Place-based Policy: Special Economic Zones in India

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This Paper

Research Question:
Do place-based policies generate agglomeration and productivity spillovers?

- Do SEZ openings generate new firm entry?
- Do they increase the productivity of these nearby firms?

Identification

- Staggered DiD comparing Approved vs. Operational applicants to estimate effects on towns/cities with SEZ and areas around the SEZ's.

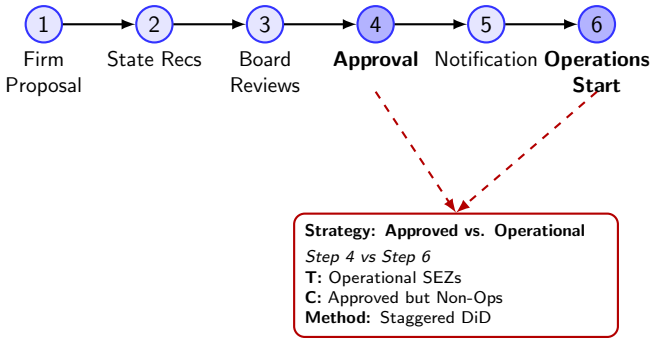
Data

- Board of Approval (BoA) minutes (2005-2025).
- Prowess, Economic Census, Population Census, and Registry of Companies.

Preview of findings

- **Structural Change:** Operational SEZs drove a **5.4pp increase** in modern non-farm employment and significantly improved literacy.
- **Formalization:** Growth was led by manufacturing ($\beta = 0.85 \approx 132.8\%$) and wage labor ($\beta = 0.72$), with entry concentrated in **large firms**.
- Large firms within 10 km of operational SEZs have sales **8.6%** and profits **5.7%** higher than firms in approved areas.
- Operational SEZs spur significant firm entry.
  - Short Run (Years 2–4): Positive and growing entry responses in high-skill services
    - IT & Communications, Professional & Technical Services
  - Medium Run (Years 5–7): Significant entry increases in locally consumed services
    - Accommodation & Food, Administrative Services, Education, Water & Waste Management, Arts & Entertainment.
  - Long Run (Years 8–10): Effects on broader sectors
    - transport, utilities, manufacturing (light and heavy), finance and insurance and low-skill services

Setting up a Special Economic Zone (SEZ)



GIFT SEZ - Apply/Approve 2007, Operations 2011 - Images 2010 to 2025

Static

SEZ Incentives: Firms vs. Developers

Category	Benefits for Firms (Units)	Benefits for Developers
Tax	• Income tax brake on export profits (100% 5Y, 50% 5Y) • Zero-rated GST on supplies (GST=18% - 40%)	• Income tax deduction on profits (100% 10Y) • Exemption from Div. & Corp. tax
Trade	• Duty-free import (Capital goods, raw materials)	• Duty-free import (Const. materials, equipment)
Regulatory	• No industrial licensing • Simplified subcontracting rules	• Single-window clearance • Flexible land use permissions
Financial	• Access to ECBs on easier terms • Simplified repatriation	• Easier access to FDI • Relaxed capital raising rules
Infra/Land	• Shared infrastucture (Power, Logistics) • Subsidized utilities (State)	• Concessions on Stamp Duty • Land acquisition cost benefits

Details - Units Details - Developers

Data

- Prowess (CMIE)
  - Panel data for 50,000 large firms
  - Measure sales, profits, employment
- Firm Registry of India (MCA)
  - Universe of all formal firms
  - Geolocate to identify firms close to SEZ
  - Measure new formal firm entry by sector and location
  - NIC's Sector | Broad Categories | High/Low Skill Services | Heavy/Light Manufacturing

NEW Population Census - Track $\approx 94\%$ of the 600,000 Villages/Towns in 2011 across the 3 periods.

- Population count, literacy, working status, broad sectors for 1991, 2001, & 2011

NEW Economic Census

- Employment, formal and informal firms in 1990, 1998, 2005 & 2013

Population (Economic) Census - Difference-in-Differences

We use villages with **Approved SEZs** only and estimate the impact of SEZ operation on village/town-level using the following specification:

$$Y_{it} = \alpha + \beta(\text{Operational}_i \times \text{Post}_t) + \gamma_i + \delta_t + \epsilon_{it}$$

- Y_{it}: Outcome for village i in census year t (e.g. Log Population).
- **Operational**$_i$: Indicator=1 if the village contains a SEZ operational by 2011 (2013).
- **Post**$_t$: Indicator equal to 1 for the year 2011 (post-2005 SEZ Act).
- β: **Coefficient of Interest**. Captures the differential growth in outcomes for operational SEZs relative to approved-but-not-yet-operational SEZs.
- γ_i: **Village Fixed Effects**. Controls for time-invariant location characteristics
- δ_t: **Year Fixed Effects**. 1991, 2001, and 2011 (1990, 1998, 2005, 2013).

