

Falling into the Middle-Income Trap? A Study of the Risks of EU Regions to be Caught in a Middle-Income Trap

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Starting point: the Middle-Income Trap

- An economy that suffers from a sharp drop in economic dynamism after a successful transition from low-income to middle-income status. Shows up as stop-and-go growth, not steady long-term growth of productivity and incomes. Thus, prevents the economy from moving to high income level (Gill & Kharas, 2007)
- Empirically thus far identified at country level. In past century, only a handful of countries went from being low-income to high-income. For example: South Korea and Brazil had identical per capita income in 1950. Today, South Korea is high-income country. Brazil is middle income country since the 1960s. Stagnated at about 23% of US per capita income since then.
- Many economies, by contrast, go from being low-income to middle-income.

Defining the “trap”

- Structural nature of transition from low-income to high-income:
- Economy becomes:
 - More expensive than low-income competitors: labor costs rise. Urban land costs rise.
 - But: can't reach productivity levels of high-income economies
 - Obstacles: not enough capacity in high-quality products or in being innovative
 - Why: because per unit investment costs in quality, skills, innovation are high. Developed countries have scale economies in these areas that give them additional advantages
 - For example: generating a skilled worker more expensive to society than mobilizing a low-skilled worker into initial industrialization (education systems are very expensive with latent productivity effects)

Why does the trap exist?

- Structural transformation required from strategy of cheapness to higher quality, more knowledge-based economy
- Business environment, governmentality, infrastructure, R&D, education: all must be transformed
- All require investment: large-scale, high unit cost, coordinated
- Formal and informal institutions and some kind of societal “consensus” needed to achieve this over time
- Thus: easy to get trapped – not make the right investments; not get the political consensus or coordination; suffer multiple external shocks

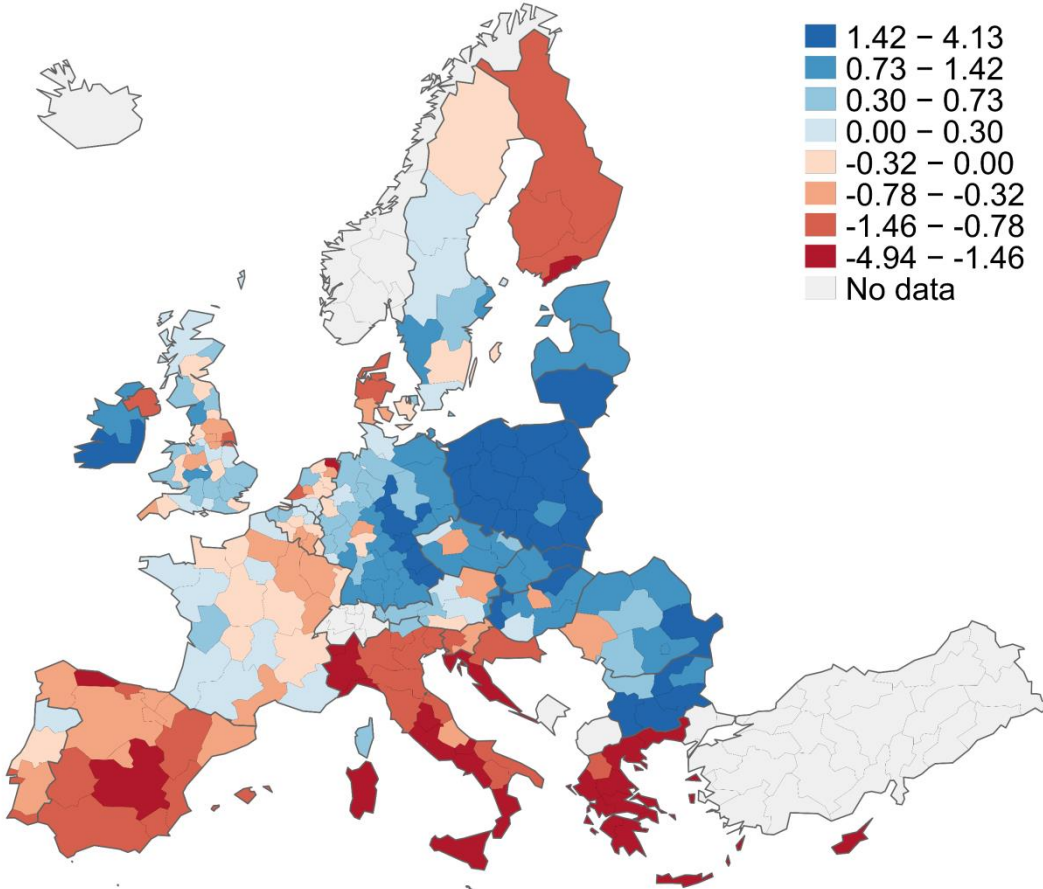
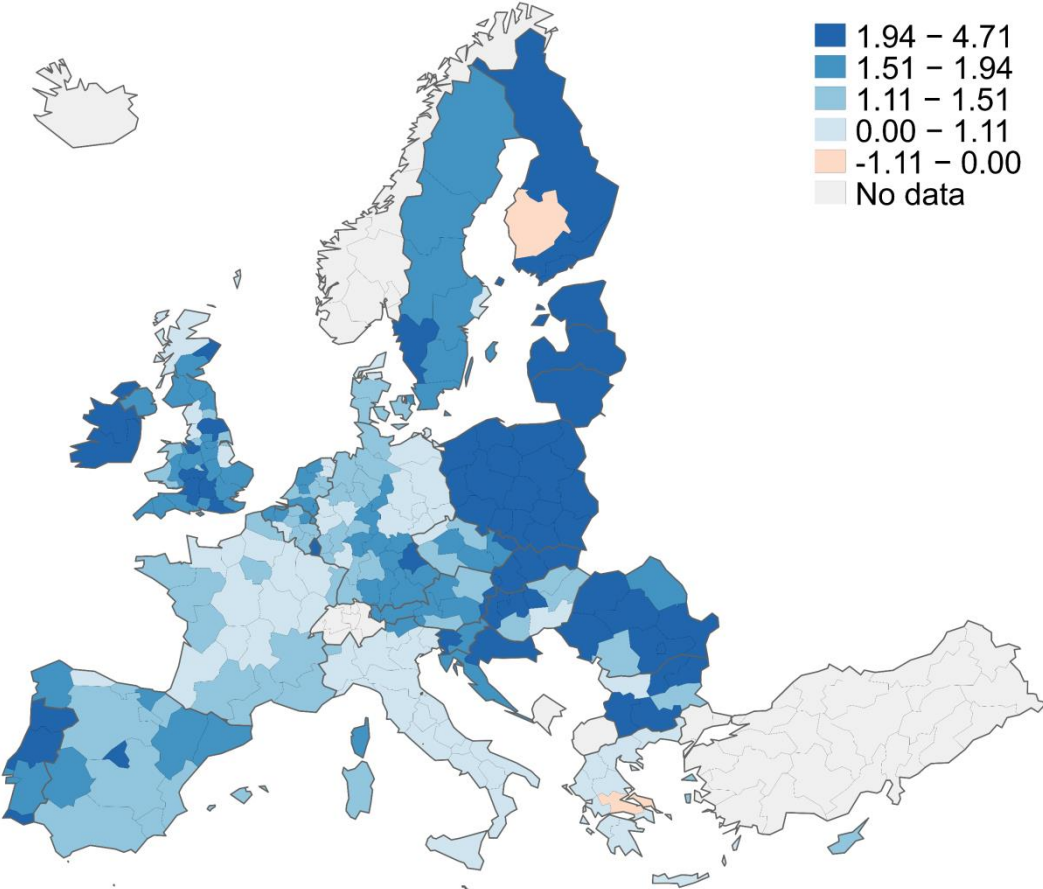
Our study

- Apply the conceptual framework about development traps to European regions
- No extant studies at regional level
- Starting point is the uneven growth performance of EU regions: could be a sign that some are falling into traps

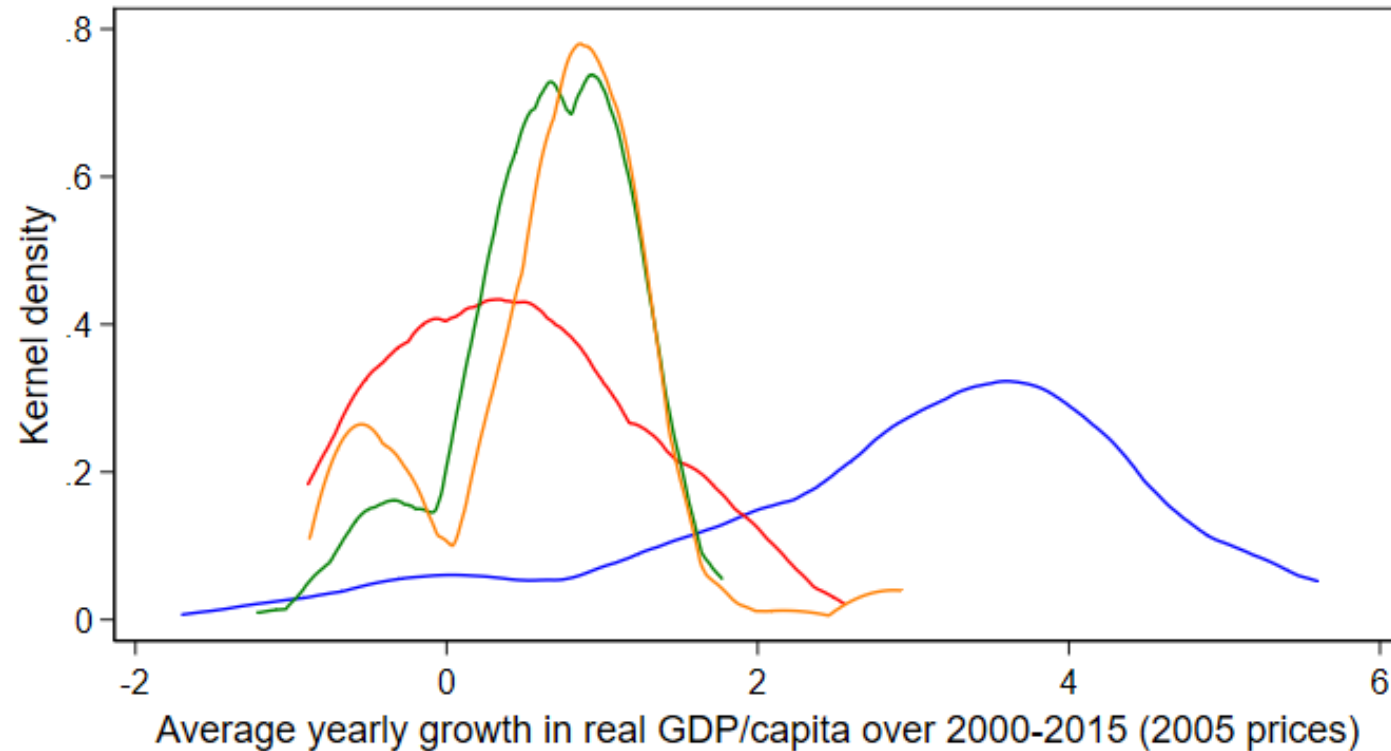
EU Regions: Heterogeneous Growth Performance

