

# REVISITING THE “COBDEN-CHEVALIER NETWORK” TRADE AND WELFARE EFFECTS

**Jacopo Timini**

JOINT CEPR AND BANCO DE ESPAÑA ECONOMIC HISTORY SEMINAR

Madrid (online)

8 October 2021



- **Trade and trade policy**
  - Does trade policy matters? Evidence from the 19<sup>th</sup> century “free trade epidemic”
- **Economic history**
  - Did the Cobden-Chevalier network increase trade?

## More in detail:

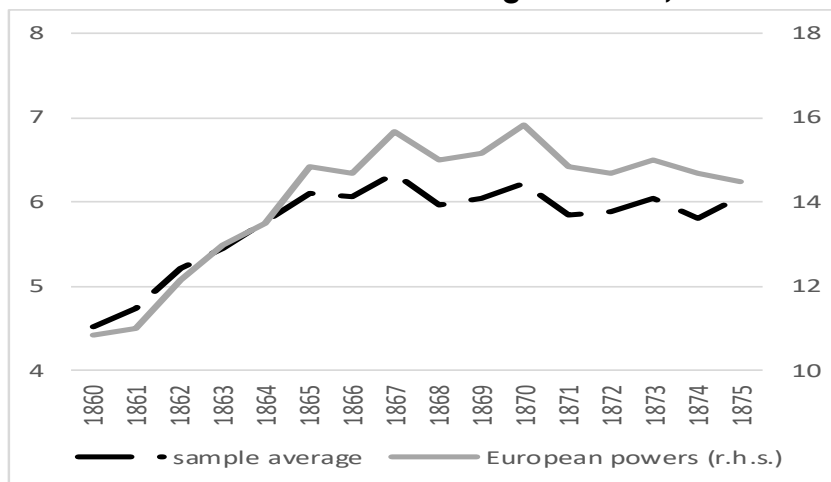
- I use a structural gravity model to obtain a quantification of the trade and welfare effects of the Cobden-Chevalier network;
- Importantly, I take into account the latest advances of structural gravity theory, including the incorporation of domestic trade, when performing the estimations

## Results:

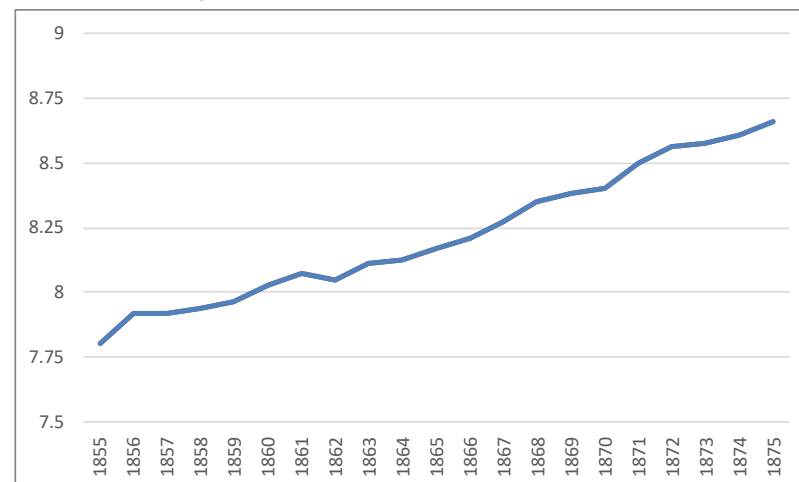
- Cobden-Chevalier network effect on trade is large, positive and significant, and also very heterogeneous;
- Limited evidence for trade diversion;
- Welfare effects are sizable.

