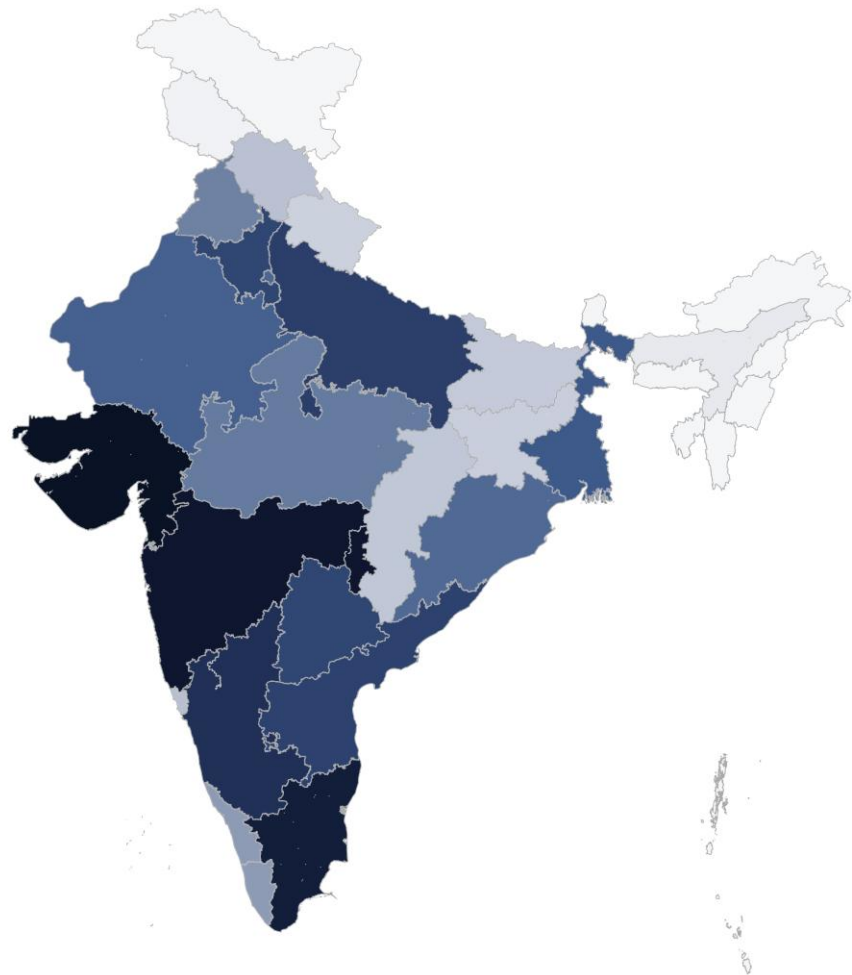


Mapping India's Export Geography

*A District-Level Cluster Strategy for the National
National Manufacturing Mission*

Kannan Kumar

Work in progress — comments welcome



From 'Don't' to 'How'

Four decades of the industrial policy debate

1 · The orthodoxy (1980s–90s)

- Krueger, Lal, Washington Consensus: states cannot pick winners
- East Asian Miracle (World Bank, 1993): read as market success

2 · The revisionists

- Amsden (1989): Korea 'got prices wrong', disciplined firms via export targets
- Wade (1990); Chang (2002): 'kicking away the ladder'

3 · The 'how' turn (2000s)

- Rodrik (2004), Hausmann–Rodrik (2003): not whether but how — self-discovery, sunset clauses
- Lin & Monga (2011): facilitate latent comparative advantage

4 · The new mainstream (2010s–)

- Mazzucato (2013): mission-oriented state; Juhász, Lane & Rodrik (2023): empirical turn
- Place-based turn — Krugman; Kline & Moretti (2014)

Where this paper sits: firmly in camps 3 and 4 — use revealed performance to find what the economy is already trying to do (Rodrik), and act on it through place-based, WTO-safe ecosystem investment rather than subsidies.

The Return of Industrial Policy

After decades in the wilderness, every major economy is now doing it — openly

China (2000s–)

Shenzhen: from a fishing town to an electronics capital via an SEZ. Suzhou and Kunshan: industrial parks that became export clusters. Made in China 2025: sectors *and* places - BYD in Shenzhen, CATL in Ningde.

United States

CHIPS Act (\$52B): TSMC in Arizona, Intel in Ohio. IRA (\$370B+): EV and battery credits tied to location — a "battery belt" from Georgia to Michigan.

EU, Japan, Korea

EU Chips Act (€43B): Intel in Magdeburg, TSMC in Dresden. Japan: Rapidus in Hokkaido, TSMC in Kumamoto. Korea: Yongin semiconductor mega-cluster, ~\$470B.

