
SEZ	0.108	0.309**	0.115	0.537**
	(0.131)	(0.134)	(0.269)	(0.226)
Obs	922	2,080	921	2,072

- Supplier-linkages appear to matter more within SEZs $\rightarrow$ reason for local firms to "move in"?
- Indirect effect almost identical $\rightarrow$ no evident first-tier supplier for SEZs; potentially general agglomeration effects

Mechanism - Access to credit

Do SEZs improve firms' access to finance?

- Recall: many SEZs attract firm with (temporary) tax exemptions and credit support

Mechanism - Access to credit

Do SEZs improve firms' access to finance?

- Recall: many SEZs attract firm with (temporary) tax exemptions and credit support

Table 4: Mechanism - Probability of Getting Credit

Dep var:	**Probability of getting credit**	
Effect	Direct	Indirect
SEZ	0.072***	0.004
	(0.013)	(0.005)
Obs	34,854	127,337

- Significantly positive coefficient for "directly" treated firms supports fiscal benefits
- Potential (additional) explanation for larger direct effects on firm performance; *but*: endogeneity remains caveat

Mechanisms - Technology gap

Are limited/fragile labor productivity effects result of technological distance?

Mechanisms - Technology gap

Are limited/fragile labor productivity effects result of technological distance?

- Use information on MNE origin in communes' SEZs; compute total number of MNEs from high-income countries

Mechanisms - Technology gap

Are limited/fragile labor productivity effects result of technological distance?

- Use information on MNE origin in communes' SEZs; compute total number of MNEs from high-income countries
- Expectation: if technological distance matters, communes where SEZs are dominated by MNEs from high-income countries benefit less

Mechanisms - Technology gap

Are limited/fragile labor productivity effects result of technological distance?

- Use information on MNE origin in communes' SEZs; compute total number of MNEs from high-income countries
- Expectation: if technological distance matters, communes where SEZs are dominated by MNEs from high-income countries

Table 5: Mechanism - Origins of FDI

Dep var:	**Labor productivity**	
Effect	Direct	Indirect
Panel A. FDI from developed countries		
SEZ	-0.077	0.043
	(0.196)	(0.051)
Obs	16,338	30,455
Panel B. FDI from developing countries		
SEZ	0.544***	0.201***
	(0.184)	(0.029)
Obs	14,071	77,092

- Results seem to support that technological distance matters

Outline

Conclusion

- SEZs popular policy tool in developing countries to facilitate technology and knowledge transfer $\rightarrow$ our paper studies the case of Vietnam

Conclusion

- SEZs popular policy tool in developing countries to facilitate technology and knowledge transfer $\rightarrow$ our paper studies the case of Vietnam
- We disentangle direct and indirect exposure to SEZs and find overall positive effects on employment and sales (scale)

Conclusion

- SEZs popular policy tool in developing countries to facilitate technology and knowledge transfer $\rightarrow$ our paper studies the case of Vietnam
- We disentangle direct and indirect exposure to SEZs and find overall positive effects on employment and sales (scale)
- Effects on labor productivity are less robust, suggesting that actual industrial upgrading faces obstacles

Conclusion

- SEZs popular policy tool in developing countries to facilitate technology and knowledge transfer $\rightarrow$ our paper studies the case of Vietnam
- We disentangle direct and indirect exposure to SEZs and find overall positive effects on employment and sales (scale)
- Effects on labor productivity are less robust, suggesting that actual industrial upgrading faces obstacles
  - $\rightarrow$ Benefits to upstream suppliers mainly within SEZs, no evident spillovers

Conclusion

- SEZs popular policy tool in developing countries to facilitate technology and knowledge transfer $\rightarrow$ our paper studies the case of Vietnam
- We disentangle direct and indirect exposure to SEZs and find overall positive effects on employment and sales (scale)
- Effects on labor productivity are less robust, suggesting that actual industrial upgrading faces obstacles
  - $\rightarrow$ Benefits to upstream suppliers mainly within SEZs, no evident spillovers
  - $\rightarrow$ Labor productivity effects concentrated where SEZs dominated from lower-income country firms