Real GDP/capita growth 1980-2015

Real GDP/capita growth 2008-2015

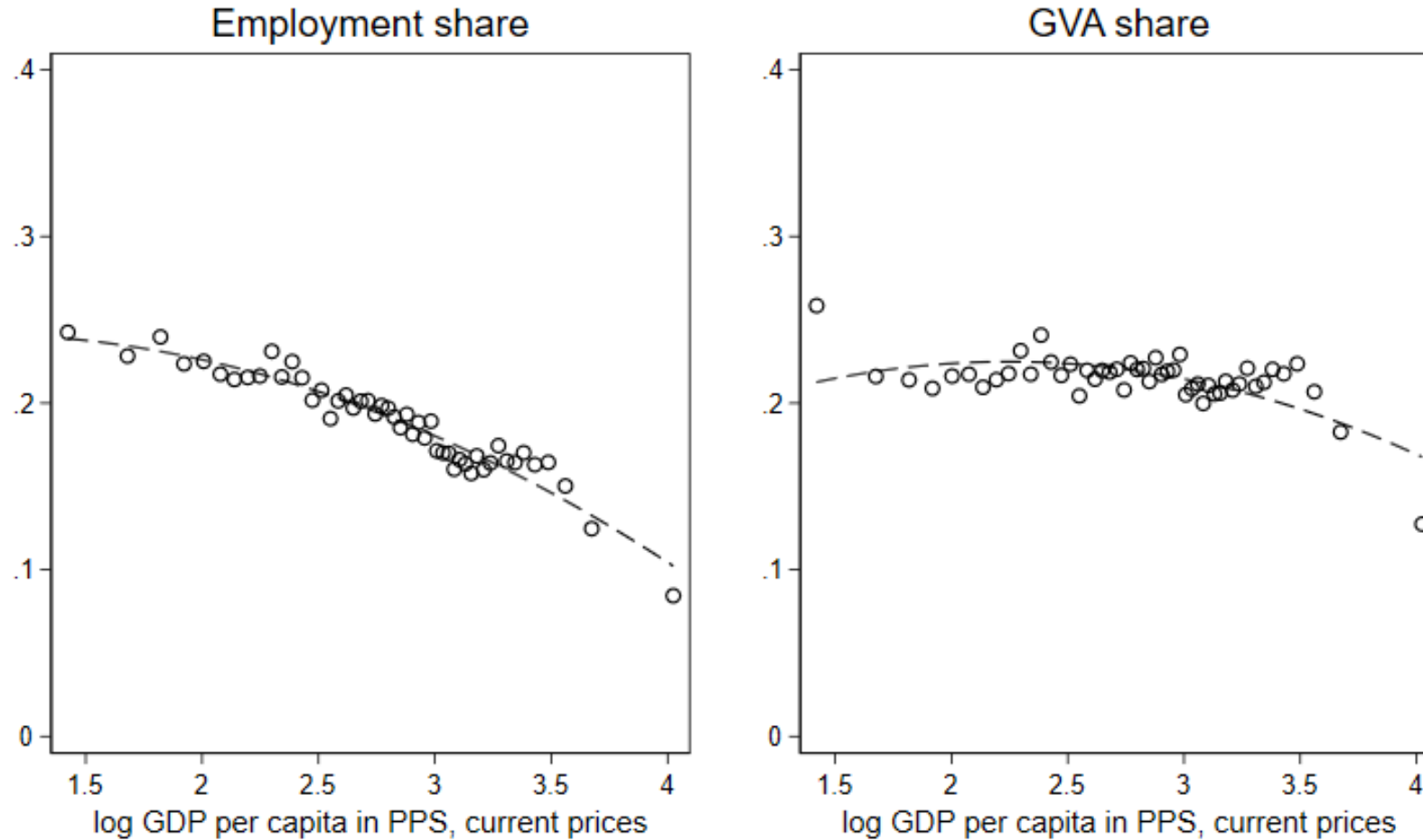


Regional Middle-Income Traps?



All observations are weighted by regional population in 2000. Categories expressed as a percentage of average EU GDP/capita in 2000 in PPS. Low: <75%; Middle: 75-120%; High: 120-150%; Very high: >150%.

Mfg. industry Across Development Levels



Shared Characteristics of Regional MITs: similar to those facing countries

- High production costs compared to low-income regions
- Low skills and innovation compared to high-income regions
- Additional pressure from international outsourcing/offshoring
- Inability to attract FDI and to support firm internationalisation

As a result, regions typically experience prolonged stagnation, high unemployment, demographic decline

EU Regional vs. National MITs

- Stagnation at higher middle-income levels
- Heterogeneous growth trajectories leading to MITs
 - ‘From above’: old industrial regions
 - ‘From below’: unsuccessful transition
 - ‘Stagnating’: long-term trapped
- More complex and diverse set of determinants of MITs
- Polarisation, political backlash and ‘geography of discontent’

Thus: adapt conceptual framework from national level to consider a broader notion of regional **Development Traps**

Objectives of the Study

- Identify EU regions in (or at risk of falling into) a MIT/DT
 - Provide a suitable definition at regional level
 - Determine appropriate measurement strategy
- Detect factors that are preventing these economies from developing to their full potential
- Establish the economic, social and political risks of DTs
- Provide advice on policy responses to support regions in a DT and/or prevent regions from falling into one

Methodology

Measuring Development Traps in EU Regions

Identification of a DT

- Three dimensions of economic dynamism
 - GDP per capita
 - Productivity
 - Employment
- Regional performance on these three dimensions relative to:
 - Itself in the past (previous five years)
 - The country the region belongs to
 - The EU
- With the aim of combining the three dimensions and measures of performance in one Development Trap index

Two alternative indices

- A basic index, using dummies (DT1)
 - Standardised between 0 and 1
 - Measuring whether a region is in a development trap at a given point in time
- An alternative index (DT2),
 - Taking into account the magnitude of the accelerations of the three factors and deviations relative to the country and the EU
 - Using un-standardised values
 - Aiming to measure the intensity of the trap

Measurement Strategy (1)

- Draw on growth accelerations/slowdowns framework
- Using changes for three main factors considered
 - Acceleration of region with itself: $a_{i,t}^R = g_{i,t,t-n} - g_{i,t-n,t-2n}$
 - Deviation of region from MS: $a_{i,t}^{MS} = g_{i,t,t-n} - g_{t,t-n}^{MS}$, with $i \in MS$
 - Deviation of region from EU: $a_{i,t}^{EU} = g_{i,t,t-n} - g_{t,t-n}^{EU}$

Measurement Strategy (2)

$$DT_{1,i,t} = \begin{cases} 1 - \frac{\sum_y D_{i,t}^{y,R} + \sum_y D_{i,t}^{y,MS} + \sum_y D_{i,t}^{y,EU}}{9}, & \text{if NUTS2 in MS} \geq 2 \\ 1 - \frac{\sum_y D_{i,t}^{y,R} + \sum_y D_{i,t}^{y,EU}}{6}, & \text{if NUTS2 in MS} = 1 \end{cases}$$

$$DT_{2,i,t} = \begin{cases} -1 \times \frac{[(\sum_y a_{i,t}^{y,R} + \sum_y a_{i,t}^{y,MS} + \sum_y a_{i,t}^{y,EU}) \times 9^{-1}] - \mu_{1990}^{Raw DT2}}{\sigma_{1990}^{DT2}}, & \text{if NUTS2 in MS} \geq 2 \\ -1 \times \frac{[(\sum_y a_{i,t}^{y,R} + \sum_y a_{i,t}^{y,EU}) \times 6^{-1}] - \mu_{1990}^{Raw DT2}}{\sigma_{1990}^{DT2}}, & \text{if NUTS2 in MS} = 1 \end{cases}$$