The new consensus has two features

- Geographic — governments pick places as much as sectors; agglomeration is where returns are
- Ecosystem-led rather than subsidy-led — partly by design, partly because WTO rules bind
- **India has joined: PLI (2020), Districts as Export Hubs (2023), National Manufacturing Mission (2025)**

India's Turn: From Incentives to Places

Why geography has to be at the centre of India's version

\$2 Trillion

2030 export target; today \$438B,
\$438B, flat

WTO DS541

MEIS-style subsidies closed off
off

NMM 2025

Cluster mission —no map

- Union Government controls fiscal levers; States control land, power, water, labour. So Delhi has historically done incentives, not places.
- NMM breaks this: it is about ecosystems —logistics, testing, GVC linkage —which are inherently spatial and WTO-compatible.
- **But 'cluster-based' is only a philosophy until you say where. That is the gap this paper fills.**
- Our lens: revealed export performance at the district level, over four years, across all sectors simultaneously — let the data say where India is already trying to export.

What We Ask — and What We Find

Four questions

- How concentrated is India's export geography at district level?
- Has it changed over FY22–FY25?
- Which districts combine export readiness, manufacturing depth, consistency and diversification — i.e. are viable NMM clusters?
- Why do some states manufacture a lot but export very little?

01

Extreme, persistent concentration

Top 10% of districts = 82% of exports; Gini > every year

02

Manufacturing–export disconnect

8 states: \$60B GVA, \$8.8B exports — 15% intensity vs 80% national

03

A geographically narrow transition

Electronics +119%, but two districts capture most of it

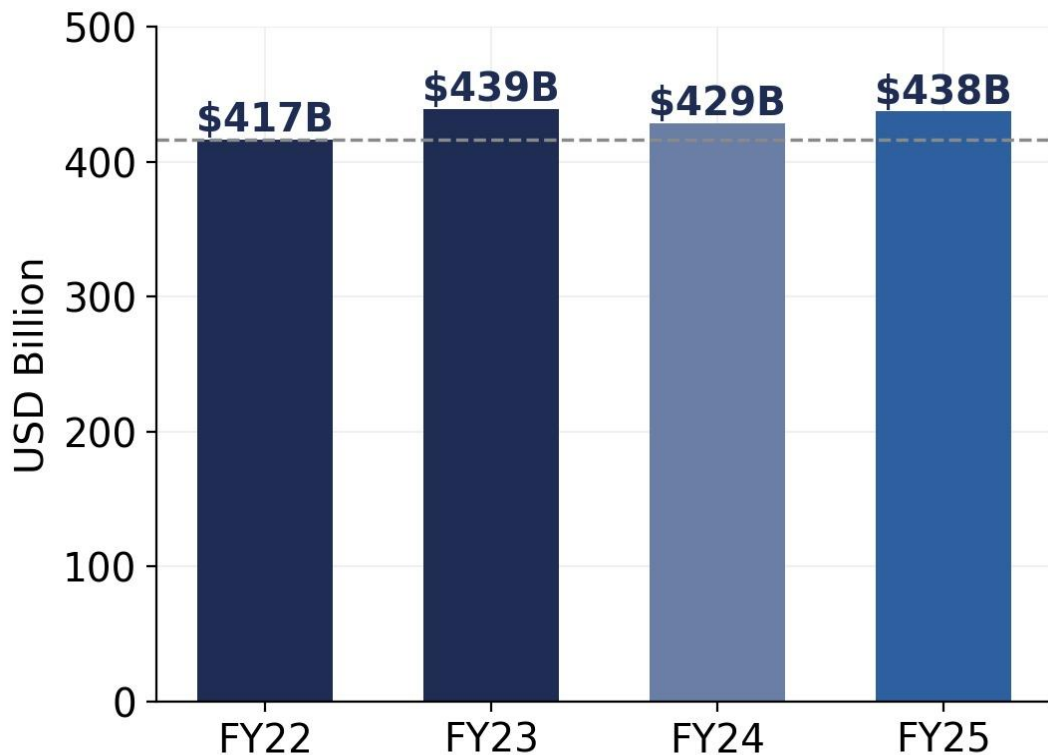
Part 1

India's Export Geography

National → State → District → the disconnect

The National Picture: Flat

Merchandise exports, FY2021-22 to FY2024-25



Source: DGCI&S. Includes 'Unspecified' category.

