North South Divide in Italy

Balassa-Samuelson and Real Exchange Rate Analysis

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Workshop

La questione salariale in Italia

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Organization

- The tale of the Two-Italies … and the Two Europes
- The evolution of cost of livings
  - Did the North-South Divide Remain the same?
- Balassa-Samuelson and Real Exchange Rate Analysis:
  - did changes in total factor productivity (Granger) cause the north-south differential? Prices or competitiveness?
- Policy and Fairness Considerations

Motivation: The Tale of the Two Italies

- *Alesina and Giavazzi (Il Liberismo è di Sinistra, 2007)*: Public employment has served as a perverse system to support the South because
  - Public employees receive the same salary regardless of the region of residence, although in the south the cost of living is much lower
    - So, the purchasing power of public wages is significantly higher in the South
  - Public employees are more numerous in the South than in the North
- Previous studies are based on approximate rather than True Cost of Living Indices
- We intend to qualify these assertions and explain why the gap in cost of living did not contract between the North and South

Key Research Questions

- **Evolution of the Cost-of-Living Gap**
  - A previous study of ours (Econ Modelling 2023) estimates that the average cost-of-living differential between the North and the South is around **30–40%** (depending on regions compared).
  - Has this gap **widened or narrowed over time**?
- **The Belassa-Samuelson / Graziani Misalignment**
  How do **factor productivity differentials** affect the persistency of the TCLI gap? Is competitiveness also important?

The Evolution of Cost of Living:

the North-South Divide

Comparisons of Standard of Livings

- Comparisons of standards of living should account for
  - ***I.*** ***price*** differences
    - space, time
  - II. differences in ***quality*** of services
    - quality adjusted prices
  - III. differences in ***household production, specialization and social capital***
    - Current (the role of wealth) and extended income
- We implement I and II estimating regional price parities (RPP) based on
  - Time-series of household budget data 1999-2019 and
  - ***Time-series of prices 1999-2019*** to be extended to 2023 (“pseudo” unit values).

Method

- True Cost of Living Index (TCLI)
  - *Recovery of prices* as pseudo-unit values
  - Estimation of a demand system for 11 commodities with spatial correction for autocorrelation to derive cost C(u,p) and individual welfare V(p,y) functions
  - Adjusting for regional differences in the quality of services.

True Cost of Living Index (TCLI)

- TCLI: *the cost C(u,p) of achieving a certain level of utility (or standard of living) in one year (or place) relative to the cost of achieving the same level the next year*

$$I(u, p^1, p^0) = \frac{C(u, p^1)}{C(u, p^0)}$$

- The Laspeyres ($I_L = \frac{p_0 q_1}{p_1 q_1}$) and Paasche ($I_P = \frac{p_0 q_0}{p_1 q_0}$) price indexes are respectively the Upper and Lower bound of TCLI

Quality Adjusted True Cost of Living Index

- The QA-TCLI is given by the difference between the expenditure function of region *r* (or for the same region through time) and the expenditure function of Italy adjusted for the amenity and affluence indexes

$$\ln P(p^1, p^0, u^*) = \ln C(u, p^{*1}, d^1) - \ln C(u, p^{*0}, d^1)$$

- In the Jorgenson and Slesnick tradition, this is a "*general equilibrium*" object apt to simulate the impact on households' well-being associated with the set of equilibrium prices generated by a general equilibrium model such as the MEG-SD.

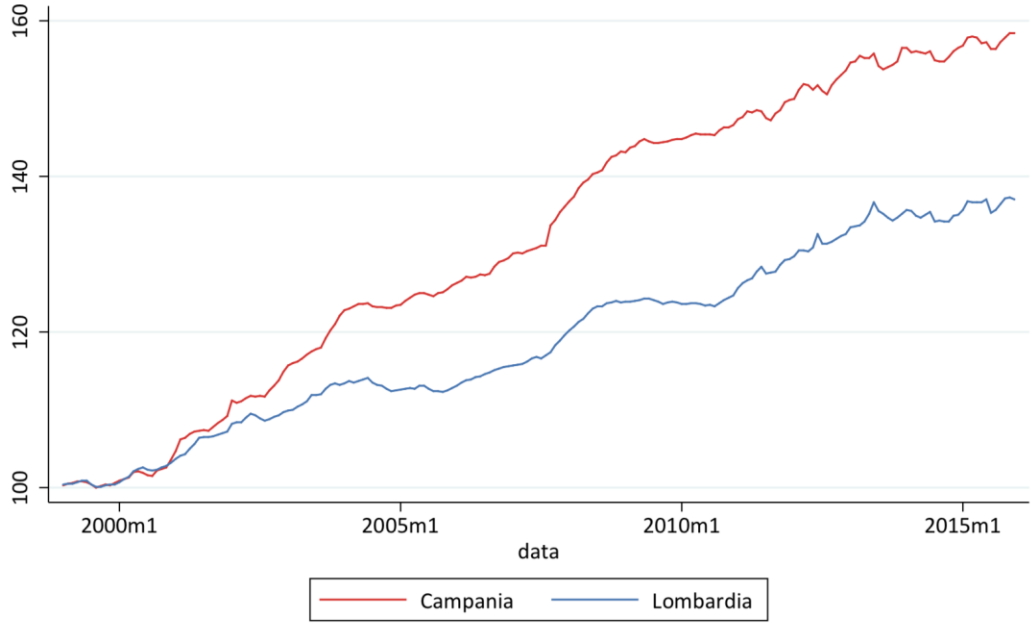
Micro Data

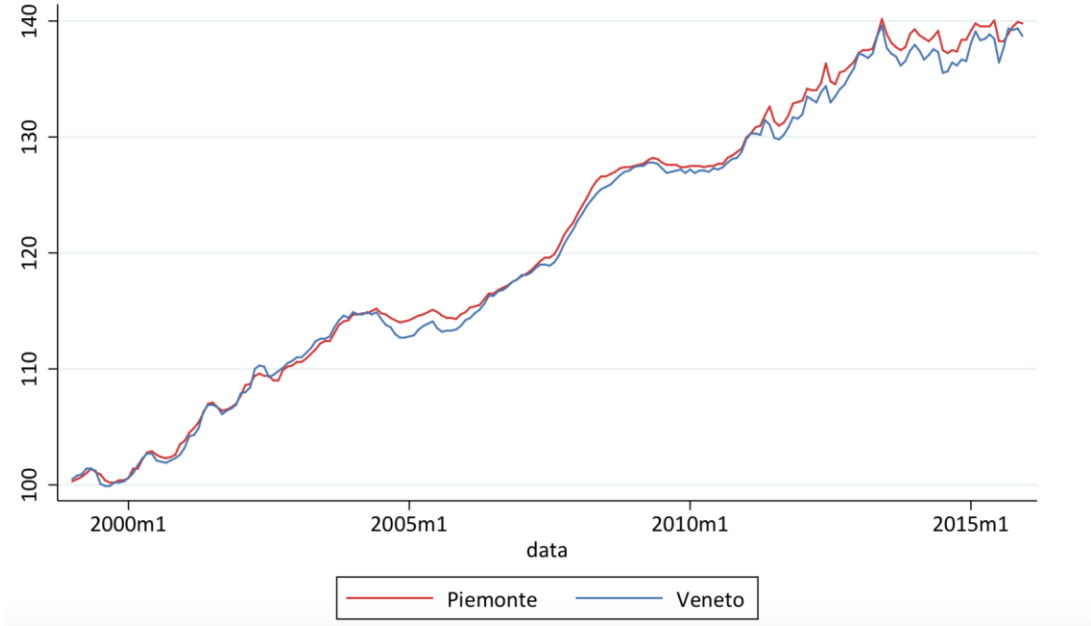
1999-2019 Household Budgets with Estimated Price Information