Population Census

Table: DID Population Census 1991-2001-2011

	Ihs Pop (1)	Ihs Work (2)	Ihs Non-Farm (3)	Literacy Rate (4)	Share Ag Lab (5)	Share Modern (6)
Operational × $Post_{2011}$	0.218***	0.226***	0.400***	0.024**	-0.036*	0.054**
	(0.077)	(0.087)	(0.121)	(0.010)	(0.021)	(0.022)
Mean Control	9.28	8.34	6.87	0.60	0.18	0.37
Operational SEZs	82	82	82	82	82	82
Unique Locations	270	270	270	270	270	270
R-Squared	0.984	0.978	0.963	0.921	0.739	0.843
Observations	798	798	798	798	797	798
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Village/Town FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors clustered at the village level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All regressions include Village and Year Fixed Effects.
Column (6): Operational SEZs led to a 5.4 percentage point increase in the share of modern (non-farm) employment.

Event Study - Literate/ Share Agg Labor | Event Study - Total Pop/ Working Pop | Balance Table

ECON Census: Villages/Towns near SEZ have more firms

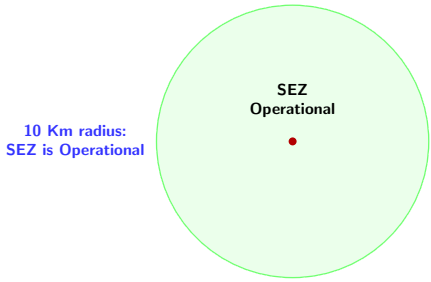
Table: DID Economic CENSUS 1990-1998-2005-2013: Firm Size

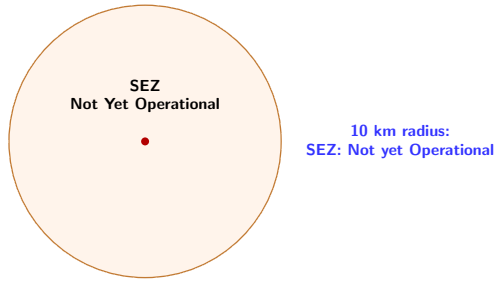
	IHS(Number of firms by size of the firm)				IHS(Number of workers by size of the firm)			
	(1) ≤ 20	(2) 21 to 49	(3) 50 to 100	(4) 100 $<$	(5) ≤ 20	(6) 21 to 49	(7) 50 to 100	(8) 100 $<$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Operational $\times$ Post	0.222**	0.277**	0.306***	0.412***	0.236*	0.511	0.777***	1.090**
	(0.110)	(0.126)	(0.114)	(0.124)	(0.122)	(0.312)	(0.292)	(0.445)
Mean Control	11735.72	127.64	52.73	47.12	33132.33	4116.17	3831.10	12227.80
Oper. SEZs	103	103	103	103	103	103	103	103
Unique Locs	263	263	263	263	263	263	263	263
R-Squared	0.948	0.914	0.906	0.881	0.942	0.816	0.830	0.766
Obs	906	906	906	901	906	906	906	901
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Village/Town FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Number of Firms by Size (1-4) represents count of firms with employees in range. Number of Workers by Size (5-8) represents total employment in those firms. Size categories: $\leq$ 20, 21-49, 50-100, $>$ 100. All outcomes IHS transformed.

Female/Male Workers and Ownership | Balance Table | Total Workers

Defining SEZ Influence - 10 Km radius from the SEZ





Treatment Group: Firms in the 1km and 10km of the geolocated SEZ point with an operational SEZ. Dates Dist

Control Group: Firms within 1 and 10 km of the geolocated approved but "Never Operational" SEZs

Empirical Strategy: Staggered Difference-in-Differences

We estimate treatment effects under staggered adoption using Callaway & Sant'Anna (2021).

Event-study:

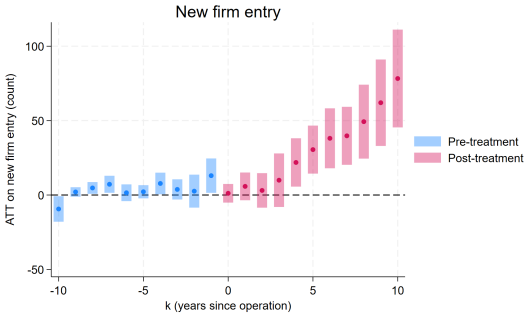
$$ATT_k = \sum_{g \in \mathcal{G}_k} w_{g,k}\, ATT(g, g+k), \qquad \sum_{g \in \mathcal{G}_k} w_{g,k} = 1$$

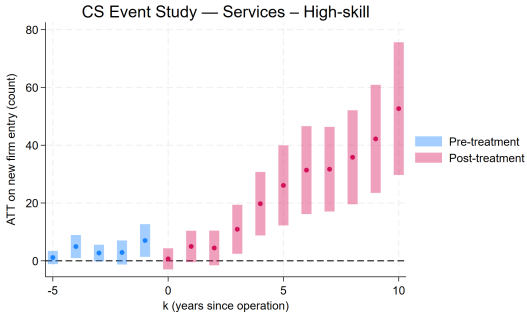
- Y_{it} is the outcome for firm i in year t (e.g., ln(sales)).
- $G_i = g$ is the first year firm i is within 10 km of an operational SEZ.
- We plot ATT_k by relative time $k = t - g$.
- **Treated:** firms within 10 km of SEZs that become operational in year g.
- **Controls:** firms within 10 km of SEZ sites that are not yet operational in year t (including sites that never become operational during the sample).

