Jewish Communities and City Growth in Preindustrial Europe

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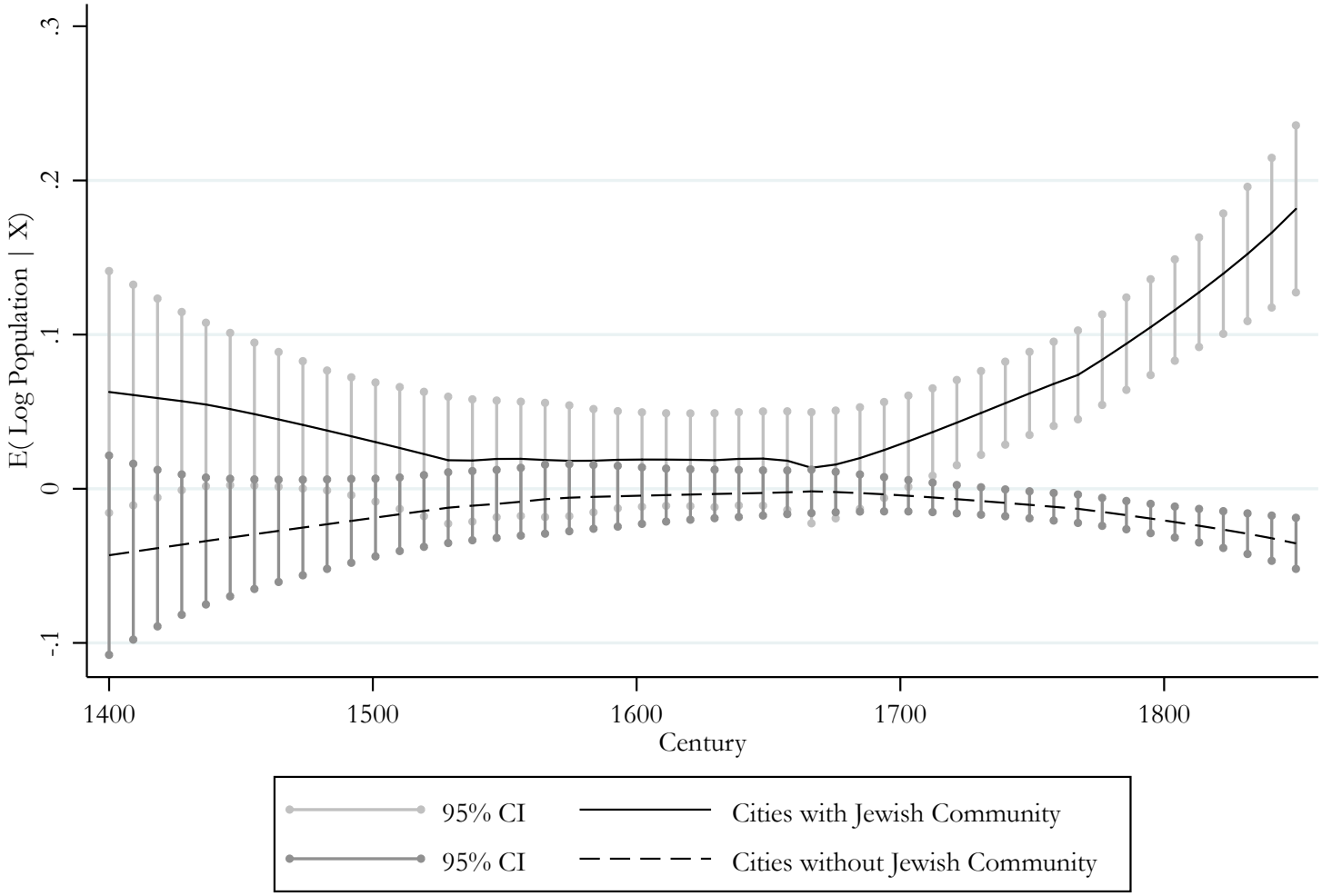
Research Question

- Various literatures suggest economically productive minorities (e.g. Huguenots, Quakers, Jews, Chinese, Lebanese) can be a source of economic growth (Weber, 1922, 1968; Sombart, 1962, 1911; Braudel, 1979, 1982; Hornung, 2014).
- Was this true for Jewish communities in pre-industrial Europe?
- We show the following:
  1. Cities with Jewish communities grew faster than comparable cities without Jewish communities in Europe between 1400 and 1850.
  2. This growth advantage accelerated after 1600.
  3. We identify the causal effect of Jewish communities on city growth by creating an IV based on a spatial model of the Jewish network across Europe and exploiting 'nearby' expulsions.
  4. We provide evidence that cities with Jewish communities benefited more from market access on the intensive margin, but not on the extensive margin. Jewish communities were better able to translate greater *potential* market density into economic gains.
  5. We show that cities which emancipated Jewish communities grew faster.

Urban Populations and Economic Development

- City populations widely used in literature on preindustrial development (De Long and Shleifer, 1993; Dittmar, 2011; Nunn and Qian, 2011; Bosker et al., 2013; Dincecco and Onorato, 2015).
- European economy was Malthusian in the preindustrial period and urban population data are an important source of disaggregated information on technological change and productivity in commerce and agriculture (de Vries, 1976; Ashraf and Galor, 2011)
- Cities were were disease ridden and unhealthy. Had to attract migrants by offering higher wages. Increases in productive capacity were reflected in the growth of city populations (Braudel, 1979, 1982; Bairoch, 1988).
- Cities are often the appropriate unit of analysis for studying institutions. For example, nation states didn't exist for much of the period we study.
- Given recent advances in geospatial analysis and the accompanying increases in data availability, it's increasingly possible to do empirical studies using cities as the unit of analysis.

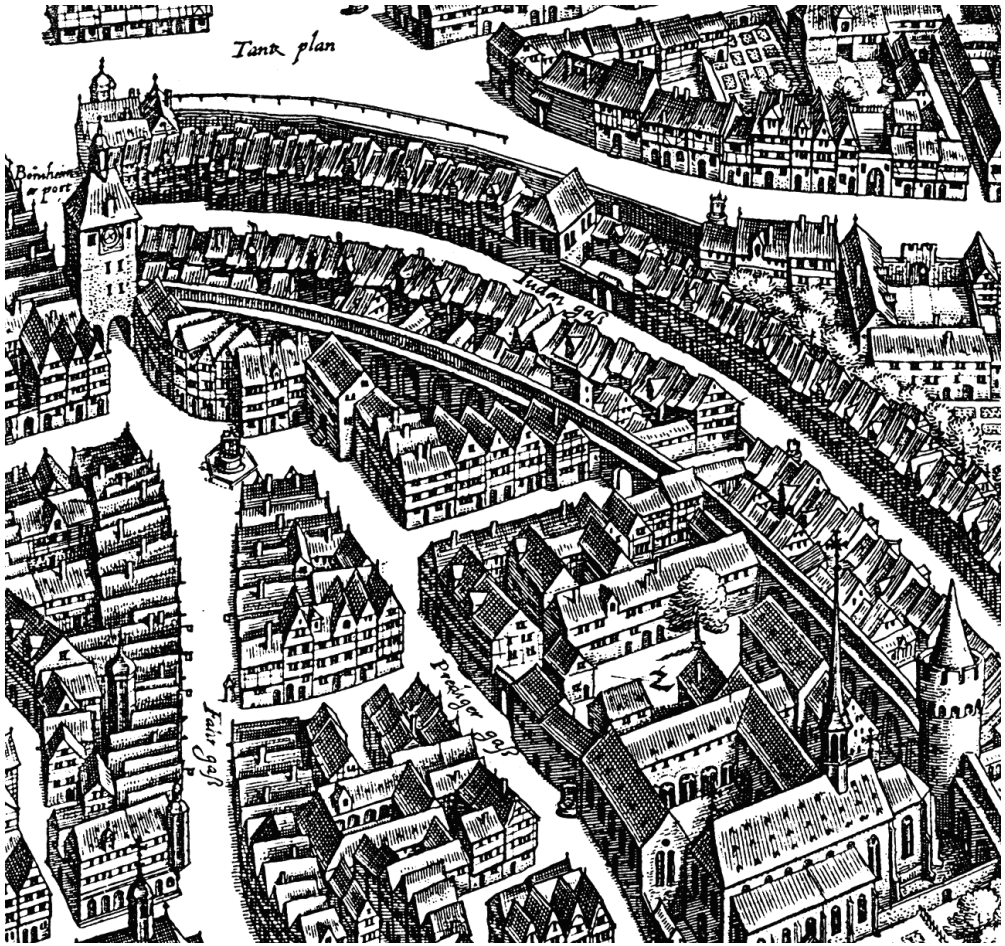
Jewish vs. Non-Jewish City Growth: Extended Sample (conditional)



kernel = epanechnikov, degree = 1, bandwidth = 75, pwidth = 38.11

The Economic Role of Jews in Early-Modern Europe

- Across Europe Jews were a small proportion of the population of the countries where they lived. ▸ Populations
- Spatial distribution highly heterogenous. ▸ Spatial Distribution
- Jews faced a range of discriminatory rules that shaped the occupations within which they worked. Extent of discrimination varied across time and place. (see *inter allia* Baron, 1967*a*,*b*, 1975; Koyama, 2010). ▸ Rent Seeking
- Concentrated in long-distance trade, medicine, retailing, wine trade, and moneylending (e.g. Greif, 2006; Chazan, 2006, 2010)



Judengasse – Frankfurt Am Main

What determined Jewish settlement? According to the historian Jacob Katz:

> *'There is no rational explanation in economic or other terms for the presence or absence of Jews in particular localities. In Fürth there was a thriving Jewish community, but in neighboring Nuremberg a Jew could appear only in daytime and only in the company of a local inhabitant. Halberstadt and Magdeburg, both important centers of commerce and administration and Prussian dominated since the middle of the seventeenth century, differ greatly in their attitude to Jews. Halberstadt harbored one of the earliest Jewish communities uninterruptedly since the Middle Ages. In Magdeburg, Jews struggled for mere admission even during the comparatively tolerant rule of the Prussian kings (Katz, 1974, 12).'*

But clearly Jews did not settle randomly across Europe. In particular, the probability of a Jewish settlement was higher if there were other Jewish settlements nearby. This could be due to trade, cultural linkages, or simply 'dispersion'. We will exploit this fact in our identification strategy.

▸ Identification Problem

HYPOTHESES

Why would we expect Jewish settlement to be associated with economic growth?

1. **Human capital**
   - e.g. Botticini and Eckstein (2005, 2007, 2012); also Acemoglu, Hassan and Robinson (2011); but Abramitzky and Halaburda (2014) suggests this may be a composition affect (at least in the Pale of Settlement).
2. **Cultural Transmission of Pro-Market Values**
   - Recent literature emphasizes the importance of cultural values (Greif, 2006; Tabellini, 2008; Mokyr, 2009; McCloskey, 2010). Horizontal transmission rather than vertical.
3. **Market Integration**
   - Jewish merchants and traders shared a common culture (sometimes a common language) and played a role integrating Europe's commercial and trading networks.

The Economic Role of Jews in Early-Modern Europe: Human Capital

- Botticini and Eckstein (2012): Jews in medieval Europe had higher levels of human capital than Christians.
- Kuznets (1960): this the case in the late 19th century.
- Acemoglu, Hassan and Robinson (2011): this held true in Eastern Europe before the Holocaust.
- Today high levels of human capital are associated with city growth (Glaeser and Mare, 2001; Davis and Dingel, 2012, 2014).

The Economic Role of Jews in Early-Modern Europe: Pro-Market Values

- Weber (1930) associates Jewish values with Puritan values.
- Ultimately dismisses role of Jews as restricted to 'pariah capitalism'.
- Weber's argument criticized by Sombart (1962, 1911) who argues Jews played crucial role in early stages of modern capitalism.
- However, Sombart's ideas are contaminated by anti-Semitism.

Quentin Massys – *The Money Lenders*

The Economic Role of Jews in Early-Modern Europe: Trading Networks

- Market integration between 1500-1800 has been widely studied as a potential driver of urbanization and subsequent economic growth.
- Numerous studies use law of one price to test level of market integration (e.g Shiue and Keller, 2007; Bateman, 2011; Chilosi et al., 2013).
- But extensive data only exists for widely traded staples such as grain.
- Jewish merchants were active in luxury trade, especially in the Levantine trade (spices, silk, cotton), and in Atlantic trade (sugar, tobacco, rum, silver) and in finance and banking.
- In particular, Sephardic Jews were extremely prominent in international trade during the early modern period.

Data

We use two primary datasets:

- Information on the presence of Jewish communities at cityXyear level collected from the *Encyclopedia Judaica*. Same data used in Anderson, Johnson and Koyama (Forthcoming). We extend this dataset to 1850.

- City size data from Bairoch (1988) from 1400 to 1850. city populations in 1400, 1500, 1600, 1700, 1750, 1800, and 1850. 1,752 cities total.