Micro Data

- Complete data set spans the period 1999-2019 under extension to 2023
  - 20 Cross-sections of Household Budget Surveys
  - Pseudo-unit values as prices
  - NIC-FOI consumer price indexes by **1481** elementary COICOP products (Classif. Of Indiv. COns. By Purpose)
    - NIC (official for the entire national community)
    - FOI (weights based on the consumption basket of dependent workers)
  - Aggregation: 11 goods
- Present application
  - Years 1999-2019

NIC – Food and Beverages

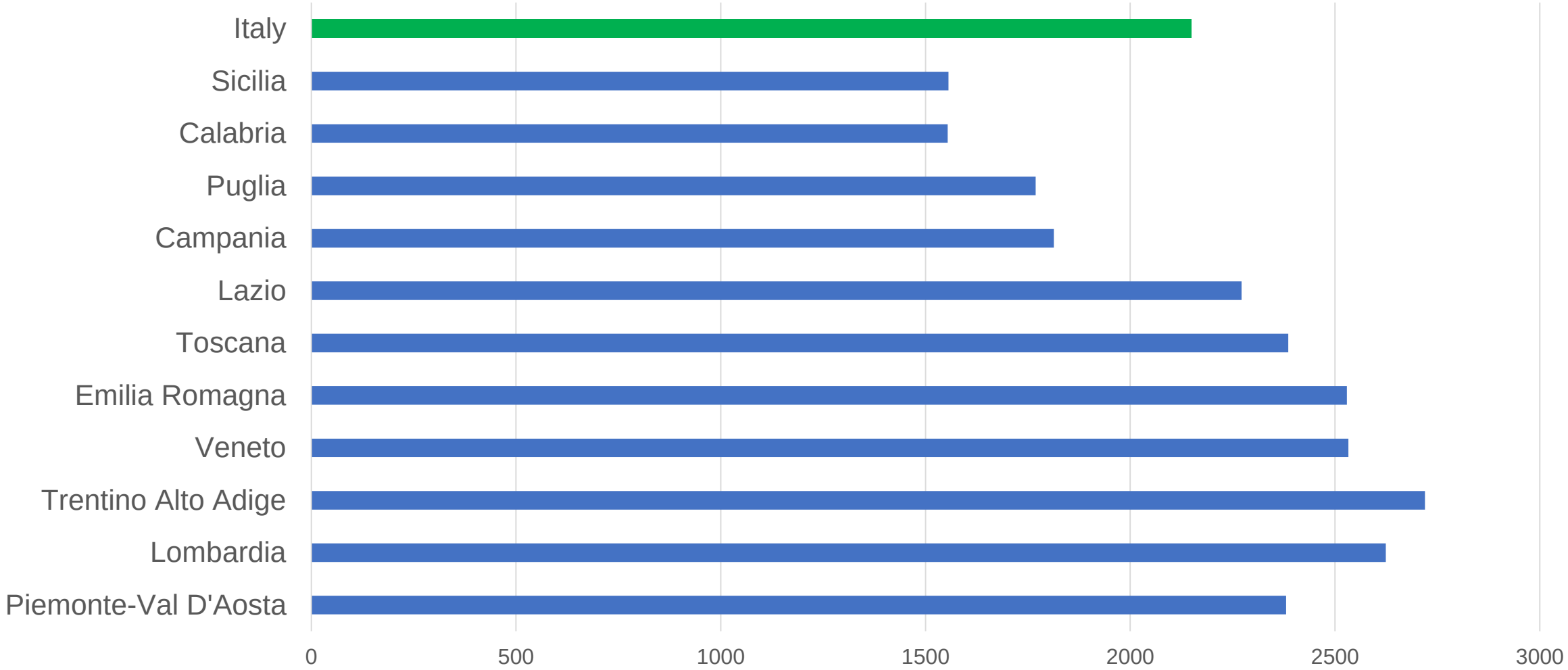




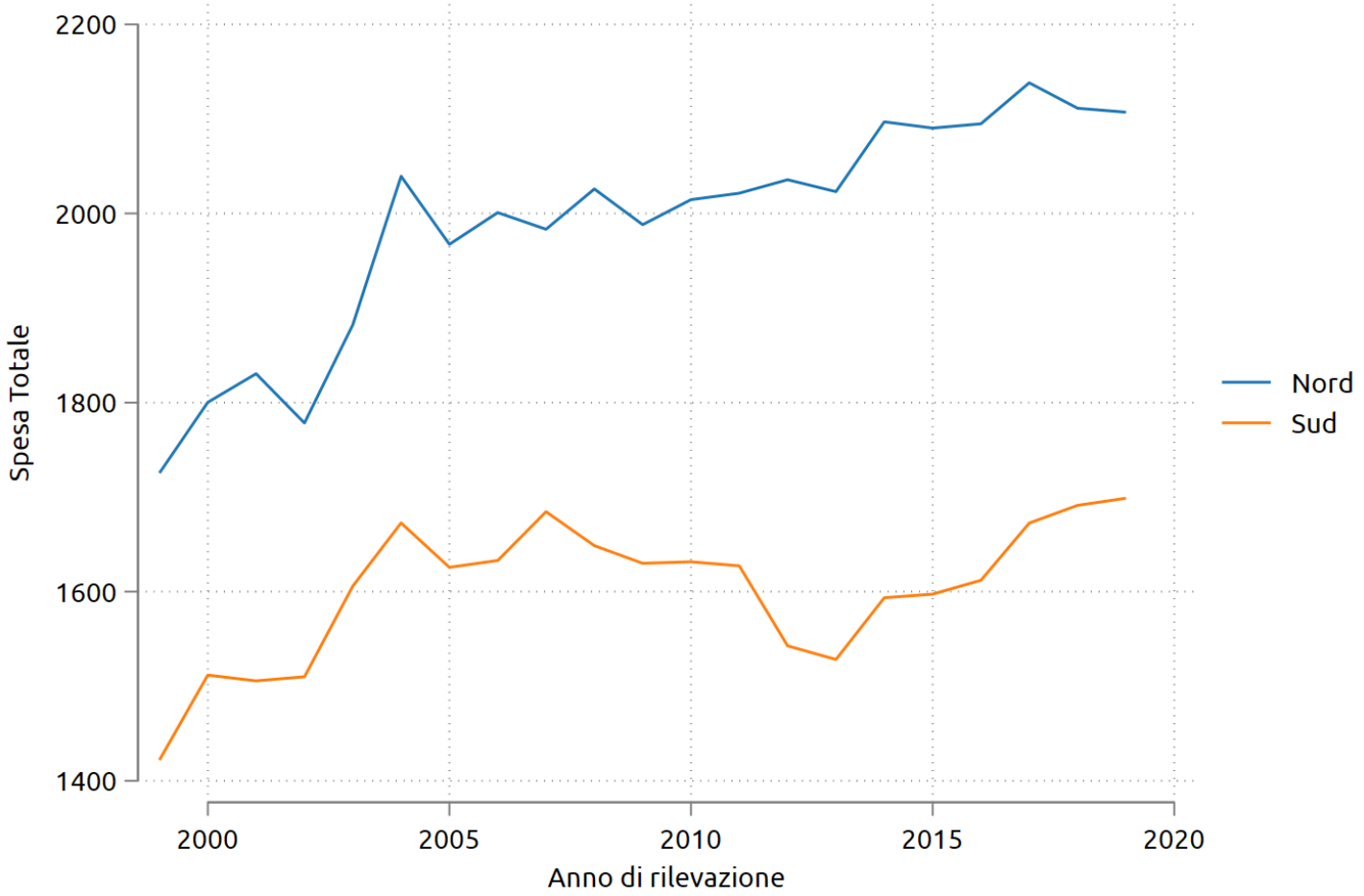
Expenditures and Share Trends HBS 1999-2019