Identification: In the absence of SEZ operations, treated and control would follow parallel trends.

Registry of Companies - Firm Entry in High Skill

We find strong positive and growing effects on firm entry driven by high-skill services.





Find positive and growing entry responses in

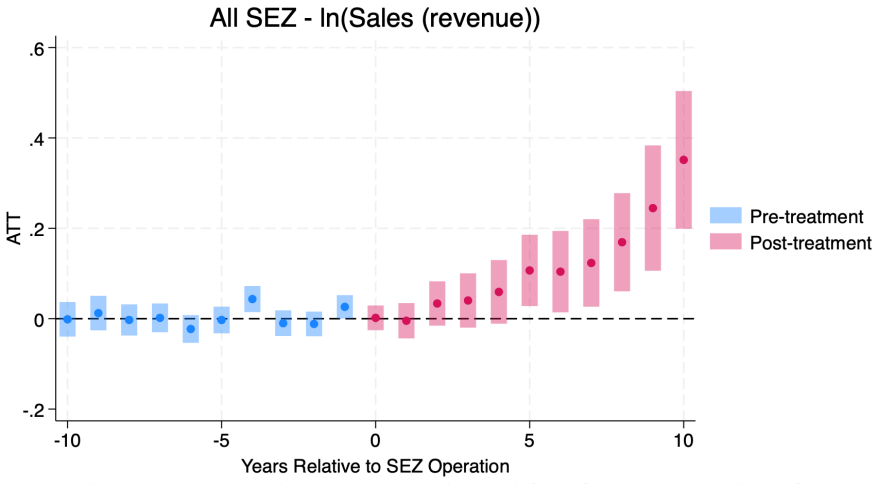
- Professional & Technical Services – Main contributor to growth of firms Link
- IT & Communications Link

Firm Level - Sales and Profits Increase by 8.6% and 5.7%

Table: Effect of SEZ notification on firm outcomes

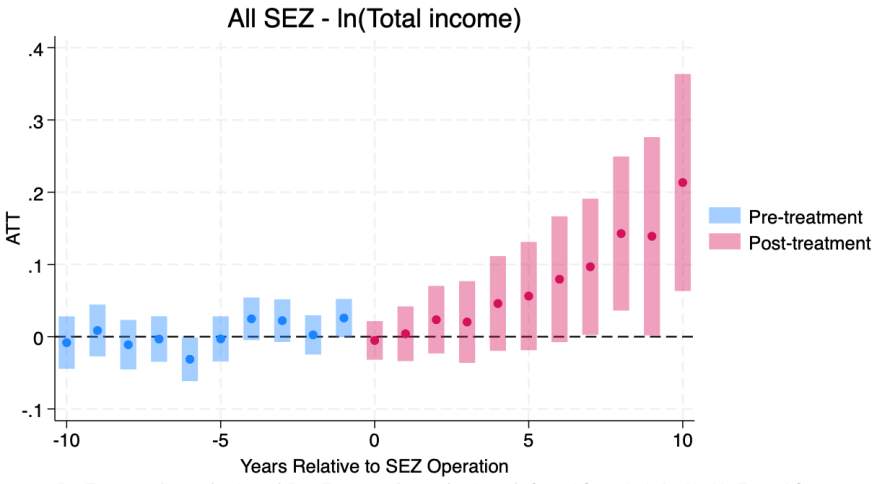
	Ln sales	Ln number employees	Ln total income	Ln salaries pc
ATT	0.0823***	0.0788	0.0557**	–0.000821
	(0.0280)	(0.0575)	(0.0273)	(0.0119)
N	134665	12652	165766	11721

Firm Level - Firms Increase Sales



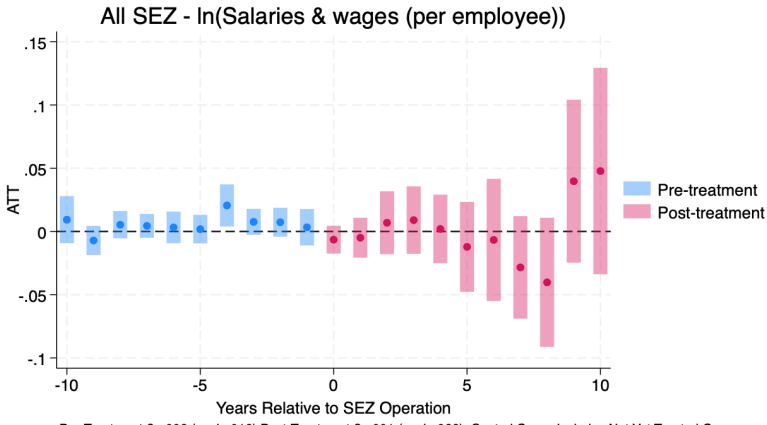
Pre-Treatment β=.003 (pval=.636) Post-Treatment β=.112 (pval=.001). Control Group Includes Not Yet Treated Group.