Alt. specifications were considered and robustness tests performed

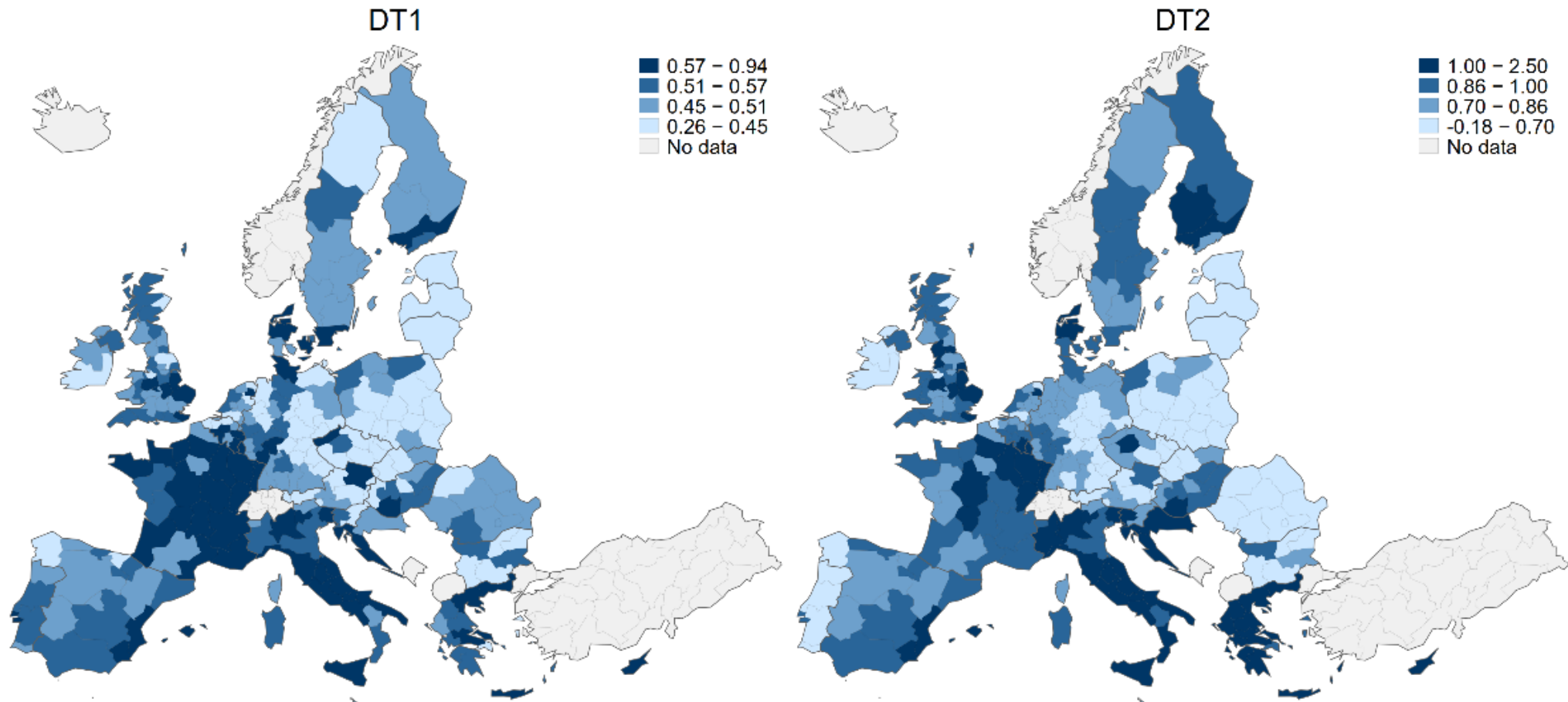
Strengths of this Approach

- Nuanced definition that considers several dimensions of DTs, not just per capita income, with stronger links to theory
- Does not condition on past growth performance, allowing to capture different growth trajectories and traps
- Ex-ante agnostic about income levels at which traps occur, allows to test middle-income trap hypothesis at different GDP per capita levels

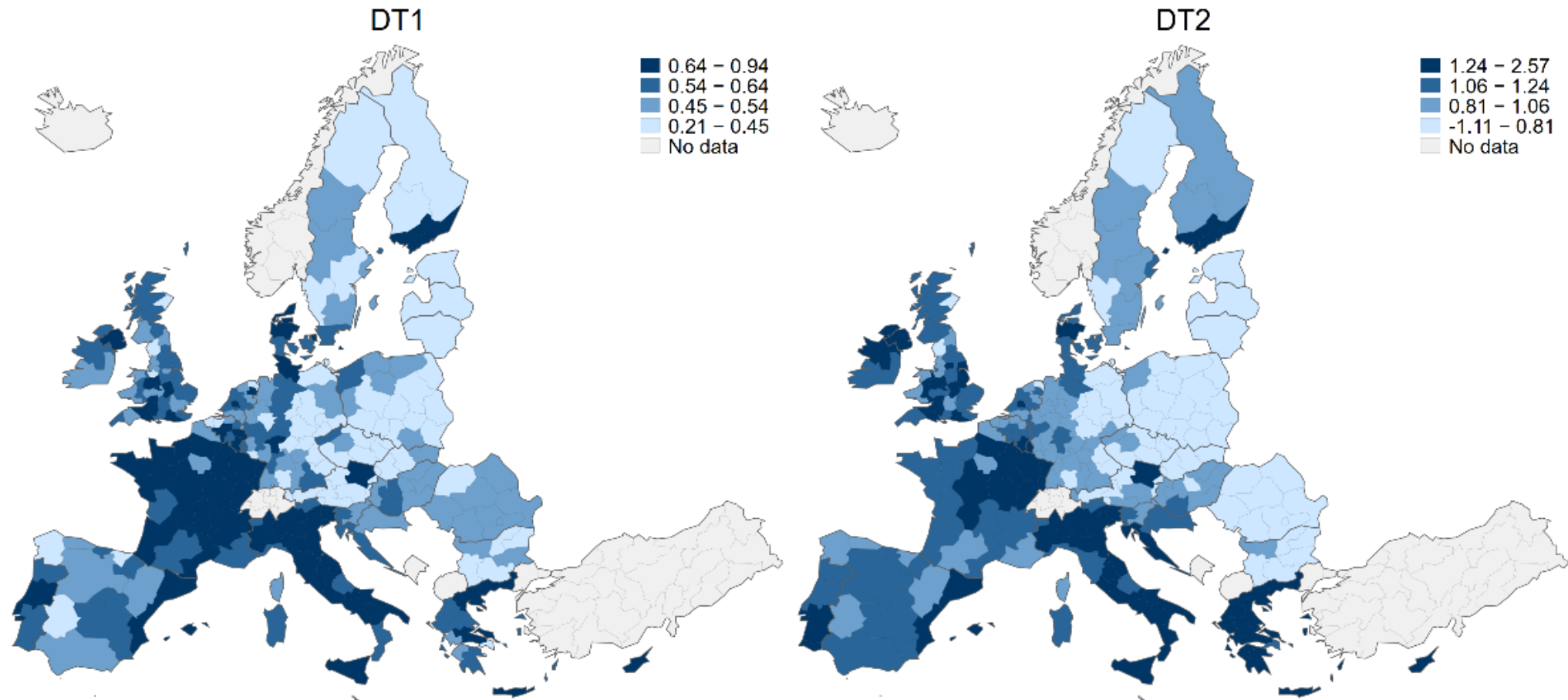
Descriptive Findings

A Portrait of DT Regions in the EU

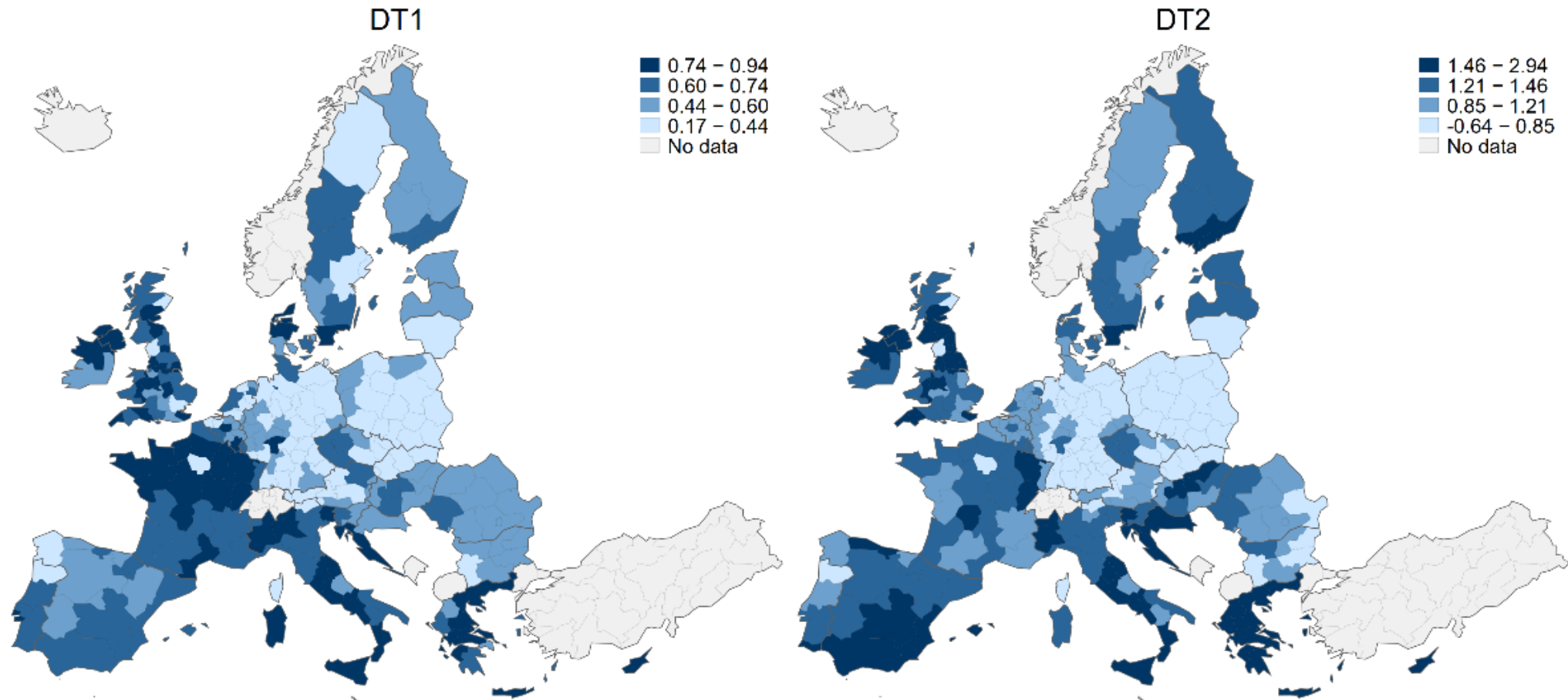
Average DT by Quartile (1990-2015)



