The economic consequences of geopolitical fragmentation: Evidence from the Cold War

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Trade Policy Research Forum: Trade and Geopolitics during the Cold War: Lessons for the Future

The views expressed in this paper are those of the authors and do not necessarily coincide with those of the Banco de España or the Eurosystem.

Background and motivation

- Trade integration as the guiding principle of international trade is on its way out, and the world trading system is aligning along geopolitical lines:
  - Trade war between United States and China (under both Trump and Biden)
  - Russian invasion of Ukraine (and related economic sanctions)
- Obvious question: What are the economic consequences of this geopolitical fragmentation?
- $\Rightarrow$ Interestingly, the defining episode of geopolitical fragmentation in the twentieth century, the Cold War, and its effects on trade have been understudied.

The paper in a nutshell

- **What do we do?**
  We quantify the trade effects of the Iron Curtain, the symbolic and physical barrier that divided Europe into two distinct blocs (East and West).
- **How do we do it?**
  We built a new database to address the lack of historical trade data for some major Eastern bloc countries. We analyze this new database using structural gravity models.
- **What do we find?**
  Trade between East and West across the Iron Curtain was restricted, but the severity of these restrictions varied over time.

Our main contributions

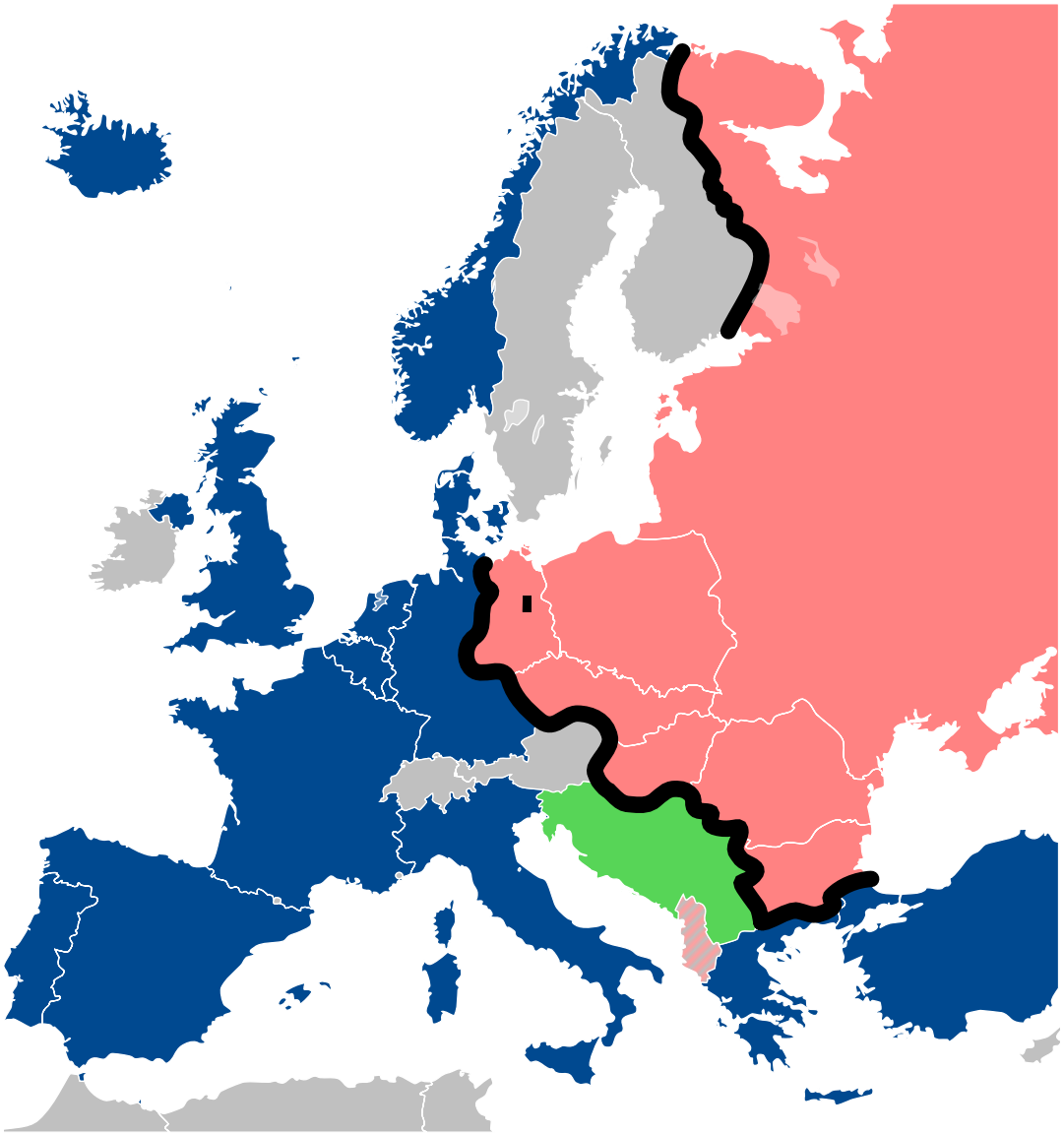
Our paper makes three contributions:

1. We estimate how the trade-restricting effects of the Iron Curtain between East and West varied over time.
2. We build a new database using historical primary sources to address the lack of trade data for major Eastern bloc countries (such as East Germany and the Soviet Union).
3. We provide a counterfactual quantification of the trade and real wage effects of the Iron Curtain using state-of-the art quantitative trade models that allow us to quantify the trade diversion effects caused within the two economic blocs.

Related literature

1. **The effect of borders on trade**
   Comparing domestic vs. international trade: McCallum (1995), Anderson and van Wincoop (2003), Yotov (2012)
2. **The relationship between geopolitics and trade**
   The trade effects of sanctions, political regimes (democracy), civil and interstate wars, CIA interventions, etc., e.g., Martin et al. (2008), Berger et al. (2013), Felbermayr et al. (2020)
3. **The effect of the Iron Curtain on trade**
   - Studies using cross-sectional data, e.g., Van Bergeijk (2015), Egger et al. (2024).
   - Studies using only the period after the fall of the Iron Curtain, e.g., Beestermöller and Rauch (2018).
   - Do not study how the effect varies over time, do not quantify the general equilibrium trade diversion and real wage effects.

The Iron Curtain



Methodology: Identifying the Iron Curtain effect using structural gravity

We estimate the following structural gravity equation that allows us to estimate a **time-varying** Iron Curtain effect:

$$X_{ijt} = \exp(\theta_t IC_{ij} + \gamma_t b_{ij} + \phi_{it} + \psi_{jt} + \boldsymbol{z}'_{ij}\boldsymbol{\beta} + \varepsilon_{ijt}), \tag{1}$$

where

- IC_{ij} is a dummy that is 1 if country i and j are members of the opposite economic block (i.e., trade across the Iron Curtain), and 0 otherwise,
- $\gamma_t b_{ij}$ controls for a time-varying border effect,
- ϕ_{it} and ψ_{jt} controls for multilateral resistance terms,
- $\boldsymbol{z}'_{ij}\boldsymbol{\beta}$ are control variables.

We transform estimated coefficients into their tariff equivalent:

$$\text{Tariff equivalent}_t = 100 \times \left[\exp\left(-\hat{\theta}_t/\epsilon\right) - 1\right], \tag{2}$$

setting the trade elasticity $\varepsilon = 1 - \sigma = -5.03$, following Head and Mayer (2014).