- Trade liberalization policies spread in Europe (and beyond) during the 1860s and 1870s
- Since the signing of the 1860 Anglo-French Treaty of Commerce more than 50 agreements were signed in less than two decades.
- This corresponds with a period of sustained increase in world trade

Post-Cobden-Chevalier trade agreements, 1860-1875



World trade, 1855-1875



- **Traditional accounts regard the Cobden-Chevalier treaty and the subsequent network of bilateral trade agreements incorporating MFN clauses, as a catalyst for trade liberalization**
  - Bairoch, 1989; Nye, 1991a; Nye, 1991b; Irwin, 1993a and 1993b; O'Rourke and Williamson, 1999
- **The role of the network in decreasing tariffs has been recently confirmed with a detailed analysis of tariff levels on manufacturing products**
  - Tena-Junguito et al. (2013)
- **However, earlier cliometric efforts quantifying the trade effects of the Cobden-Chevalier trade network casted some doubts on its effectiveness**
  - Accominotti and Flandreau (2008): no aggregate effect.
  - Lampe (2009): sector-level effects only.

- **Contribution:**
  - Inclusion of domestic trade to estimate the effects of bilateralism in the 19<sup>th</sup> century on trade.
  - Treaty-level estimates.
  - Quantify general equilibrium effects on total trade and welfare

- **My empirical framework is based on a well-know general theoretical framework: a structural gravity model**
  - Anderson and van Wincoop (2003); Head and Mayer (2014); Yotov et al. (2016)

$$X_{ijt} = \frac{Y_{it} E_{jt}}{Y_t} \left( \frac{\tau_{ijt}}{\Omega_{it} \Pi_{jt}} \right)^{1-\sigma} \quad (1)$$

$$\Omega_{it}^{1-\sigma} = \sum_j \left( \frac{\tau_{ijt}}{\Pi_{jt}} \right)^{1-\sigma} \frac{E_{jt}}{Y_t} \quad (2)$$

$$\Pi_{jt}^{1-\sigma} = \sum_i \left( \frac{\tau_{ijt}}{\Omega_{it}} \right)^{1-\sigma} \frac{Y_{it}}{Y_t} \quad (3)$$

- **Poisson pseudo-maximum likelihood estimating procedure:**

$$X_{ijt} = \exp(\beta_0 + \beta_1 TA_{ijt} + \rho_t INTL\_BRDR_{ijt} + \delta_{it} + \gamma_{jt} + \omega_{ij}) + \varepsilon_{ijt}$$

- $X_{ijt}$ : **exports from the country of origin  $i$  to the country of destination  $j$  at time  $t$  (also includes the specific case  $X_{ijt}, \forall i=j$ , i.e. domestic flows).**
- $TA_{ijt}$  **dummy =1 if exporter  $i$  and the importer  $j$  have a trade agreement in force at time  $t$ , and zero otherwise.**
- $INTL\_BRDR_{ijt}$  **the result of the interaction of a dummy ( $INTL\_BRDR_{ij}$ ) that identifies an international border (i.e.  $INTL\_BRDR_{ij}=1$  if  $i \neq j$ ), with year dummies**
- $\delta_{it}, \gamma_{jt}$ : **exporter and importer-time fixed effects (theory-based way to control for MTRs, also absorb all it and jt variation, e.g. GDP, GDP per capita, etc.)**
- $\omega_{ij}$ : **directional pair fixed effects (endogeneity, also absorb. time-invariant asymmetric trade costs )**



- **International bilateral trade data: TRADHIST Database**
- **Domestic trade: not readily available. Calculated as the difference between GDP and total nominal exports (TRADHIST).**
  - Campos et al. (2021) recently show empirically that the estimations of the impact of trade policy on trade and welfare are very robust to different ways of calculating domestic trade
- **Trade agreements: Trade Agreements Database (Pahre, 2007)**
- **Period of analysis: 1855-1875 (in line with other studies)**
- **24 countries**