+5%

cumulative growth over four years

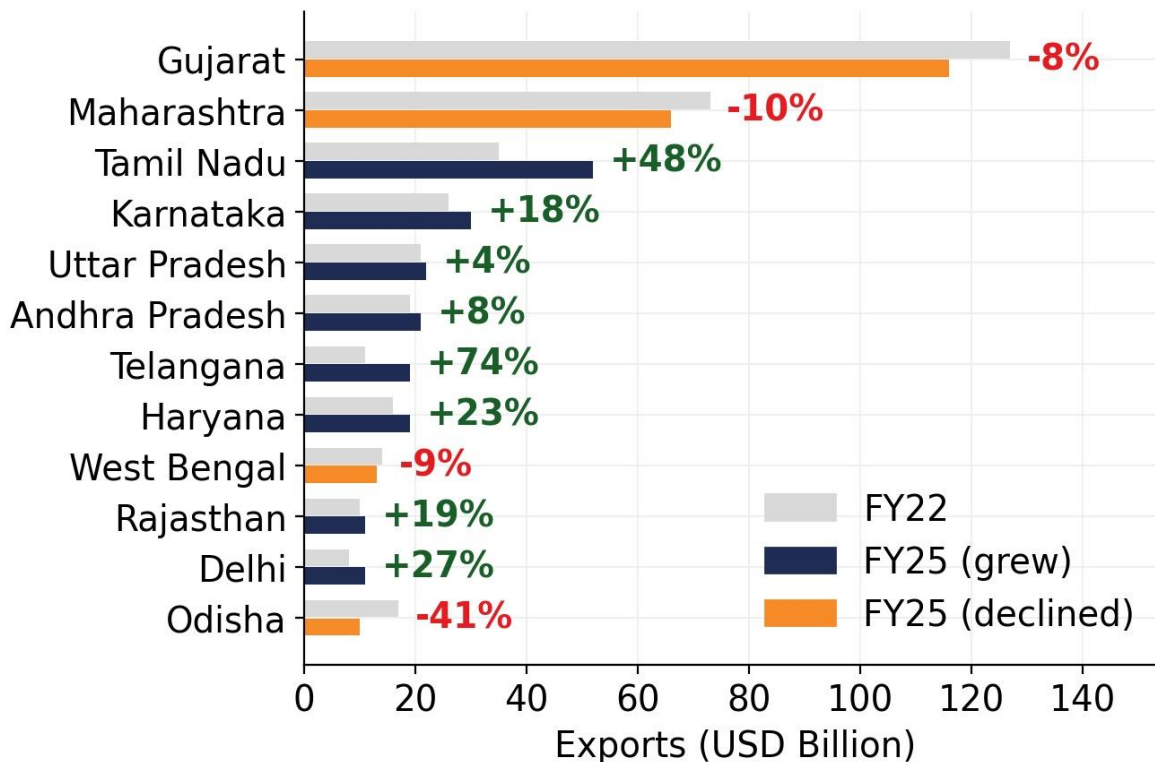
~4.5×

growth needed to hit \$2T by 2030

The headline is flat. The story underneath is not — it is one sharp divergence.

Beneath the Headline: States Are Diverging

FY22 vs FY25, top 12 exporting states

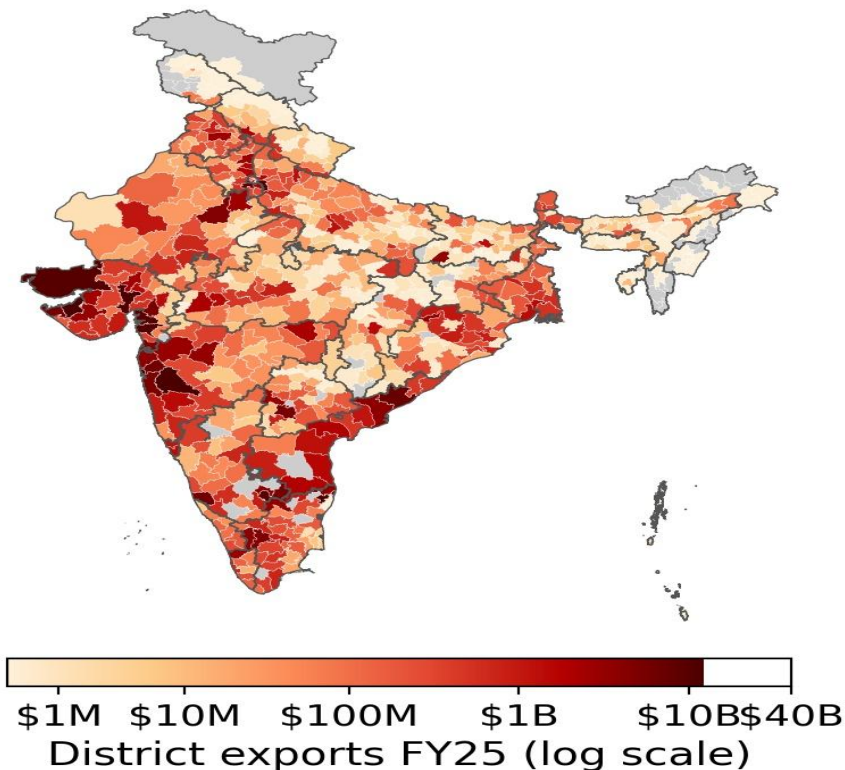


- Tamil Nadu +48% (electronics, Kanchipuram)
- Telangana +74% (pharma, aerospace)
- Gujarat -8%: almost entirely Jamnagar's petroleum cycle (\$72B → \$37B)
- Maharashtra -10%: gems and steel
- Top 5 states = 67% of all exports

Source: Authors' calculations from DGCI&S data.

Zoom In: Two Geographies

District-level export value, FY2024-25 (98.5% of exports mapped)



Source: Authors' calculations from DGCI&S data.