Data

- **Historical bilateral international trade data:** TRADHIST database by Fouquin and Hugot (2016): compiles historical bilateral goods trade flows
- **Domestic trade data:** constructed as GDP − total exports (best alternative possible for the period of interest; proxy, but works well in practical applications, see Campos et al. (2021).
- **Gravity controls: $z'_{ij}\beta$:** TRADHIST

Contribution: digitization of statistical reports of East Germany and the Soviet Union

Trade flows are gross, expressed in nominal terms, and measured in the same currency (British pounds). ▷ Data validation

Primary sources: East Germany

Land	Außenhandel (ohne innerdeutschen Handel)							
	Ausfuhr				Einfuhr			
	1953	1954	1955	1956	1953	1954	1955	1956
	1000 Rubel							
Sämtliche Länder	3 591 152	4 700 952	4 566 885	5 013 018	3 679 331	3 968 607	4 166 471	4 750 130
darunter in:								
Europa								
Albanien	11 964	9 603	24 602	18 316	3 699	3 387	5 071	7 738
Belgien mit Luxemburg .	27 042	24 689	25 069	31 642	62 713	39 246	46 429	45 919
Bulgarien	79 708	95 409	85 013	129 661	72 073	98 847	123 998	137 359
Dänemark	49 219	53 381	56 052	56 012	54 401	62 405	60 198	55 391
England	36 964	55 745	48 292	48 761	66 319	77 758	69 635	69 534
Finnland	40 438	67 785	78 847	81 304	33 573	47 166	69 093	69 982
Frankreich	11 481	11 150	16 868	16 309	16 368	24 356	29 760	37 102
Griechenland	6 888	8 759	11 020	13 948	3 866	7 621	6 795	13 081
Holland	71 933	78 556	72 888	85 059	109 856	95 078	117 406	108 454
Island	5 450	5 366	6 209	10 049	7 278	4 033	3 601	10 137
Italien	19 634	29 090	38 211	31 024	21 462	31 402	42 024	30 445
Jugoslawien	—	2 253	7 633	13 401	—	3 585	6 394	14 127
Norwegen	29 985	40 348	29 037	40 346	29 374	33 110	32 939	30 647

Notes: Excerpt of East Germany's statistical yearbook.