Cost of Living by Region (Euro)

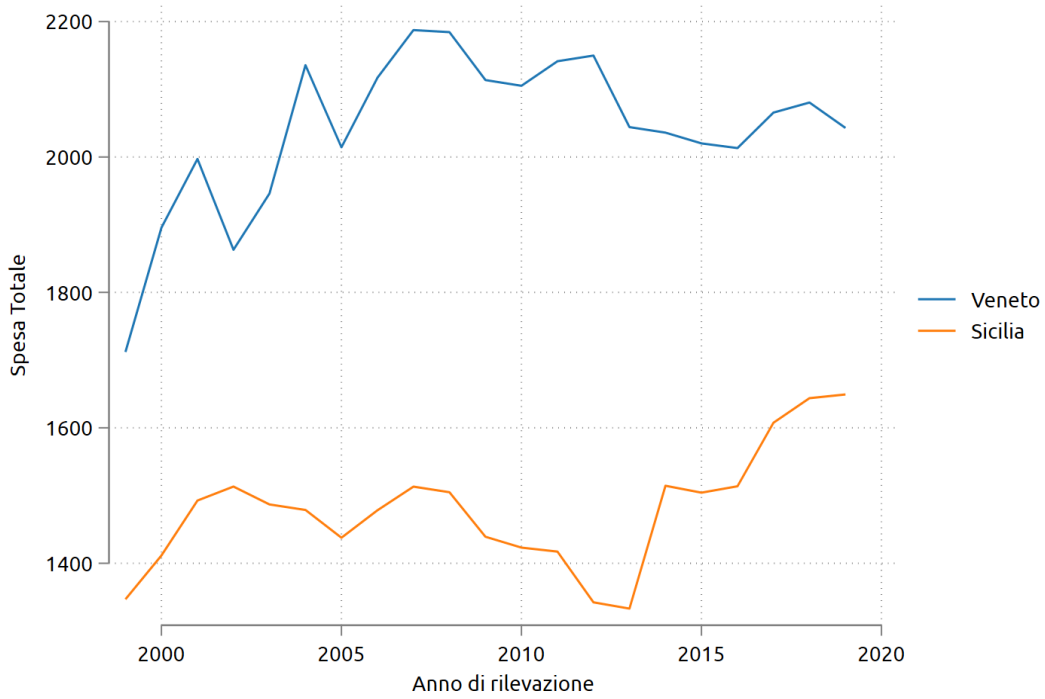
Sicily/Veneto=0.6



The Evolution of Cost of Livings:
did the North-South Divide Remain the same? In real terms



Regional comparison – 1999-2019



The Balassa-Samuelson Hypothesis (BSH) and Test

The BSH posits that differences in productivity growth between the tradable and non-tradable sectors across regions or countries lead to differences in relative price levels.

Stylized Facts on the North–South Divide (1999–2019)

- TCLI in the South ≈ **40% lower** than in the North
- Gap **persistent**, no convergence over two decades
- Tradable productivity **much higher in the North**
- Non-tradable prices **higher in the North**, but move in parallel
- South shows **lower competitiveness despite lower prices**

The Balassa–Samuelson Mechanism

- The BS mechanism:
  - Higher productivity in tradables (industry, high-tech, manufac) in the North →
    - higher wages in tradables →
    - wage spillovers to non-tradables → Baumol disease
    - higher non-tradable prices →
    - higher cost of living in the North.
  - The South, with lower tradable productivity, ends up with lower wages, lower non-tradable prices, and ultimately lower living standards.
- In a narrow sense, BS predicts a "natural" divergence in relative prices and incomes **if productivity gaps persist**.

BS within the Same Country

- More productive regions see faster wage growth in tradable sectors, which spills over into non-tradable sectors due to labor mobility, raising their prices.
  - This results in an appreciation of the real exchange rate and a corresponding increase in the cost of living.
- While this framework is traditionally applied across countries, its logic holds within countries,
  - particularly in cases of marked regional disparities, as is the case with Italy.
- The within-country application requires defining a **shadow real exchange rate (SRER)** to measure regional price differentials,
  - because there are no nominal exchange rate differences between regions using the same currency.

Shadow Real Exchange Rate

- Let P_N and P_S denote the price levels in the North and South of Italy.
- Assuming a common nominal exchange rate E=1, the standard real exchange rate formula simplifies to:

$$SRER = \frac{P_N}{P_S} = \frac{TCLI_N}{TCLI_S}$$

- The SRER thus captures regional differences in purchasing power, adjusting for quality and consumption differences across space and time.
  - A rising SRER implies a **real appreciation** in the North (relative to the South), indicating that the cost of living is rising faster in the North, likely driven by productivity-led wage and price growth.
  - Conversely, a falling SRER reflects a **relative depreciation** of the North's purchasing power.

Not Only Prices

- The SRER captures pure relative price differences, abstracting from currency movements. It is the analogue of the international RER in a single-currency economy.
- So far, this is still a price-only object.
- Graziani's key insight is that competitiveness is not determined by prices alone, but by prices relative to productivity, because:
  - wages are set nationally,
  - firms' competitiveness depends on unit labor costs,
  - productivity differs structurally across regions.

Thus, a region can be:

- cheap in absolute terms but still overvalued relative to what it produces.

This motivates redefining the relevant "real exchange rate."

Graziani-style Real Exchange Rate

- Start from unit labor costs in tradables: $ULC_{T,r} = P_{T,r} = w/ a_{T,r}$. With national wage setting, *w* is common across regions, so relative competitiveness depends on $a_{T,r.}$
- Prices that matter for local welfare and costs are mainly non-tradable prices $P_{NT,r}= w / a_{NT,r}$. Graziani's internal RER is therefore defined as

$$RER_r^* = P_{NT,r} / a_{T,r}$$

This is not a price index. It is a cost–productivity ratio.

$RER_r^*\uparrow$: prices are high relative to productivity → real overvaluation → low competitiveness.

$RER_r^*\downarrow$: prices are low relative to productivity → real undervaluation → high competitiveness.