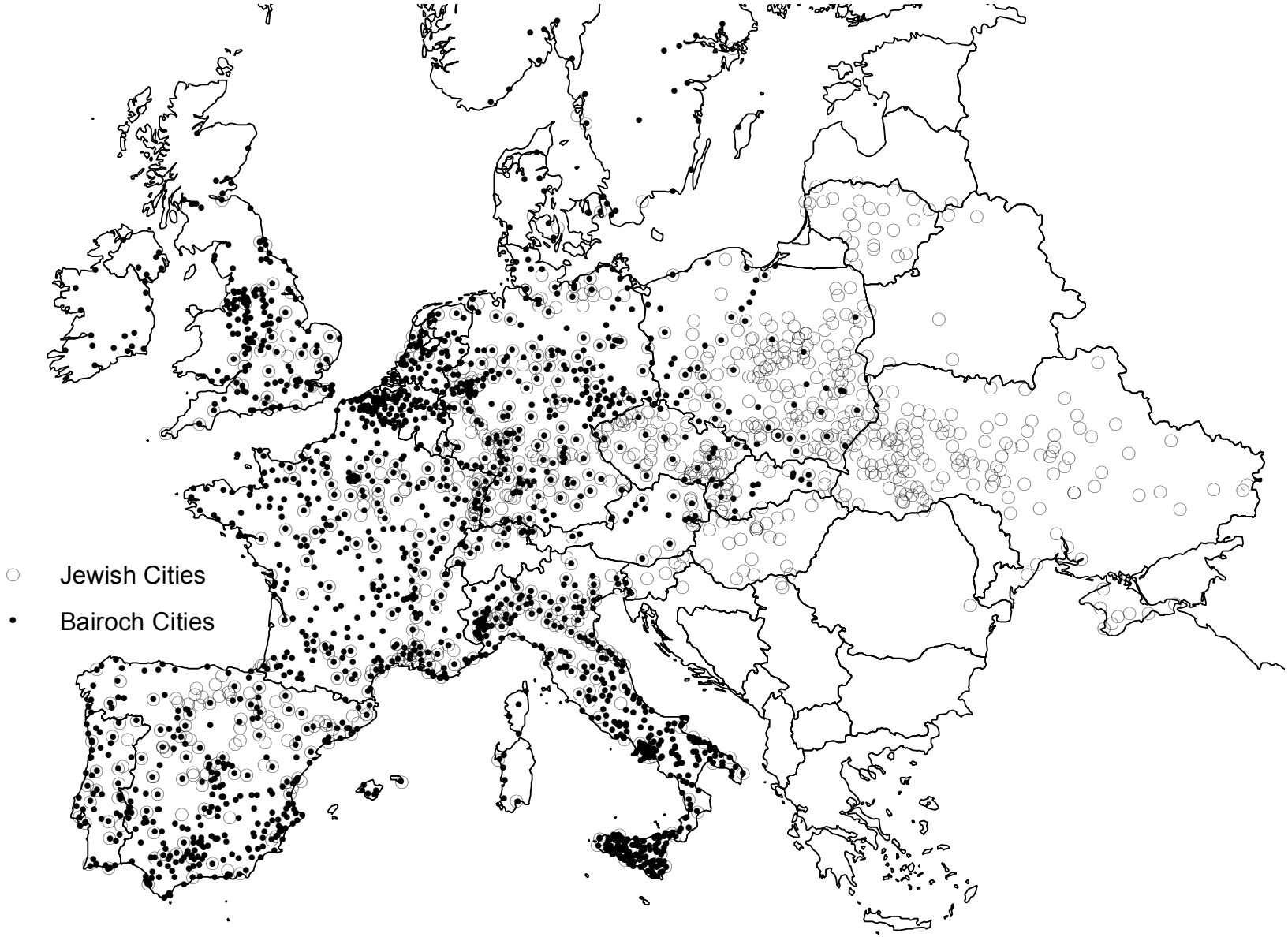
We complement these with time-varying data on expulsions and pogroms from Anderson, Johnson and Koyama (Forthcoming) and with numerous time-invariant variables collected for Jedwab, Johnson and Koyama (2015).

Data: Matching Jewish Cities to Bairoch Population Cities

- For each city recorded with a Jewish community we create a list of cities in the Bairoch dataset within 15km.
- We then inspect each of these city pairs to determine if the Bairoch city matches the city listed as having a Jewish community.
- Challenges include: (1) Suburbs, (2) How should we treat unmatched Bairoch cities? Assume no Jewish community?

Vincent Van Gogh – *Le Moulin de la Galette*

Jewish Cities and Bairoch Cities, 1400-1850



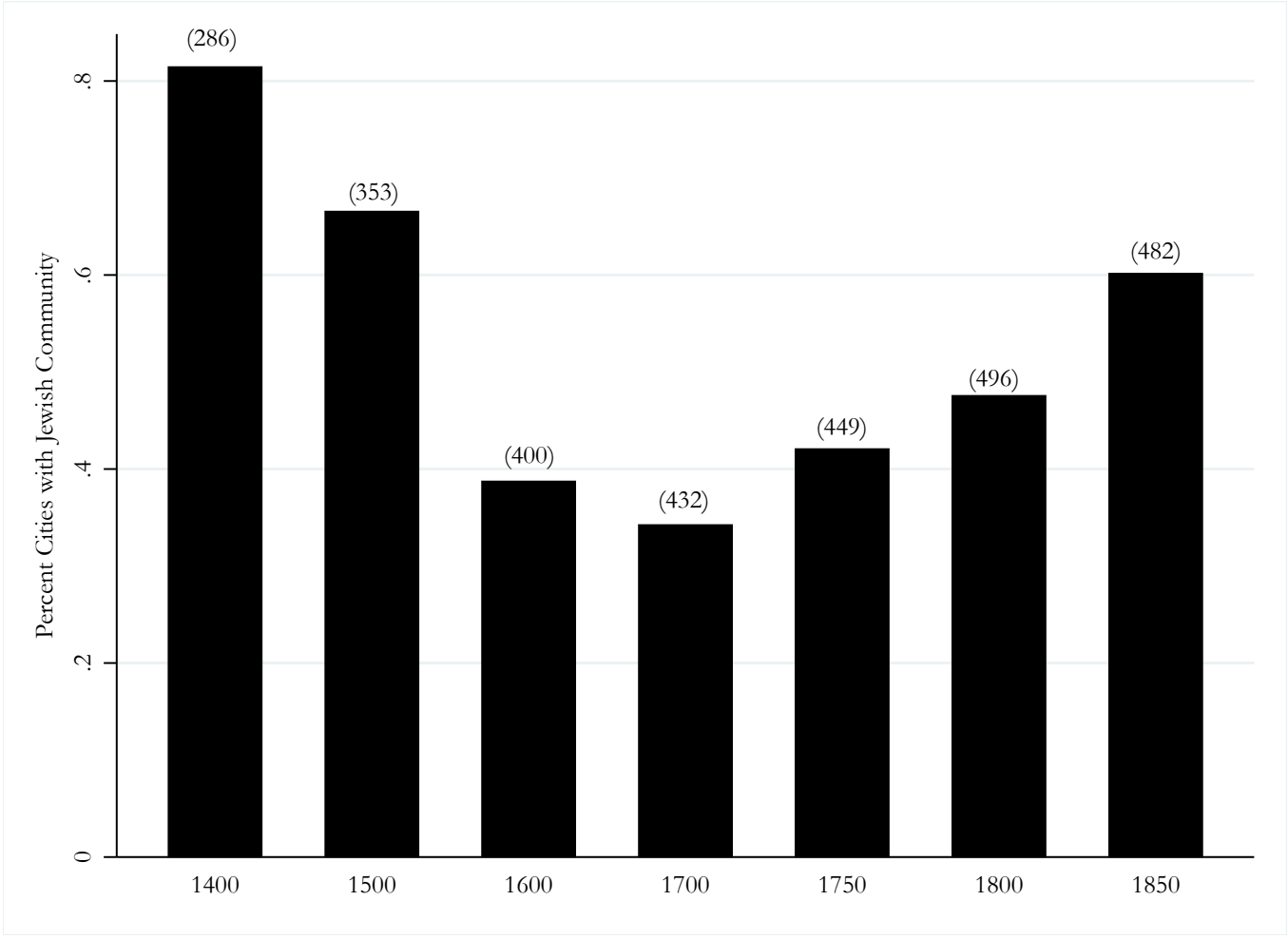
Data: Main and Extended Sample

- We end up with two samples:

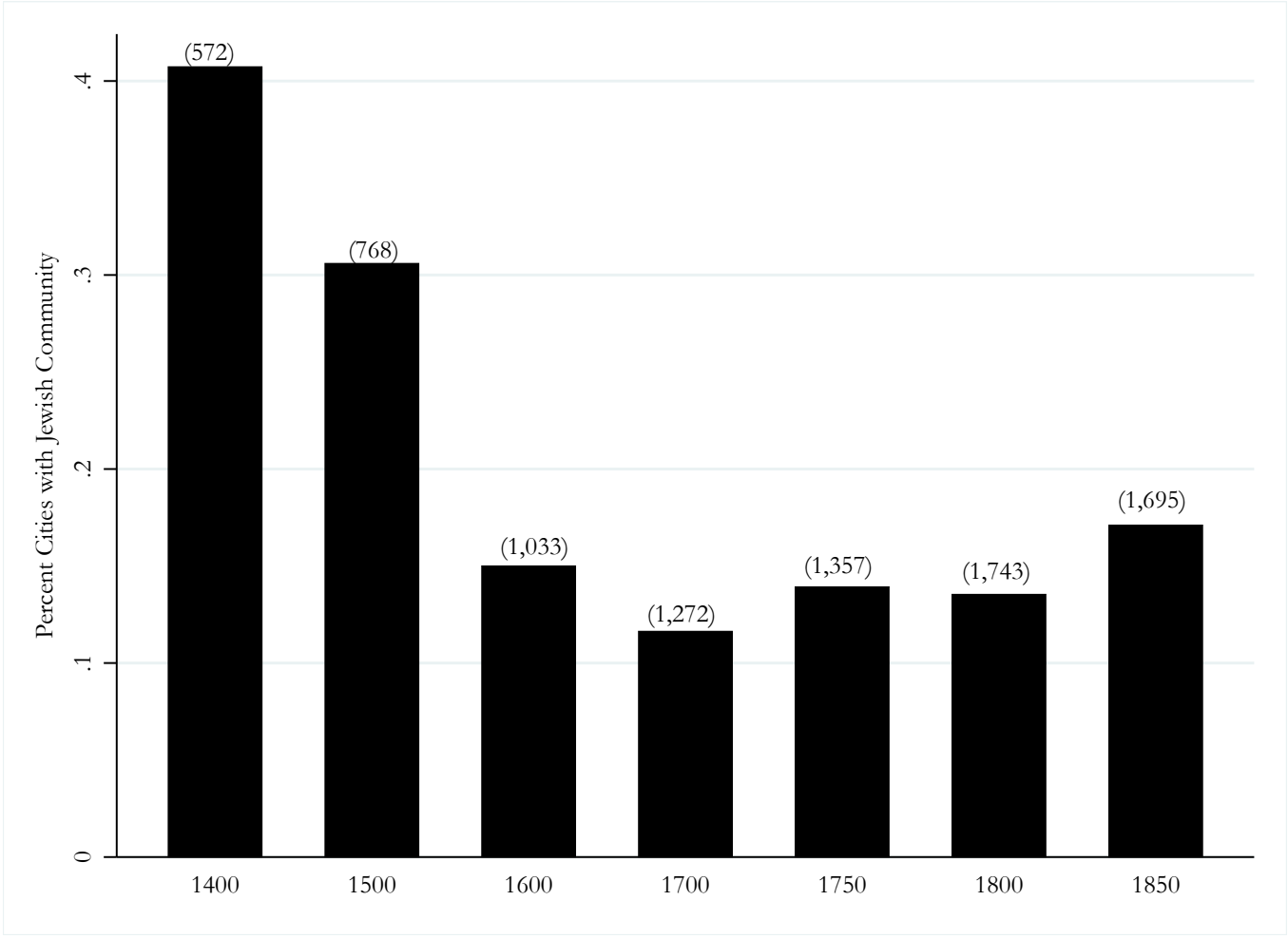
1. The Main Sample – this consists of 493 cities total, includes only the Bairoch cities for which we have perfect matches with Jewish communities. It is a more valid sample because all the cities are 'the kind of cities that might have Jewish communities'. ▸ Restricted Descriptive Statistics

2. The Extended Sample – this consists of both the matched cities and the Bairoch cities for which we don't find a match (1,711 cities total). We assume if there is no Jewish City matched to the Bairoch city, then it never had a Jewish community. This sample is less valid, but allows us to describe more general results. ▸ Extended Descriptive Statistics

Descriptive Statistics for Main Sample, 1400-1850



Descriptive Statistics for Extended Sample, 1400-1850



Empirical Specification

We estimate the following difference-in-differences specification:

$$\text{Log Population}_{i,t} = \beta \text{Jewish Community}_{i,t} + \sum_{t=1500}^{1850} \mathbf{X}_i' \mu_t + \delta_i + \eta_t + \varepsilon_{i,t} \,. \quad (1)$$

- $\text{Jewish Community}_{i,t}$ is a dummy = 1 if there was a Jewish community in city i during the time period preceding year t.
- $\mathbf{X}$ is a vector of city-level time invariant variables interacted with year dummies that control for geography (cereal suitability, proximity to rivers, proximity to coast), local infrastructure (distance to medieval trade route), and human capital (universities).
- Regressions also include city and year fixed effects.
- We report results for the both the Main and Extended samples.