82%

of exports: top 10% of districts

0.47%

of exports: bottom half half

>0.87

Gini, every year

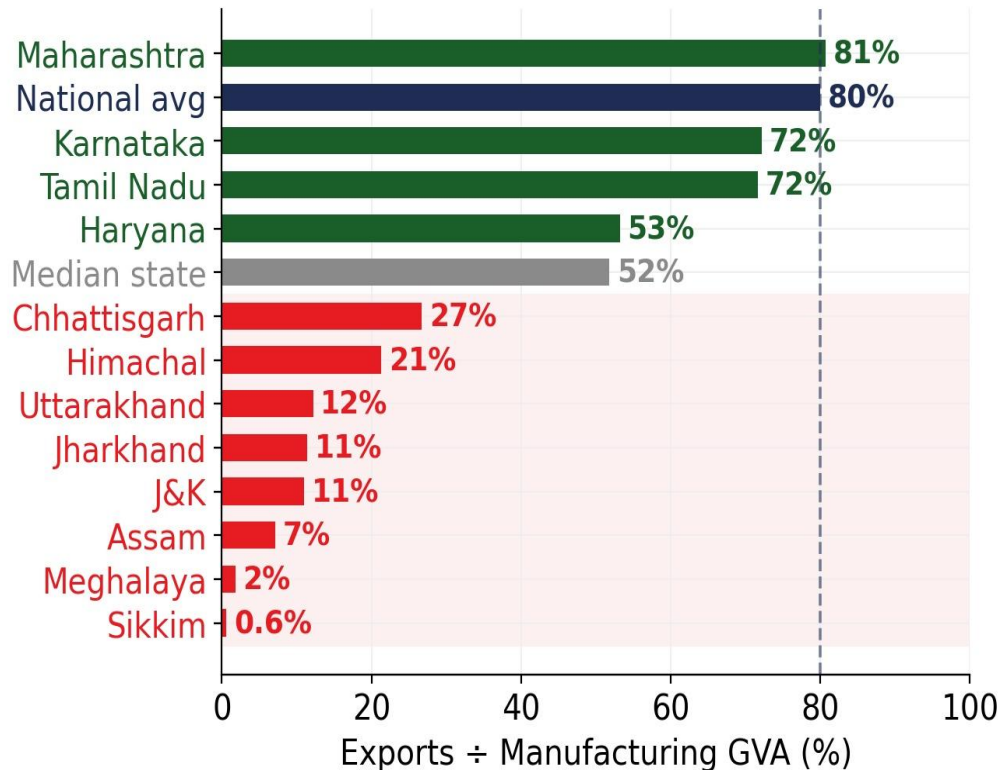
-31%

median growth, bottom bottom quartile

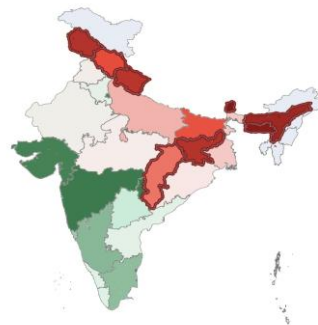
Excluding Jamnagar barely moves the Gini (0.880 → 0.880 → 0.872). Concentration is systemic, not one one refinery — consistent with Myrdal's cumulative cumulative causation.

The Manufacturing–Export Disconnect

States that make a lot but sell abroad very little (FY2022-23)



- **8 states: \$60B manufacturing GVA → only \$8.8B exports**
- **Intensity 14.7% vs national 80% — a 5.4× gap**
- An ecosystem failure, not a production failure: the fixed cost of exporting (Melitz) binds