Formal Link between SRER and Graziani's RER*

- Definitions:

  $SRER=(TCLI_N / TCLI_S)$; $RER_r^*=P_{NT,r} / a_{T,r}$

- We are interested in the N-S ratio (price and productivity component):

  $RER_N^* / RER_S^* = P_{NT,N}/P_{NT,S} \cdot (a_{T,S} / a_{T,N})$

- Use the (log) TCLI decomposition:

  $\ln TCLI_r \approx \alpha \ln P_{T,r} + (1-\alpha) \ln P_{NT,r}$

- If tradable prices are approximately integrated across regions (ok for Italy), $P_{T,N}/P_{T,S} \approx 1$, hence

  $\ln(TCLI_N/TCLI_S) \approx (1-\alpha)\cdot\ln(P_{NT,N}/P_{NT,S})$

- Invert this to express the NT price ratio as a power of the SRER:

  $P_{NT,N}/P_{NT,S} \approx (TCLI_N / TCLI_S)^{1/(1-\alpha)} = SRER^{1/(1-\alpha)}$

In Sum

- Decomposing TCLI into tradable and non-tradable components may show how
  - productivity-driven price dynamics (Balassa–Samuelson),
  - service-sector productivity inertia (Baumol), and
  - centralized wage-setting (Graziani)
- jointly generate a persistent North–South divide in prices, competitiveness and real living standards.

Consequences of Lower Southern Prices

- Theories predict **relative prices**, not absolute levels
- South prices are lower, but **too high relative to productivity**
- Stable gaps reflect structural rigidity, not equilibrium convergence

The South is cheaper, but not cheap enough relative to its productivity. The RER overvaluation decreases competitiveness.

So, we intend to test both BS and Graziani

VAR 1 — Price formation (BS)

- Dependent: $\Delta \ln (TCLI_N/TCLI_S)$
- Regressors: $\Delta(a_T - a_{NT})$, wage proxy (or national trend)

Interpretation: *short-run BS transmission*

VAR 2 — Misalignment (Graziani)

- Dependent: $\Delta \ln$ RER
- Regressors: Δa_T, structural controls

Interpretation: *competitiveness dynamics*

The absence of strong Granger causality:

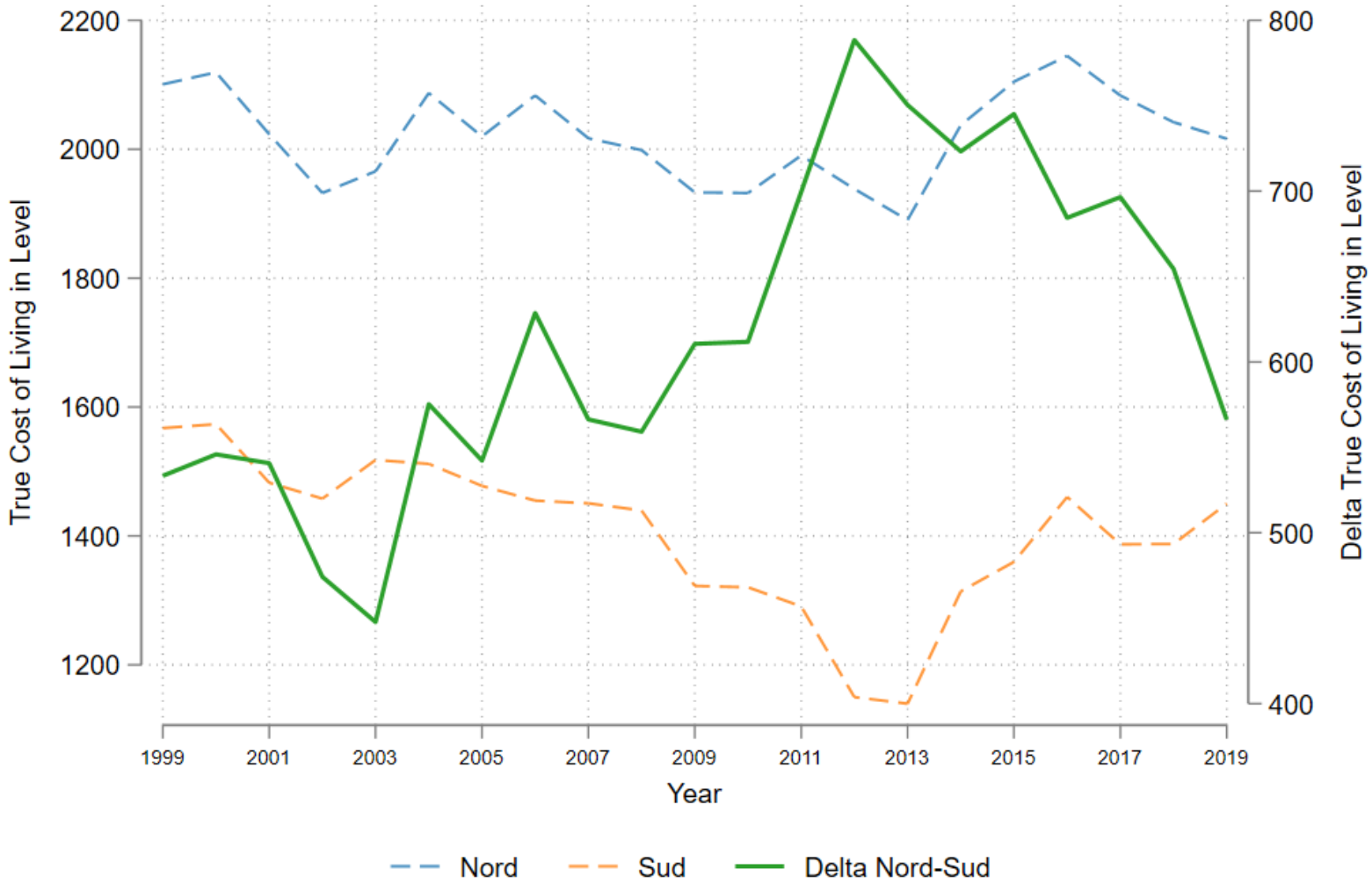
- indicates structural rigidity
- consistent with Baumol and centralized wage setting