Primary sources: USSR

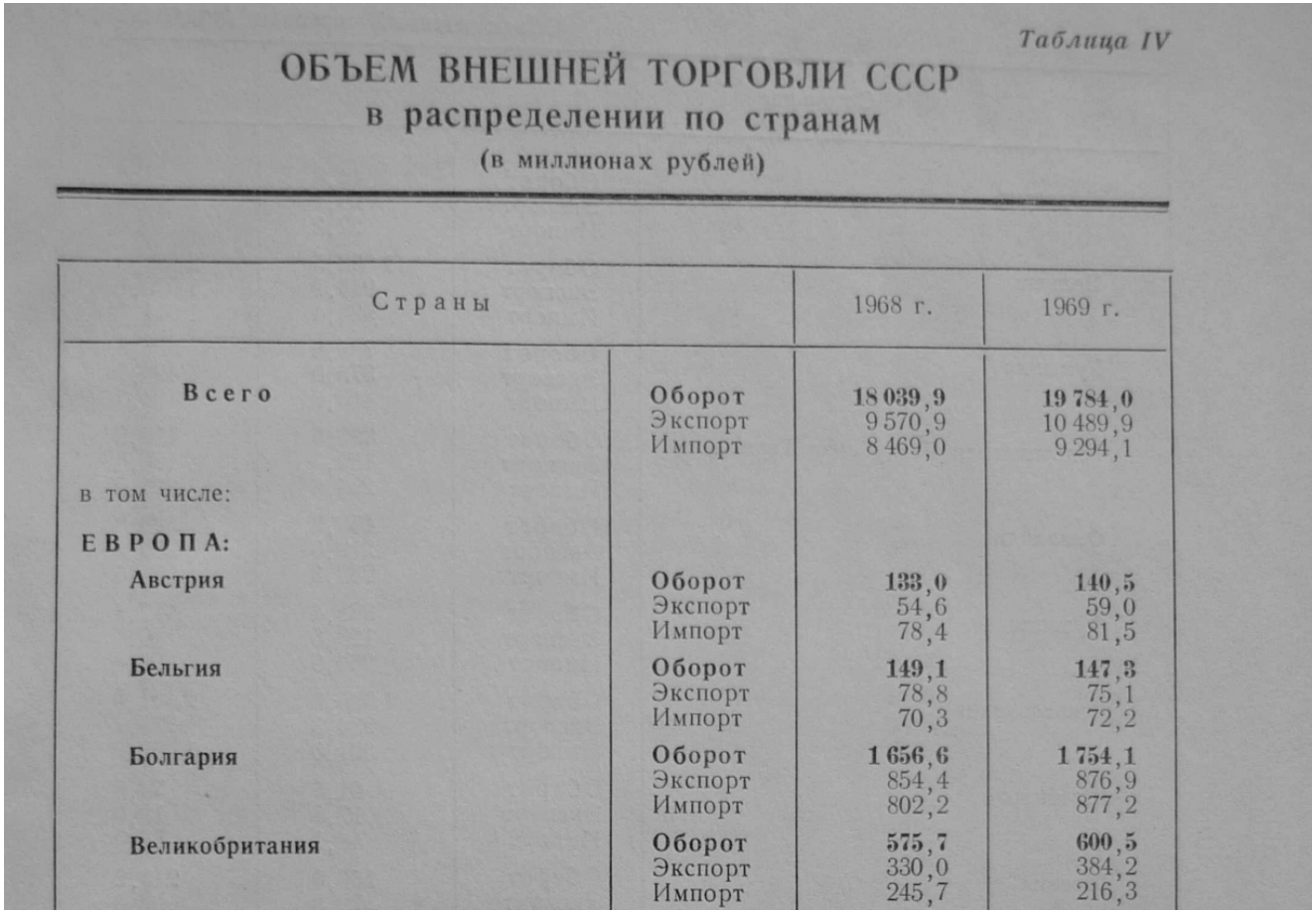


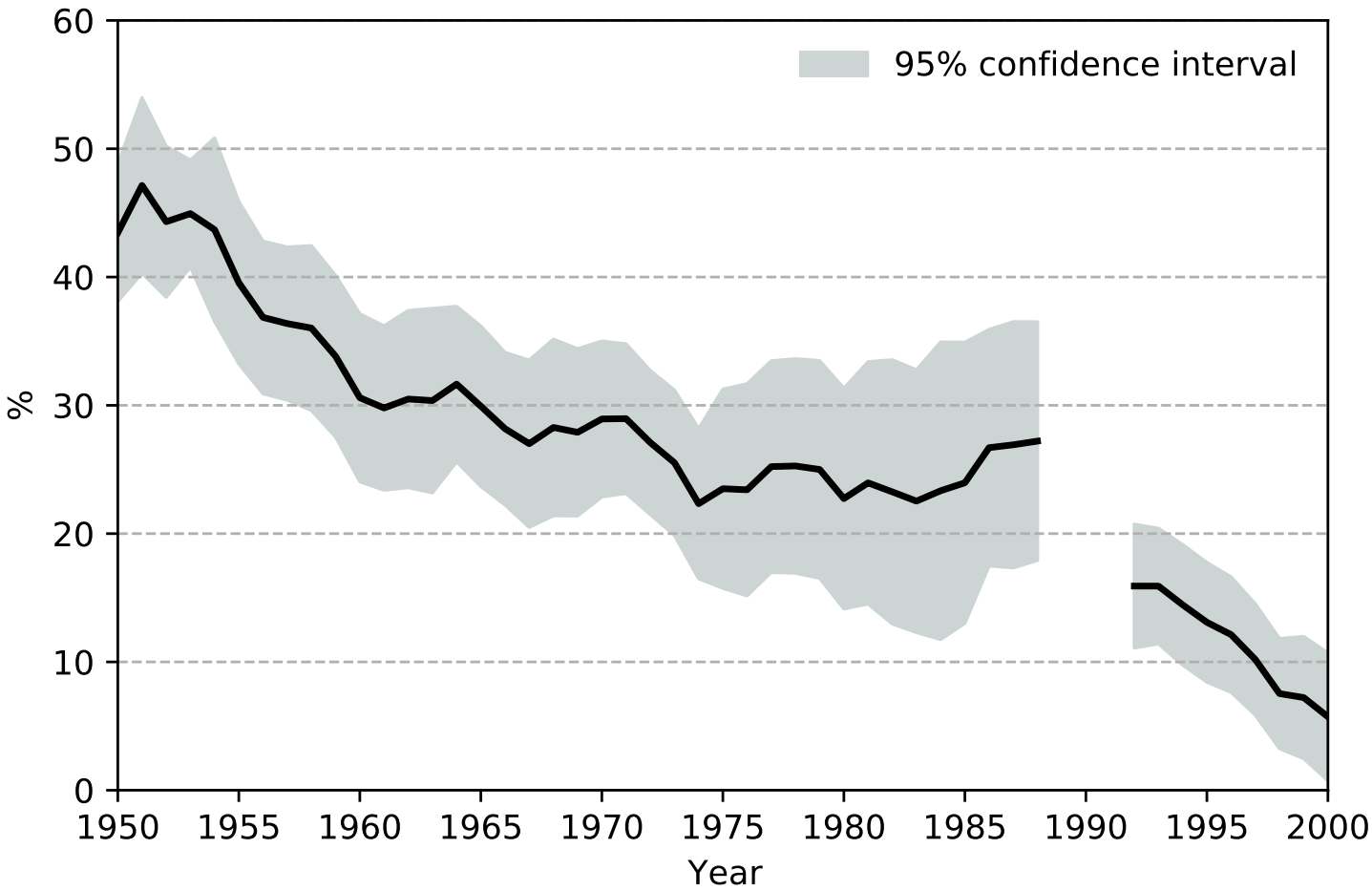
Таблица IV

ОБЪЕМ ВНЕШНЕЙ ТОРГОВЛИ СССР
в распределении по странам
(в миллионах рублей)

Страны		1968 г.	1969 г.
Всего	**Оборот**	**18 039,9**	**19 784,0**
	Экспорт	9 570,9	10 489,9
	Импорт	8 469,0	9 294,1
в том числе:			
ЕВРОПА:			
Австрия	**Оборот**	**133,0**	**140,5**
	Экспорт	54,6	59,0
	Импорт	78,4	81,5
Бельгия	**Оборот**	**149,1**	**147,3**
	Экспорт	78,8	75,1
	Импорт	70,3	72,2
Болгария	**Оборот**	**1 656,6**	**1 754,1**
	Экспорт	854,4	876,9
	Импорт	802,2	877,2
Великобритания	**Оборот**	**575,7**	**600,5**
	Экспорт	330,0	384,2
	Импорт	245,7	216,3

Notes: Excerpt of the yearly foreign trade statistical review for the USSR.

Estimated tariff equivalent of the Iron Curtain



Notes: The figure shows the estimated tariff equivalent of the Iron Curtain's borders measured in percentage points. The estimation uses the specification in (1). The tariff equivalent is calculated from the estimates $\hat{\theta}_t$ using the transformation $100 \times [\exp(-\hat{\theta}_t/5.03) - 1]$. The 95% confidence interval is calculated using the delta method.

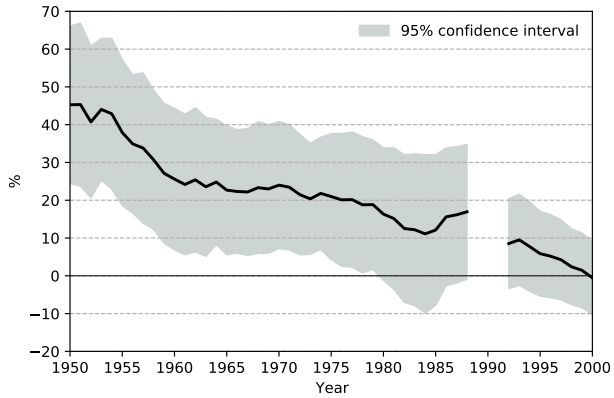
▷ Estimated coefficients ▷ Without domestic trade

Methodology: Allowing for asymmetric effects

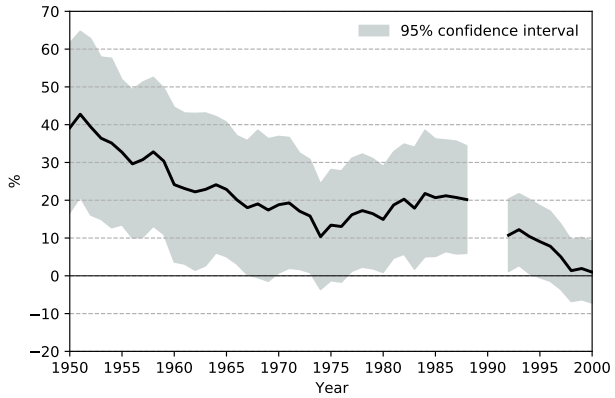
- We can allow for asymmetric effects, i.e., for the Iron Curtain to have different trade cost effects for East to West ($\theta_t^{EW} EW_{ij}$) versus West to East ($\theta_t^{WE} WE_{ij}$) trade.
- Similarly, for international trade within the blocs: $\theta_t^{EE} EE_{ij}$ and $\theta_t^{WW} WW_{ij}$:

$$X_{ijt} = \exp(\theta_t^{EW} EW_{ij} + \theta_t^{WE} WE_{ij} + \theta_t^{EE} EE_{ij} + \theta_t^{WW} WW_{ij} + \\ + \gamma_t b_{ij} + \phi_{it} + \psi_{jt} + \boldsymbol{z}'_{ij}\boldsymbol{\beta} + \varepsilon_{ijt}). \tag{3}$$

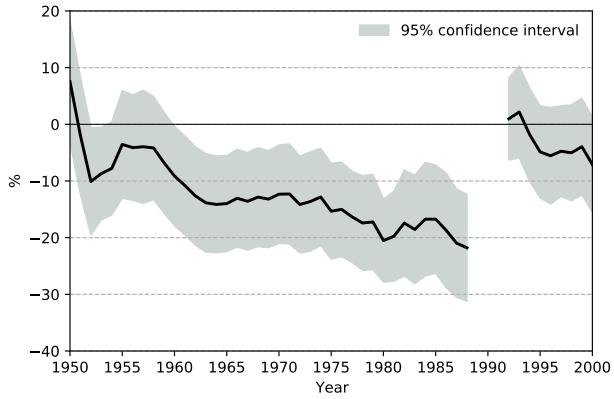
Tariff equivalent of trade costs across and within blocs