Baseline Estimates Using Main and Extended Samples

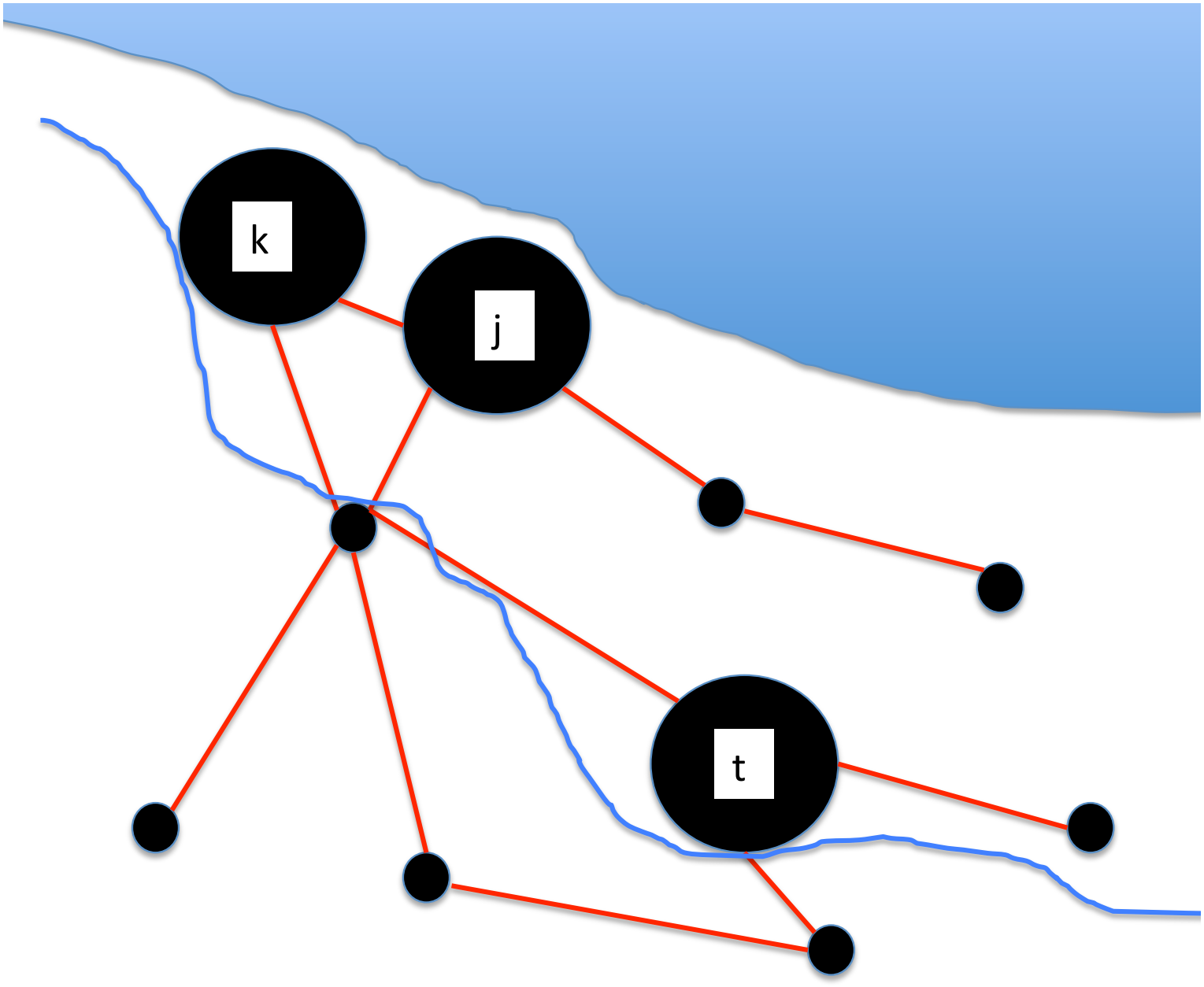
	Dependent Variable: Log City Population					
	Main Sample			Extended Sample		
	(1)	(2)	(3)	(4)	(5)	(6)
Jewish Community	0.175***	0.273***	0.350***	0.625***	0.641***	0.302***
	(0.0399)	(0.0379)	(0.0455)	(0.0307)	(0.0305)	(0.0430)
Year FE's	Yes	Yes	Yes	Yes	Yes	Yes
Controls X Year FE's	No	Yes	Yes	No	Yes	Yes
City FE's	No	No	Yes	No	No	Yes
N	2898	2898	2898	8440	8440	8440
R-sq	0.0888	0.212	0.471	0.156	0.222	0.445

Creating the IV: Jewish Network Access

- We build on the *Market Access* literature. For example, see 'Railroads of the Raj' (Donaldson (2016)).

- We assume:

  1. A Jewish community is more likely to be established close to another Jewish community (e.g. because of trade networks, financial relationships, cultural linkages, or other spatial externalities).
  2. 'Close' is defined as the least cost travel path.
  3. Unobservable characteristics of the cities in which the communities are located become less correlated the further they are from each other.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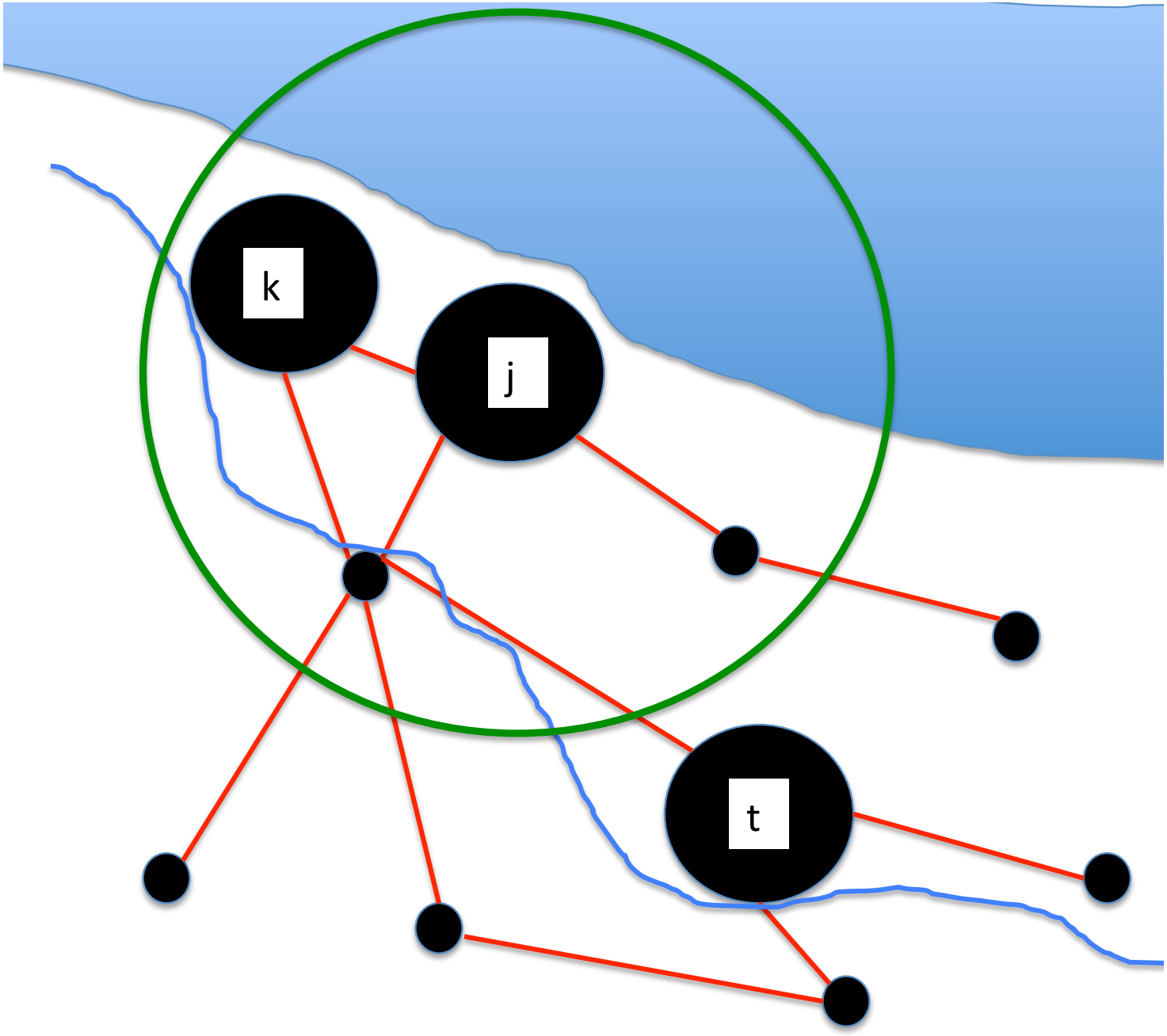
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Creating the IV: Jewish Network Access

- Jewish Network Access for city j is defined as:

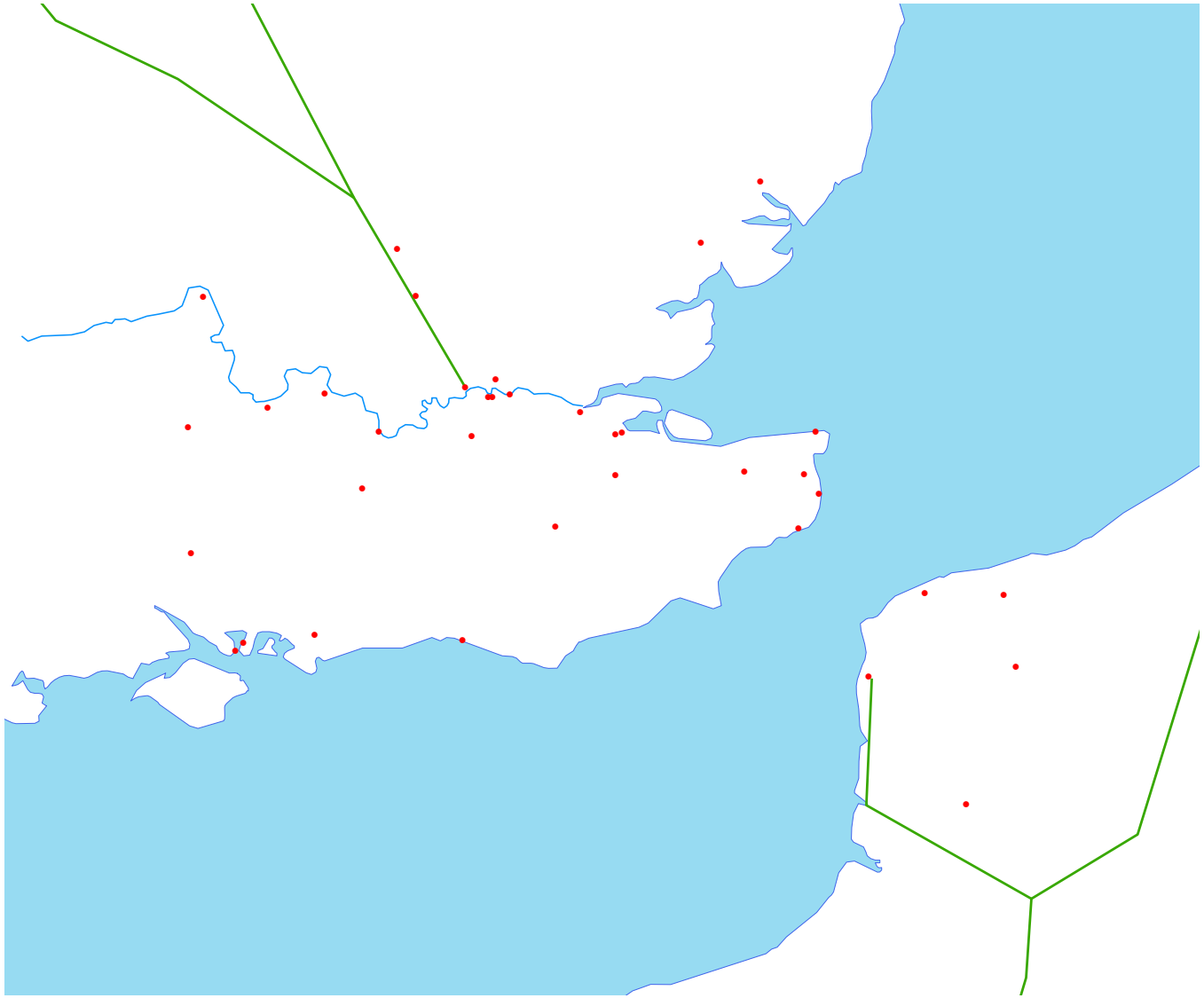
$$NA_{jt} = \sum_{i \neq j} JC_{it} \tau_{ji}^{-\sigma} \tag{2}$$

- where JC_i is a dummy variable for city i taking a value of 1 if a Jewish community is located in it in time period t, τ_{ji} is the cost of travel between cities j and i, and σ is a trade elasticity (we experiment with various values and choose $\sigma = 1$).