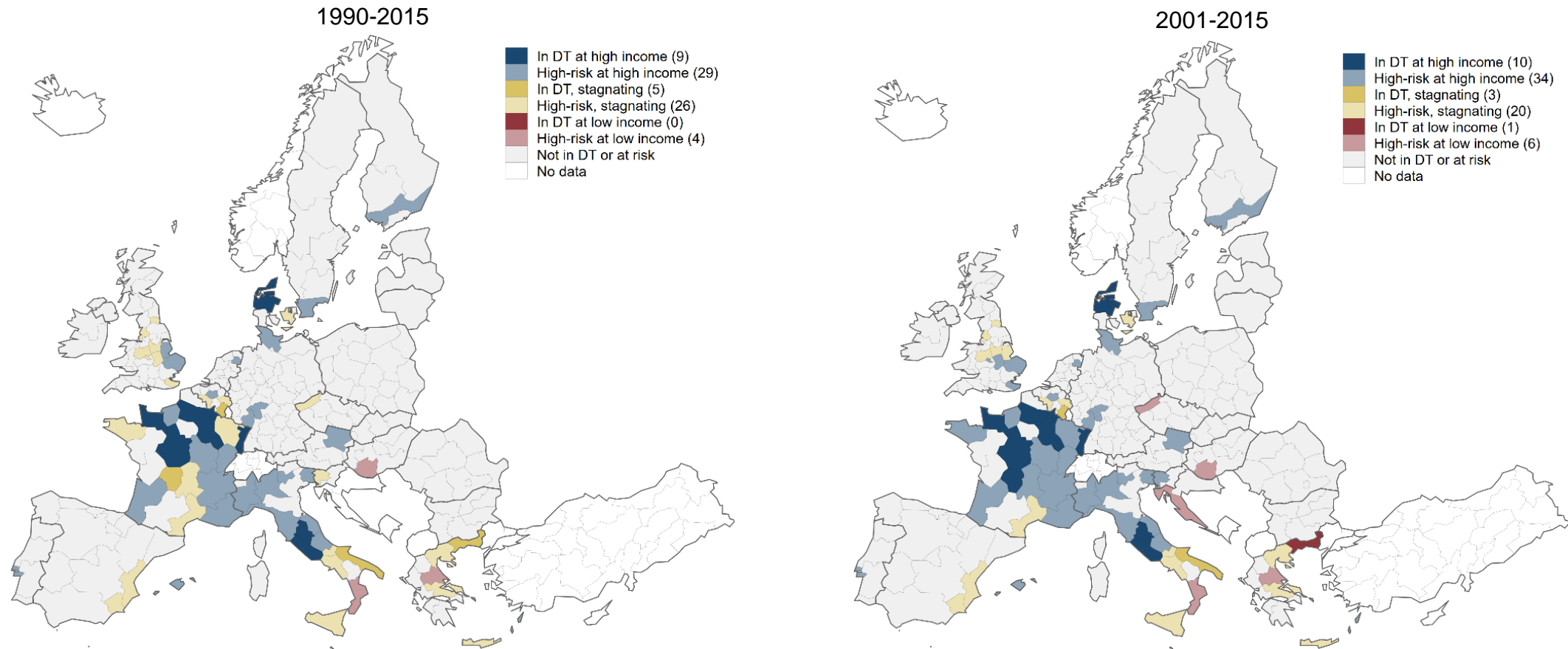
Average DT by Quartile (2001-2015)



Average DT by Quartile (2008-2015)



DT Risk by Initial Level*

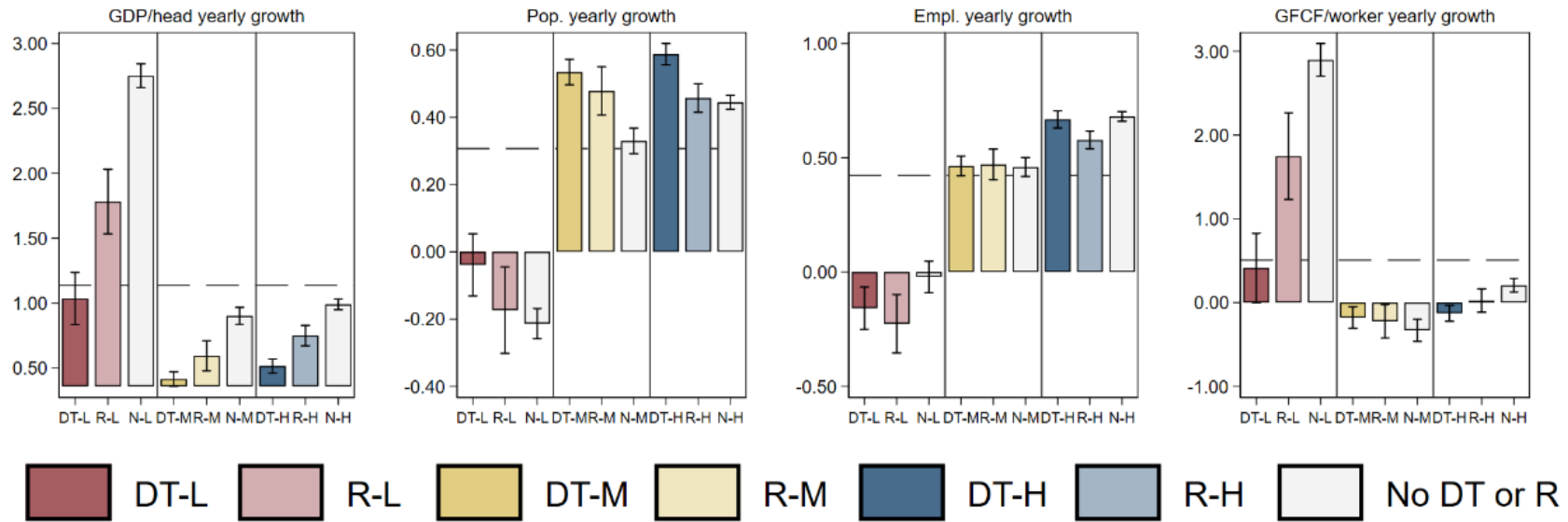


Initial levels of development consider GDP/capita in PPS in the earliest available year. Categories defined relative to EU average. High income: above year average. Middle income: 75-100% of year average. Low income: below 75% of year average. In DT: mean scores above 75th percentile computed over the entire series. At risk: mean scores above median and below 75th percentile over the entire series. Both maps drop regions for which DT could only be computed after 2002.

Initial levels of development consider GDP/capita in PPS in 2001. Categories defined relative to EU average. High income: above year average. Middle income: 75-100% of year average. Low income: below 75% of year average. In DT: mean scores above 75th percentile computed over the entire series. At risk: mean scores above median and below 75th percentile over the entire series. Regions with less than 10 years available in the series are not considered when drawing these maps.

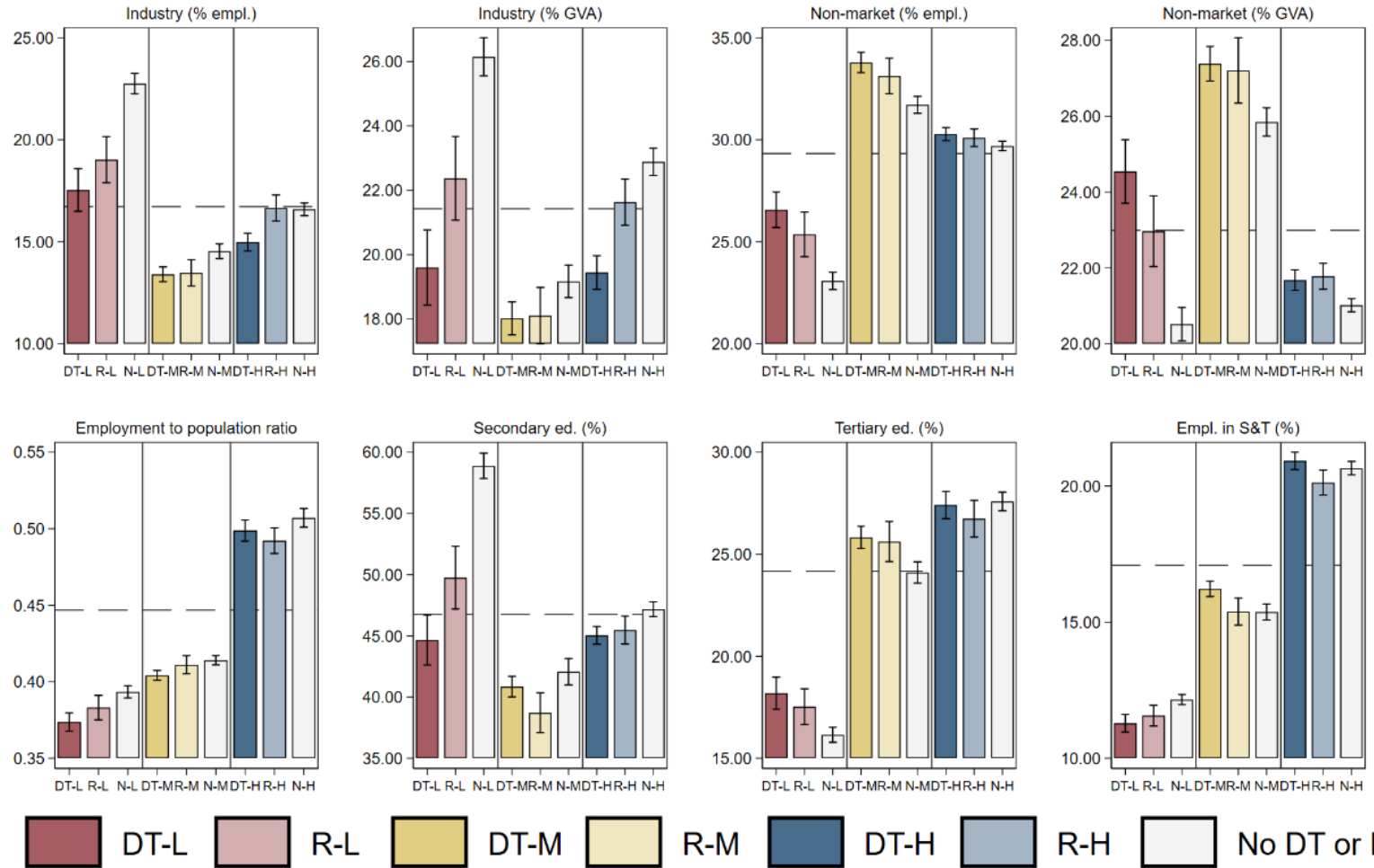
* The rest of this presentation focuses on the DT1 measure