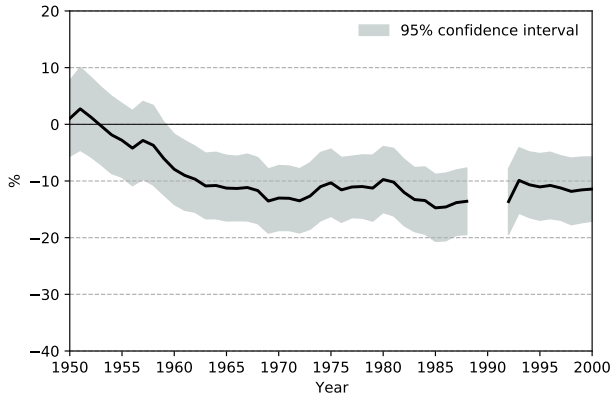
(a) East to West



(b) West to East



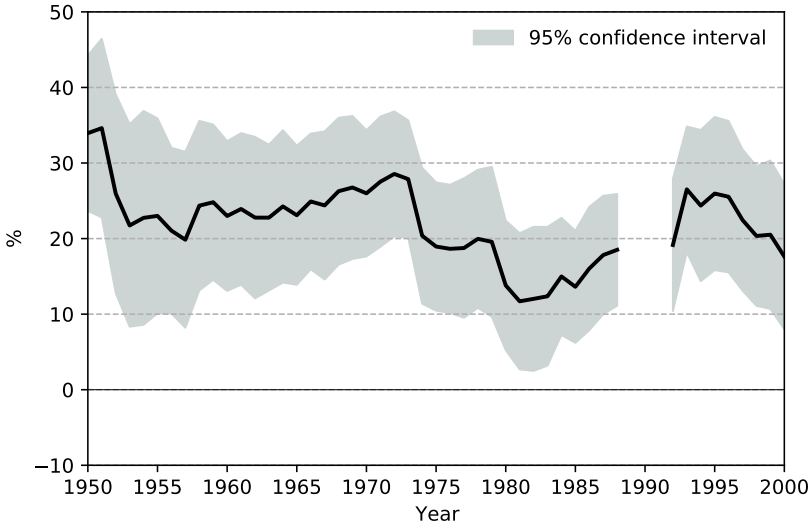
(c) East to East



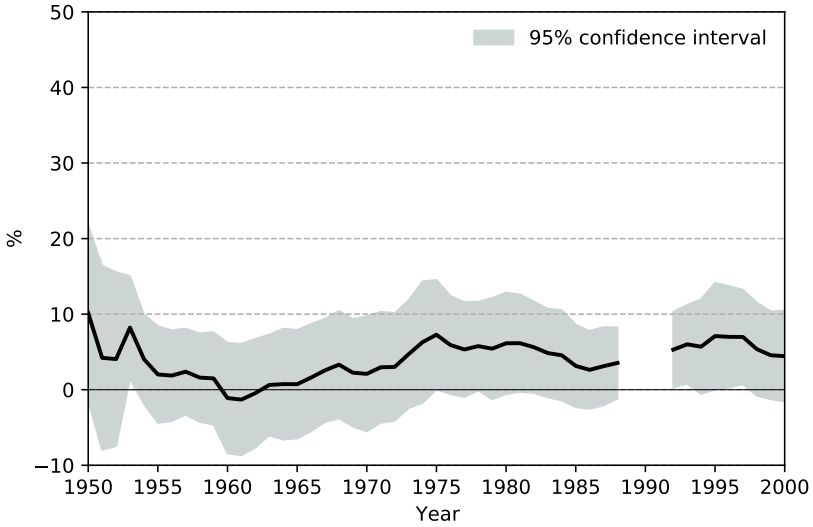
(d) West to West

Notes: The figures show the tariff equivalent of the trade costs estimated using the specification in (3). The tariff equivalent measure is calculated from the estimates $\hat{\theta}_t^{ij}$, where $ij \in \{EW, WE, EE, WW\}$, using the transformation $100 \times [\exp(-\hat{\theta}_t^{ij}/5.03) - 1]$. The tariff equivalent measure is expressed in percentage points. The 95% confidence interval is calculated using the delta method.

Tariff equivalent for trade with neutral countries



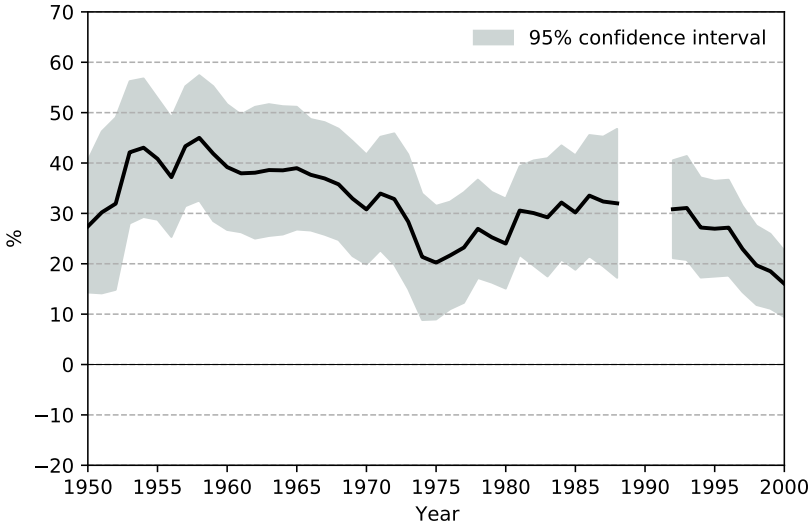
(a) Trade with the East



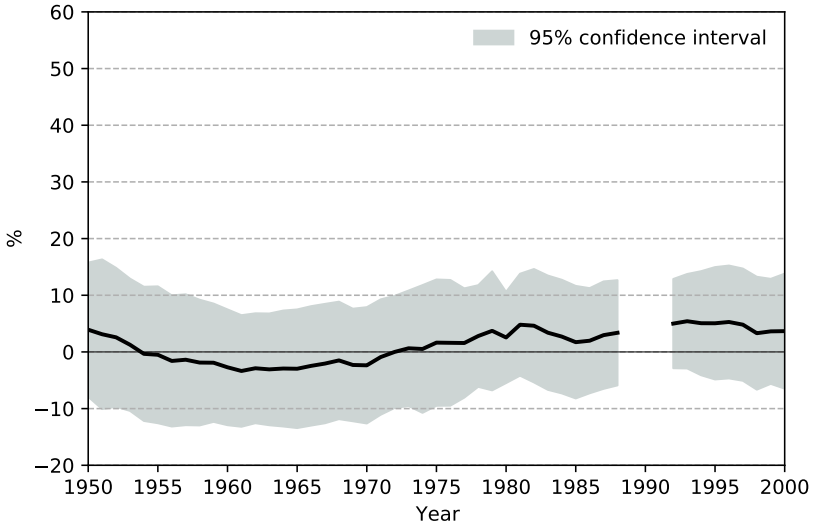
(b) Trade with the West

Notes: The figures show the tariff equivalent of the trade costs for neutral countries (Austria and Finland). The tariff equivalent measure is expressed in percentage points. The 95% confidence interval is calculated using the delta method.