Conclusion

- SEZs popular policy tool in developing countries to facilitate technology and knowledge transfer → our paper studies the case of Vietnam
- We disentangle direct and indirect exposure to SEZs and find overall positive effects on employment and sales (scale)
- Effects on labor productivity are less robust, suggesting that actual industrial upgrading faces obstacles
  - → Benefits to upstream suppliers mainly within SEZs, no evident spillovers
  - → Labor productivity effects concentrated where SEZs dominated from lower-income country firms
  - → Nevertheless significant spillovers to local economy, possibly through agglomeration

Conclusion

- SEZs popular policy tool in developing countries to facilitate technology and knowledge transfer → our paper studies the case of Vietnam
- We disentangle direct and indirect exposure to SEZs and find overall positive effects on employment and sales (scale)
- Effects on labor productivity are less robust, suggesting that actual industrial upgrading faces obstacles
  - → Benefits to upstream suppliers mainly within SEZs, no evident spillovers
  - → Labor productivity effects concentrated where SEZs dominated from lower-income country firms
  - → Nevertheless significant spillovers to local economy, possibly through agglomeration
- Overall, SEZs in Vietnam appear to stimulate sectoral transformation and growth of manufacturing sector

Thanks!

k.mau@maastrichtuniversity.nl

Appendix

Descriptive statistics

Table 6: Sample Construction

Panel	Sample	Nb of Firms	Nb of Observations
A	All Sample	172,004	285,762
	SEZ Firms	13,985	113,712
	Firms in SEZ Communes	152,826	565,455
	Non-SEZ Firms	5,193	19,224
B	All Sample	985,293	4,141,739
	SEZ Firms	13,985	113,712
	Firms in SEZ Communes	152,826	565,455
	Non-SEZ Firms	818,482	3,875,201

back

Descriptive statistics

Table 7: Summary statistics for treated and control groups

Firm type	Nb of Obs	Nb of firms	avg. log Employees	avg. log Sales	avg. log Prod
Treated firms					
(1) SEZ firms	113,712	13,985	3.42	9.08	3.98
(2) SEZ commune	565,455	152,826	2.30	7.63	3.34
Control-group firms					
(3) Canceled commune	19,224	5,193	1.88	7.62	3.98
(4) Non-neighboring commune	3,607,664	771,370	2.00	7.55	3.95
T-tests					
(1) vs (3)			(***)	(***)	
(2) vs (3)			(***)		(***)
(1) vs (4)			(***)	(***)	
(2) vs (4)			(***)	(***)	(***)

back

Descriptive statistics

Table 8: Summary statistics by firm type

Firm type	Nb of Obs	Nb of firms	avg. log Employees	avg. log Sales	avg. log Prod
Firm size					
Very small	32,684	7,342	1.48	7.33	4.13
Small and medium	76,252	9,348	3.58	9.87	4.55
Large	24,000	2,488	6.21	12.13	4.35
Ownership type					
Foreign	45,123	5,459	4.74	10.92	4.73
Private domestic	84,336	13,840	2.87	8.96	4.25
State domestic	3,477	547	3.96	9.51	4.28

back

Robustness check: PSM

Potential issues

- Firms selection into SEZ areas

Approach

- **Step 1**: Adjust for selection bias by using propensity score matching
- **Step 2**: Run year-to-year matching
- **Step 3**: Match each treated firm with 3 other never treated firms based on 2-digit dummy industries, province, log of lagged interested outcomes (employees, revenue, and assets), and foreign dummy
- **Step 4**: Run ETWFE by Woodridge (2023)

back

Robustness check - PSM

Table 9: Baseline results, PSM sample

Dep var:	**Number of employees**		**Sales**		**labor productivity**	
Effect	Direct	Indirect	Direct	Indirect	Direct	Indirect
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Control group is matched never-treated firms						
SEZ	0.186***	0.091***	0.216***	0.154***	0.230**	0.066**
	(0.062)	(0.017)	(0.079)	(0.030)	(0.056)	(0.033)
Obs	25,375	287,011	25,278	286,890	21,912	250,532

back

Robustness test - Remove two star cities

Table 10: Baseline results - exclude 2 "star cities"