Characteristics of DT Regions (1)

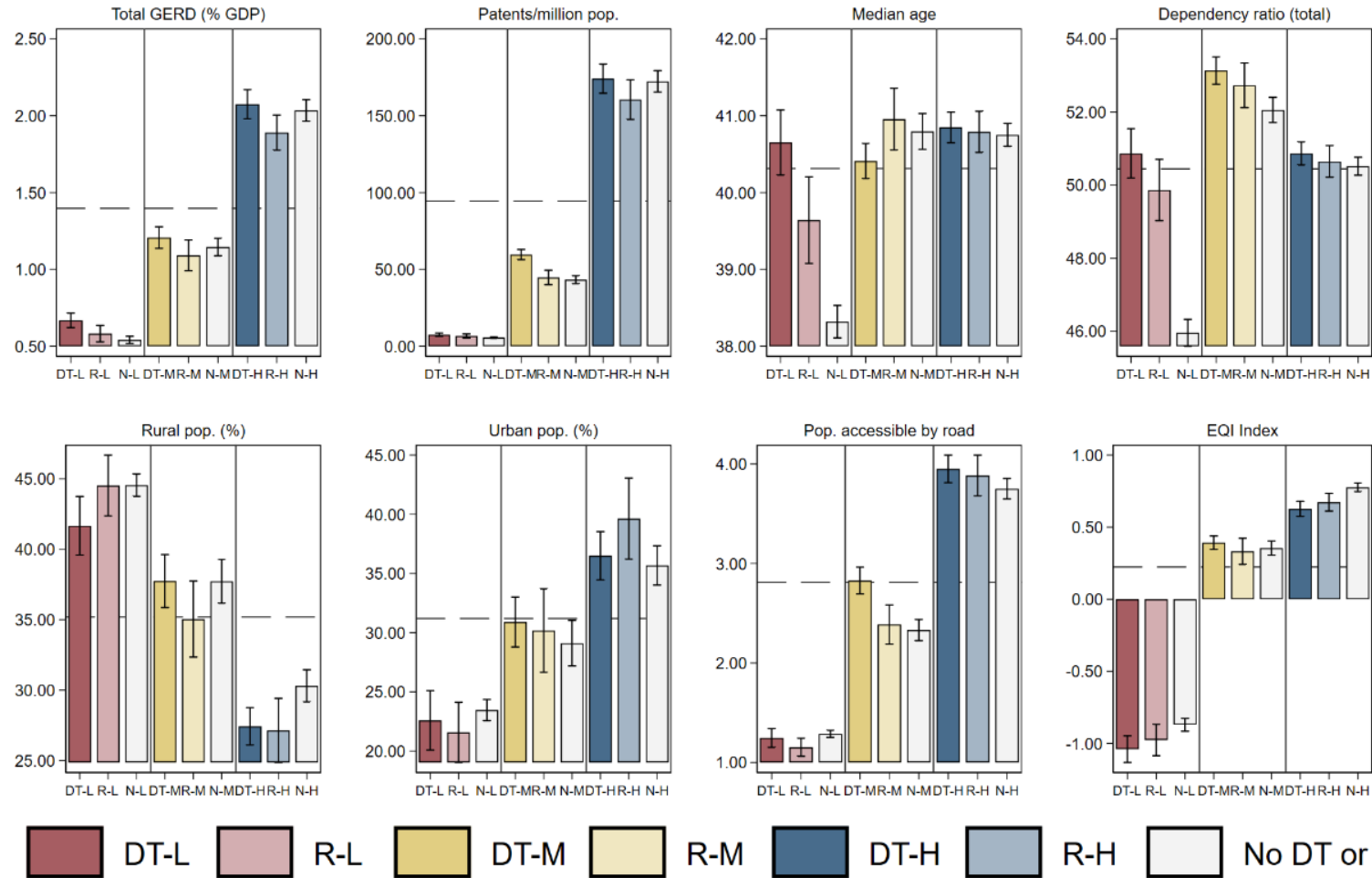


Average values by category over 2000-2015. High income (H): above the year average. Middle income (M): 75-100% of year average. Low income (L): below 75% of year average. In a trap (DT): mean scores above 75th percentile computed over 1990-2015. At risk (R): mean scores above median and below 75th percentile over 1990-2015. Dashed line: EU mean. Vertical bars: 90% CIs.

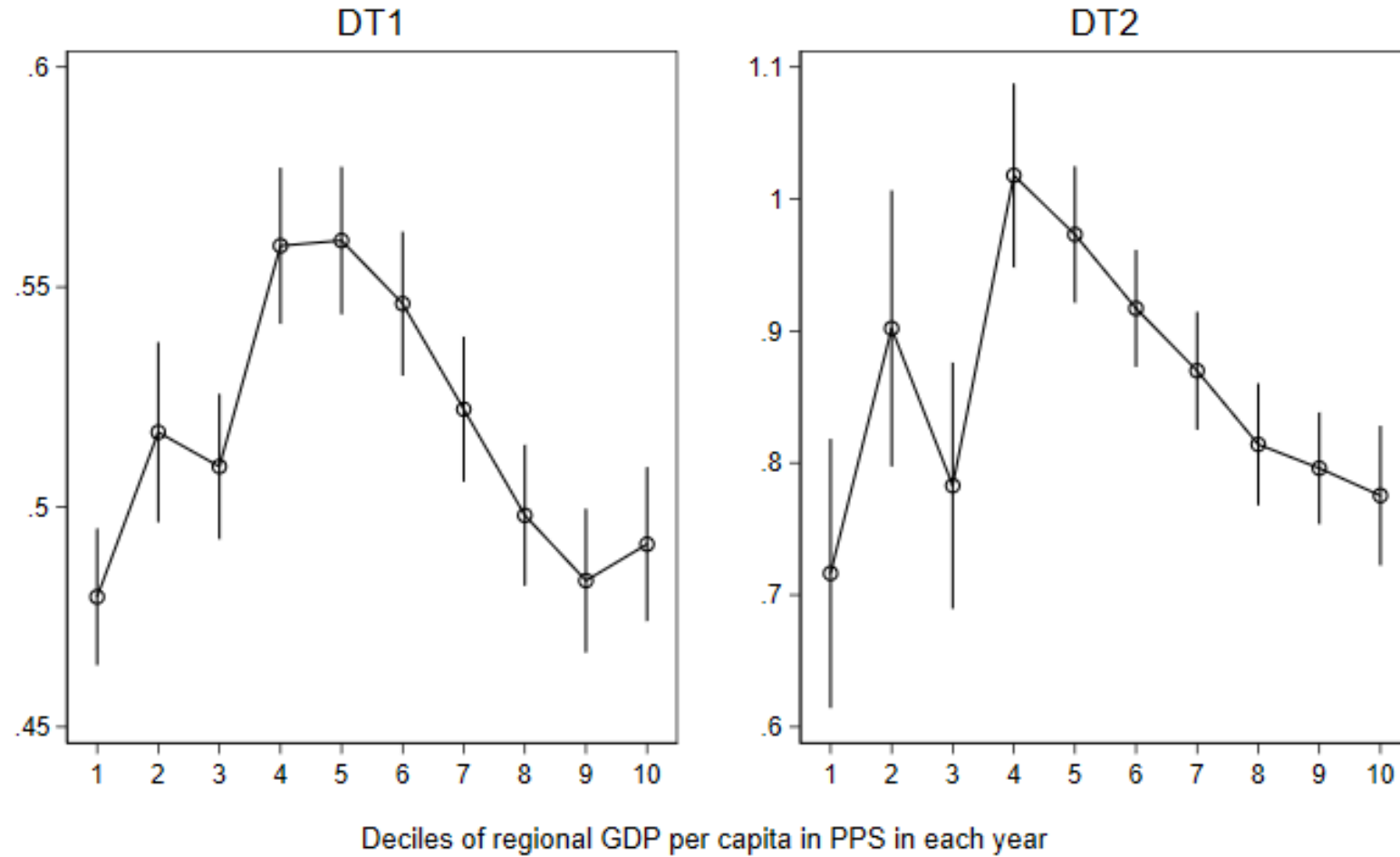
Characteristics of DT Regions (2)