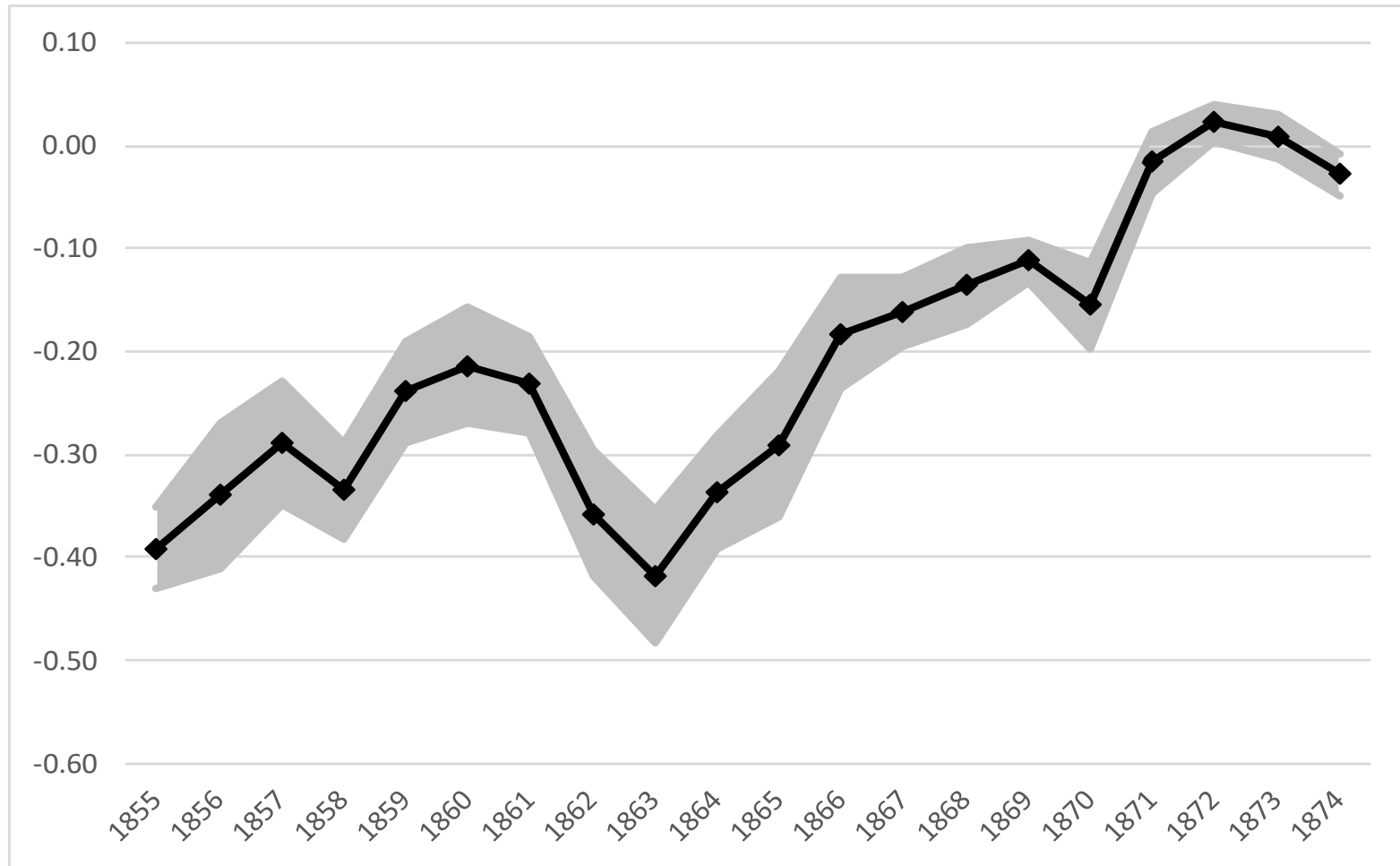
**Table 1: Effects of the Cobden-Chevalier network – Structural gravity estimates**

Agreement	w/o domestic trade	with domestic trade	with domestic trade & “globalization”
	(1)	(2)	(3)
<b>TA</b>	0.0125	0.270***	0.241***
	(0.054)	(0.060)	(0.041)
<b>Observations</b>	5,232	5,638	5,638
<b>Domestic trade</b>	NO	YES	YES
<b>Intl.bord*year</b>	NO	NO	YES
<b>Exp.-time &amp; imp.time FEs</b>	YES	YES	YES
<b>Dir. pair FEs</b>	YES	YES	YES

Note: PPML regressions. Fixed effects, control variables and constants not reported for the sake of simplicity. Standard errors (in parentheses) are clustered at the exporter, importer and time level.]

\*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.1.