Macro Data

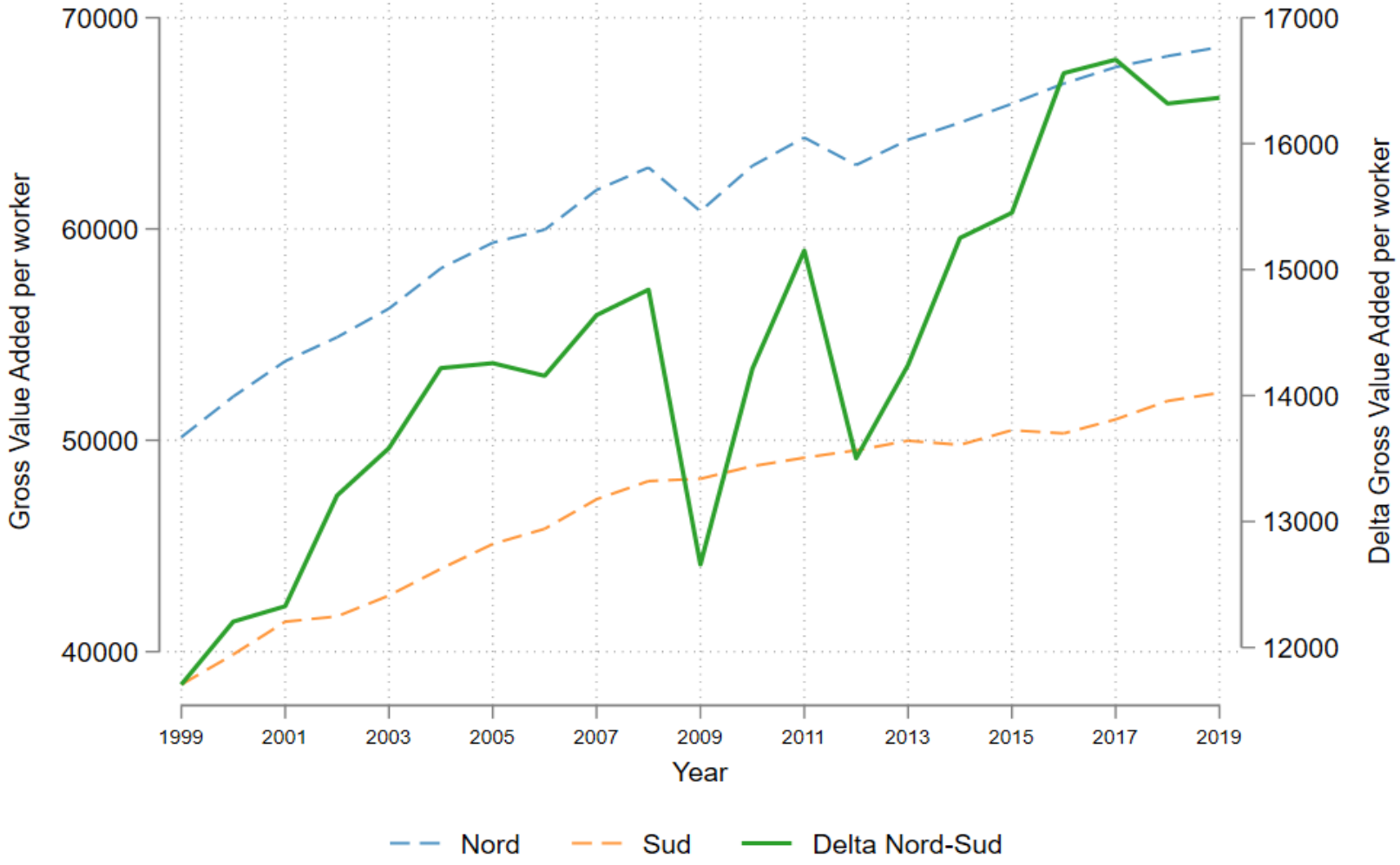
Years 1999-2019

NORTH, SOUTH, AND THEIR DIFFERENCES

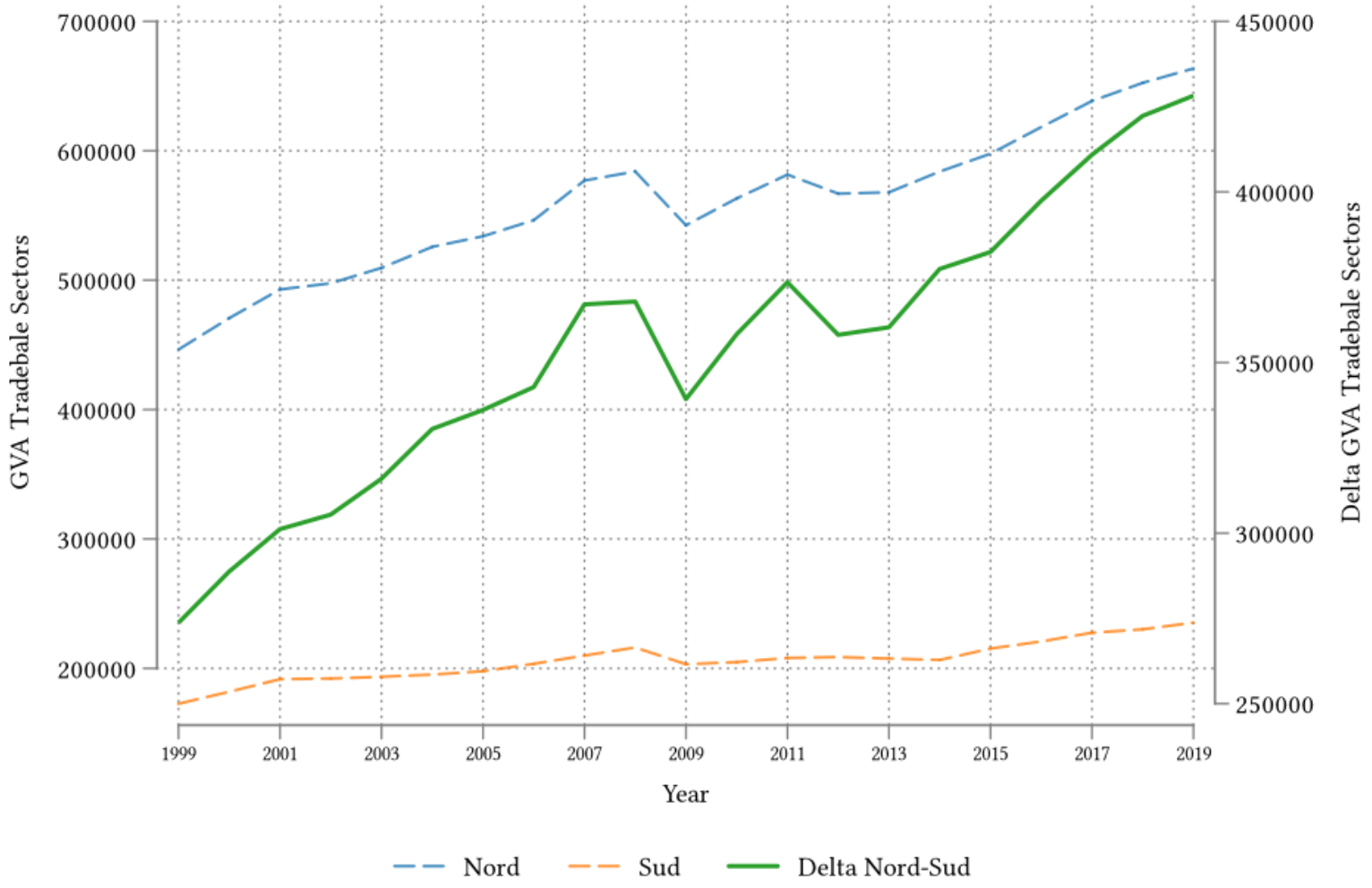
True Cost of Living (Real Levels) – micro data