Firm Level - Firms Increase Profits



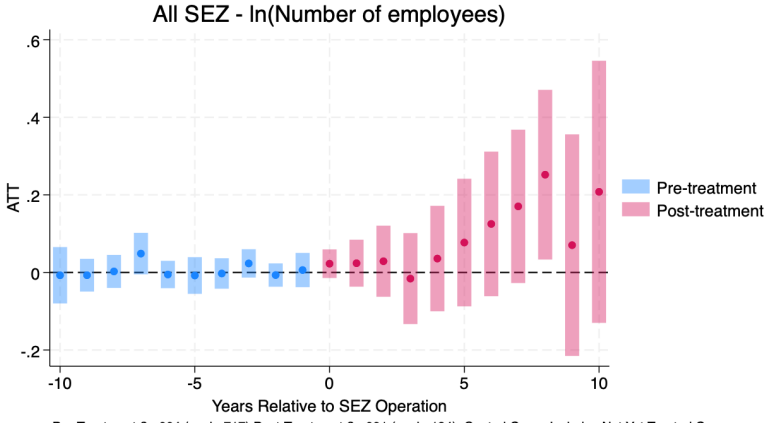
Pre-Treatment β=.003 (pval=.674) Post-Treatment β=.074 (pval=.022). Control Group Includes Not Yet Treated Group.

Firm Level - Ln(Wage Bill/Employees)



Pre-Treatment β=.006 (pval=.016) Post-Treatment β=.001 (pval=.966). Control Group Includes Not Yet Treated Group.

Firm Level - Ln(workers)



Pre-Treatment β=.004 (pval=.717) Post-Treatment β=.091 (pval=.184). Control Group Includes Not Yet Treated Group.

Taking Stock

- **Design:** Staggered DiD comparing locations near SEZs that become operational vs. locations near SEZ sites that are approved but not yet / never operational.
- **Structural change:** Operational SEZs are associated with higher modern non-farm employment and improved human capital outcomes (literacy).
- **Firm performance (intensive margin):** Among large firms, outcomes increase after SEZ operation/notification (sales and total income), while employment/wages are less clearly affected.
- **Entry (extensive margin):** Operational SEZs spur new formal firm entry, with early high-skill services.

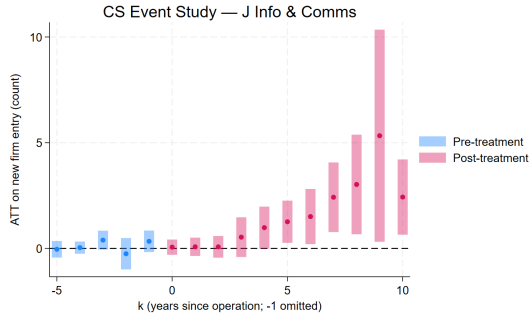
Next Steps: From Reduced-Form Effects to Mechanisms

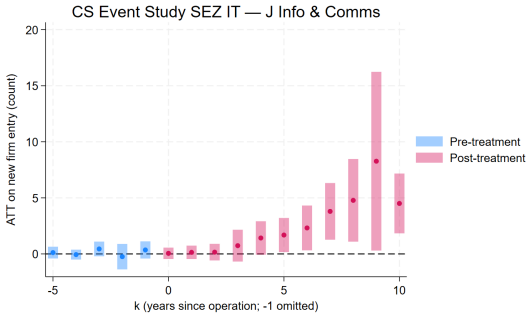
1. **Strengthen identification and interpretation:**
   - Expand BoA-minute data work to improve timing (approval/notification/operation) and increase sample controls/sample size.
   - Add placebo tests?.
2. **Characterize entrants**
3. **Tighten spatial exposure (direct vs. spillover):**
   - Compare Inside vs Outside SEZ

Thank you!

Please send any questions or comments to aneeshap@umich.edu or jendara@umich.edu

IT & Communications





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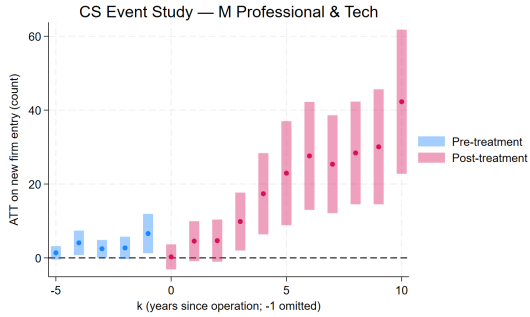
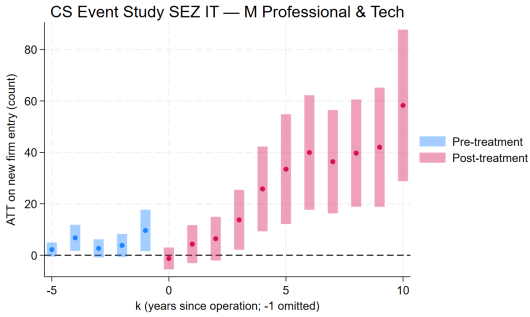
Professional & Tech