### The declining effect of international borders, 1855-1875.



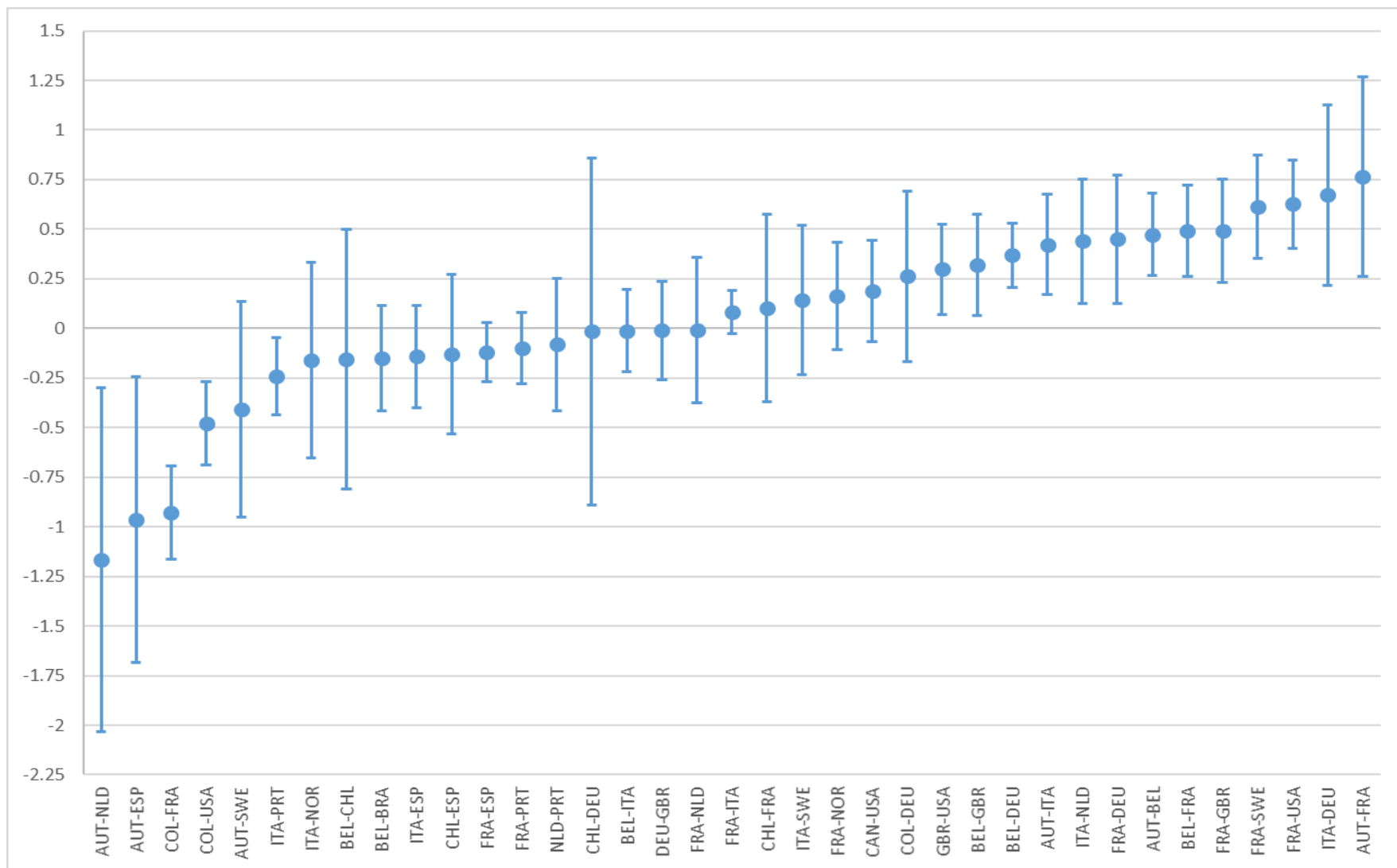
- **I test the robustness of the results considering the following issues:**
  - Distance effect varying over time
  - Other bilateral arrangements (fixed exchange rates; currency unions)
  - Strict(er) exogeneity test (including lead of the TA dummy variable, both for original on-year interval sample and using five-year intervals)
  - Tariffs