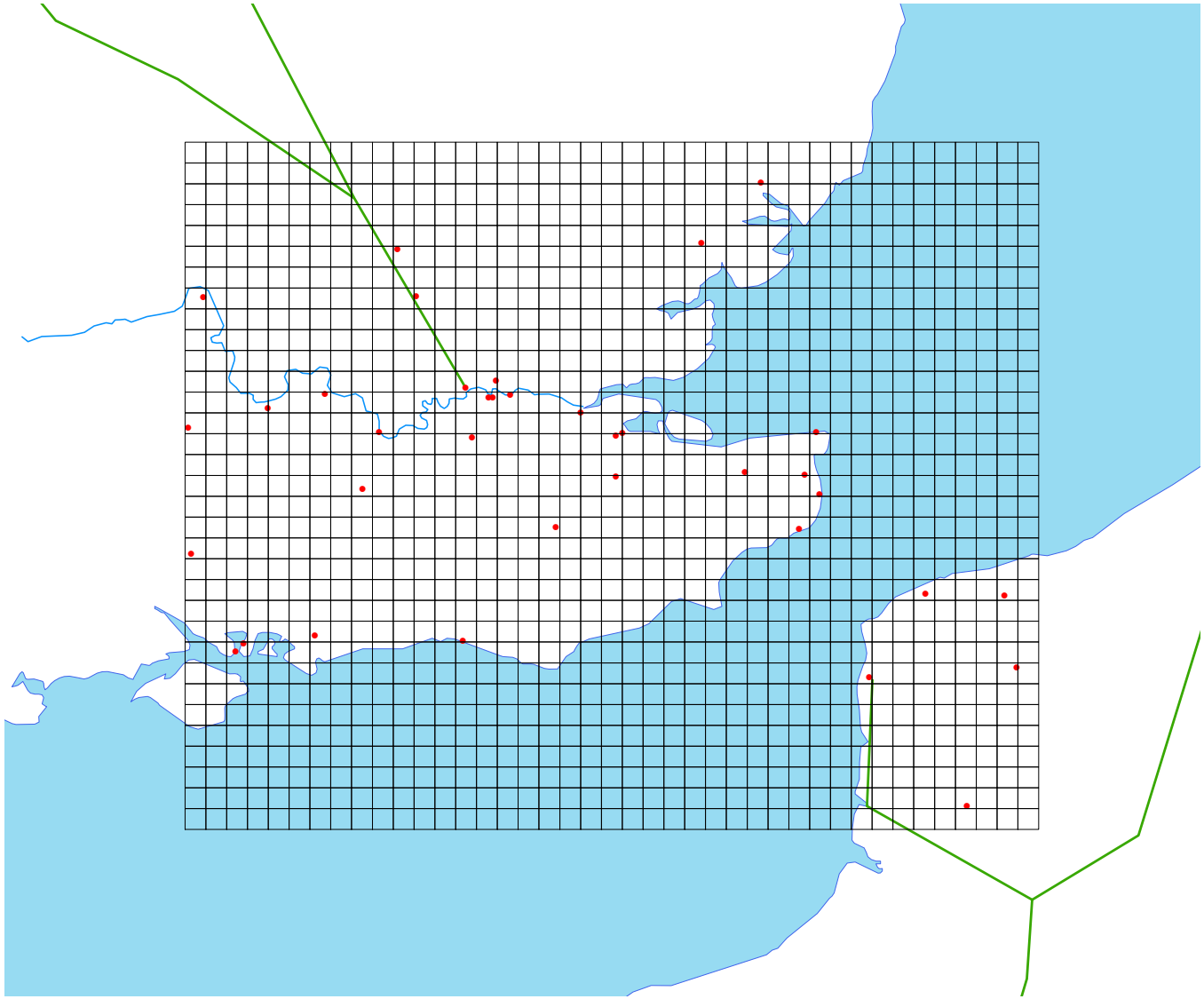
- The average cost of transport per km/ton expressed in terms of cereals in the early 20th century was: 8.8 k.g for porters, 3.9 for transportation by cart, 0.99 for river transport, and 0.3-0.4 kg for sea transport (Bairoch, 1990, 141). We normalize these costs so that porter transport = 1.

- Where does τ_{ji}, or, 'travel cost' come from? We combine tools in ArcGIS and R (gdistance package) to create it.

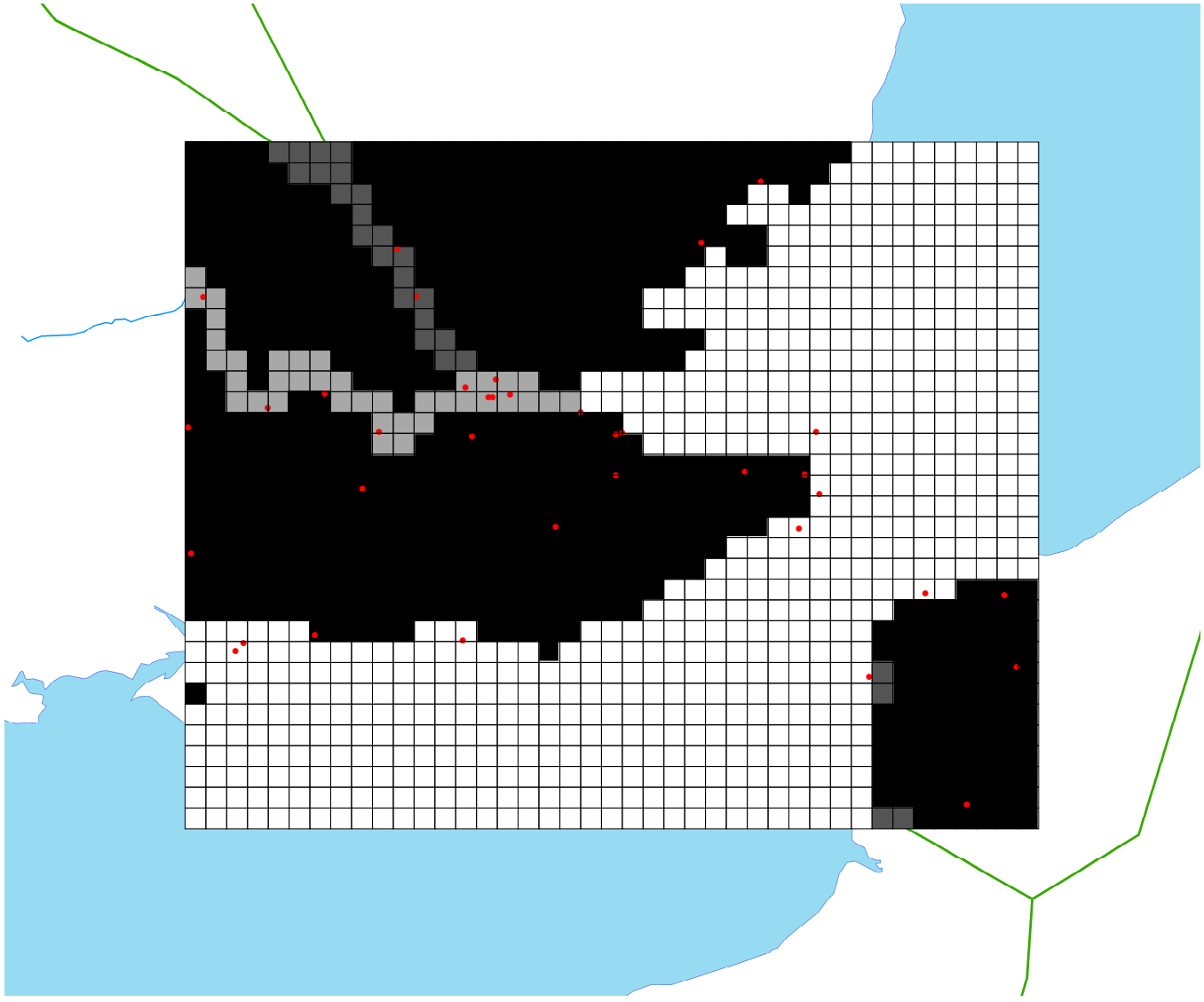
START WITH VECTOR DATA CONTAINING CITIES, RIVERS, SEAS, AND TRADE ROUTES. . .



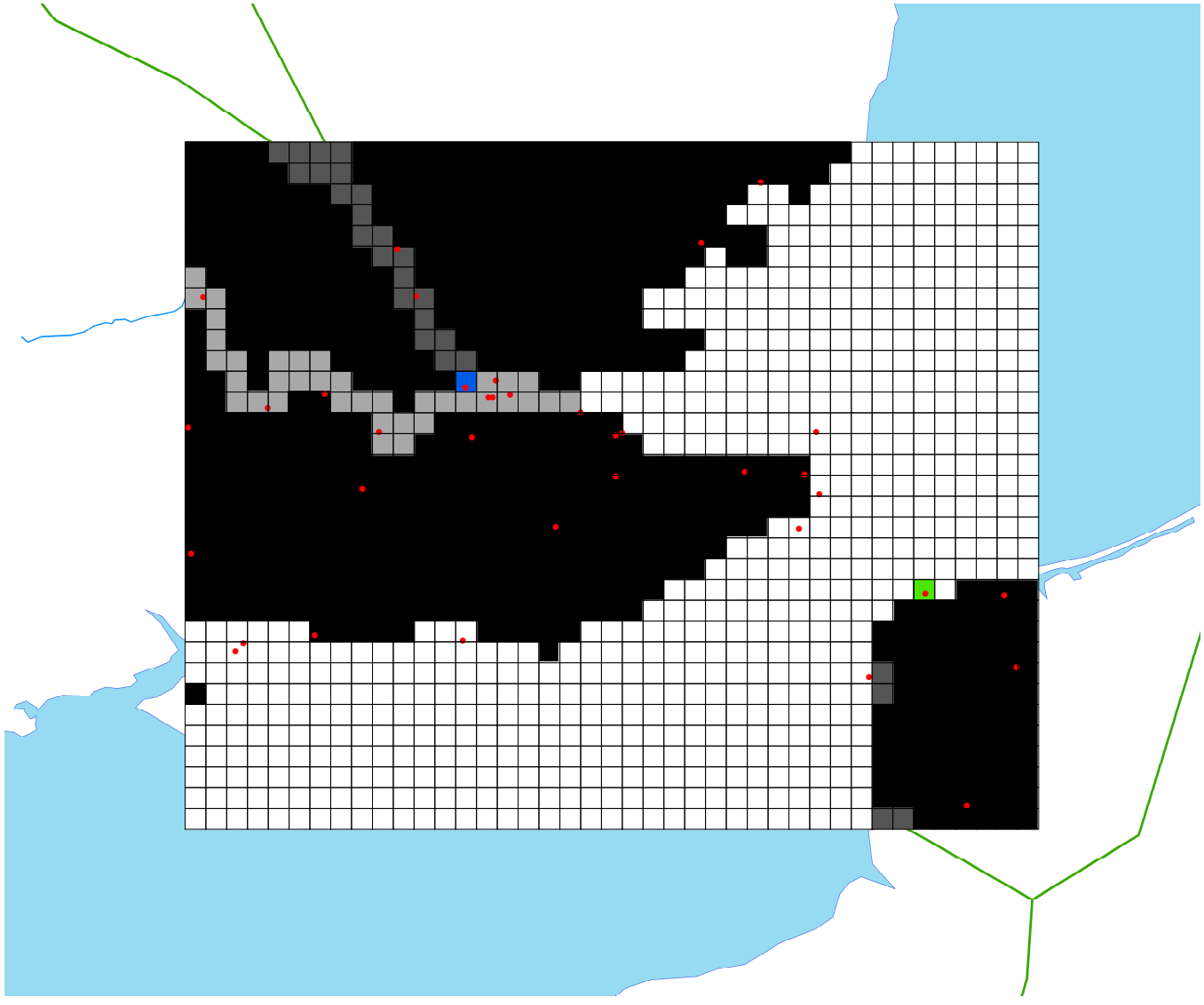
Superimpose a 5km x 5km grid...