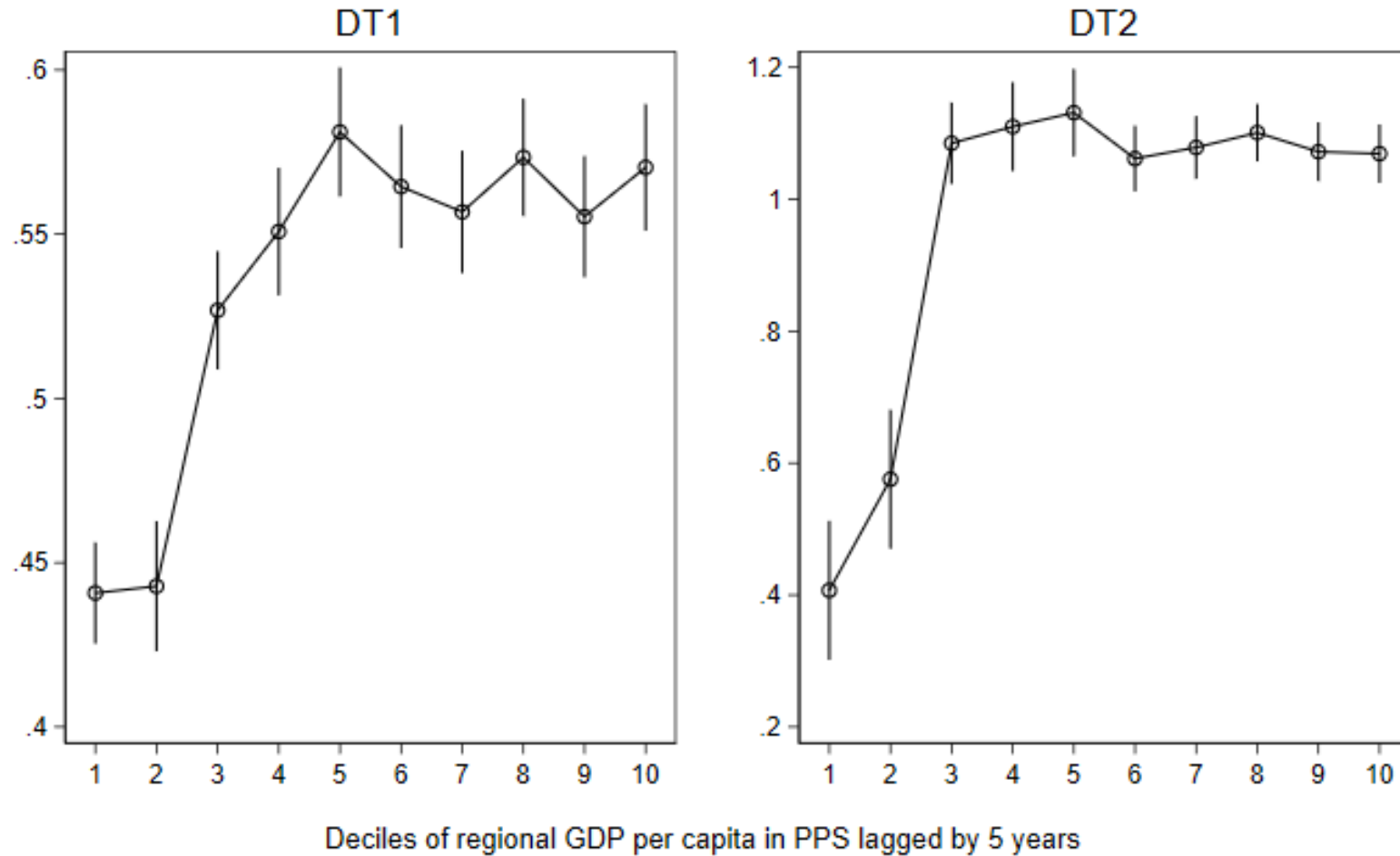
Characteristics of DT Regions (3)



Middle-Income Traps...



...Or Rather Development Traps?



Econometric Evidence

Quantitative Analysis of Factors Associated with DTs

Empirical Models

- Use **pooled Ordinary Least Squares (OLS)** regressions to study factors associated with the propensity of a region to be trapped (or to be at risk of being trapped)

$$DT_{i,t} = \alpha + X'\beta + \gamma GDP_{t-1} + \delta POP_{t-1} + \theta_t + \epsilon_{i,t}$$

- Use **fixed-effect panel data analysis** to explain within-region annual changes in MIT measures as a function of changes in selected covariates of interest

$$DT_{i,t} = X'\beta + \phi_i + \theta_t + \epsilon_{i,t}$$

Possible Explanatory Variables

Category	Covariates of interest
Economic structure	Shares of employment or GVA in industry, non-financial services, and non-market services. Other sectors can also be considered.
Physical capital and infrastructure	Gross fixed capital formation by sector, mainly considering industry, non-financial services, and financial and business services.
Demographics and labour force	Share of population with tertiary education and/or employed in science and technology occupations; Median age / dependency ratios (total, old, young).
Total factor productivity	<ul style="list-style-type: none">• Productivity by sector (especially industry)• Innovation (GERD and R&D employment by activity; Patents)• Quality of institutions (quality, corruption, impartiality)
Economic geography and trade (with limitations)	<ul style="list-style-type: none">• Population density and degree of urbanisation• Accessibility and transport performance• FDI flows by type, origin, and sector

Overview of Findings from Regressions

		Pooled				Fixed effects			
		All	Low	Mid	High	All	Low	Mid	High
Economic structure	Industry (% Empl.)	-				-			-
	Non Fin. Serv. (% Empl.)			-		-			-
	Non Market Serv. (% Empl.)	+	+	+	+	+	+		
Productivity and innovation	Ind. productivity	-	-		-	-	-	-	
	Gov't GERD (% GDP)	-			-				
Human capital	Secondary ed. (%)		+		-	-		-	-
	Empl. in S&T (%)		-			-	-		-
Other	Dependency ratio	+	+			-		-	-
	EQI Index	-	-	-	-	-			-

Key Takeaways

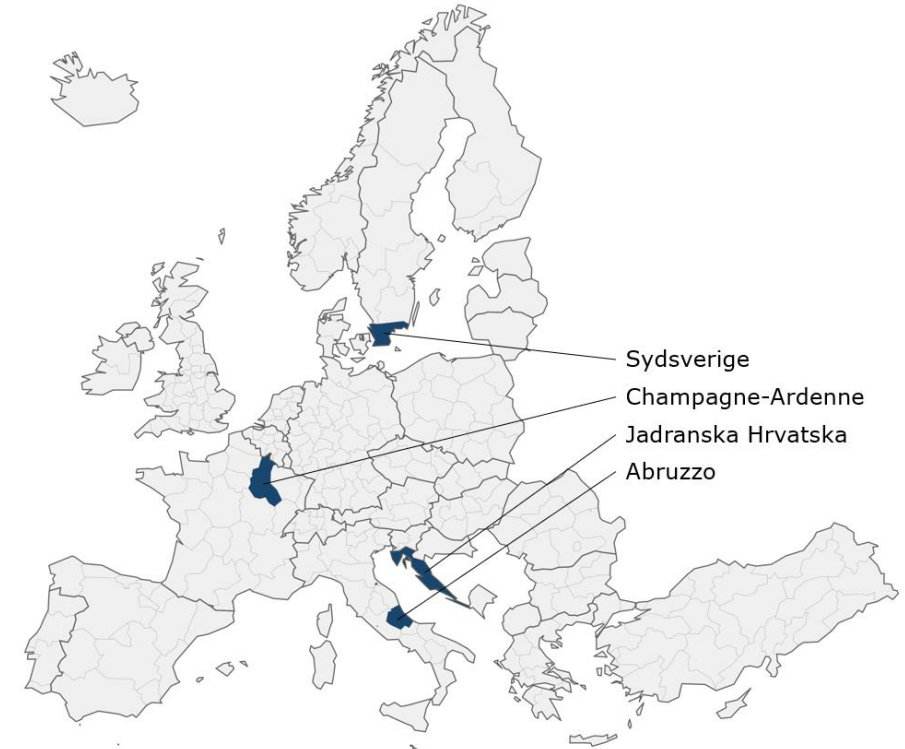
- DT risk increases with GDP/head, but
 - Higher income regions better equipped to claw their way out
- A productive and competitive industry can provide shelter
 - But promotion of industry jobs at all costs is not a solution
- Greater reliance on non-market services in DT regions
- R&D is especially helpful in higher-income regions
- Human capital plays a role if local S&T jobs can absorb it
- Quality of local institutions matters!

Case Studies

Qualitative Evidence from the Field

Objectives and Methods

- Validation of the quantitative analysis
- Nuance discussion with field data
- Four representative regions
- Primary and secondary sources
 - Project data (EC, Eurostat)
 - Semi-structured interviews with key regional actors (N=26)
 - Various local data and sources



Characteristics of Case Study Regions

Abruzzo: middle-income region at high DT risk

Economy		Economic structure (% empl.)	
GDP/capita (k EUR, 2005)	21.17	Agriculture	5.25
GDP/capita growth (y-o-y)	0.21	Industry	20.86
GVA/worker (k EUR, 2005)	48.46	Construction	9.20
GVA/worker growth (y-o-y)	0.45	Non fin. serv.	25.31
Empl./pop. ratio	0.39	Fin. and bus. serv.	10.46
Empl./pop. growth (y-o-y)	-0.20	Non market serv.	28.93
Demographics		Innovation and other	
Population (thousands)	1284.48	Empl. in S&T (%)	14.12
Population growth (y-o-y)	0.24	GERD business	0.39
Median age	41.49	GERD government	0.12
Primary ed. (%)	43.71	Patents/million pop.	35.32
Secondary ed. (%)	41.74	EQI (mean 0, stdev 1)	-0.73
Tertiary ed. (%)	14.54	Urban pop. (%)	14.73

Note: All figures computed as averages over 1990/91-2015. Exceptions are education, S&T employment, and GERD (1998/99-2015), EQI (1995-2015), and urbanisation (2004-2015).