Tariff equivalent for trade with West-leaning countries



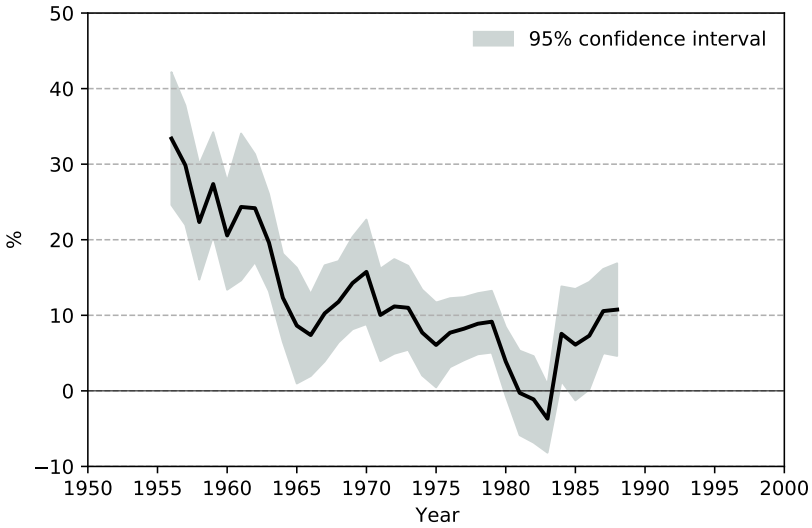
(a) Trade with the East



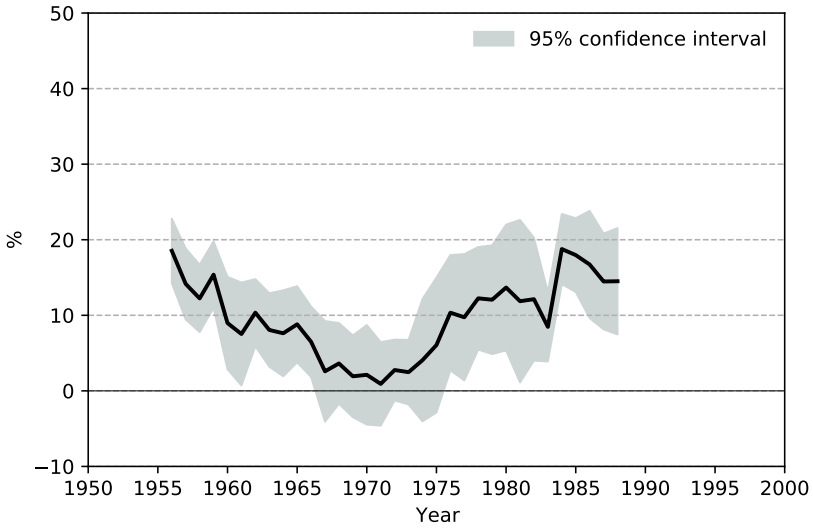
(b) Trade with the West

Notes: The figures show the tariff equivalent of the trade costs for West-leaning countries (Switzerland, Ireland, and Sweden). The tariff equivalent measure is expressed in percentage points. The 95% confidence interval is calculated using the delta method.

Tariff equivalent for trade with Yugoslawia



(a) Trade with the East



(b) Trade with the West

Notes: The figures show the tariff equivalent of the trade costs for Yugoslavia. Estimates are not available for all years because of lack of data. The tariff equivalent measure is expressed in percentage points. The 95% confidence interval is calculated using the delta method.

Counterfactual quantification of the trade and real wage losses due to the Iron Curtain

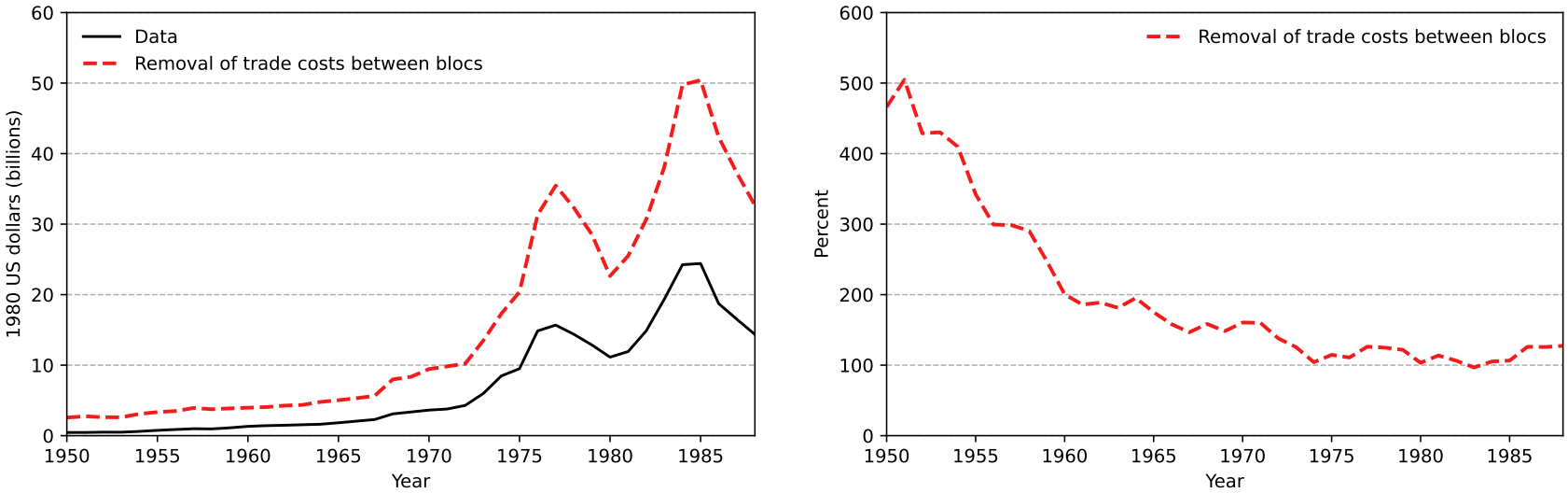
We use a standard quantitative trade model in which:

- Goods are produced by combining labor with intermediate inputs ("roundabout production")
- Trade is costly and is characterized by ad valorem iceberg trade costs
- Demand is given by CES preferences defined over varieties differentiated by origin
- This model is isomorphic in terms of its trade and welfare implications to a wide class of alternative trade models, see Arkolakis et al. (2012); Allen et al. (2020).