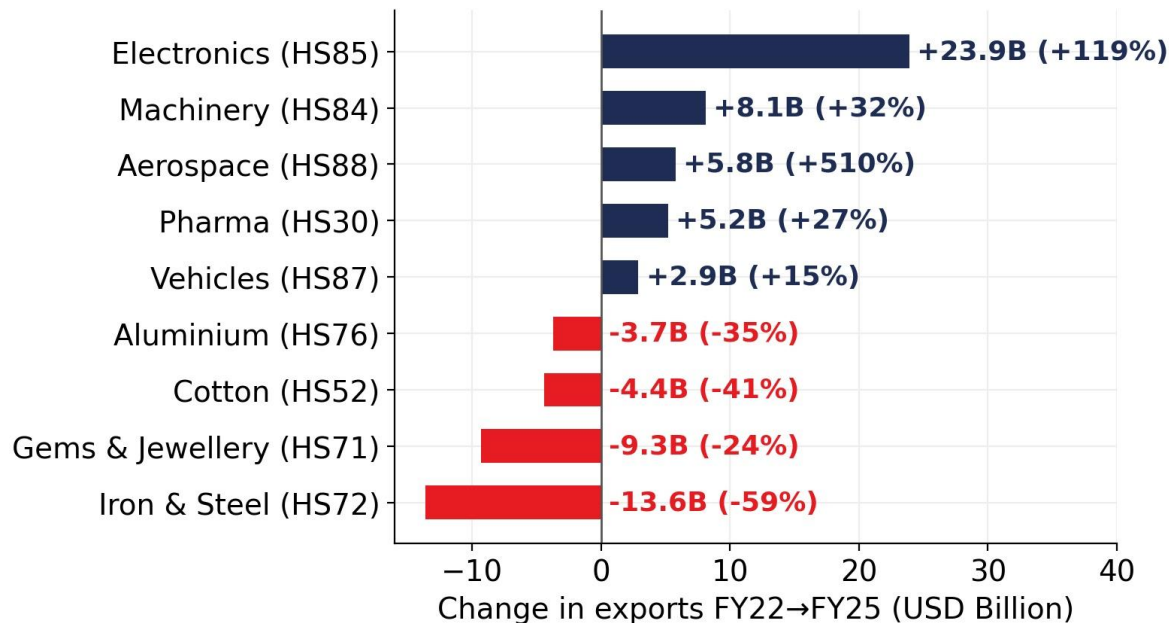


Sirmaur (HP) is the proof: Baddi-corridor pharma exports fine where infrastructure exists. Same state, different ecosystem.

Source: ASI (MoSPI), DGCI&S. Gujarat, Delhi excluded as outliers.

A Real but Geographically Narrow Transition

Change in exports by HS chapter, FY22 → FY25



- **Electronics +\$24B: 90%+ 90%+ from Kanchipuram Kanchipuram and Kolar Kolar alone**
- **Aerospace + \$6B: Ranga Reddy; steel -\$14B: Odisha, Jharkhand**
- **Gains and losses are concentrated. The PLI is deepening spatial inequality, not it.**

Source: Authors' calculations from DGCI&S data.

Part 2

Finding the Clusters

Data, four criteria, three categories — and the results

Data and Approach

Let revealed performance, not sectoral preference, pick the districts

DGCI&S district exports

713 districts · 98 HS-2 chapters · FY22–FY25
· 115,879 district-sector-year observations.
Attributed to exporter's registered address.

Annual Survey of Industries

State × 2-digit NIC GVA, FY23. Proxy for manufacturing depth. State-level only — a known limitation.

- Scope: 55 manufacturing chapters (\$311B, 71% of exports). HS 27 petroleum (\$67B) (\$67B) excluded — a price cycle, not an ecosystem.
- Each district × sector pair scored on four criteria, normalised 0–1, equal weights. Weights 0.10–0.40 don't change the top clusters.
- Closest Indian antecedent: Gaur (2023, DGCI&S index) — cross-sectional, no manufacturing depth. NITI Aayog's district indices are precedents for composite scoring, but not for export readiness.

Four Criteria, Each Anchored in Theory

C1

Export readiness — *log of FY25 sector exports*

Melitz (2003): districts already exporting have crossed the fixed-cost threshold — highest marginal return

C2

Manufacturing depth — *log of state GVA in matching NIC sector*

Ellison–Glaeser (1997), Porter (1998): supplier base, labour pool, spillovers — Chakraborty (2025) shows SEZs only work where this exists

C3

Export consistency — *years of positive growth, 0–3*

Roberts–Tybout (1997): strips out commodity spikes; rewards trajectory, not a good year

C4

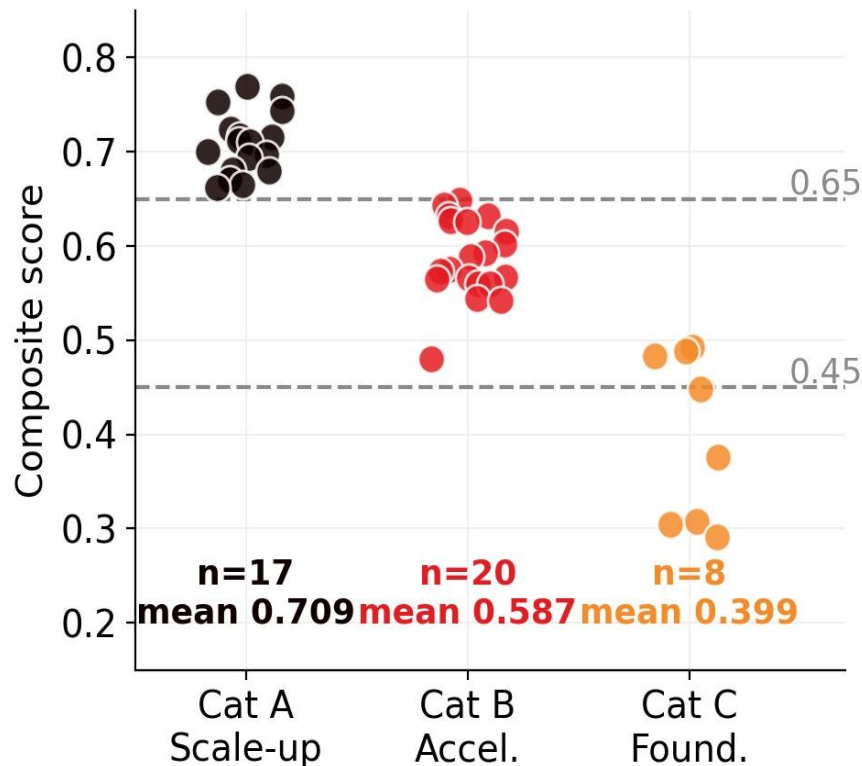
Meaningful diversification — *Δ HS chapters with exports > \$1M*

Hausmann–Rodrik (2003) self-discovery; \$1M threshold kills one-off shipments

C1 + C3 together operationalise Rodrik's (2004) self-discovery principle.