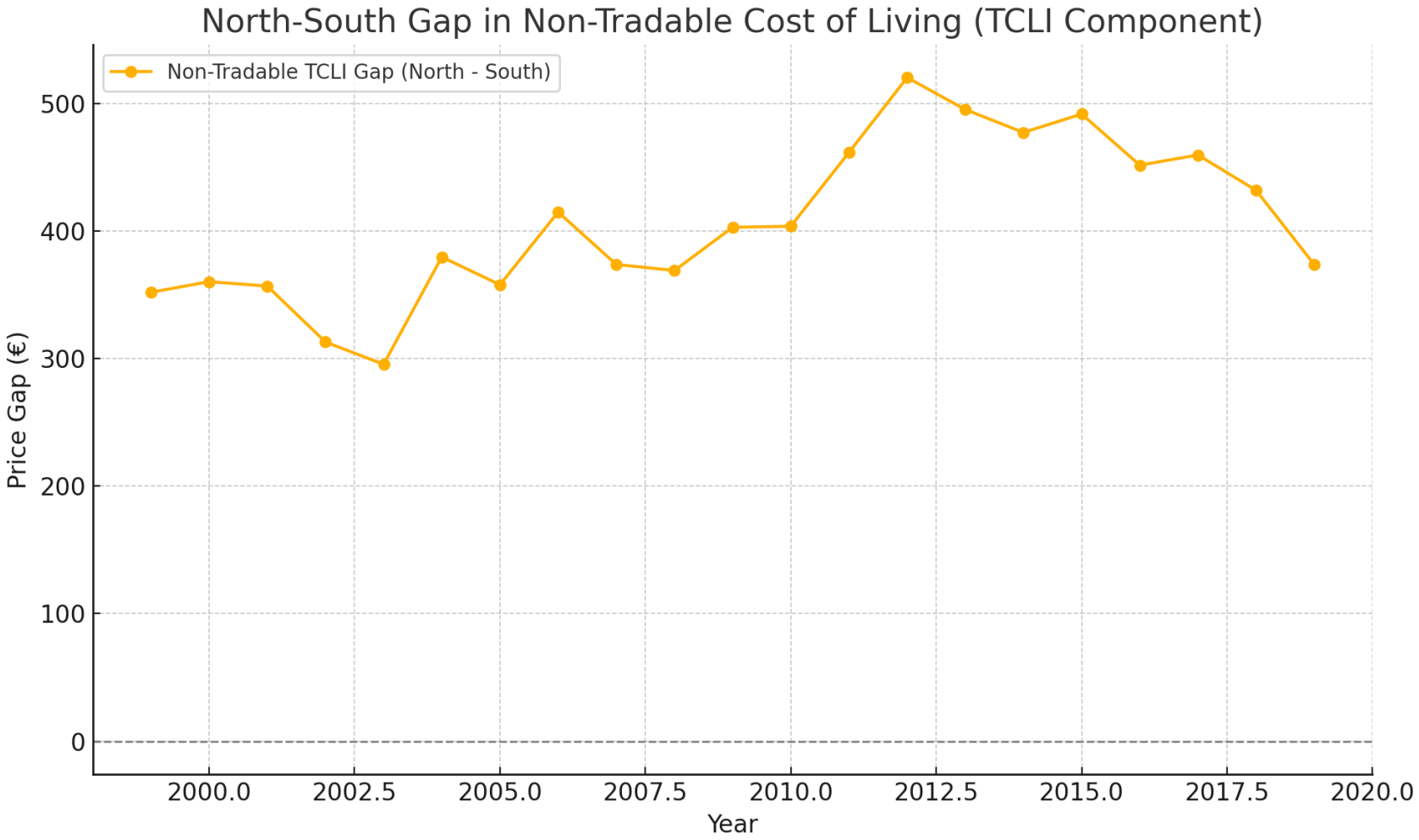
Gross Value Added per Worker



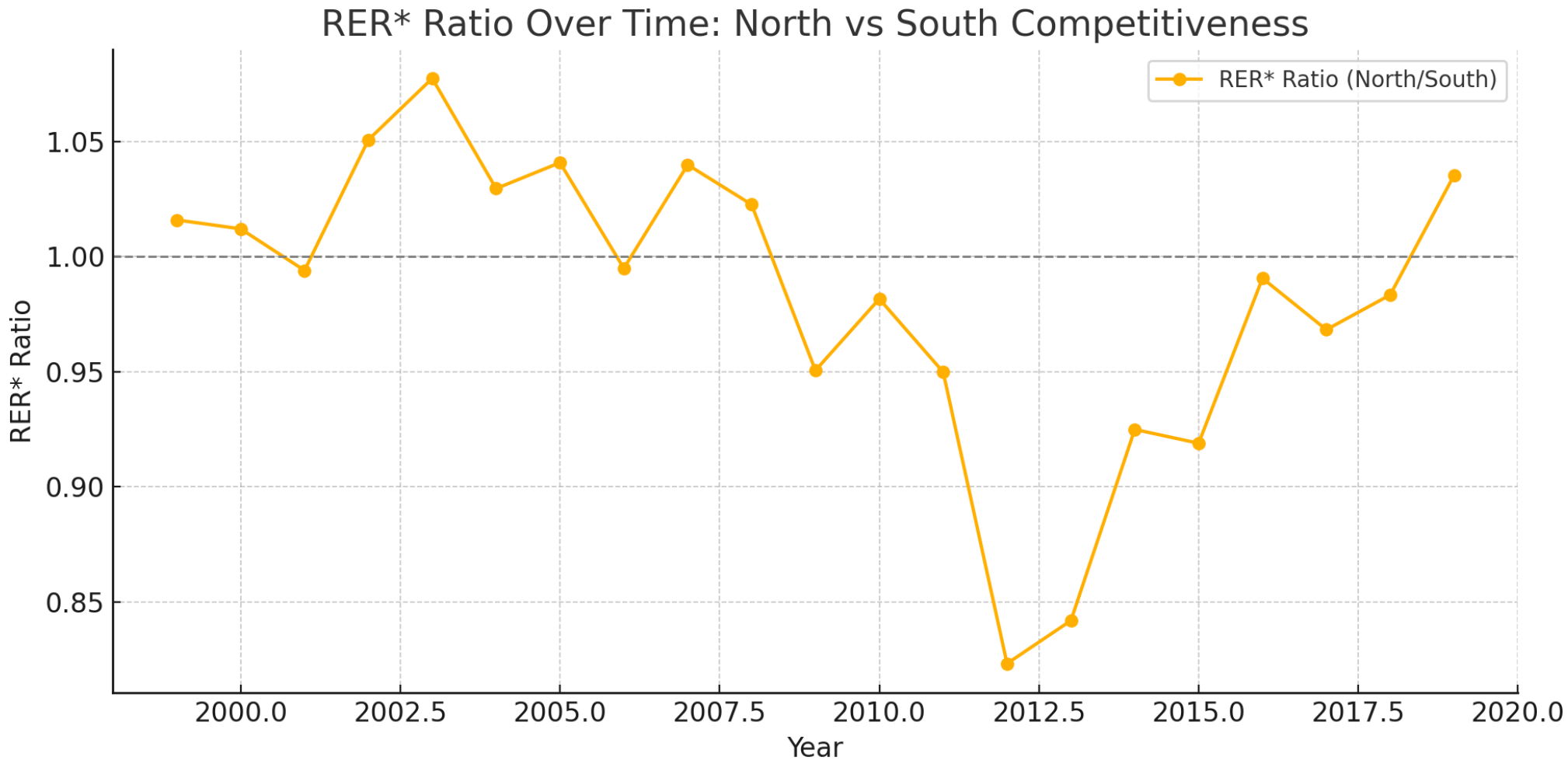
GVA in the Tradable Sector



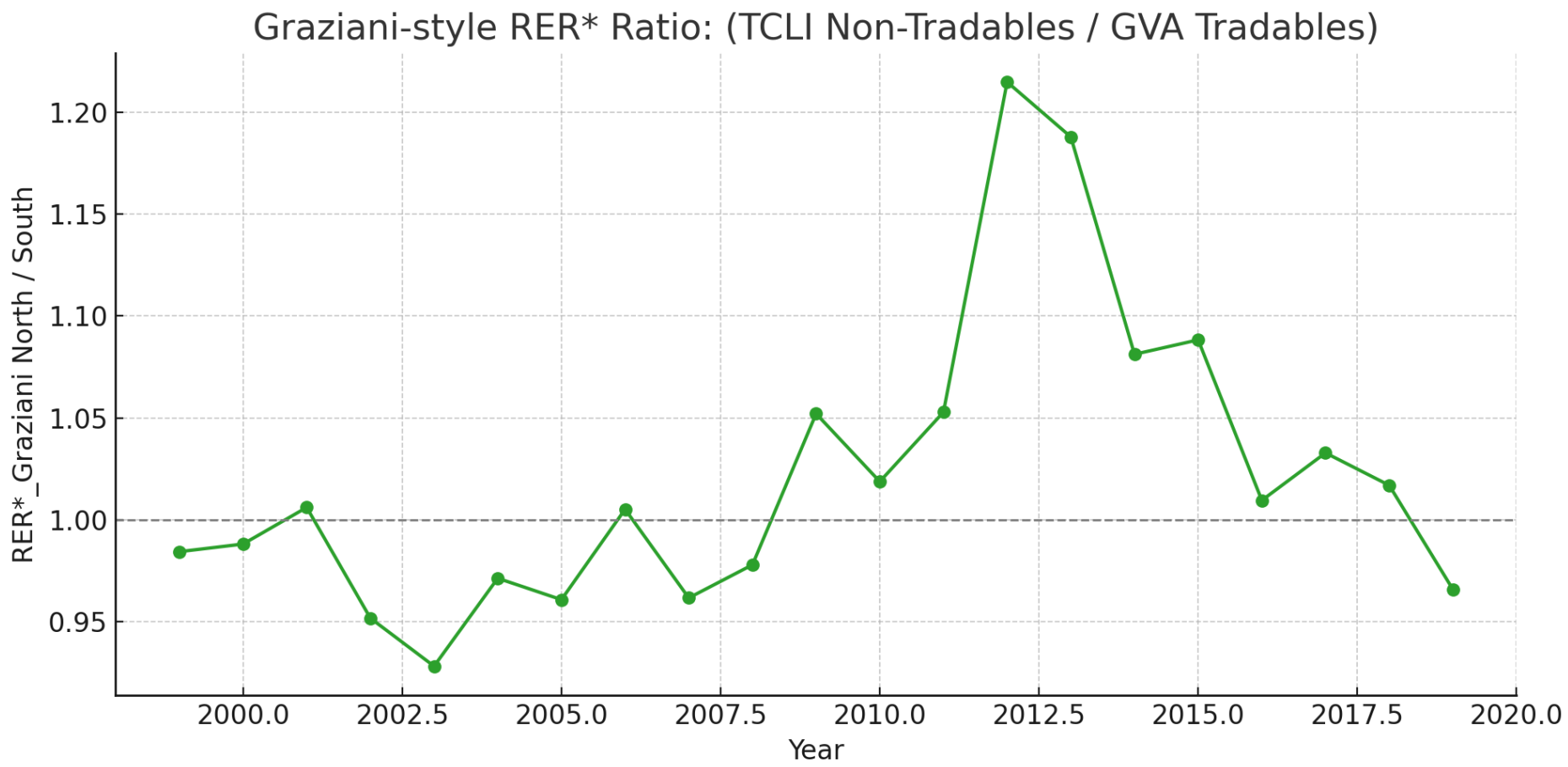
