Premature Integration? Competing Unions and Uneven Market Integration in Germany, 1828–1833

Ichio Aoki - Graduate School of Economics, The University of Tokyo - JSPS Research Fellow DC2

May 23 2026 - JEA 2026 Spring Meeting, Osaka Metropolitan University

Introduction and Summary

The study of customs unions and their effects on market integration is a central question in economics. The **Zollverein of 1834**, a customs union among states of the German Confederation, is the prototypical case (Viner, 1950): extensively studied, and broadly judged to have reduced trade frictions and integrated markets (Keller and Shiue, 2014).

This positive view obscures an important and overlooked episode. Six years prior, three competing regional unions formed in 1828 in reaction to one another:

- **PHC** Prussia-Hesse-Darmstadt Customs Union
- **SGCU** South German Customs Union
- **CGCU** Central German Commercial Union

This paper provides the first empirical analysis of the precursor unions and their border effects, using a dyadic panel of grain prices across up to 64 cities and 17 German states, 1815–1833. The CGCU was not integrative — it was actively disintegrative, and widened price gaps both within its membership and along the CGCU–PHC frontier.

Data & Methods

Data. Annual grain prices (wheat, rye, barley, oats) for 49–64 cities across 17 German states, 1815–1833 (coverage varies by grain). Sources: (Keller and Shiue, 2014; Albers and Pfister, 2023, 2024). Customs union membership is coded as time-varying from each union's formation onward.

Dyadic Panel. All city-pair combinations are constructed for each grain and year. The outcome is the absolute log price gap between cities i and j for grain g in year t. Same-state pairs are excluded throughout.

Specification.

$$\left|\log p_{i,g}^{t} - \log p_{j,g}^{t}\right| = \alpha_{i,j} + \alpha_{t,g} + \beta \times X_{i,j}^{t} + \varepsilon_{i,j,g}^{t}$$

where $\alpha_{i,j}$ are city-pair and $\alpha_{t,g}$ year-by-grain fixed effects. $X_{i,j}^{t}$ captures either *joint union membership* or *border configurations* between unions, depending on the specification. Standard errors clustered at the city-pair level.

Market Integration

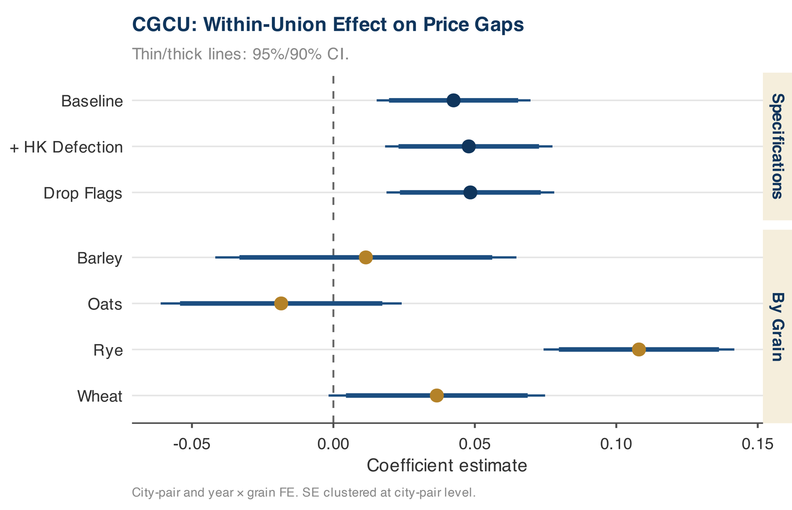
Market integration describes the process by which spatially separated markets converge toward a common price. The conceptual foundation derives from the **Law of One Price**: in integrated markets, price gaps between locations are bounded by the costs of arbitrage. As markets integrate, these costs fall and gaps narrow (Federico, 2024).

Empirically, integration is measured through bilateral price differentials across city pairs. The absolute log price gap between cities i and j serves as the outcome variable; its evolution around 1828 identifies the effect of institutional change on market structure.

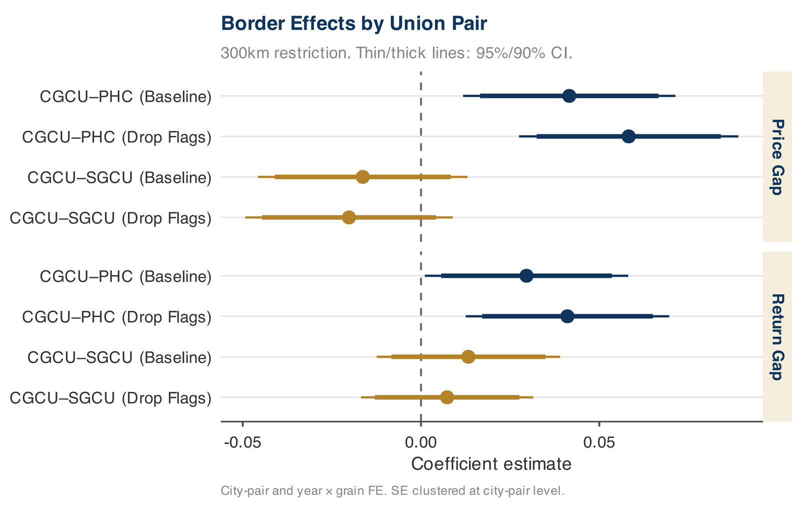
Customs unions matter for integration through two competing channels. Internally, they reduce barriers and should narrow price gaps between members. Externally, by erecting common barriers against outsiders, they may divert trade and *widen* gaps across union boundaries (Viner, 1950). Both margins are estimated here.