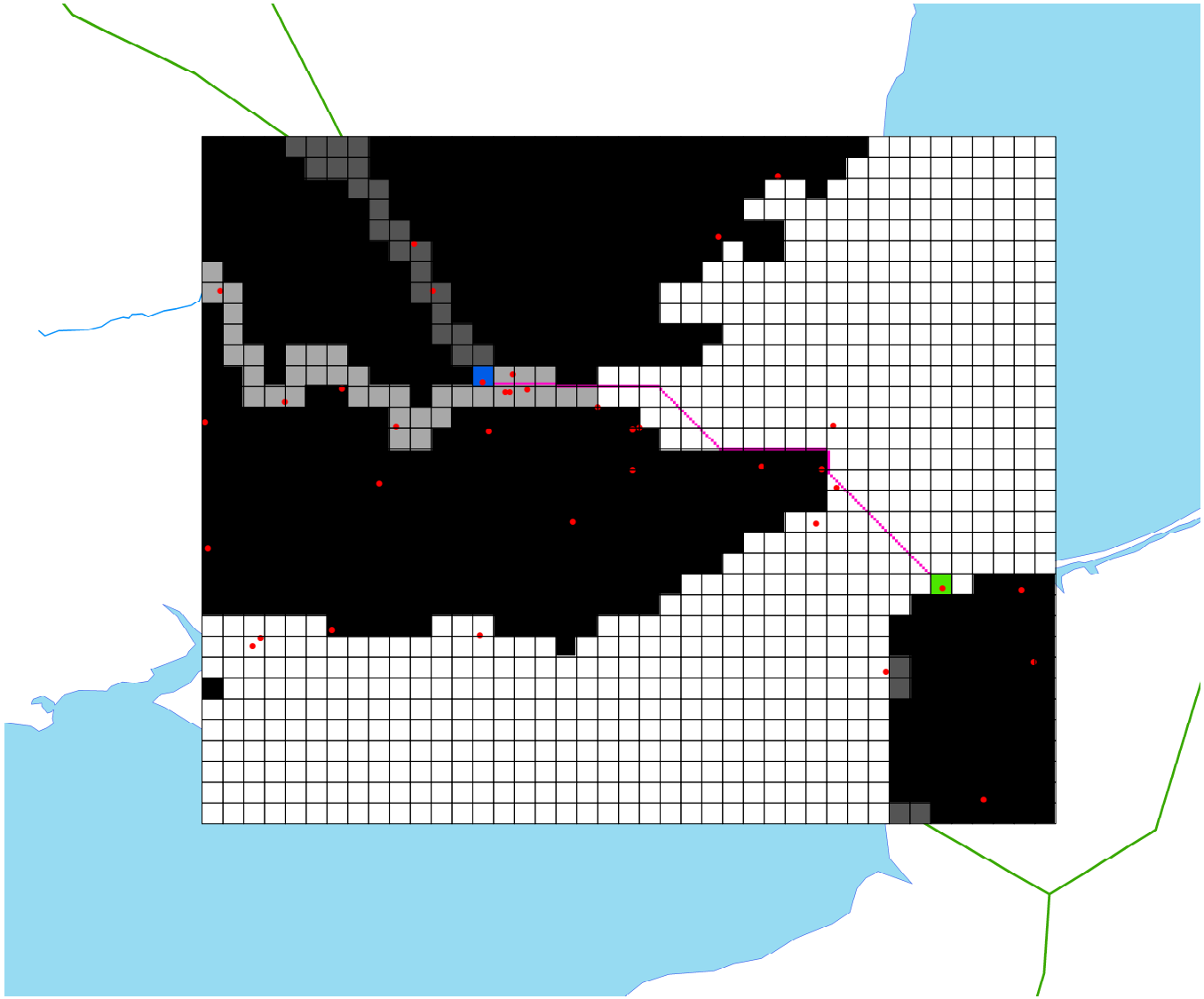
TRANSFORM INTO A RASTER TAKING VALUE OF LEAST COST TRANSPORT FOR EACH GRID...



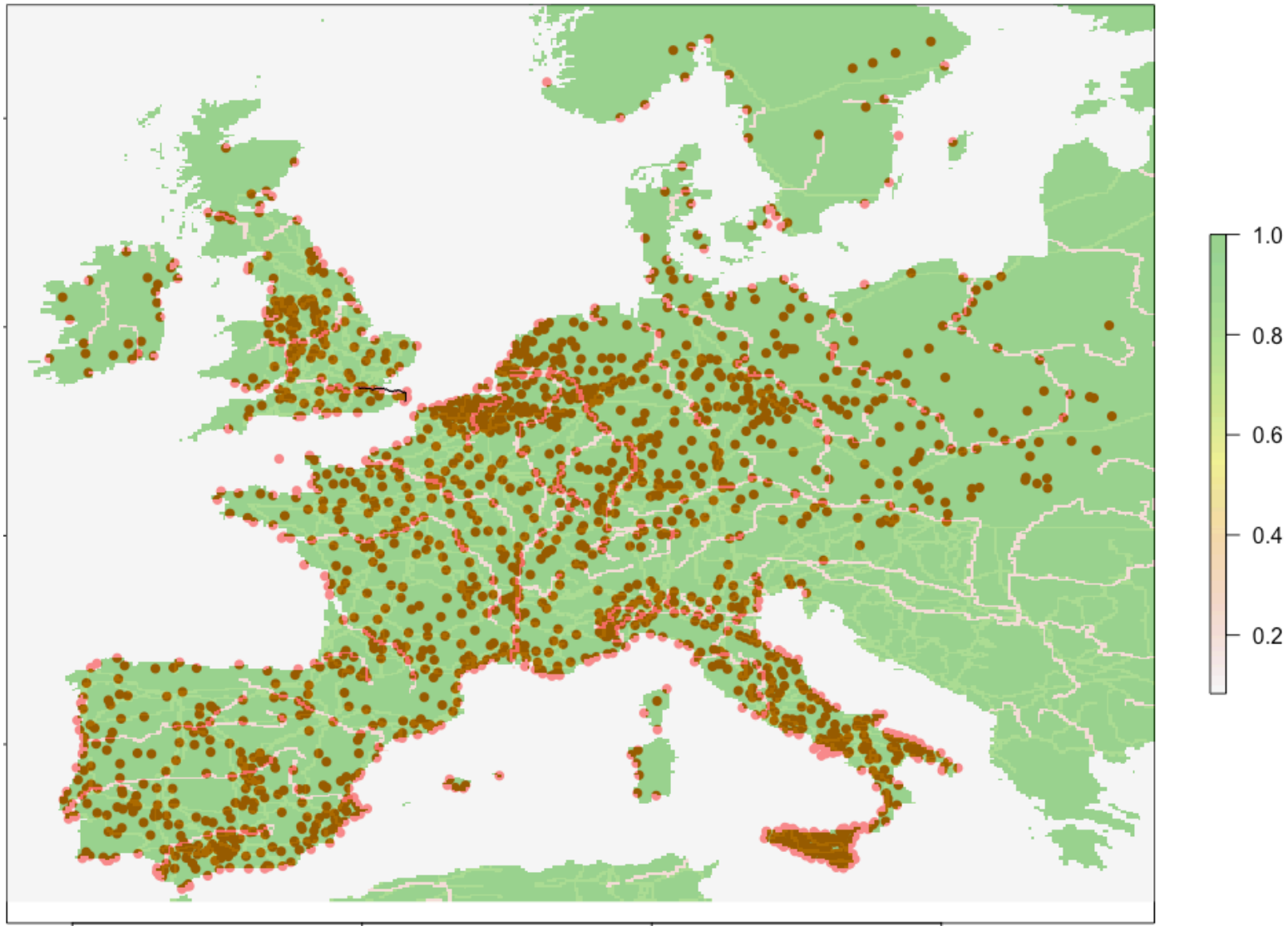
Choose two cities: London and Calais...



Apply Dijkstra's Algorithm to identify least cost path and cost of taking least cost path (τ)...



RINSE AND REPEAT 1,603,840 TIMES. . .



▸ Paris to Rome

Creating the IV's

- Recall that:

$$NA_{jt} = \sum_{i \neq j} JC_{it} \tau_{ji}^{-\sigma} \tag{3}$$

- We create two sets of IV's based on the Jewish Network Access variable.
  1. The Jewish Network IV's
  2. The Expulsions IV's

The Jewish Network IV's

- Recall that:

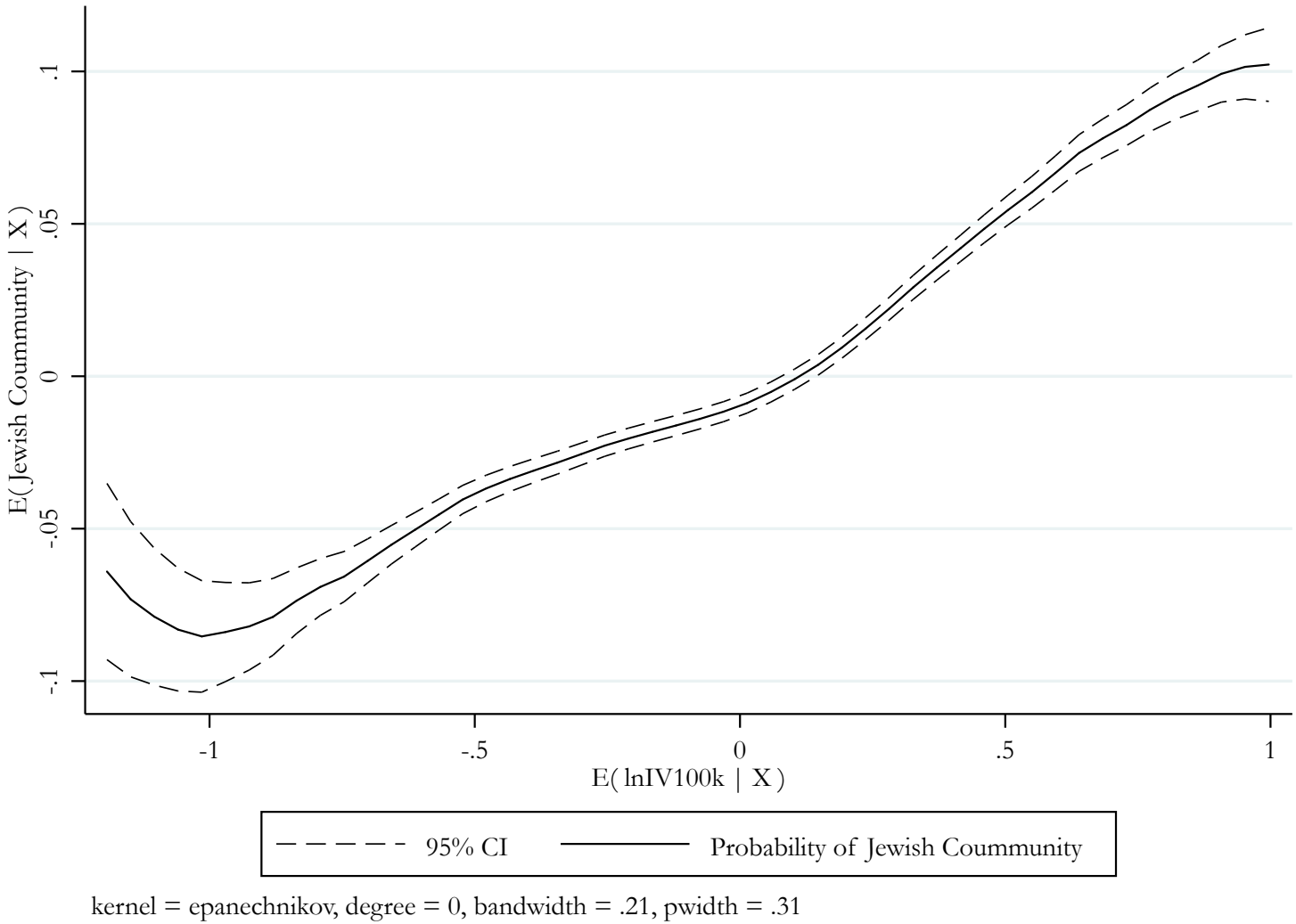
$$NA_{jt} = \sum_{i \neq j} JC_{it} \tau_{ji}^{-\sigma} \tag{4}$$

- The Jewish Network IV for city j is defined as $\text{IVNetwork}_{jt} = NA_{jt} \Big|_{i>Dkm}$.

- In this way we will be only be predicting the presence of a Jewish community in city j based on the network of Jewish cities that are more than D kilometers away. Since it is likely that any unobserved variables correlated with both the growth of city j and Jewish presence in city j will be uncorrelated with Jewish presence in city i that is $\hat{D}$ kilometers away, then this is a potentially valid instrument.

- We create the instrument for Dkm=0, 50, 100, 250, and 500.

Relevance of the Jewish Network IV with D=100km



kernel = epanechnikov, degree = 0, bandwidth = .21, pwidth = .31

THE EXPULSIONS IV'S

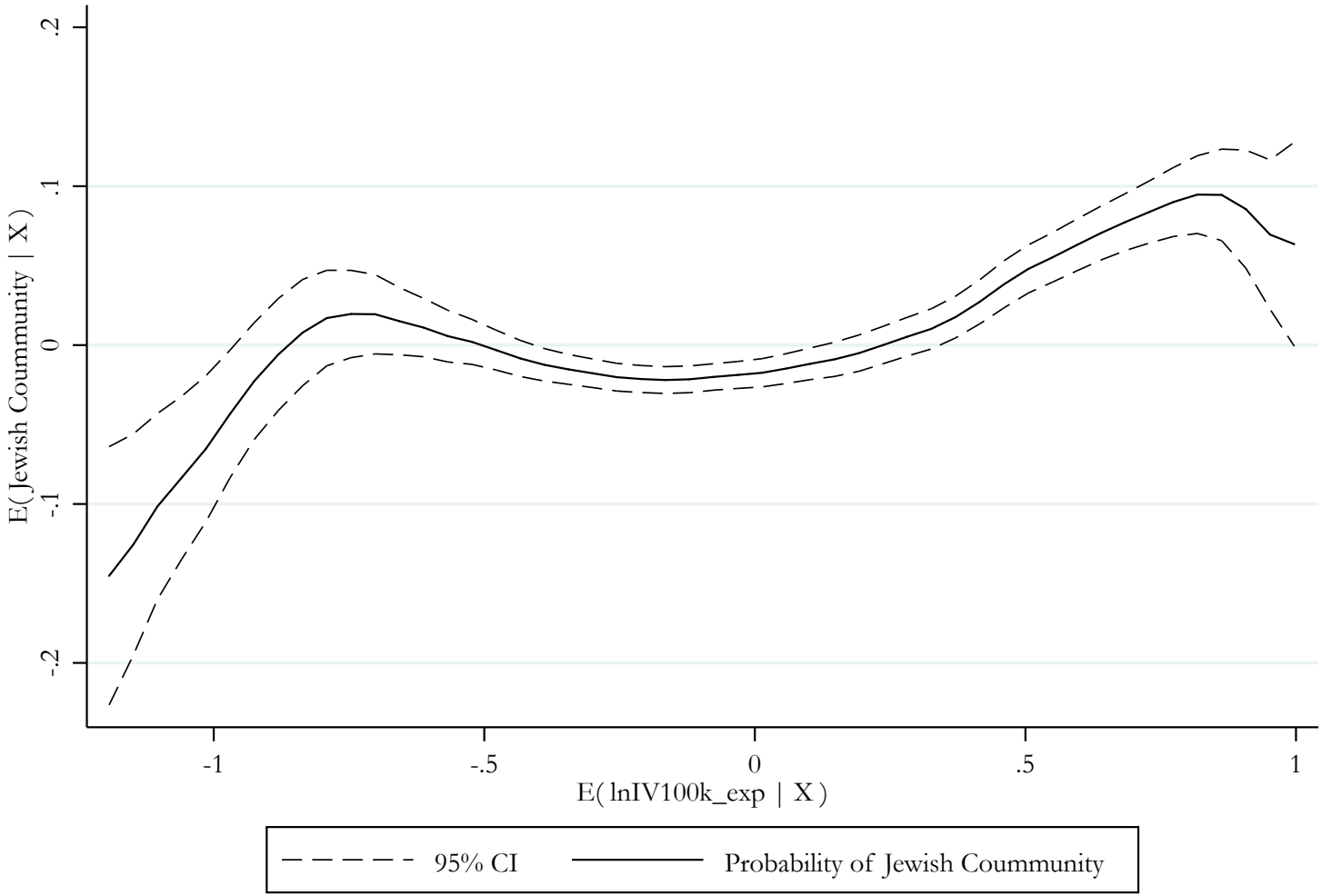
- To construct the Expulsions IV we reconstruct the Jewish Network variable but weight by $\text{Expulsion}_{it} = 1$ if there was an expulsion in city i in the period before year t. Then the Expulsions Network variable becomes...