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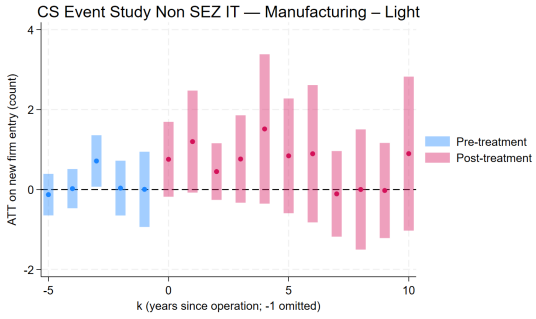
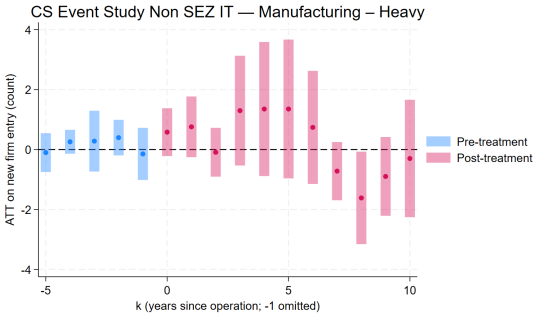
Light & Heavy Manufacturing





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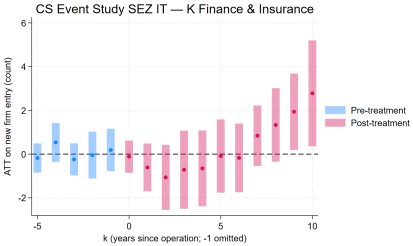
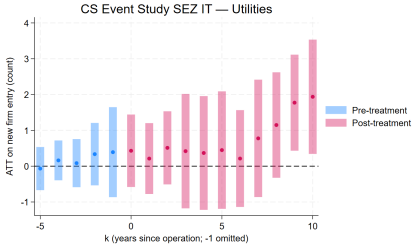
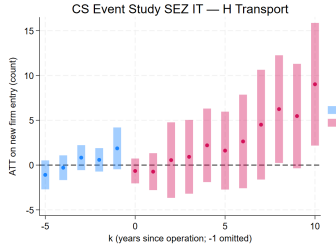
Other long run firm entry







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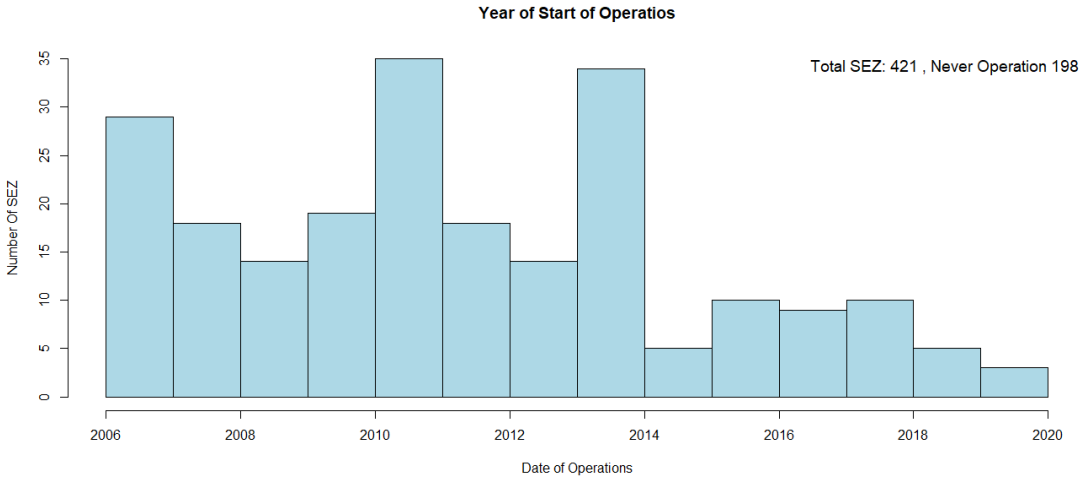
SEZ Operation Dates



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Sector Classification 2-digit NIC

Broad Sector	NIC Sections	Notes
Agriculture/Extractive	A, B	Agriculture, Forestry, Fishing, Mining
Manufacturing – Light	C (Selected)	Div 10–18, 22, 31 (Food, Textiles, Paper, Furniture)
Manufacturing – Heavy	C (Rest)	All other manufacturing divisions
Utilities	D, E	Electricity, Gas, Water, Waste
Construction	F	Construction
Services – High-skill	J, K, M, P, Q	IT, Finance, Scientific, Education, Health
Services – Low-skill	G, H, I, L, N, R–T	Retail, Transport, Food Service, Real Estate, Arts
Govt./International	O, U	Public Admin, Extraterritorial Orgs

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Manufacturing Classification Logic

Manufacturing (Section C) is split into two distinct categories based on capital intensity and product type:

Manufacturing – Light

Includes labor-intensive and non-durable goods.