Regression Results

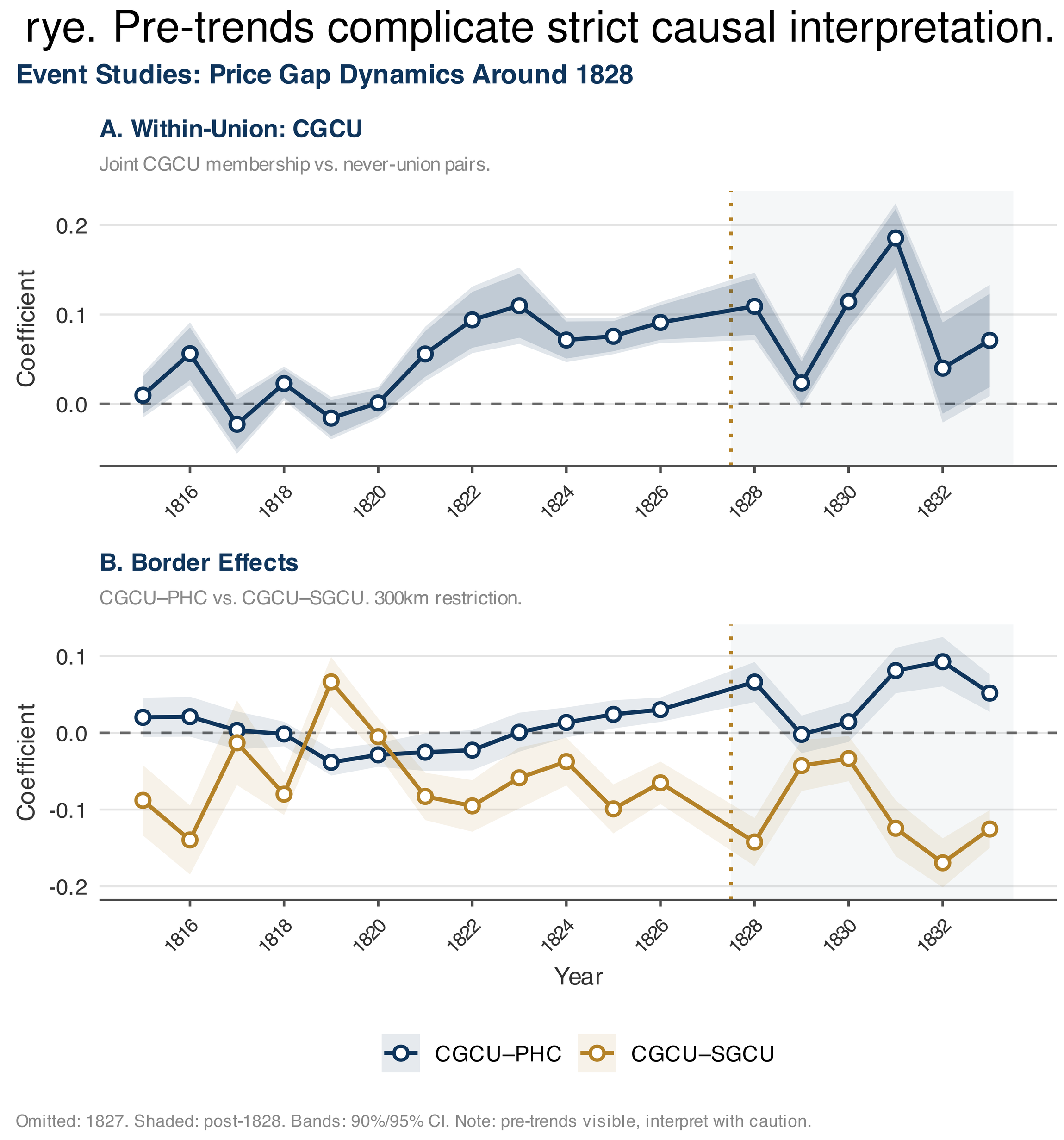
Within-Union Effect. Joint CGCU membership widened price gaps after 1828.