$$EN_{jt} = \sum_{i \neq j} \text{Expulsion}_{it} \tau_{ji}^{-\sigma} \tag{5}$$

- Our time varying instrument is defined as $\text{IVExpulsion}_{jt} = EN_{jt} \Big|_{i > Dkm}$.

- Assumes that expulsions of Jews that happen more than $\hat{D}$ kilometers away are uncorrelated with other factors driving growth in city j. Relevance comes from the exogenous 'push' of expelled Jews towards city j combined with the 'pull' of city j being on a relatively short least cost travel path to the city from which the Jews are expelled.

Relevance of the Jewish Expulsions IV with D=100km



kernel = epanechnikov, degree = 0, bandwidth = .13, pwidth = .2

IV Regressions, 1400-1850

	Dependent Variable: Log City Population				
	Panel A: Jewish Network IV				
	(1)	(2)	(3)	(4)	(5)
	All Cities	*>50km*	*>100km*	*>250km*	*>500km*
Jewish Community	0.467***	0.467***	0.491***	0.522***	0.348
	(0.0615)	(0.0643)	(0.0695)	(0.100)	(0.367)
Year FE's	Yes	Yes	Yes	Yes	Yes
Controls X Year FE's	Yes	Yes	Yes	Yes	Yes
City FE's	Yes	Yes	Yes	Yes	Yes
N	2889	2889	2889	2889	2889
First Stage F-stat	677.05	676.60	540.73	179.84	11.84
	Panel B: Expulsions IV				
	(1)	(2)	(3)	(4)	(5)
	All Cities	*>50km*	*>100km*	*>250km*	*>500km*
Jewish Community	0.125	0.381**	0.864***	2.777***	-0.755
	(0.165)	(0.172)	(0.255)	(0.918)	(0.503)
Year FE's	Yes	Yes	Yes	Yes	Yes
Controls X Year FE's	Yes	Yes	Yes	Yes	Yes
City FE's	Yes	Yes	Yes	Yes	Yes
N	2889	2889	2889	2889	2889
First Stage F-stat	51.78	48.36	28.40	9.51	11.17

Robustness: Additional Controls

	(1) *Potato*	(2) *Atlantic Cities*	(3) *Market Access*	(4) *Persecutions*	(5) *BD Mortality*
$\beta_{OLSMain}$	0.347***	0.341***	0.275***	0.383***	0.353***
	(0.0450)	(0.0464)	(0.0455)	(0.0512)	(0.0457)
$\beta_{OLSExtended}$	0.301***	0.292***	0.237***	0.370***	0.311***
	(0.0426)	(0.0431)	(0.0418)	(0.0509)	(0.0432)
$\beta_{IV100km}$	0.578***	0.456***	0.242***	0.586***	0.529***
	(0.0858)	(0.0696)	(0.0865)	(0.0943)	(0.0782)
β_{IVExp_100k}	0.993***	0.839***	0.672**	1.675**	0.989***
	(0.365)	(0.233)	(0.296)	(0.784)	(0.325)
N_{Main}	2898	2898	2898	2898	2898
$N_{Extended}$	8440	8440	8440	8440	8440

Market Access

- Another important determinant of urban development which economists emphasize is market access (Marshall, 1890; Harris, 1954; Fujita et al., 2001; Donaldson, 2016).
- Market access is calculated as:

$$\text{Market Access}_{jt} = \sum_{i \neq j} \text{Population}_{it} \tau_{ji}^{-\sigma} \tag{6}$$

- Where Population_{it} is simply the population of city i in year t.
- Given the size of the IV coefficients, especially for the Expulsions IV, we are worried that we may be violating the exclusion restriction. Perhaps market access is correlated through distinct channels to both Jewish Community and Population.
- When we control for market access in our regressions, the IV coefficients on Jewish Community suggest that cities with Jewish residents grew between 24% and 67% faster than comparable cities with no Jewish presence.

Robustness: Additional Controls

	(6) *Years Jewish*	(7) *Zero Pop=500*	(8) *Solow Spec.*	(9) *1200- Sample*	(10) *Cluster Country*
$\beta_{OLSMain}$	0.405***	0.368***	0.0866***	0.356***	0.350**
	(0.0507)	(0.0460)	(0.0182)	(0.0486)	(0.124)
$\beta_{OLSExtended}$	0.356***	0.320***	0.155***	0.306***	0.302**
	(0.0476)	(0.0432)	(0.0151)	(0.0447)	(0.109)
$\beta_{IV100km}$	0.586***	0.562***	0.371***	0.540***	0.491**
	(0.0828)	(0.0773)	(0.0594)	(0.0644)	(0.216)
β_{IVExp_100k}	0.977***	0.632*	0.429***	0.252	0.864**
	(0.297)	(0.329)	(0.0876)	(0.214)	(0.394)
N_{Main}	2898	3507	2647	3282	2898
$N_{Extended}$	8440	12544	7101	9080	8440

Robustness: Additional Controls

	(11) *Cities 1400*	(12) *Cities 1500*	(13) *Cities 1600*	(14) *Cities 1700*	(15) *Drop UK*
$\beta_{OLSMain}$	0.353***	0.355***	0.356***	0.363***	0.228***
	(0.0538)	(0.0493)	(0.0481)	(0.0470)	(0.0438)
$\beta_{OLSExtended}$	0.307***	0.307***	0.314***	0.313***	0.188***
	(0.0505)	(0.0465)	(0.0454)	(0.0443)	(0.0383)
$\beta_{IV100km}$	0.439***	0.459***	0.495***	0.495***	0.196**
	(0.0801)	(0.0678)	(0.0686)	(0.0692)	(0.0836)
β_{IVExp_100k}	1.078***	0.912***	0.957***	0.959***	0.570**
	(0.366)	(0.259)	(0.280)	(0.284)	(0.239)
N_{Main}	1953	2349	2564	2694	2652
$N_{Extended}$	3850	5002	6272	7201	7636

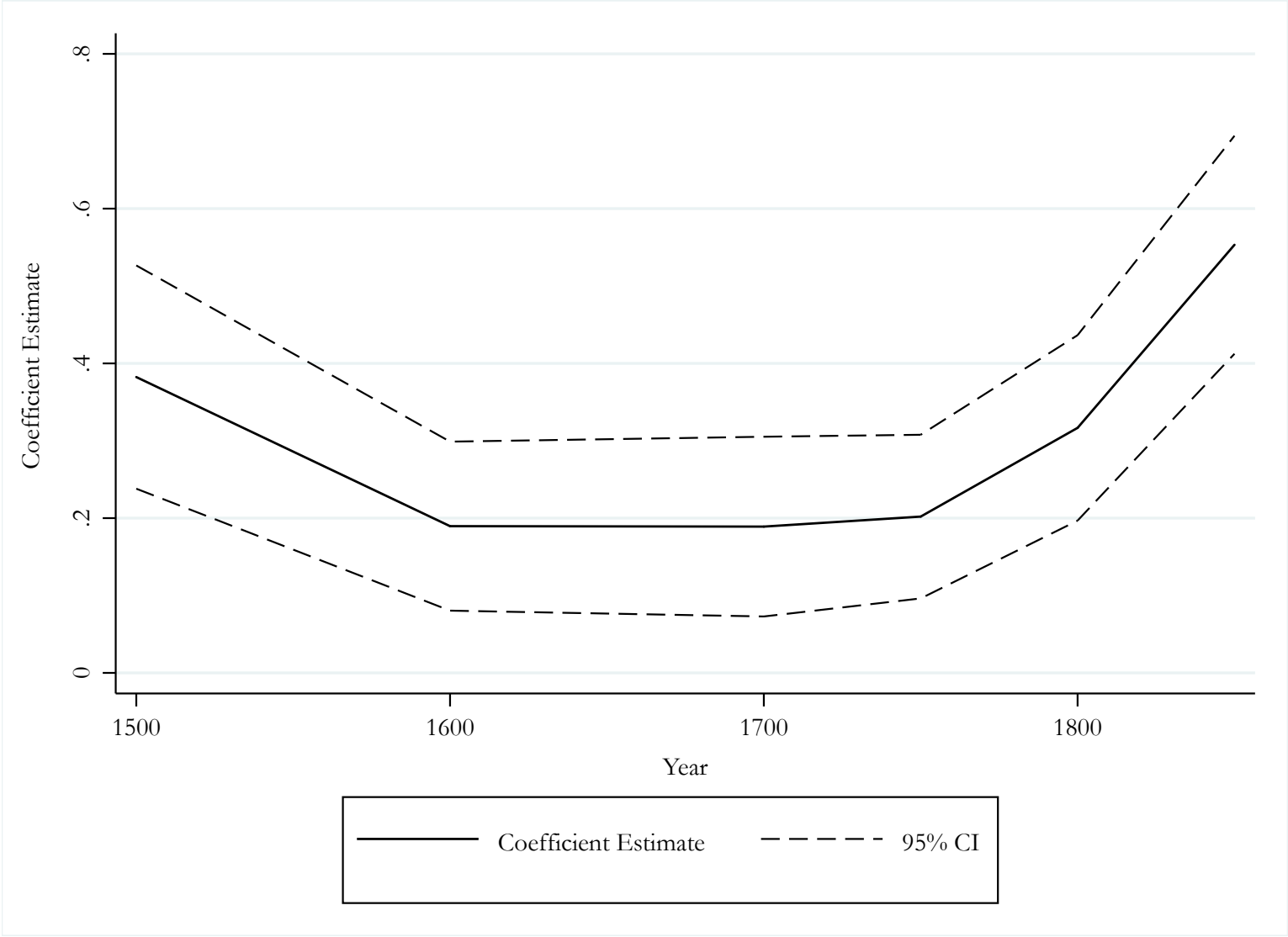
Robustness: Additional Controls

	(16) *Drop NLD*	(17) *Drop France*	(18) *Drop Germany*	(19) *Drop Italy*	(20) *Drop Spain*
$\beta_{OLSMain}$	0.355***	0.399***	0.426***	0.337***	0.307***
	(0.0464)	(0.0536)	(0.0521)	(0.0509)	(0.0437)
$\beta_{OLSExtended}$	0.299***	0.344***	0.351***	0.307***	0.272***
	(0.0435)	(0.0502)	(0.0499)	(0.0490)	(0.0425)
$\beta_{IV100km}$	0.542***	0.627***	0.540***	0.432***	0.485***
	(0.0802)	(0.0725)	(0.0656)	(0.0843)	(0.0777)
β_{IVExp_100k}	1.061***	1.023***	0.694***	0.878***	1.112**
	(0.318)	(0.274)	(0.199)	(0.272)	(0.436)
N_{Main}	2835	2349	2199	2428	2527
$N_{Extended}$	8128	6960	7111	6641	7239