Champagne-Ardenne: middle-income region at high DT risk

Economy		Economic structure (% empl.)	
GDP/capita (k EUR, 2005)	24.37	Agriculture	7.65
GDP/capita growth (y-o-y)	0.33	Industry	17.66
GVA/worker (k EUR, 2005)	54.95	Construction	5.97
GVA/worker growth (y-o-y)	0.68	Non fin. serv.	20.88
Empl./pop. ratio	0.39	Fin. and bus. serv.	12.30
Empl./pop. growth (y-o-y)	-0.09	Non market serv.	35.53
Demographics		Innovation and other	
Population (thousands)	1348.50	Empl. in S&T (%)	14.40
Population growth (y-o-y)	-0.03	GERD business	0.52
Median age	37.98	GERD government	0.01
Primary ed. (%)	37.07	Patents/million pop.	55.08
Secondary ed. (%)	42.88	EQI (mean 0, stdev 1)	0.05
Tertiary ed. (%)	20.06	Urban pop. (%)	22.35

Note: All figures computed as averages over 1990/91-2015. Exceptions are education, S&T employment, and GERD (1998/99-2015), EQI (1995-2015), and urbanisation (2004-2015).

Adriatic Croatia: low-income region at high DT risk

Economy		Economic structure (% empl.)	
GDP/capita (k EUR, 2005)	7.77	Agriculture	8.80
GDP/capita growth (y-o-y)	1.70	Industry	19.45
GVA/worker (k EUR, 2005)	18.51	Construction	8.24
GVA/worker growth (y-o-y)	2.18	Non fin. serv.	33.06
Empl./pop. ratio	0.36	Fin. and bus. serv.	6.89
Empl./pop. growth (y-o-y)	0.14	Non market serv.	23.56
Demographics		Innovation and other	
Population (thousands)	1388.34	Empl. in S&T (%)	12.74
Population growth (y-o-y)	0.19	GERD business	0.23
Median age	42.22	GERD government	0.12
Primary ed. (%)	19.96	Patents/million pop.	2.67
Secondary ed. (%)	61.24	EQI (mean 0, stdev 1)	-1.67
Tertiary ed. (%)	18.81	Urban pop. (%)	25.66

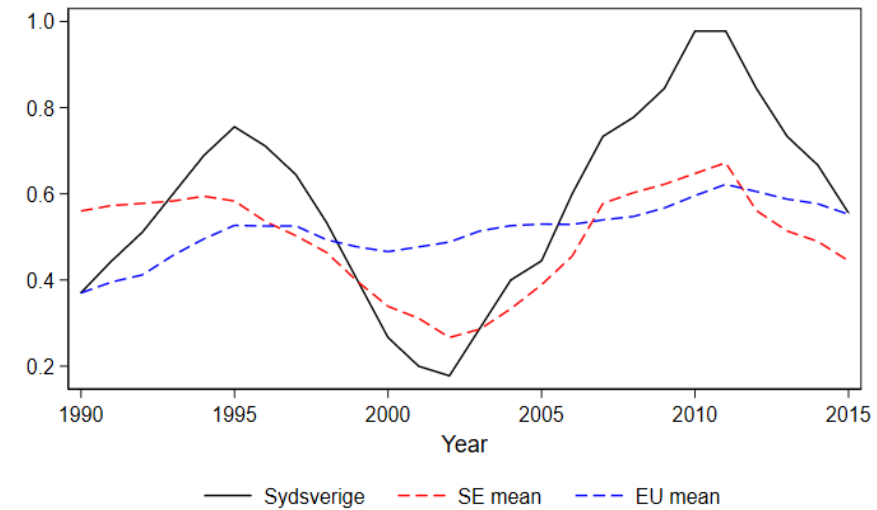
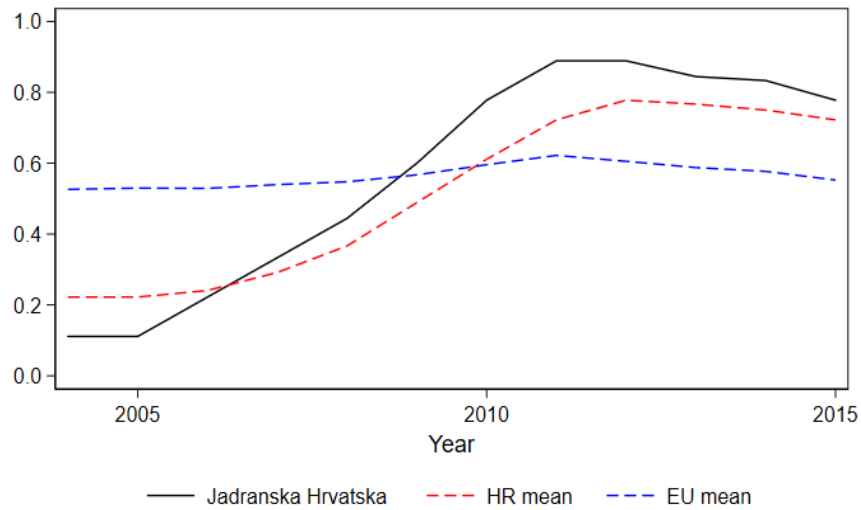
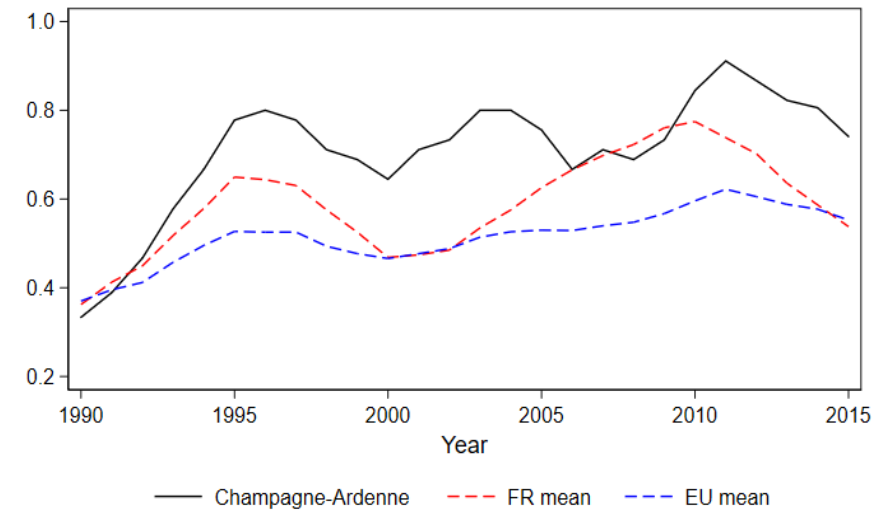
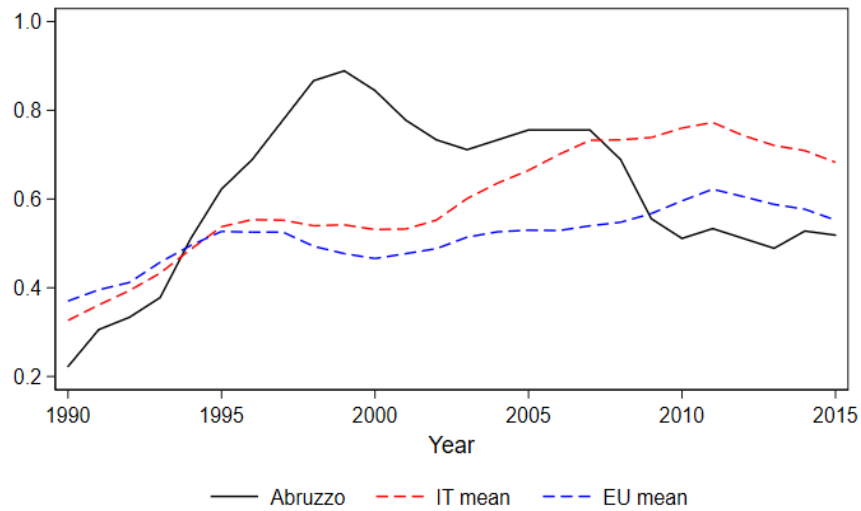
Note: All figures computed as averages over 1995/96-2015. Exceptions are education, S&T employment, and GERD (2001-2015), EQI (1995-2015), and urbanisation (2004-2015).

South Sweden: high-income region at high DT risk

Economy		Economic structure (% empl.)	
GDP/capita (k EUR, 2005)	27.83	Agriculture	3.61
GDP/capita growth (y-o-y)	1.26	Industry	16.80
GVA/worker (k EUR, 2005)	53.10	Construction	6.24
GVA/worker growth (y-o-y)	1.78	Non fin. serv.	23.88
Empl./pop. ratio	0.46	Fin. and bus. serv.	12.01
Empl./pop. growth (y-o-y)	-0.50	Non market serv.	37.47
Demographics		Innovation and other	
Population (thousands)	1314.44	Empl. in S&T (%)	24.77
Population growth (y-o-y)	0.71	GERD business	3.02
Median age	39.90	GERD government	0.09
Primary ed. (%)	19.58	Patents/million pop.	296.76
Secondary ed. (%)	47.52	EQI (mean 0, stdev 1)	1.37
Tertiary ed. (%)	32.89	Urban pop. (%)	30.73

Note: All figures computed as averages over 1990/91-2015. Exceptions are education, S&T employment, and GERD (1998/2001-2015), EQI (1995-2015), and urbanisation (2004-2015).