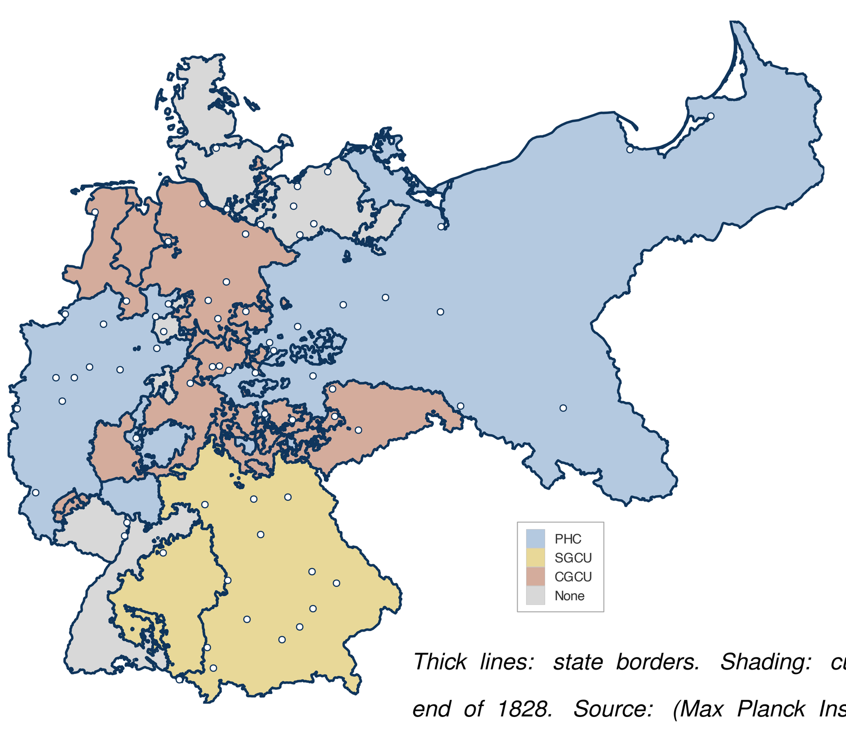
Border Effects. The CGCU–PHC frontier widened price gaps.



Dynamics. Post-1828 divergence accelerates sharply, concentrated in rye. Pre-trends complicate strict causal interpretation.



Customs Unions, 1828



Thick lines: state borders. Shading: customs zone, end of 1828. Source: (Max Planck Institute for Demographic Research, 2011); own classification.

Historical Background of German Economic Unification

Following the Congress of Vienna in 1815, 39 sovereign states remained in the German Confederation, each maintaining its own customs system. The resulting landscape of internal barriers, tolls, and fragmented trading jurisdictions made commerce across state lines costly and unpredictable (Henderson, 1939).

Early integration came from within states. Territorial consolidation following the Napoleonic Wars reduced internal fragmentation, and trade reforms replacing heterogeneous internal duties with unified external tariffs drove meaningful price convergence (Albers and Pfister, 2023).

The **Zollverein of 1834** then completed this process at the national level, reducing bilateral price gaps across member markets (Keller and Shiue, 2014).

The transition between these two phases is the focus of this paper. Three unions formed in rapid succession in 1828 — SGCU (January), PHC (February), CGCU (September) — each a reaction to Prussian commercial expansion; the CGCU organized explicitly to block Prussia (Henderson, 1939). They have been treated as a footnote to the Zollverein story and require attention in their own right.

Conclusion and Future Research Direction

The CGCU was not integrative. Price gaps widened *within* its borders and along the CGCU–PHC frontier, while the CGCU–SGCU boundary remained integrated. The contrast tracks the political geography of 1828 directly: the CGCU was built to obstruct Prussian expansion, not to promote trade.

Customs unions are not inherently integrative. The costs fell hardest at fault lines between rival blocs. Political intent, not institutional separation alone, determined outcomes.

Future work pursues a geographic instrument based on territory-level changes in customs border exposure, and traces how competitive bloc membership, the Steuerverein rivalry, and mid-century Prussian annexations jointly reshaped the political geography of German markets through unification.

References

Albers, Hakon and Ulrich Pfister, "State Formation and Market Integration: Germany, 1780–1830," *Journal of Comparative Economics*, June 2023, *51* (2), 403–421.

__ **and** __ , "Grain Prices in Pre-industrial Germany, Fifteenth to Nineteenth Centuries," *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, 2024.

Federico, Giovanni, "Market Integration," in Claude Diebolt and Michael Haupert, eds., *Handbook of Cliometrics*, 2024, pp. 899–924.

Henderson, W.O., *The Zollverein* Cambridge Studies in Economic History, 0 ed., Cambridge University Press, 1939.

Keller, Wolfgang and Carol H. Shiue, "Endogenous Formation of Free Trade Agreements: Evidence from the Zollverein's Impact on Market Integration," *The Journal of Economic History*, December 2014, *74* (04), 1168–1204.

Max Planck Institute for Demographic Research, "MPIDR Population History GIS Collection — Germany: Administrative Units, 1815–1918," Distributed via IPUMS Mosaic, Minnesota Population Center 2011.

Viner, Jacob, *The Customs Union Issue*, Carnegie Endowment for International Peace, 1950.

Acknowledgements

The author would like to thank Professor Masaki Nakabayashi for his support and feedback. This work was supported by the Japan Society for the Promotion of Science (JSPS) Grant-in-Aid JP26KJ0705.

Contact

Ichio Aoki
University of Tokyo
JSPS Research Fellow (DC)
ichio-aoki@g.ecc.u-tokyo.ac.jp
`https://ichio-aoki.com`

Download

Poster
Companion

updated: 18/05/2026