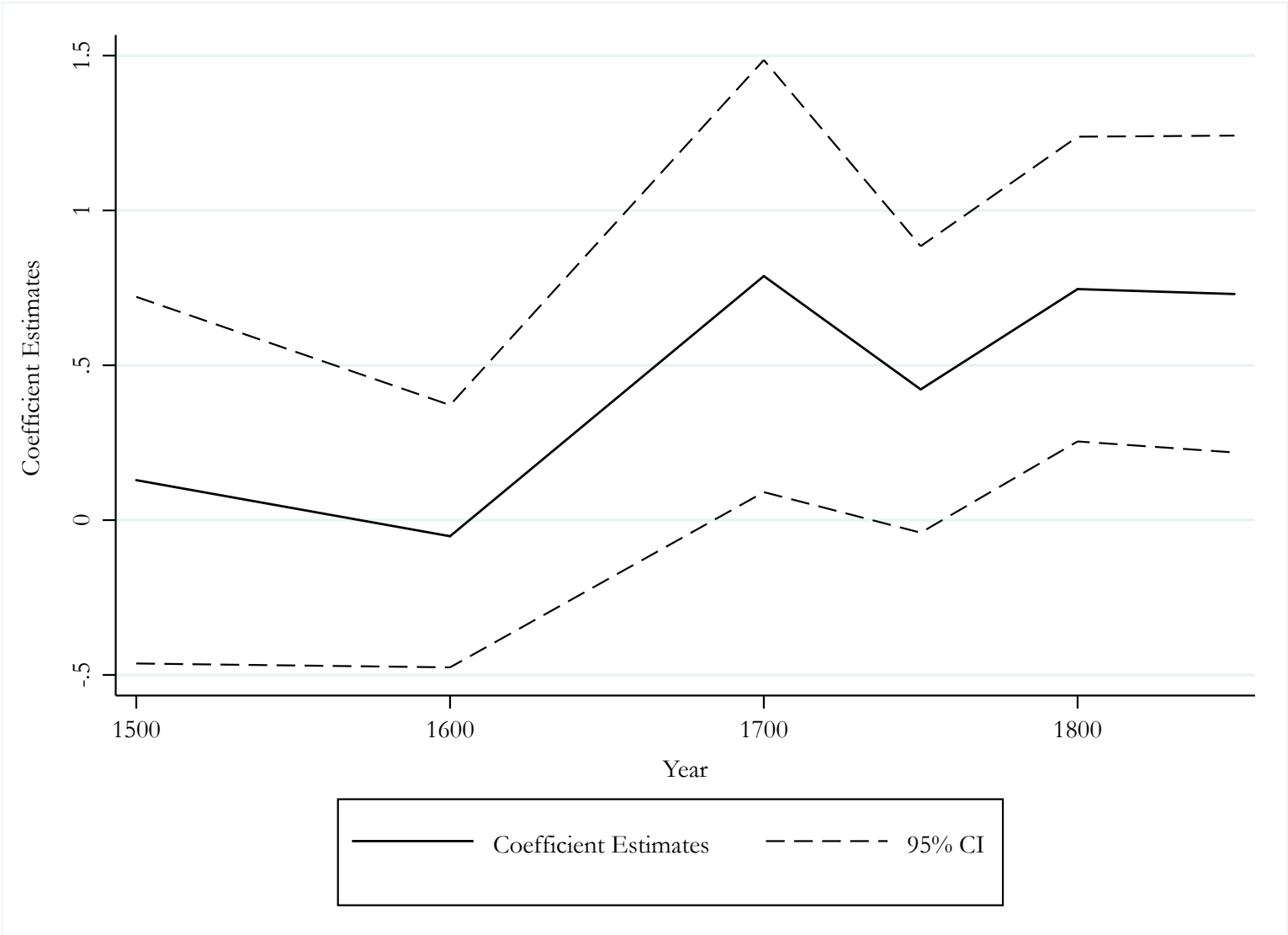
Flexible Regressions: Jewish City Divergence After 1600

	Dependent Variable: Log City Population					
	Main Sample					Extended Sample
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	*IV100k*	*IVExp_100k*	*IV100k*	*IVExp_100k*	*OLS*
Jewish Community X 1500	0.382***	0.080	-0.973	0.129	-0.773	0.194***
	(0.074)	(0.308)	(1.147)	(0.302)	(1.017)	(0.052)
Jewish Community X 1600	0.190***	0.064	0.356	-0.052	0.256	0.174***
	(0.056)	(0.208)	(0.308)	(0.216)	(0.338)	(0.049)
Jewish Community X 1700	0.189***	0.999***	1.878***	0.788**	1.668**	0.311***
	(0.059)	(0.342)	(0.663)	(0.356)	(0.662)	(0.063)
Jewish Community X 1750	0.202***	0.599***	1.287***	0.422*	1.088**	0.279***
	(0.054)	(0.222)	(0.488)	(0.236)	(0.530)	(0.058)
Jewish Community X 1800	0.317***	0.991***	1.794***	0.746***	1.545**	0.358***
	(0.061)	(0.231)	(0.613)	(0.251)	(0.619)	(0.063)
Jewish Community X 1850	0.553***	1.236***	2.079***	0.730***	1.686**	0.506***
	(0.072)	(0.205)	(0.792)	(0.261)	(0.856)	(0.067)
Control for Market Access	No	No	No	Yes	Yes	No
Year FE's	Yes	Yes	Yes	Yes	Yes	Yes
Controls X Year FE's	Yes	Yes	Yes	Yes	Yes	Yes
City FE's	Yes	Yes	Yes	Yes	Yes	Yes
N	2898	2889	2889	2889	2889	8440

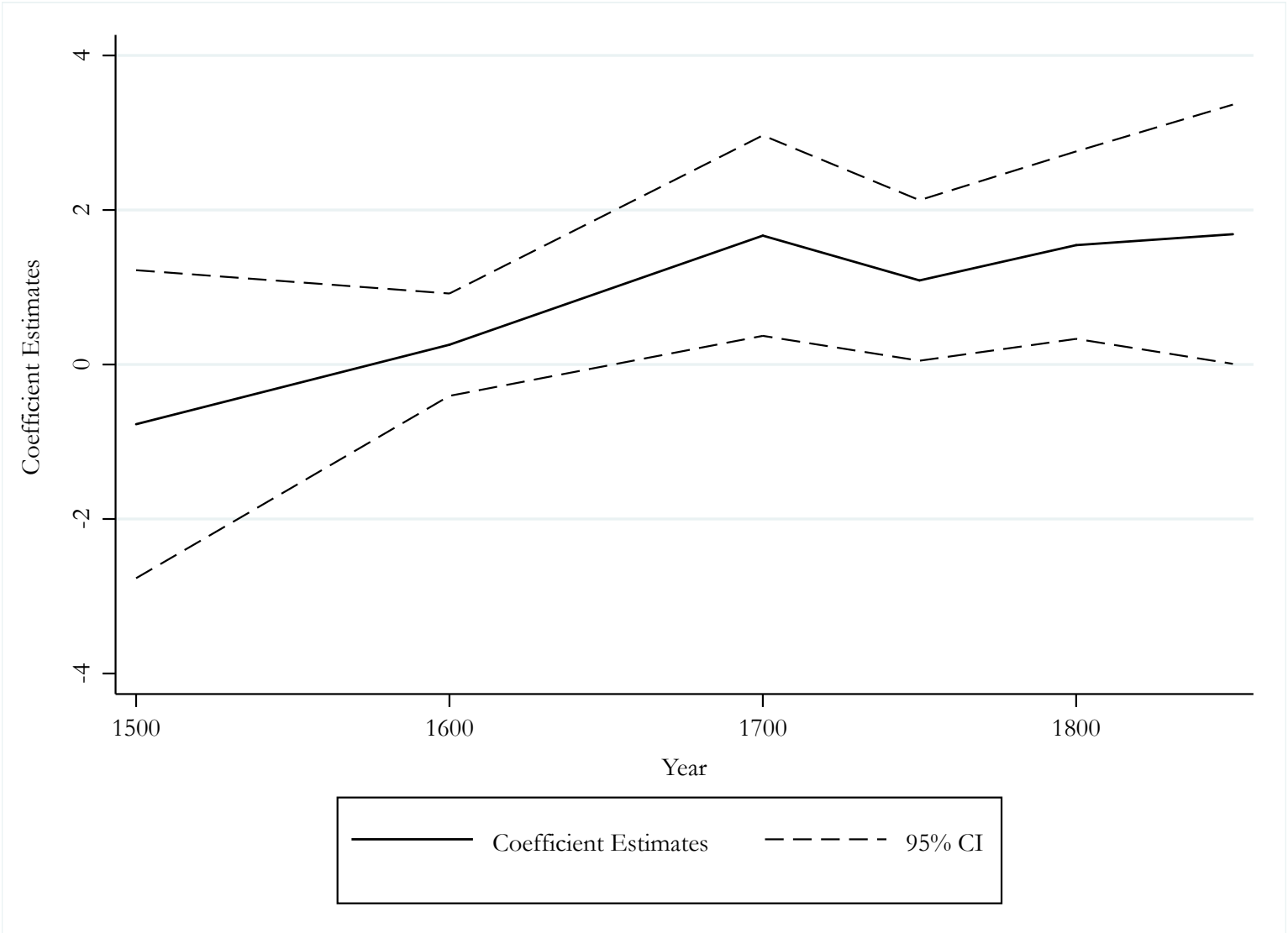
Flexible Regressions: Main Sample OLS, 1400-1850



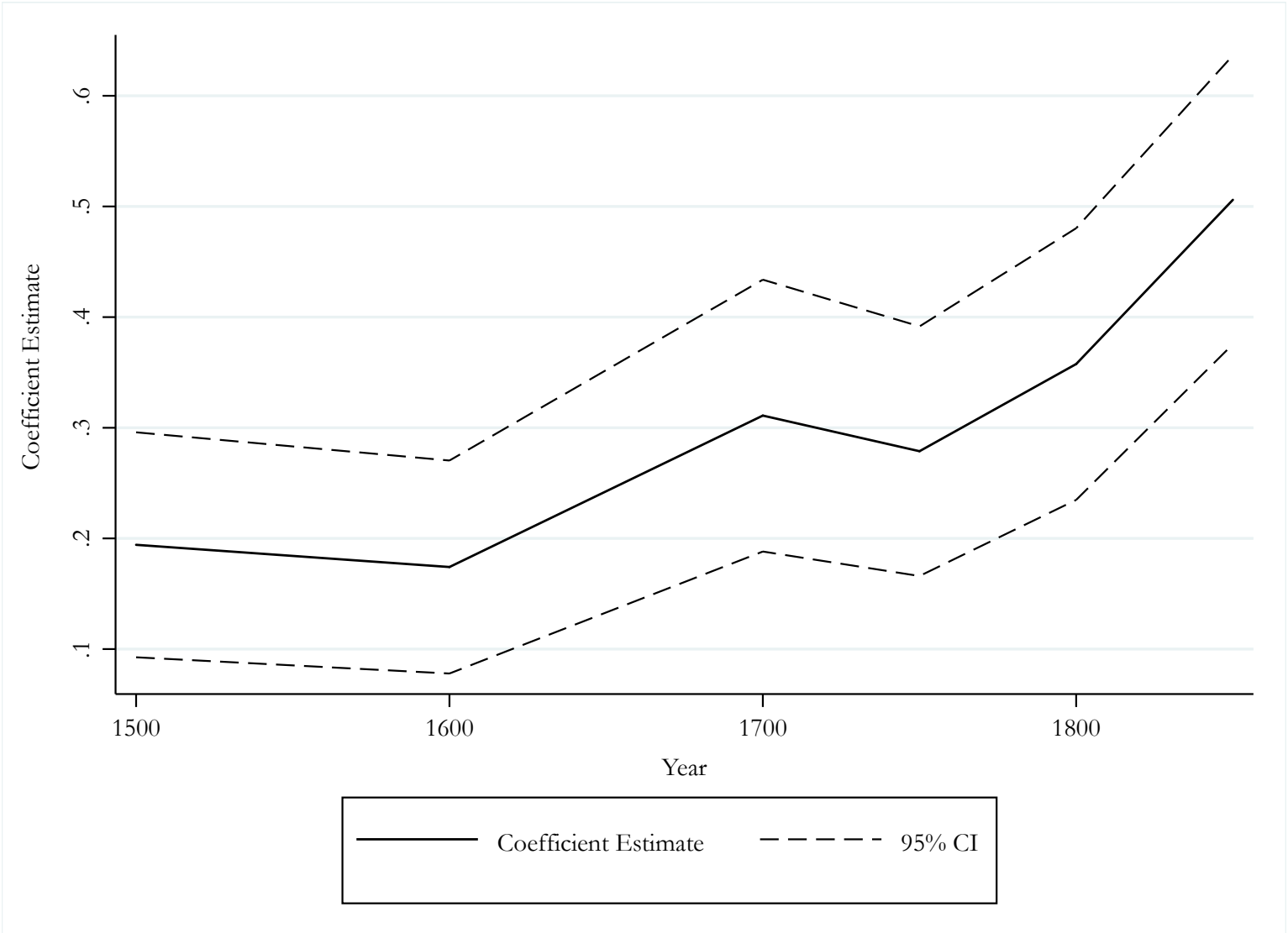
Flexible Regressions: Jewish Network IV, 1400-1850



Flexible Regressions: Expulsions IV, 1400-1850



Flexible Regressions: Extended Sample OLS, 1400-1850



Mechanisms

- *Sephardic Communities*
- *Hebrew Printing Press*
- *Port Jewish Cities*
- *Market Access*
- *Emancipation*

Mechanisms: Sephardic Communities

- Israel (2005, 11) argues that the Sephardic diaspora created 'a new phenomenon . . . a new type of Jewish commercial system' that was based not on local markets, or on trade in agricultural products but on the transportation of luxury goods over long distances.
- Trivellato (2009) argues that the Sephardic diaspora was remarkable for its 'geographical breadth' and 'stability' and that '[o]ther branches of the Jewish diaspora could not count on the same geographical dispersion or interconnectedness' (Trivellato, 2009, 149).
- Sephardic Jews formed a network of interconnected merchants tied together 'on the basis of implicit contracts with blood-kin and in-law'. Sephardic merchants formed long-lasting partnerships and employed long distance agency relationships relying on both formal courts and on reputation-based mechanisms of the kind that Greif (1992, 2006) studied

Mechanisms: Sephardic Communities, 1400-1850

	(1)	(2)
	OLS	*IV100k*
Jewish Community	0.311***	0.465***
	(0.0443)	(0.0722)
SephardicXJewishComm	0.482**	0.375***
	(0.205)	(0.136)

Mechanisms: Sephardic Communities, 1750-1850

	(1)	(2)
	OLS	*IV100k*
Jewish Community	0.135***	2.398***
	(0.0513)	(0.589)
SephardicXJewishComm	-0.456***	-2.181***
	(0.142)	(0.511)

Mechanisms: Hebrew Printing Press

- To explore evidence of a cultural mechanism we collect data on the existence of Jewish printing presses based on Beinart (1992).
- Historical literature suggests that the existence of a Hebrew printing was a measure of cultural interaction between Jews and Christians (see Burnett, 1998).