Dep var:	**Number of employees**		**Sales**		**labor productivity**	
Effect	Direct	Indirect	Direct	Indirect	Direct	Indirect
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Control group is never-treated firms in the canceled SEZs						
SEZ	0.147*	0.006	0.661***	0.250***	0.381***	0.061
	(0.080)	(0.018)	(0.153)	(0.034)	(0.114)	(0.040)
Obs	12,177	104,314	12,171	104,250	9,879	83,753

back

Robustness test - Alternative specifications

Table A.5: Baseline results - Average Treatment Effects on the Treated.

Dep var:	**Number of employees**		**Sales**		**Labor productivity**	
Effect	Direct	Indirect	Direct	Indirect	Direct	Indirect
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Control group is firms in the canceled SEZ communes; province*year fixed effect						
SEZ	0.226**	0.082***	0.515***	0.304***	0.180	0.085*
	(0.076)	(0.029)	(0.122)	(0.037)	(0.116)	(0.043)
Obs	21,962	146,800	21,947	146,681	18,072	118,377
Panel B. Control group is firms in the canceled SEZ communes: no covariates						
SEZ	0.559***	0.287***	1.060***	0.540***	0.161	0.092**
	(0.119)	(0.055)	(0.149)	(0.055)	(0.118)	(0.044)
Obs	21,962	146,800	21,947	146,681	18,072	118,377

back

Heterogeneity analysis - Types of SEZs

National SEZs

- Industrial parks (or Industrial zones)
- High-tech zones
- Export processing zones
- Border economic zones
- Coastal economic zones

Provincial SEZs

Heterogeneity analysis - Types of SEZs

National SEZs

	1991-1993	1994-1996	1997-2002	2003-2011	2012-2019
National-level SEZs	**5**	**14**	**56**	**262**	**85**
By type					
Industrial zones	3	14	43	237	77
High-tech zones	0	0	2	1	1
Export processing zones	2	0	0	1	0
Border economic zones	0	0	11	9	4
Coastal economic zones	0	0	0	14	3
By region					
Northern region	0	4	15	97	34
Middle region	1	3	18	59	30
Southern region	4	7	23	106	21

Table 11: SEZ Wave Establishment by Type, and Region

Provincial SEZs

	Northern region	Middle region	Southern region
Province-level SEZs	311	270	117

Table 12: Province-level SEZs by Region

Heterogeneity results - Types of SEZs

Table 13: Heterogeneity Results: By Types of SEZs

	Number of employees		Sales		labor productivity	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
Panel A. Industrial zones						
SEZs	0.114*	0.083***	0.369***	0.383***	0.235***	0.147***
	(0.058)	(0.020)	(0.087)	(0.039)	(0.074)	(0.035)
Obs	24,862	55,785	24,791	55,739	20,537	45,306
Panel B. Economic zones						
SEZs	0.215***	0.141***	0.107	0.297***	-0.003	-0.140**
	(0.036)	(0.029)	(0.098)	(0.062)	(0.096)	(0.066)
Obs	22,327	23,366	22,317	23,351	18,561	18,567
Panel C. Border zones						
SEZs	0.019	0.177***	0.097	0.352***	0.065	-0.265***
	(0.056)	(0.032)	(0.125)	(0.067)	(0.125)	(0.065)
Obs	21,530	25,532	21,498	25,519	17,590	20,074
Panel D. Provincial zones						
SEZs	0.135***	0.085***	0.351***	0.252***	0.006	0.060**
	(0.047)	(0.014)	(0.083)	(0.029)	(0.066)	(0.026)
Obs	23,710	99,698	23,678	99,620	19,803	82,056