- **Div 10–12**: Food, Beverages, Tobacco
- **Div 13–15**: Textiles, Apparel, Leather
- **Div 16–18**: Wood, Paper, Printing
- **Div 22**: Rubber & Plastics
- **Div 31**: Furniture

Manufacturing – Heavy

Includes capital-intensive and durable goods.

- Chemicals & Pharmaceuticals
- Metals (Basic & Fabricated)
- Computers & Electronics
- Machinery & Equipment
- Automotive & Transport

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Service Sector Aggregation

Services – High-skill

Knowledge-intensive sectors

- **J**: Info & Communication
- **K**: Financial & Insurance
- **M**: Professional/Scientific
- **P**: Education
- **Q**: Health & Social Work

Services – Low-skill

Labor-intensive/Trade sectors

- **G**: Wholesale/Retail Trade
- **H**: Transportation
- **I**: Accommodation/Food
- **L**: Real Estate
- **N, R, S, T**: Admin, Arts, Personal Services

Note: Government (O) and International Orgs (U) are excluded from Services and categorized separately.

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NIC Section Classification (2-Digit Mapping)

Sec	Divisions	Description
A	01–03	Agriculture, Forestry, Fishing
B	05–09	Mining & Quarrying
C	10–34	Manufacturing
D	35	Electricity, Gas, Steam, AC
E	36–39	Water Supply, Sewerage, Waste
F	41–43	Construction
G	45–47	Wholesale & Retail Trade
H	49–53	Transportation & Storage
I	55–56	Accommodation & Food Service
J	58–63	Information & Communication
K	64–66	Financial & Insurance
L	68	Real Estate Activities
M	69–75	Professional, Scientific, Tech
N	77–82	Administrative & Support
O	84	Public Admin & Defence
P	85	Education
Q	86–88	Health & Social Work
R	90–93	Arts, Entertainment, Recreation
S	94–96	Other Service Activities
T	97–98	Household Employers
U	99	Extraterritorial Organizations

Legacy (NIC-2004) Reconciliation: The following older divisions were mapped to current sections to ensure continuity:
40 → **D**; 89 → **E**; 44 → **G**; 48, 54 → **H**; 57, 67 → **K**; 76 → **O**; 83 → **P**.

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Census Event Study

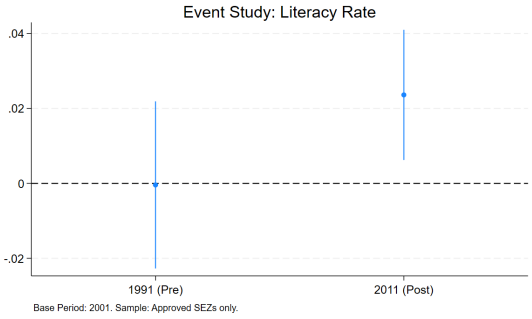

Figure: Literacy Rate

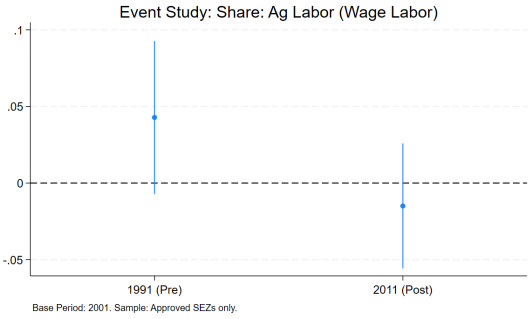

Figure: Share of Ag Labor

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Census Event Study

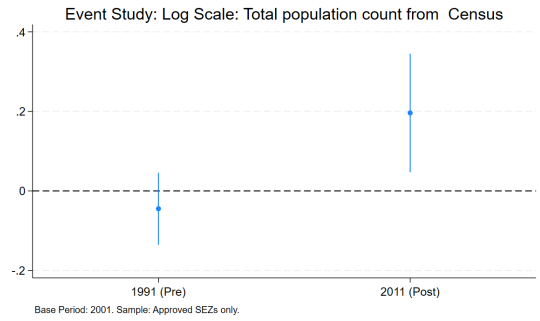

Figure: Ln(Total Pop)

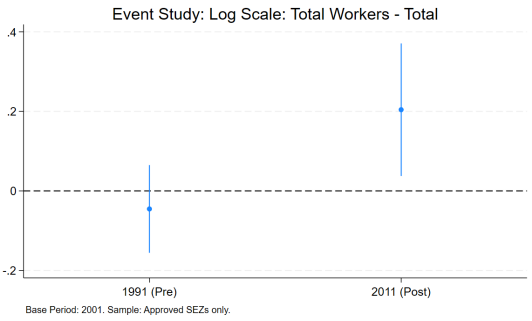

Figure: Ln(Working Pop)