Table 2: Effects of the Cobden-Chevalier network – Robustness tests

Agreement	ln(dist)*year	GS, LMU	5-year intervals	TA lead (1-year)	TA lead (5-year)	Tariffs
	(1)	(2)	(3)	(4)	(5)	(6)
<b>TA</b>	0.196***	0.253***	0.332***	0.180***	0.333***	0.130***
	(0.058)	(0.041)	(0.075)	(0.062)	(0.072)	(0.046)
<b>GS</b>		-0.115				
		(0.092)				
<b>LMU</b>		-0.005				
		(0.072)				
<b>TA_Lead</b>				0.079	-0.006	
				(0.068)	(0.083)	
<b>ln(1+tariff)</b>						-4.625***
						(0.703)
<b>Observations</b>	5,638	5,638	1,391	5,638	1,391	2,186
<b>Dir. pair FEs</b>	YES	YES	YES	YES	YES	YES
<b>Exp.-time &amp; imp.time FEs</b>	YES	YES	YES	YES	YES	YES
<b>Intl.bord*year</b>	YES	YES	YES	YES	YES	YES
<b>ln(dist)*year</b>	YES	NO	NO	NO	NO	NO
<b>Year intervals</b>	NO	NO	YES (5-year)	NO	YES (5-year)	NO

Note: PPML regressions. Fixed effects, additional control variables and constants not reported for the sake of simplicity. Standard errors (in parentheses) are clustered at the exporter, importer and time level.

\*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.1.



- **Under some (standard) assumptions**
  - CES trade model
  - Labor as the only factor of production
  - Market clearing condition
- **Structural gravity models allow to calculate general equilibrium trade and welfare effects, by simply relying on two “sufficient statistics”:**
  - The change in the exporter's  $i$  domestic trade share due to the “shock” inserted in the model
  - A trade elasticity parameter

## Cobden-Chevalier trade network general equilibrium effects

COUNTRY	Δ% EXPORTS	Δ% IMPORTS	Δ% WELFARE
AUS	-1.32	-1.06	-0.05
AUT	19.41	27.77	0.14
BEL	16.91	18.61	0.80
BRA	-0.08	-0.09	-0.01
CAN	8.65	10.75	0.34
CHL	19.23	21.09	0.61
CHN	-0.75	-1.67	0.00
COL	23.39	24.36	0.76
DEU	19.38	19.48	0.46
DNK	-0.73	-0.76	-0.04
ESP	10.84	7.47	0.13
FIN	-1.14	-0.74	-0.01
FRA	22.50	23.92	0.49
GBR	15.85	13.08	0.74
GRC	-1.41	-1.44	-0.08
ITA	27.55	18.70	0.46
JPN	-0.91	-1.24	0.00
NLD	7.00	8.15	0.97
NOR	3.28	3.53	0.16
NZL	-0.83	-0.51	-0.01
PRT	18.36	14.96	0.22
SWE	1.41	1.71	0.05
URY	6.99	8.59	0.81
USA	17.99	24.10	0.26



- **This paper exploits econometric methods at the frontier of the empirical trade literature to reassess the trade and welfare effects of the “free trade epidemic” during the 1860s and 1870s.**
- **Using a PPML estimation strategy (with domestic trade flows), I find that:**
  - Trade agreements have, on average, a large, positive, and significant effect (+27%) on members’ bilateral trade;
  - Treaty-level estimates reveal a considerable degree of heterogeneity across trade agreements. For example, the famous Anglo-French treaty of 1860, the Cobden-Chevalier network milestone, had an effect more than two times larger than the average (+64%)
  - GE results: sizeable effects on trade and welfare; limited trade diversion
- **These results reshape the understanding of the trade and welfare effects of the Cobden-Chevalier trade network. It did increase trade (and welfare)!**
  - Further research: distributional and structural consequences of trade integration; causes of heterogeneity.

GRACIAS POR SU ATENCIÓN