Three Categories, Three Policy Logics

Composite score distribution, 45 districts



A • Scale-up (≥ 0.65 , $n=17$)

Already dynamic. Deepen GVC integration, quality quality infrastructure. PLI continues.

B • Acceleration ($n=20$)

Score 0.45–0.65. Primary NMM target: demonstrated potential, ecosystem gaps. Max 2 per state; 14 states.

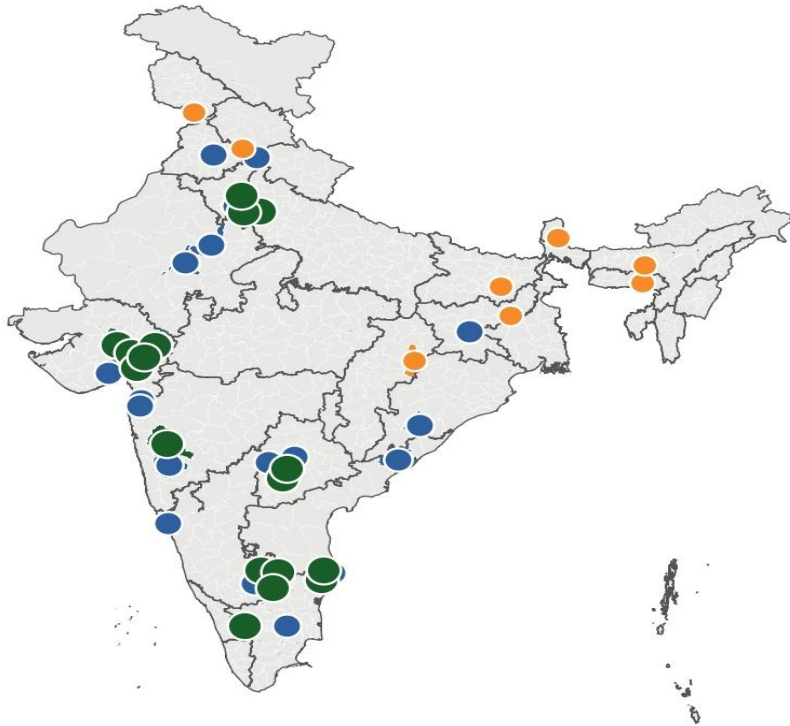
C • Foundational (<0.45 , $n=8$)

One per disconnected state. Diagnostic before any before any capital.

Means: A 0.709 · B 0.587 · C 0.399 — clearly separated tiers.

The Map NMM Does Not Have (Yet)

37 manufacturing clusters across 15 states, plus 8 foundational districts



17

Category A

Kanchipuram, Gurugram, Pune, Ahmedabad, Kolar, Bharuch, Ranga Reddy...

20

Category B

Valsad, Visakhapatnam, Bengaluru Urban, Chennai, Jaipur, Ramanagara... Ramanagara...