back

Heterogeneity analysis - Firm size

Table 14: Heterogeneity Analysis - Firm Sizes

	Number of employees		Sales		labor productivity	
	Direct	**Indirect**	**Direct**	**Indirect**	**Direct**	**Indirect**
Panel A. Very Small Firms (< 10 employees)						
SEZs	0.061	0.133***	-0.177	0.331***	-0.014	0.029
	(0.062)	(0.035)	(0.169)	(0.049)	(0.185)	(0.046)
Obs	13,099	81,253	13,092	81,219	10,928	65,269
Panel B. Small and Medium Firms (10-200 employees)						
SEZs	0.194**	0.010	0.585***	0.283***	0.218	0.145***
	(0.084)	(0.029)	(0.156)	(0.051)	(0.141)	(0.053)
Obs	8,210	61,892	8,207	61,863	6,651	50,258
Panel C. Big Firms (> 200 employees)						
SEZs	-0.149	0.026	0.822***	0.489***	0.715	0.290**
	(0.277)	(0.111)	(0.243)	(0.161)	(0.462)	(0.129)
Obs	653	3,655	648	3,599	493	2,850

back

Heterogeneity analysis - Firm type

Table 15: Heterogeneity analysis - Types of Firms

	Number of employees		Sales		labor productivity	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
Panel A. Foreign Firms						
SEZs	0.663***	-0.072	1.611***	0.442*	0.476**	-0.198
	(0.124)	(0.101)	(0.230)	(0.252)	(0.185)	(0.232)
Obs	971	2,344	965	2,320	719	1,716
Panel B. Private Domestic Firms						
SEZs	0.161**	0.086***	0.397***	0.299***	0.130	0.079*
	(0.079)	(0.026)	(0.123)	(0.035)	(0.127)	(0.043)
Obs	20,411	135,882	20,402	135,798	16,893	109,431
Panel C. State Domestic Firms						
SEZs	0.078	-0.037	2.179**	0.168	0.227	0.150
	(0.279)	(0.076)	(1.018)	(0.156)	(0.344)	(0.129)
Obs	569	8,267	569	8,256	449	7,017

back

Heterogeneity analysis - By industry

Firm Categories (Bogliacino & Pianta, 2010)

- Supplier-Dominated Firms
  - Traditional sectors relying on external suppliers for innovation.
- Scale-Intensive Firms
  - Benefit from economies of scale, common in manufacturing & large-scale production.
- Science-Based Firms
  - Strong in-house R&D, including technology & pharmaceuticals.
- Specialized Suppliers
  - Produce specialized inputs & machinery for other industries.

Heterogeneity analysis - By industry

Table 16: Heterogeneity analysis - By industry: Pavitt Taxonomy

Dep var:	Number of employees		Sales		labor productivity	
Effect	**Direct**	**Indirect**	**Direct**	**Indirect**	**Direct**	**Indirect**
Panel A. By Pavitt taxonomy						
Panel A1. Only supplier-dominated firms						
SEZ	0.105***	0.081***	0.278***	0.361***	0.143**	0.111***
	(0.037)	(0.013)	(0.069)	(0.029)	(0.062)	(0.027)
Obs	24,036	94,096	23,988	94,031	19,200	75,765
Panel A2. Only scale-intensive firms						
SEZ	0.110	0.038	0.306**	0.179**	0.125	-0.060
	(0.076)	(0.040)	(0.135)	(0.077)	(0.112)	(0.065)
Obs	4,454	10,457	4,422	10,445	3,619	8,605
Panel A3. Only science-based firms						
SEZ	0.370*	0.126	1.143***	0.158	0.915***	0.128
	(0.220)	(0.155)	(0.130)	(0.242)	(0.273)	(0.233)
Obs	1,145	2,242	1,115	2,236	891	1,859
Panel A4. Only specialized suppliers firms						
SEZ	0.156	0.110**	0.509*	0.180	0.083	0.015
	(0.119)	(0.052)	(0.243)	(0.111)	(0.217)	(0.097)
Obs	2,644	8,355	2,641	8,338	2,069	6,663

back