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Pop Census Balance Table: Village Characteristics by SEZ Status

	(1) 1991 (Pre)			(2) 2001 (Pre)			(3) 2011 (Post)		
	Non-Op	Operational	Diff	Non-Op	Operational	Diff	Non-Op	Operational	Diff
Total population	9.08	9.57	-0.49	9.31	9.73	-0.41	9.42	10.07	-0.64**
Total Workers	8.12	8.62	-0.51*	8.39	8.83	-0.43	8.50	9.18	-0.68**
Other Services Workers	5.54	6.03	-0.49	7.41	7.91	-0.50	7.63	8.52	-0.90**
Literacy Rate	0.49	0.47	0.02	0.62	0.59	0.03	0.69	0.69	0.00
Share Ag Labor (Wage Labor)	0.26	0.33	-0.06**	0.14	0.16	-0.02	0.15	0.15	0.00
Share Non-Farm/Modern Employment	0.11	0.13	-0.01	0.47	0.50	-0.03	0.52	0.60	-0.08**
Share Total Marginal Labor	0.07	0.04	0.02*	0.19	0.18	0.01	0.17	0.13	0.04**
Observations	260			268			278		

All village/town level information. We use the ASIN of Total Population, and workers

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ECON Census

Table: DID Economic CENSUS 1990-1998-2005-2013:

	(1) Female Workers	(2) Male Workers	(3) Female Ownership	(4) Male Ownership	(5) Gov Ownership
	(1)	(2)	(3)	(4)	(5)
Operational × Post	0.312	0.641***	0.160	0.313***	0.274**
	(0.208)	(0.189)	(0.152)	(0.112)	(0.121)
Mean Control	5247.96	47901.45	1535.83	11714.24	155.33
Oper. SEZs	103	103	103	103	103
Unique Locs	263	263	263	263	263
R-Squared	0.890	0.912	0.911	0.946	0.893
Obs	906	906	906	906	906
Year FE	Yes	Yes	Yes	Yes	Yes
Village/Town FE	Yes	Yes	Yes	Yes	Yes

Female and Male Workers represent the total employment count by gender. Female and Male Ownership represent the count firms owned by females and males, respectively. Gov Ownership represents the count of firms by the public sector.
All outcomes are inverse hyperbolic sine transformed.

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GIFT SEZ - Apply/Approve 2007, Operations 2011 - Images 2010 to 2025

Table: Balance Table: Economic Census Outcomes (Levels)

	(1) 1990			(2) 1998			(3) 2005		
	Ctrl	Trt	Diff	Ctrl	Trt	Diff	Ctrl	Trt	Diff
Total employee count	3668.6	6022.0	-2353.4	80414.4	73056.0	7358.4	66515.9	55917.9	10598.0
Total manufacturing employment	34008.5	14875.8	19132.7	21077.7	10953.5	10124.2			
Total services employment.	46379.7	58038.6	-11658.9	45290.1	44720.5	569.6			
Hired employees	137.5	226.2	-88.8	58054.6	51185.4	6869.2	48376.2	40053.2	8323.0
Non-hired employees	1388.3	2328.7	-940.4	22359.8	21870.5	489.3	18139.8	15864.7	2275.1
Firm count	1006.9	1636.9	-630.0	16924.3	17720.7	-796.4	15942.5	15098.3	844.2
Firm count: public	31.9	52.9	-21.1	189.5	228.7	-39.3	220.7	357.4	-136.7
Firm count: < 21	990.3	1607.0	-616.7	16539.0	17402.1	-863.1	15699.3	14881.6	817.7
Firm count: inrange(emp_all,21,50)	11.2	20.9	-9.7	249.2	220.9	28.3	104.6	121.9	-17.3
Firm count: inrange(emp_all,51,100)	3.1	5.8	-2.7	77.9	60.2	17.7	68.2	37.7	30.5
Firm count: $100 \leq$	2.3	3.1	-0.9	60.5	37.6	22.9	70.5	57.2	13.3
Employees: < 21	2433.0	4012.1	-1579.2	48972.5	47353.7	1618.8	42446.6	36910.9	5535.7
Employees: inrange(emp_all,21,50)	355.7	654.4	-298.7	7862.5	6718.6	1143.9	3540.3	3805.2	-264.9
Employees: inrange(emp_all,51,100)	214.8	401.7	-186.9	5566.4	4117.3	1449.1	5052.9	2715.3	2337.5
Employees: $100 \leq$	665.1	953.8	-288.6	18711.1	14866.3	3844.8	15476.1	12486.4	2989.7
Obs (Control)	113			134			141		
Total Obs	183			228			236		

Ctrl = Mean of Non-Operational SEZs. Trt = Mean of Operational SEZs.