8

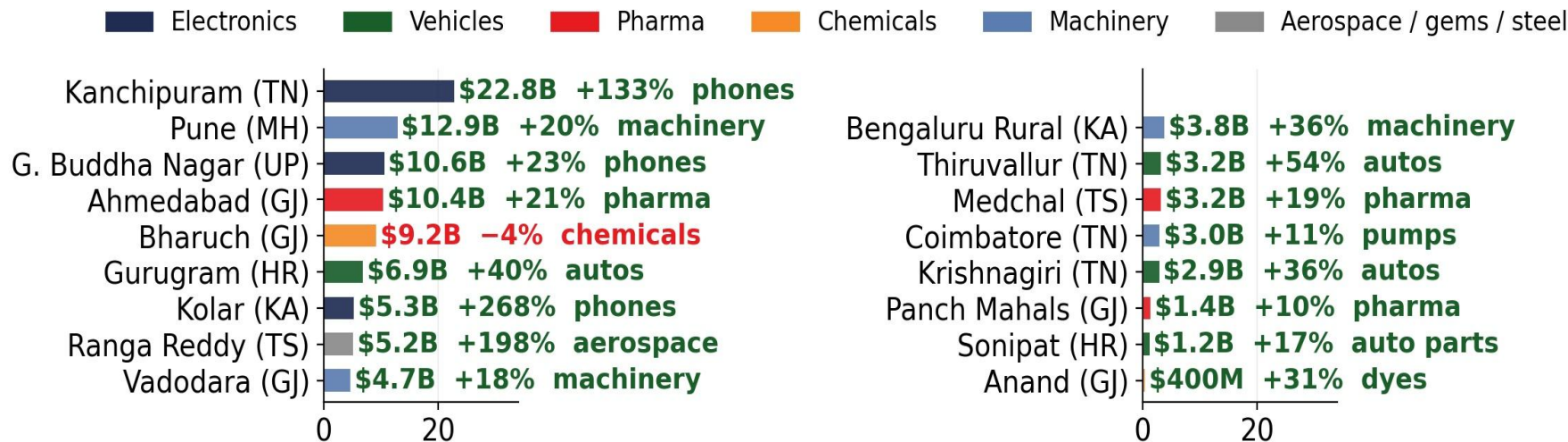
Category C

Solan, Raigarh, Kamrup, Jamtara, Munger, Samba, Gangtok, E. Khasi Hills Hills

Dots mark cluster centroids for visibility at India scale. Source: authors' calculations.

Category A—Scale-up: 17 districts

Composite score ≥ 0.65 . Policy is deepening, not building.



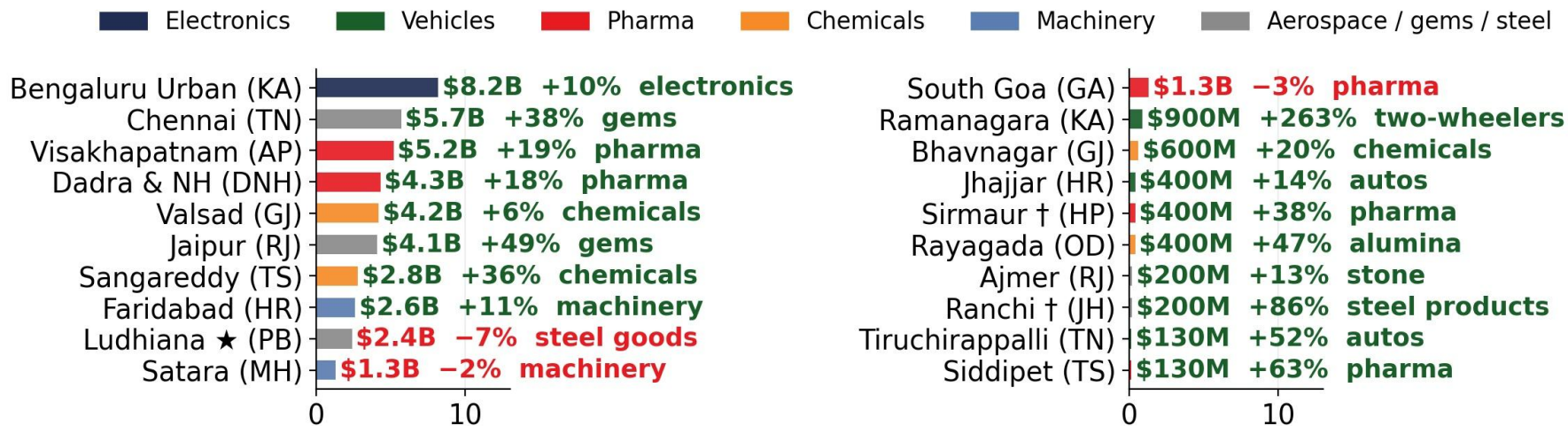
Manufacturing exports FY2024-25, USD billion · label: value, growth FY22→FY25, lead product

- \$106B of manufacturing exports in 17 districts — a quarter of India's total. Six groups: pharma, machinery, chemicals, aerospace.
- The ask is upgrading, not infrastructure: certification labs, GVC linkage, port capacity.

Source: authors' calculations from DGCI&S and ASI.