North-South Gap in Non-tradable Cost-of-Living



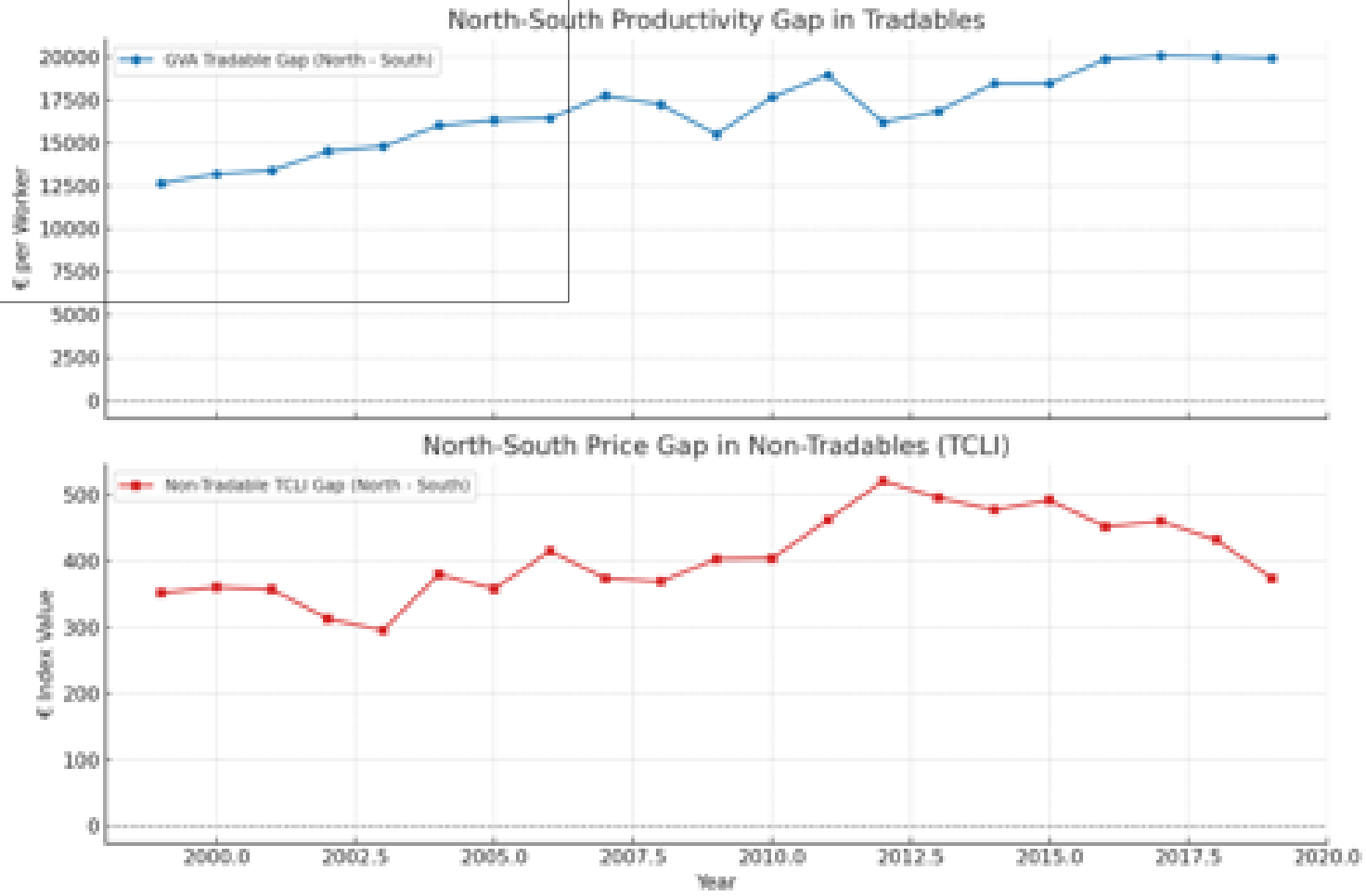
RER* Ratio over time: North vs South Competitiveness