To calculate counterfactuals, we only need:

- Bilateral trade flows
- Two elasticities:
  - Trade elasticity (measuring how bilateral trade flows respond to a change in bilateral trade costs) $\sigma = 5.03$ (Head and Mayer, 2014)
  - Supply elasticity (measuring how output in a country responds to an increase in the relative price of its export good) $\alpha = 1.24$

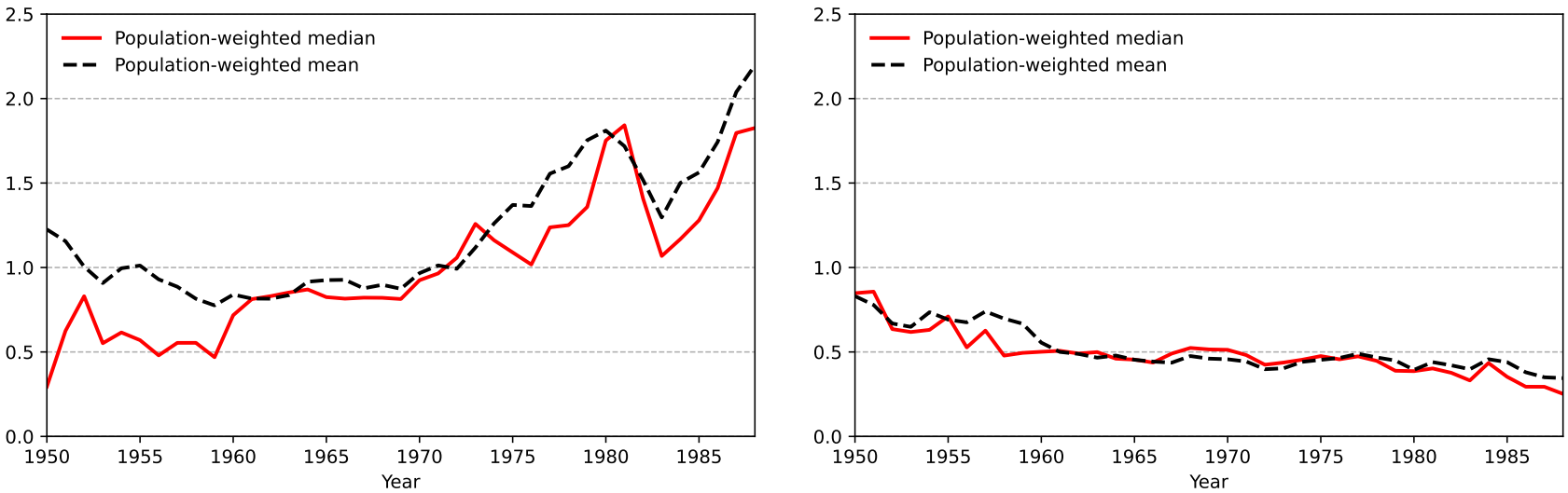
Trade effects of counterfactually removing the Iron Curtain



(a) Volume (b) Percent differences

Notes: The figure shows the results of a simulation in which the trade barriers of the Iron Curtain are removed. The solid line in the left panel shows the actual trade volume between East and West. The dashed line shows the counterfactual trade volume. The panel on the right shows the predicted percentage increase in trade volume that would occur if the trade barriers of the Iron Curtain were removed.

Year by year welfare effects of counterfactually removing the Iron Curtain



(a) Eastern countries

(b) Western countries

Notes: The figure shows the results from a simulation in which the trade barriers due to the Iron Curtain are removed. The black dashed line shows the population-weighted average welfare gains for each group of countries. The red solid line shows the population-weighted median welfare gains for each group of countries. Both measures are calculated year by year.

Conclusion

- In this paper, we quantify the evolution of a tariff-equivalent measure of the Iron Curtain. 45% at its peak, 25% by the end of the Cold War: We use previously unavailable data; We also analyze trade integration within the East and West blocs, and how trade barriers with non-aligned or neutral countries evolved over time
- We then use a quantitative trade model to show that despite the gradual easing of trade restrictions over time, the Iron Curtain still had a significant impact on trade flows and welfare, especially in the East.
- The Iron Curtain led to persistent losses in the welfare of Eastern bloc countries of about 1% per year until the end of the Cold War.
- **The Iron Curtain served as a formidable barrier to trade between Eastern and Western countries, illustrating the perils of geopolitical fragmentation.**

Thank you

Thank you for your attention!
We are looking forward to your questions and comments.

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The economic consequences of geopolitical fragmentation: Evidence from the Cold War

- **Paper**
  - https://www.cesifo.org/en/publications/2024/working-paper/economic-consequences-geopolitical-fragmentation-evidence-cold-war
  - https://arxiv.org/abs/2404.03508
- **Our digitized Eastern bloc countries trade data**
  - https://rolf-campos.github.io/project/east_data/

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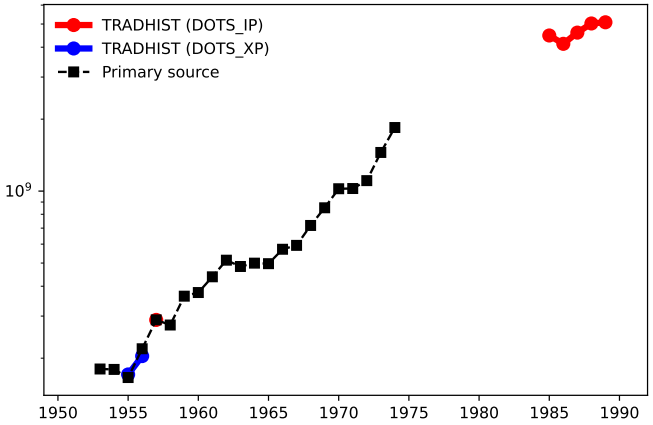
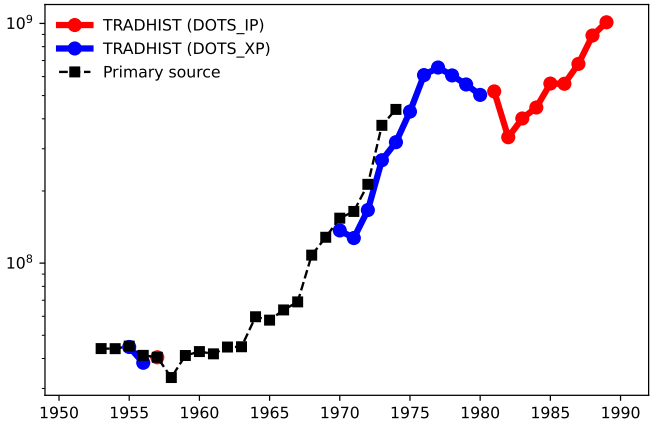
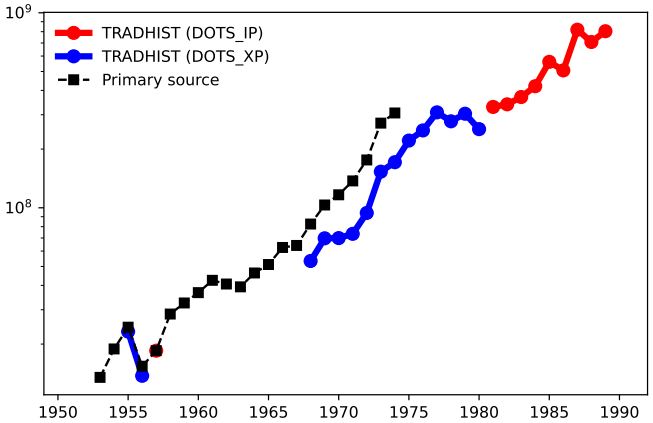
Data validation: Eastern bloc trade with East Germany