Category B —Acceleration: the NMM target

Composite score 0.45–0.65: demonstrated potential, ecosystem gaps remain



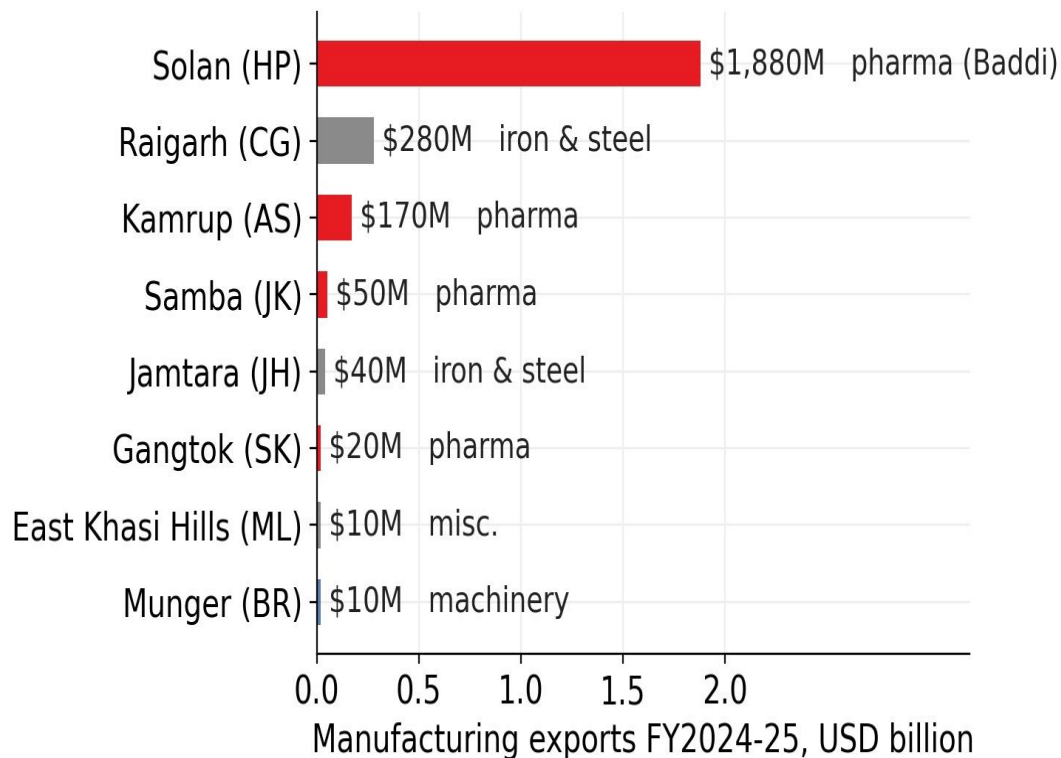
Manufacturing exports FY2024-25, USD billion · label: value, growth FY22→FY25, lead product

- Pharma and chemicals dominate: the gaps are bonded testing labs, effluent treatment and port logistics. † Ranchi, Sirmaur sit in 'disconnected' states; ★ Ludhiana added for spread, -7% is the caveat.
- Priority five: Valsad, Visakhapatnam, Bengaluru Urban, Bhavnagar, Satara**

Source: authors' calculations from DGCI&S and ASI.

Category C — Foundational: 8 districts

Composite score < 0.45. Early signals, no ecosystem. Diagnose first, invest second.



- Two stories: hill-state pharma (Solan, (Solan, Kamrup, Samba, Gangtok) that that located for tax holidays and cannot reach a port cheaply; and steel steel (Jamtara, Raigarh) hit by the commodity cycle
- **Solan alone is \$1.9B — bigger than half of Category B. It is a near-miss, not a laggard.**
- Madhya Pradesh absent by design: its big districts all declined; Dhar just misses
- **Ask: eight diagnostics, one method — NMM phase two**

Source: authors' calculations from DGCI&S and ASI.

Brownfield Clusters Are Greenfield Foundations

Semiconductors, solar, EVs, aerospace will land where ecosystems already exist

Emerging sector	Natural cluster foundations	Why there
Semiconductors / advanced electronics	Gautam Buddha Nagar, Kolar, Chennai	Apple/Foxconn GVC links, electronics workforce
Solar PV / green energy	Bharuch, Panch Mahals, Sangareddy Sangareddy	Deep chemicals base, land, component supply chains
EVs and batteries	Kanchipuram, Pune, Satara, Gurugram, Sonipat, Jhajjar, Ramanagara	Tier-1/2 auto suppliers; Kanchipuram adds autos + electronics + Hyundai EV
Defence aerospace	Ranga Reddy, Medchal, Bengaluru Rural	HAL, BrahMos, DRDO; \$3.6B aerospace exports

Greenfield instruments (ISM's 50% capital subsidy, 10–15 year horizons) and brownfield instruments (NMM ecosystem investment, 3–5 years) are different tools. The mistake is treating them as rival tracks.

What We Recommend

1 • NMM cluster programme

Designate 20 Category B districts. Sequence: diagnostic → DPR → NMM funding with milestones → PPP cluster body. Start with the top five.

2 • Category A deepening

GVC linkage, testing labs, higher-value activities. Keep PLI, calibrate it. Do not spend cluster money where it is not the constraint.

3 • Category C diagnostics

Eight funded studies, common method: binding constraint, minimum investment, 5-year export impact, instrument. Feeds NMM phase two.

4 • Destination diversification

US ≈ 18–20% of exports, far higher in electronics electronics and pharma. Build EU, Gulf and ASEAN ASEAN market programmes into every cluster cluster diagnostic.

All four are ecosystem instruments — WTO-compatible under the SCM Agreement.

Conclusion — and Limitations

Takeaways

- **India's route to \$2T runs through its manufacturing geography, not around**
- Concentration is structural; the disconnect is an ecosystem problem; the transition is narrow
- NMM has the right philosophy. It now has a map: 37 clusters, 15 states, WTO-safe instruments
- Next: annual score updates as districts graduate; FTA-utilisation follow-up paper

Limitations

- C2 is state-level — within-state variation variation is lost
- Backward-looking by design: finds what exists, not what could be created
- DGCI&S attributes to registered address — trading hubs (Delhi) overstated
- HS–NIC concordance involves judgment; published in full for scrutiny

Thank you

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Mapping India's Export Geography: A District-Level Cluster Strategy — work in progress
progress