GIFT SEZ - Apply/Approve 2007, Operations 2011 - Images 2010 to 2025

Table: Balance Table: Economic Census Outcomes (IHS Transformed)

	(1) 1990			(2) 1998			(3) 2005		
	Ctrl	Trt	Diff	Ctrl	Trt	Diff	Ctrl	Trt	Diff
IHS Total employee count	5.55	6.05	-0.50	6.23	6.86	-0.63	6.74	7.31	-0.57
IHS Total manufacturing employment	4.13	4.63	-0.51	4.56	5.24	-0.69	5.06	5.45	-0.39
IHS Total services employment.	5.08	5.58	-0.51	5.74	6.36	-0.62	6.28	6.92	-0.65*
IHS Hired employees	1.89	2.12	-0.23	5.16	5.74	-0.58	5.90	6.66	-0.76*
IHS Non-hired employees	3.25	3.62	-0.37	5.45	6.06	-0.62	5.73	6.12	-0.39
IHS Firm count	4.73	5.29	-0.55*	5.32	5.98	-0.65*	5.89	6.27	-0.37
IHS Firm count: public	2.25	2.75	-0.50*	2.30	2.57	-0.27	2.80	3.20	-0.40
IHS Firm count: <21	4.72	5.27	-0.55*	5.30	5.96	-0.66*	5.88	6.25	-0.37
IHS Firm count: 21 to 50	0.82	1.09	-0.28	1.25	1.68	-0.43	1.38	1.77	-0.39
IHS Firm count: 51 to 100	0.42	0.56	-0.13	0.79	1.24	-0.45*	0.81	1.33	-0.51**
IHS Firm count: $100 \leq$	0.33	0.41	-0.09	0.63	1.10	-0.47*	0.74	1.29	-0.55**
IHS Employees: <21	5.33	5.87	-0.54	5.98	6.63	-0.65	6.49	6.97	-0.49
IHS Employees: 21 to 50	2.04	2.49	-0.45	2.66	2.94	-0.28	2.95	3.55	-0.60
IHS Employees: 51 to 100	1.30	1.34	-0.04	1.98	2.54	-0.56	2.13	2.94	-0.81*
IHS Employees: $100 \leq$	1.17	1.17	-0.00	1.71	2.58	-0.88	2.30	3.51	-1.21**
Observations	183			228			236		

Ctrl = Mean of Non-Operational SEZs. Trt = Mean of Operational SEZs. Outcomes are Inverse Hyperbolic Sine transformed.

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GIFT SEZ - Apply/Approve 2007, Operations 2011 - Images 2010 to 2025

Figure: 2010

Figure: 2025

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Benefits of SEZs: Firms / Units

Category	Key Benefits for Firms / Units
1. Tax Incentives	• Income tax holiday on export profits (100% 5Y, 50% 5Y) • Zero-rated sales tax on supplies to/from SEZs (GST=18% - 40%)
2. Trade Facilitation	• Duty-free import of capital goods, raw materials, spares • Simplified customs procedures
3. Regulatory Easing	• Exemption from industrial licensing • Simplified import/export rules • Different labor subcontracting rules
4. Financial Incentivess	• Access to External Commercial Borrowings (ECBs) on easier terms • Simplified repatriation of profits
5. Infrastructure	• Shared infrastructure (power, telecom, warehousing, logistics)
6. State-Level	• Subsidized utilities, local tax concessions (state-specific)

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Context - Benefits of SEZs: Developers

Category	Key Benefits for Developers
1. Tax Incentives	• Income tax deductions on profits from SEZ development (100% 10Y) • Exemption from Dividends and other corporate tax • Exemption from central/state taxes during construction
2. Trade Facilitation	• Duty-free import of construction materials and equipment
3. Regulatory Easing	• Single-window clearance for approvals • Flexible land use permissions
4. Financial Incentives	• Easier access to foreign direct investment (FDI) • Relaxed rules on raising capital
5. Infrastructure & Lands	• Concessions on stamp duty and land acquisition costs
6. State-Level Benefits	• For example, discounts on electricity bills • Local tax holidays (varies by state)

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Economic Census:

Table: DID Economic Census 1990-1998-2005-2013

	(1) Total Workers	(2) Workers in Manuf	(3) Workers Service	(4) Wage Workers	(5) Non-Wage	(6) Number of Firms
	(1)	(2)	(3)	(4)	(5)	(6)
Operational × Post	0.544^{***}	0.845^{***}	0.307^{**}	0.718^{***}	0.306^{**}	0.222^{**}
	(0.188)	(0.271)	(0.151)	(0.232)	(0.147)	(0.111)
Mean Control	53149.41	19750.51	33322.31	37767.16	14756.58	11962.60
Oper. SEZs	103	103	103	103	103	103
Unique Locs	263	263	263	263	263	263
R-Squared	0.913	0.860	0.930	0.894	0.899	0.948
Obs	906	906	906	906	906	906
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Village/Town FE	Yes	Yes	Yes	Yes	Yes	Yes

Total number of workers includes hired and non-hired workers, workers in manufacturing include: Workers in Services Include, wage workers are defined using the hired workers in the survey, non-wage workers use the non-hired workers, the number of firms is the total number of firms, including formal and informal

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