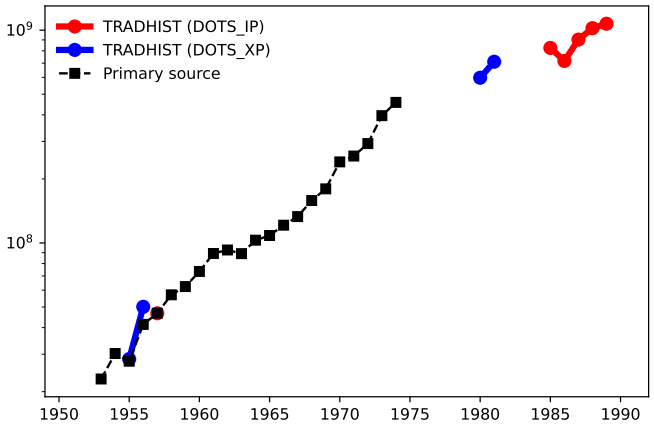
(a) USSR to East Germany



(b) Poland to East Germany



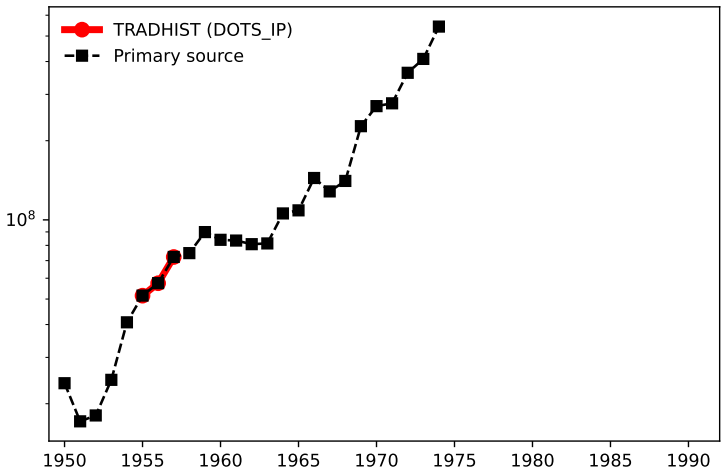
(c) Hungary to East Germany



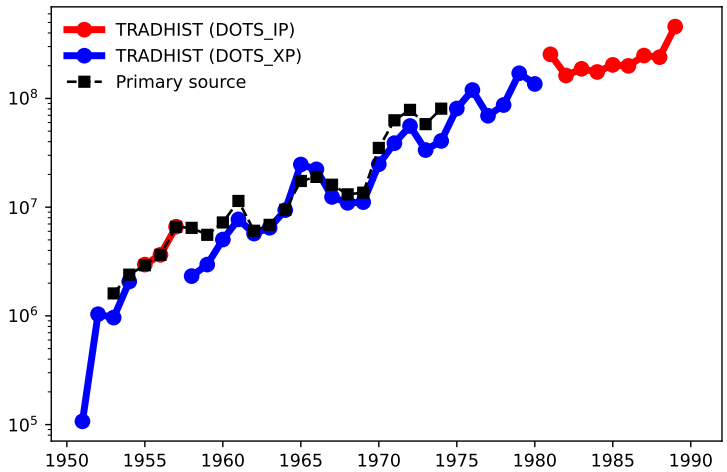
(d) Czechoslovakia to East Germany

Notes: Values are in pounds sterling. The vertical axis uses a logarithmic (base 10) scale. Values from the TRADHIST database derived from the importer in IMF DOTS (`DOTS_IP`) are plotted with a red line. Values from the TRADHIST database derived from the exporter in IMF DOTS (`DOTS_XP`) are plotted with a blue line. Data from primary sources processed according to the DOTS methodology are plotted with a black dashed line with squares.

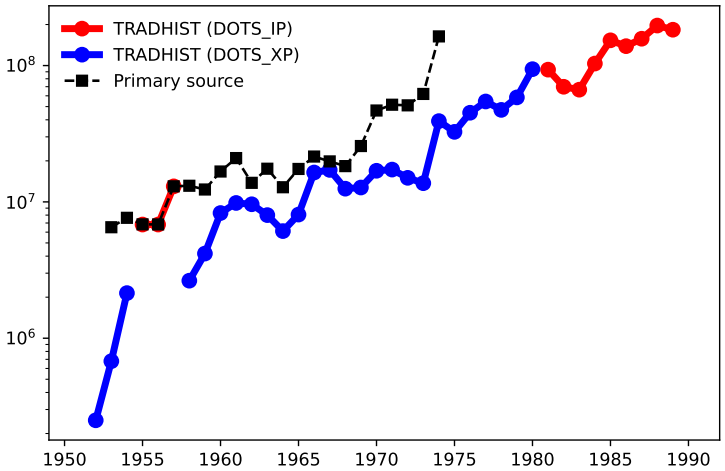
Data validation: Western bloc trade with East Germany