Graziani-style RER* Ratio: TCLI Tradables/GVA Tradables



North-South Productivity Gap in Tradables and Non Tradables



Granger Causality

The Granger causality test checks whether **lagged values** of one variable (productivity North/South) ***help predict*** the other (cost of living North/South).

Baseline VAR model - Initial Estimates

	Coeff	Std. err.	z
Equation: Ln TCLI nord/sud			
Ln TCLI nord/sud			
Lag1.	0.869	0.272	3.190
Lag2.	-0.364	0.273	-1.330
Ln GVA/worker nord/sud			
Lag1.	0.840	0.798	1.050
Lag2.	-1.518	0.782	-1.940
Ln GVA Trade/Nontrade			
Lag1.	-0.144	0.073	-1.990
Delta Spesa Pubblica Amm.			
Lag1.	0.000	0.000	-0.750
Constant	0.534	0.362	1.480

Interpretation

- The **TCLI equation** provides the main evidence:
  - Strong persistence (expected).
- **Tradable vs. non-tradable productivity matters** (significant at 5%).
  - Aggregate productivity ratio matters weakly (significant at 10%).
- The **productivity equation** shows no reverse causality:
  - TCLI does not predict productivity.
- This pattern is **consistent with the Balassa–Samuelson hypothesis**: productivity differentials (especially tradables vs. non-tradables) drive cost-of-living gaps, not the other way around.

Granger Test

Equation	Excluded	chi2	df	Prob > chi2
Ln TCLI nord/sud				
	Ln GVA/worker nord/sud	3.844	2	0.146
	Ln TCLI nord/sud ALL	3.844	2	0.146
Ln GVA/worker nord/sud				
	Ln TCLI nord/sud	1.382	2	0.501
	Ln GVA/worker nord/sudALL	1.382	2	0.501

Interpretation

- No strong evidence of Granger causality in either direction ... so far.
- Parameter stability is probably an issue because of structural breaks (e.g. 2008 great recession)
- The measurement of productivity in the public sector is difficult
- We are at a very initial explorative stage also because we are extending the data range not to exclude the COVID19 period.

Comment I

- Weak or unstable Granger causality does not reject the Balassa–Samuelson mechanism;
  - rather, it reflects the fact that productivity–price transmission is mediated by institutional rigidities and disrupted by structural breaks.
- We argue that the BS effect and Graziani's real exchange rate misalignment are not competing explanations but complementary components of a single structural mechanism.
- Lower prices mean lower GDP and therefore, apparently, lower productivity. The cost of living index is only one aspect of the impact of lower prices, because it ignores the effects on production. The productivity gap is therefore at least partly only apparent, because it is caused by lower prices and not by lower quantities produced per unit of resources (labor and capital).

Comment II

- Productivity gains in Northern tradable sectors anchor wages nationally (BS). Centralized wage-setting prevents prices and wages from adjusting to local productivity conditions, generating persistent competitiveness gaps (Graziani).
- Companies in the South are unable to generate sufficient margins to sustain the wages imposed by collective bargaining agreements, especially considering their higher real level.
- This creates a structural distortion: real wages are too high relative to local productivity, leading to high unemployment, informal employment, and a chronic lack of private investment.
- Conversely, Northern firms benefit from higher selling prices in tradable sectors and low-cost intermediate inputs from the South, generating significantly higher value added per worker.

Comment III

- These price dynamics cause Southern Italy's GDP, productivity, and nominal incomes to be systematically underestimated, as official statistics do not adequately reflect regional differences in price levels.
- The apparent parity in nominal wages thus masks a profound structural asymmetry: the Southern economy is stuck in a low-price, low-productivity equilibrium, unable to either reduce wages or raise prices to escape it.
- This mechanism exemplifies Graziani's theory of real exchange rate misalignment and challenges conventional interpretations of regional inequalities based solely on nominal indicators.

Policy and Fairness Considerations

The Policy Recipe: Three Priority Areas

- I. Large-scale investment in infrastructure, logistics, and transportation is essential.
  - Improving interregional connectivity: through sea highways, port systems, and efficient inland connections—reduces trade costs, strengthens market integration, and raises productivity in tradable sectors.
- II. Targeted support for technologically advanced tradable sectors
  - such as aerospace, advanced manufacturing, and other high-value industrial clusters, can play a catalytic role.
  - These sectors raise productivity directly and generate learning externalities, demand for skilled labor, and upstream and downstream linkages that benefit the broader regional economy.
- III. Productivity growth must extend to the non-tradable sector
  - including transport services, housing, health, education, and public administration. Without improvements in non-tradable productivity, gains in tradables risk being offset by rising local prices, weakening the impact on real incomes. Policies that improve efficiency, competition, and service quality in these sectors are complementary to industrial and infrastructure strategies.
- Taken together, these interventions would increase labor productivity in both tradable and non-tradable activities, strengthen the transmission from productivity to real incomes, and progressively narrow the regional cost-of-living gap.

The North-South Divide: Stable and Inefficient

- Productivity gaps are endogenous to the regional price system itself.
  - Higher prices in the North inflate measured value added, while lower prices in the South compress it
  - This mechanism reinforces regional disparities by making the South appear structurally less productive, thereby discouraging investment and innovation, while simultaneously justifying nationally uniform wages that are misaligned with local purchasing power.
- The North–South divide is not merely a story of technological lag or insufficient human capital.
- It is also a story of persistent internal real exchange rate misalignment, weak labor mobility, and institutional rigidities that prevent quantity adjustments and force most of the burden of adjustment onto prices and real wages.
- The resulting equilibrium is stable AND inefficient:
  - regional disparities persist, real wages diverge, and productivity comparisons become increasingly distorted.

The Policy Takeaway: leaving the status quo unchecked risks **permanent territorial dualism** — a "country within a country."

- Policies aimed solely at raising productivity—without addressing price dynamics, wage-setting institutions, and barriers to labor mobility—risk delivering limited or misleading results.
- A credible convergence strategy must act simultaneously on RER adjustment, sectoral productivity, and labor market integration, recognizing that these dimensions are inseparable components of a single internal economic system.
- More broadly, our results underscore that convergence is not an automatic outcome of market forces alone: it requires policy coordination, institutional adaptation, and sustained investment.
- When these conditions are met, the Italian case suggests that long-standing regional disparities, much like those once separating Western and Eastern Europe—can be meaningfully reduced.