Trends in DT Risk in Case Study Regions



Note: All figures computed as averages over 1990/91-2015, but for Adriatic Croatia (1995/96-2015). Exceptions are education, S&T employment, and GERD (1998/99-2015 for Abruzzo and Champagne-Ardenne; 2001-2015 for Adriatic Croatia; 1998/2001-2015 for South Sweden), EQI (1995-2015), and urbanisation (2004-2015).

REGIONS DIMENSIONS	ABRUZZO (IT) (middle-income region)	CHAMPAGNE-ARDENNE (FR) (middle-income region)	ADRIATIC CROATIA (HR) (low-income region)	SOUTH SWEDEN (SE) (high-income region)
DT trajectory	Fell in DT between mid-1990s and late 2000s (lost Obj. 1 status and national funds in mid-90s), eased later due to better (than national) economic performance because of strong industrial structure and public investments for reconstruction after 2009 earthquake; sovereign debt crisis in 2012 hit hard; GDPpc from 111 (EU = 100) in 1992 to 77 in 2017	Once prosperous industrial region, suffered from deindustrialization and automatization; approaching a DT ‘from above’ at least since mid-1990s; persistent stagnation in income and jobs, decline in GDPpc since 2000s; 2008 crisis highlighted limited economic resilience; “formerly well-off, moved into prolonged periods of relative economic decline”	Transition to market-based economy from 1990 but disrupted by War of Independence (1991-1995); hit harder than the country by the 2008 crisis; steep increase in DT risk throughout the period, despite some moderate improvements after 2010 (joined EU in 2013); exemplar of DT risk ‘from below’; ranked in bottom 20% of all EU regions in RCI 2019	Moderate to high risk of DT at different point in time throughout the period; significantly larger volatility in DT risk compared to the rest of country, particularly during economic crisis
Structural features of regional system	Strong manufacturing industry, increasing (1970-2018) both in VA and employment; large presence of foreign MNEs; high capital deepening and availability and quality of human capital; weak development of advanced tertiary sector; very weak urbanisation; low expenditure in private R&D; insufficiently developed innovation networks; lack of efficiency of government and local administrations; ageing population, and increasing depopulation	Strong specialisation in agriculture and agri-food, winemaking fundamental; biorefinery and metallurgy other core industries; clusters in bioeconomy, metalwork, and renewable energy; strategically located near European core; feeble tertiary sector; limited ability to innovate, low R&D; educational attainment, especially tertiary, lower than national average; low quality of government; demographic decline; limited access to medical services by residents	Highly heterogeneous; biggest GVA share in non-financial and non-market services, dominance of hospitality and tourism; shrinking manufacturing employment; dramatic fall of export share in 2002-2018; EU entry helped, but low FDI inflow (mostly in real estate); brain drain plus very low tertiary education; stagnant population; great natural amenities; growing house prices in coastal areas; well below EU average for government quality although improving	2 sub-regions: Skåne, specialised in services in ICT, life sciences and cleantech, and Blekinge, specialised in manufacturing; Skåne far more economically significant but below national average for productivity and GDPpc growth; concentration of economic activities in larger cities; employment driven by services and knowledge-intensive industries; large inflows of foreign migrants; rapidly ageing population; high government quality, above national and EU28
NEGATIVE perceptions (support DT)	Majority agree on DT; earthquake reconstruction as a ‘missed opportunity’; externally-controlled firms failed to develop local networks of suppliers; weakened FDI; feeble internationalisation and integration in GVCs by SMEs; inadequacy of railway and airport infrastructure; weakness of KIBS; economic structure not enough innovative; relatively low demand for skilled workers, skill-mismatch; poor quality of technical and vocational training; inadequacy and ineffectiveness of local ruling class; misalignment in policy directions and objectives across legislatures	Large support to DT (or risk of), albeit with some sub-regional variation; structural demographic decline as foremost DT indicator, youth outmigration and rapid ageing; closure or merging of local firms (even historical large); sustained job loss in core industries; tertiary employment growth due to public sector and temporary contracts; skill mismatch; absence of large urban areas, dependence from the capital; historical perception that prosperity will come back leading to a certain inertia	Predominant consensus on high DT risk; performance varies strongly within region; recent liquidation of historical shipbuilding company; many factors holding back productivity (e.g. administrative barriers, complex legal system, inadequate labour supply and skills shortage, brain drain after EU accession); dependence on large and growing tourism industry reinforced by construction and real estate developments, with connected challenges (e.g. low knowledge-intensity and productivity, high seasonality)	Agreement on some DT features; productivity in Skåne significantly lower than in Stockholm, despite transition to knowledge economy; danger in Blekinge’s reliance on a few key large private companies, and persistent aversion to risk and entrepreneurship; rising inter-regional inequality driven by urbanisation; inadequate local transport system; predicted shortage of high-school level competencies in healthcare, and university level in technology-intensive sectors; failure in integrating foreign workers in local labour markets

(synoptic table cont.)

REGIONS DIMENSIONS	ABRUZZO (IT) (middle-income region)	CHAMPAGNE-ARDENNE (FR) (middle-income region)	ADRIATIC CROATIA (HR) (low-income region)	SOUTH SWEDEN (SE) (high-income region)
POSITIVE perceptions (confute DT)	Some see beginning of a recovery phase, more than DT; indisputable strength of manufacturing, wide sectoral diversification; examples of industrial excellence (e.g. automotive and mechatronics, ICT-aerospace, pharmaceutical life sciences, agri-food); very important and innovative large firms and foreign MNEs, well connected with local universities; still partially unexploited unique natural and artistic heritage assets	Positive perceptions of surviving industrial companies managing to modernise and automate production, increasing plant productivity and preserving competitiveness; openness to international trade, with overall positive trade balance (especially production of Champagne); high investments comparable to France, and much higher than EU average; high business creation since 2015	More positive perceptions of Istria, northern counties, seacoast, and urban areas, doing relatively well; overall, region better off today than 5 years ago; examples of resilient firms showing employment and export growth; potential to facilitate upgrading to higher-end and more sustainable tourism	Visible sustained growth in productivity in some areas, linked to the presence of few large companies; in Skåne: successful diversification into life sciences and high-value niche products, world leading research institutes and some top universities, new business creation and VC attraction; overall, skills and innovative capacity strictly comparable to EU high-income regions; high public sector quality
Main forces behind DT	Lack of innovative capacity and, more generally, of a functioning innovation system; dearth of linkages and networks between MNEs, large and small firms limiting spillovers and collective learning processes; weak active internationalisation and KIBS	Long-term decline in manufacturing with employment loss and associated decline in population; narrow specialisation of industry structure; inadequate educational attainments, especially tertiary education; local reliance on non-market services	Excessive reliance on non-tradeable service jobs with limited upgrading potential (e.g. tourism); brain drain; low quality FDI in real estate/accommodation; very small investment in education and innovation; low quality of institutions and local government inherited by communist rule	Very high costs driving intense international outsourcing, offshoring, limited attractiveness to FDI; limited support to internationalization of local firms; automation/digitalisation leading to job losses; high heterogeneity in productivity and specialisation between larger cities and the rest
Examples of current policies	RIS3 entrepreneurial discovery involving local production systems and representatives of MNEs established in 5 domains of specialisation: Automotive / Mechatronics, Life Sciences, ICT / Space, Agrifood/ and Fashion / Design, broadly corresponding to strongest pillars of local industrial structure. Long-term vision: making Abruzzo the "region of sustainable industry"	Initiatives (e.g. Campus 3000 project) to strengthen success of UTT universities' network with TH missions (research, training and technology transfer); creation of the Grand Est region (with RDA) for increasing potential investment, innovation, and territorial coordination; establishment of contracts between State and local authorities, i.e. 'Pacte Ardennes'	'Act on Regional Development' 2009 adopts principles of Cohesion Policy; Ministry of Regional Development and EU funds to improve transparency and accountability; 'National Development Strategy 2030' to advance governance, plus key priorities investment in business and technological infrastructure, education, ICT, and upgrading of hospitality services	Various projects financed by EU Structural and Investment Funds currently in place, some jointly between Skåne and Blekinge, e.g. South Sweden International – Regional Cooperation on International Business Promotion, aimed at creating a more globally connected business climate by facilitating export and trade opportunities for local SMEs, and supporting inward FDI

Overall Case Study Findings

- Evidence from the field largely confirms quantitative findings
- Industrial structure, productivity, human capital, and institutions key factors in looking at long term regional development trajectories
- Additional insights include
 - Long run development outcome of complex interplay b/w these factors
 - E.g., R&D is not a panacea for all regions; education is not just a quantitative measure, and skill demand and supply mismatch matters
 - Large variation in economic performance also *within* regions
 - Trade, MNE presence, FDI, and international integration crucial but undetected

Concluding Thoughts

Key Takeaways and Policy Priorities

Policy Recommendations

- Regional dynamics as a base for policy thinking
- DT can take place at all income levels
- Policy differentiation is tricky but inevitable
- Policy coordination and integration essential
- Extension of data and measurement of DT imperative (e.g. overlooking internationalisation and integration in the global economy inevitably distorts attempts to tackling regional DTs)

Conclusions

- Development traps as an innovative concept to assess growth trajectories of regions in a dynamic setting
 - Index available on a yearly basis with long term series
 - The measure captures different dimensions of development
 - Descriptive findings align with existing theories
- Some limitations must be considered
 - Results should not be overstated: explorative analysis
 - Descriptive, rather than causal story
 - Some determinants of development elude measurement

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