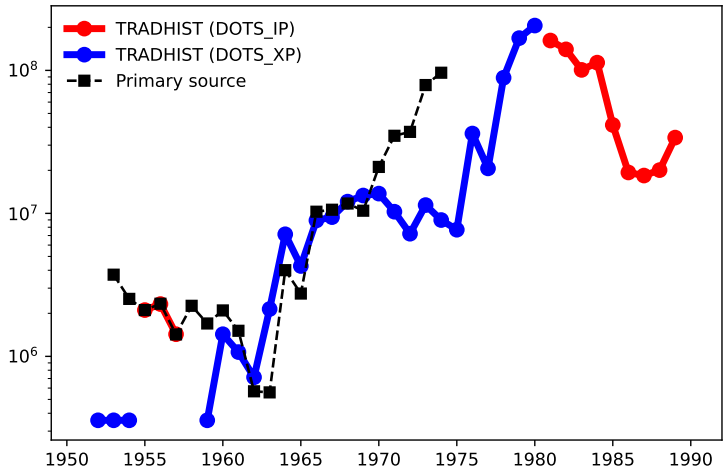
(a) West to East Germany



(b) France to East Germany



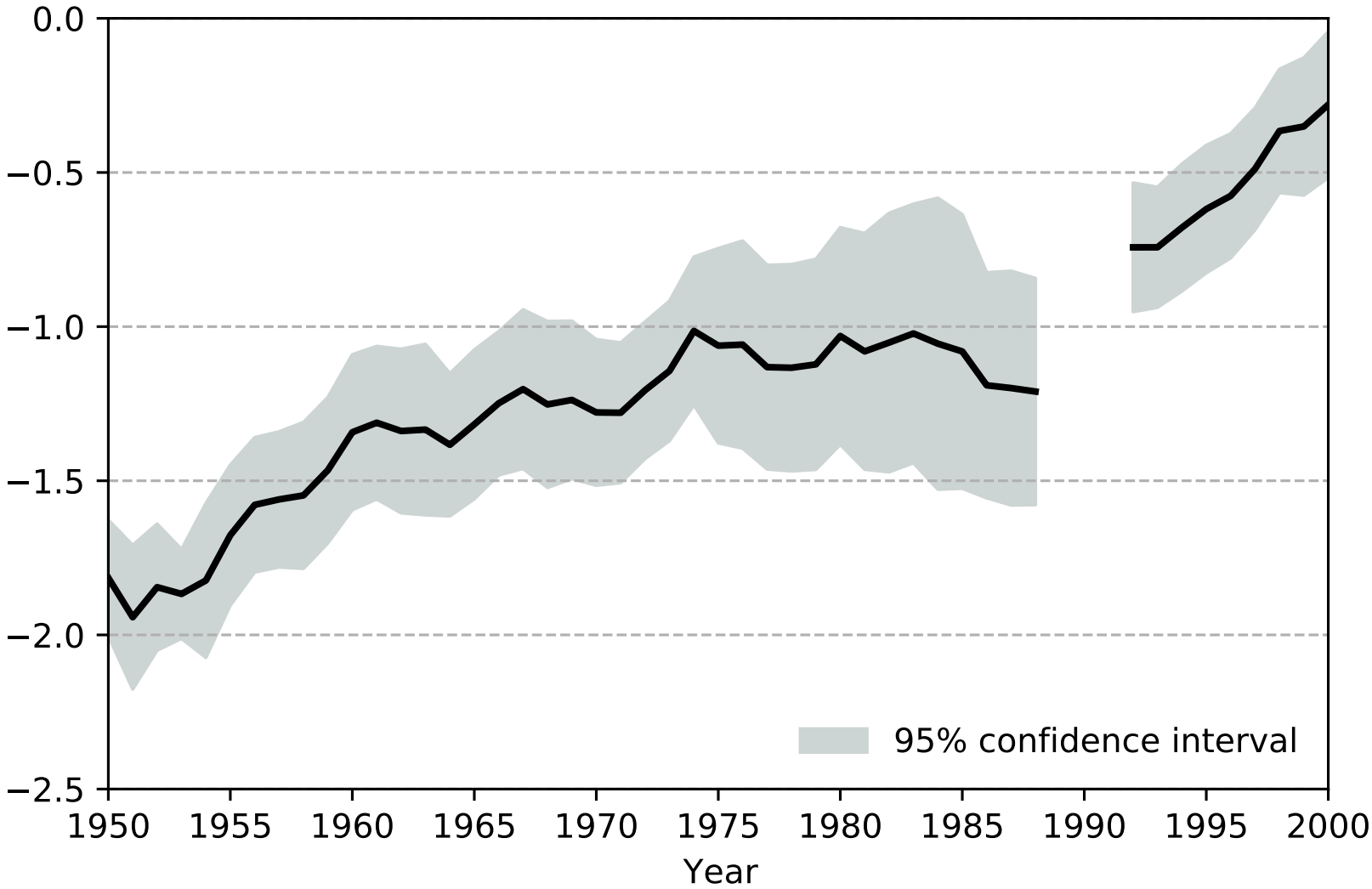
(c) UK to East Germany



(d) United States to East Germany

◁ Back to Data

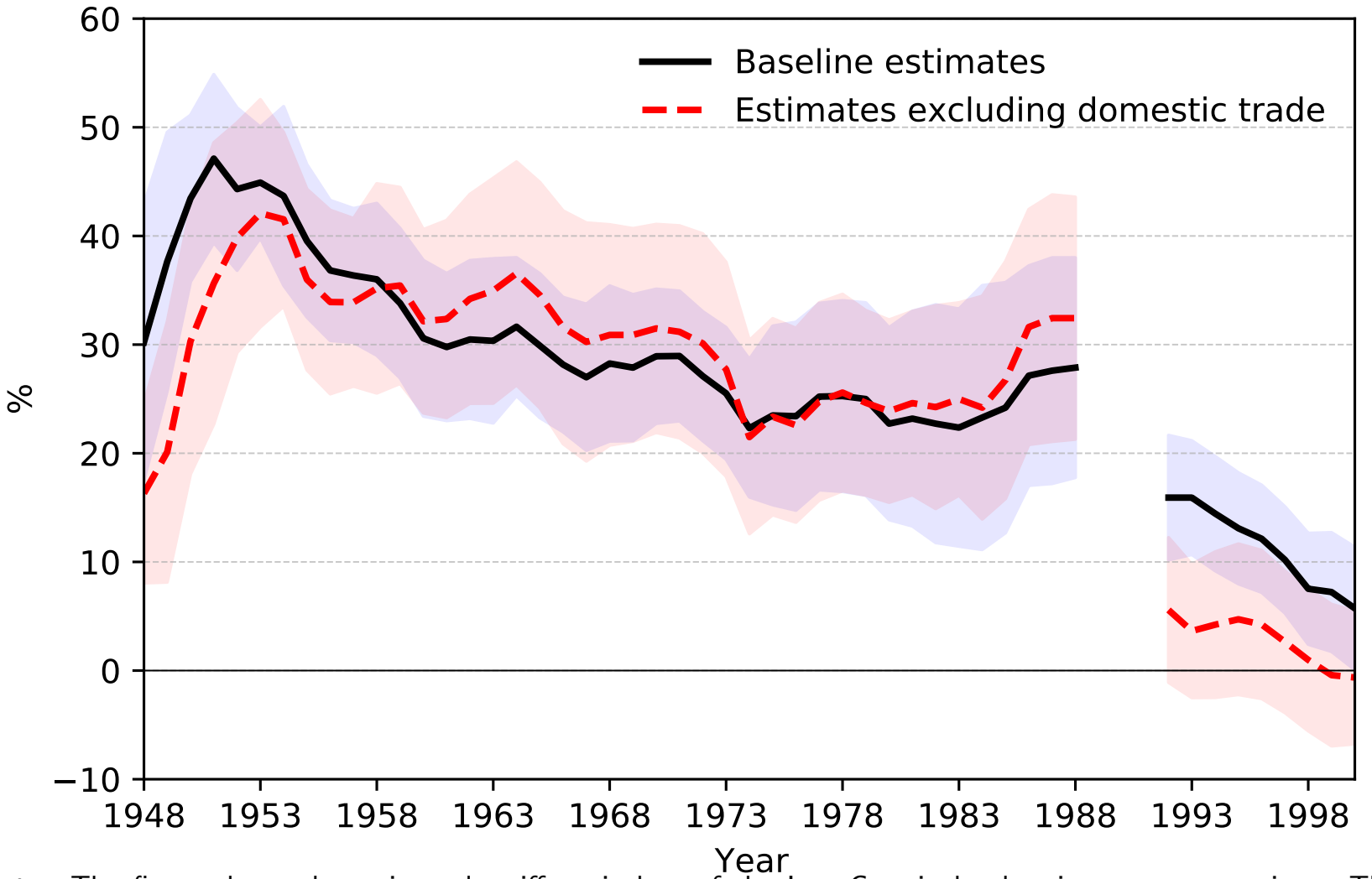
Estimated coefficients



Notes: The figure shows the estimated coefficient of the Iron Curtain's borders ($\hat{\theta}_t$). The estimation uses the specification in (1). Standard errors are clustered by exporter, importer, and year.

◁ Back to tariff-equivalent

Tariff equivalent with and without domestic trade



Note: The figure shows the estimated tariff equivalent of the Iron Curtain borders in percentage points. The estimation uses the specification in (1). The solid line shows results from the baseline estimation, which includes domestic trade. The dashed line shows results from an exercise in which all observations involving domestic trade are dropped from the estimation. The tariff equivalent is calculated from the estimates of $\hat{\theta}_t$ using the transformation $100 \times [\exp(-\hat{\theta}_t/5.03) - 1]$. The 95% confidence interval is calculated using the delta method.

◁ Back to tariff-equivalent