Mechanisms: Hebrew Printing Press, 1400-1850

	(3)	(4)
	OLS	*IV100k*
Jewish Community	0.349***	0.498***
	(0.0457)	(0.0712)
HebrewPressXJewishComm	-0.114	-0.571**
	(0.197)	(0.264)
Hebrew Press	0.518*	0.776***
	(0.274)	(0.264)

Mechanisms: Hebrew Printing Press, 1750-1850

	(3)	(4)
	OLS	*IV100k*
Jewish Community	0.123**	2.496***
	(0.0520)	(0.640)
HebrewPressXJewishComm	-0.0330	-0.722
	(0.174)	(0.814)

Mechanisms: Port Cities and Port Jews

- Historians refer to 'port Jews' to describe maritime Jewish communities that flourished in early modern cities such as Livorno, Trieste, Amsterdam, and London (Cesarani, 2001; Dubin, 2001, 2006; Sorkin, 2001)
- These communities tended to offer great religious freedom to Jewish communities.

Mechanisms: Port Cities and Port Jews, 1400-1850

	(5)	(6)
	OLS	*IV100k*
Jewish Community	0.316***	0.603***
	(0.0464)	(0.157)
PortJewXJewishComm	0.444***	-1.000
	(0.145)	(1.321)

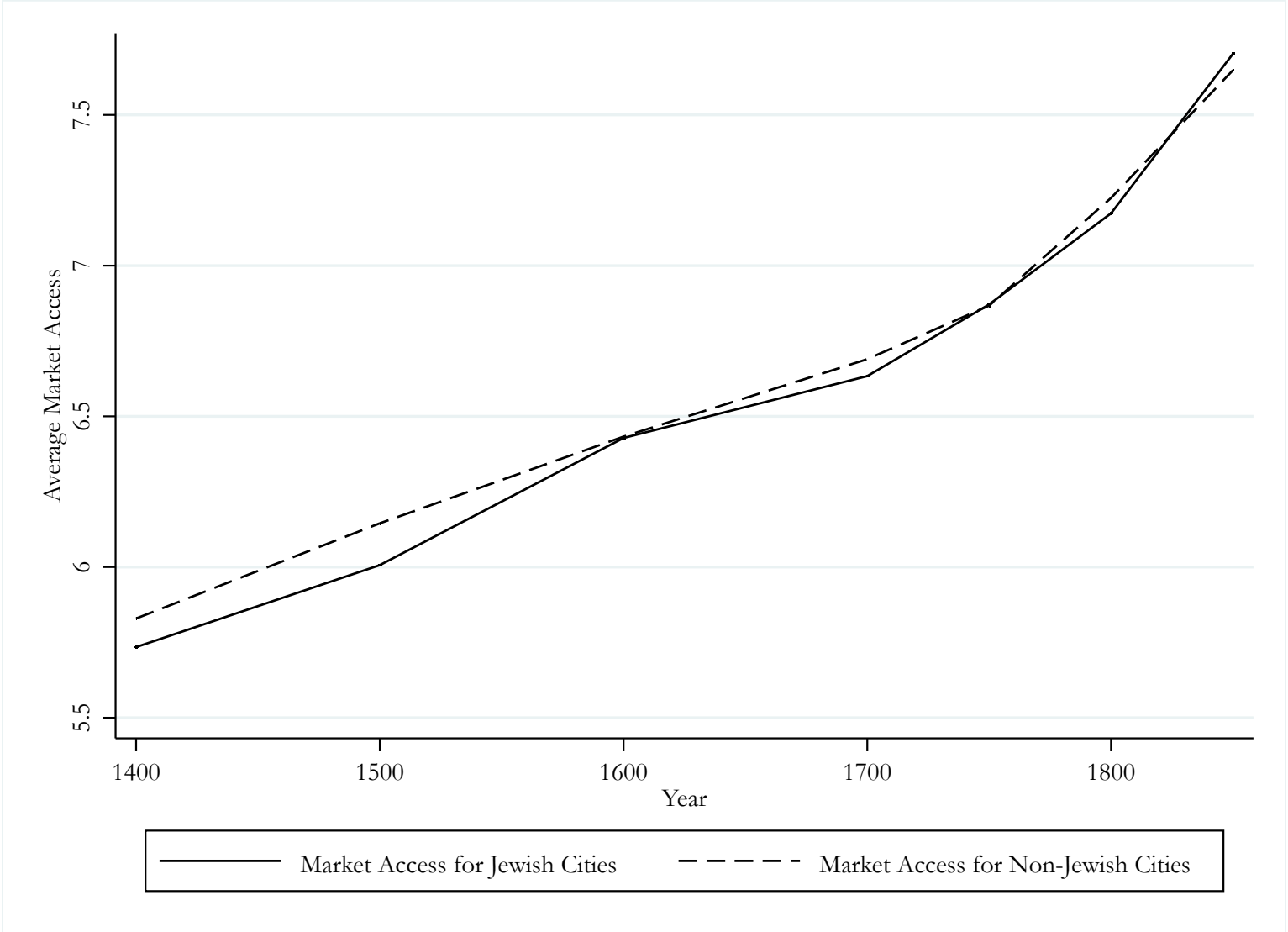
Mechanisms: Port Cities and Port Jews, 1750-1850

	(5)	(6)
	OLS	*IV100k*
Jewish Community	0.127**	4.238
	(0.0504)	(3.196)
PortJewXJewishComm	-0.0674	-8.560
	(0.148)	(12.94)

Mechanisms: Market Access

- The historical literature points to the importance of Jewish trading and financial networks.
- Economic historians have conducted numerous studies of market integration during the early modern period, with a few exceptions these have focused on the grain trade with little systematic study of other markets due to data limitations (Bateman, 2011; Chilosi et al., 2013; Clark, 2015).
- Jewish merchants in medieval and early modern Europe, however, did not play a prominent role in the grain trade but, rather, were involved in the transport of diamonds, sugar, silks, tobacco, and other luxury products in addition to playing a large role in banking and finance.
- Therefore, rather than looking at grain markets, we explore a more general measure of market integration based on market access (Eaton and Kortum, 2002; Donaldson and Hornbeck, 2016; Storeygard, 2016; Donaldson, 2016).

Market Access on the Extensive Margin



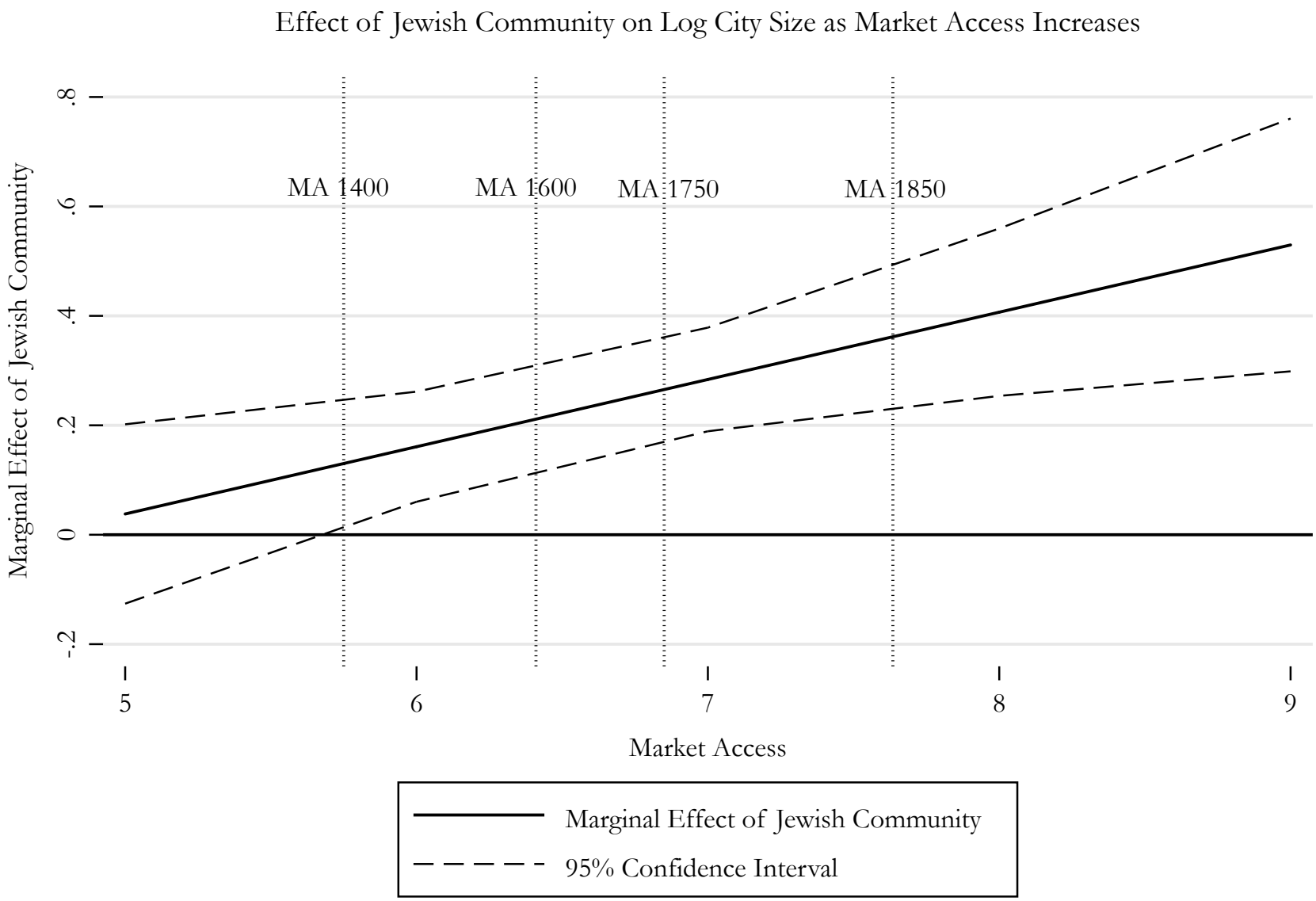
Mechanisms: Market Access, 1400-1850

	(9)	(10)
	OLS	*IV100k*
Jewish Community	-0.577*	-3.523***
	(0.299)	(0.655)
MarketAccessXJewishComm	0.123***	0.542***
	(0.0450)	(0.0971)
Market Access	2.105***	2.012***
	(0.310)	(0.294)

Mechanisms: Market Access, 1750-1850

	(7)	(8)
	OLS	*IV100k*
Jewish Community	-1.121***	-2.496*
	(0.423)	(1.451)
MarketAccessXJewishComm	0.164***	0.415***
	(0.0577)	(0.157)
Market Access	2.520***	1.942***
	(0.291)	(0.371)

Predicted Effect of Market Access on Growth for Jewish Cities, 1400-1850



Mechanisms: Emancipation

- During the medieval and early modern period Jews faced limitations on range of economic activities they could engage in. This limited the ability of Jews to put their labor to its highest value use, prevented Jewish businesses from hiring non-Jewish workers, and prevented or limited Jews from attending universities.

- Beginning in the late eighteenth century, under the influence of Enlightenment thought, Jewish communities across Europe were granted economic and civic rights (or Emancipated).

- Habsburg Empire in 1782. France in 1791 and this policy was spread into those lands conquered by the Revolutionary and Napoleonic armies (Berkovitz, 1989; Acemoglu et al., 2010; Acemoglu, Cantoni, Johnson and Robinson, 2011, 111–114). Jews were granted rights in Prussia in 1812 and in Denmark in 1814.

MECHANISMS: EMANCIPATION, 1400-1850

Dependent Variable: Log City Population

	(1)	(2)	(3)	(4)
	OLS	*IV100k*	*OLS*	*IV100k*
Jewish Community	0.248***	0.440***	0.245***	0.405***
	(0.0407)	(0.0967)	(0.0404)	(0.0967)
EmancipationXJewishComm	0.332***	1.078***	0.351***	0.947***
	(0.0788)	(0.394)	(0.0845)	(0.362)
Emancipation	0.0671	-0.573*	0.0786	-0.430
	(0.0627)	(0.306)	(0.0646)	(0.276)
No Habsburg Emancipation	No	No	Yes	Yes
Year FE's	Yes	Yes	Yes	Yes
Controls X Year FE's	Yes	Yes	Yes	Yes
City FE's	Yes	Yes	Yes	Yes
N	2898	2889	2898	2889
R-sq	0.485		0.485	

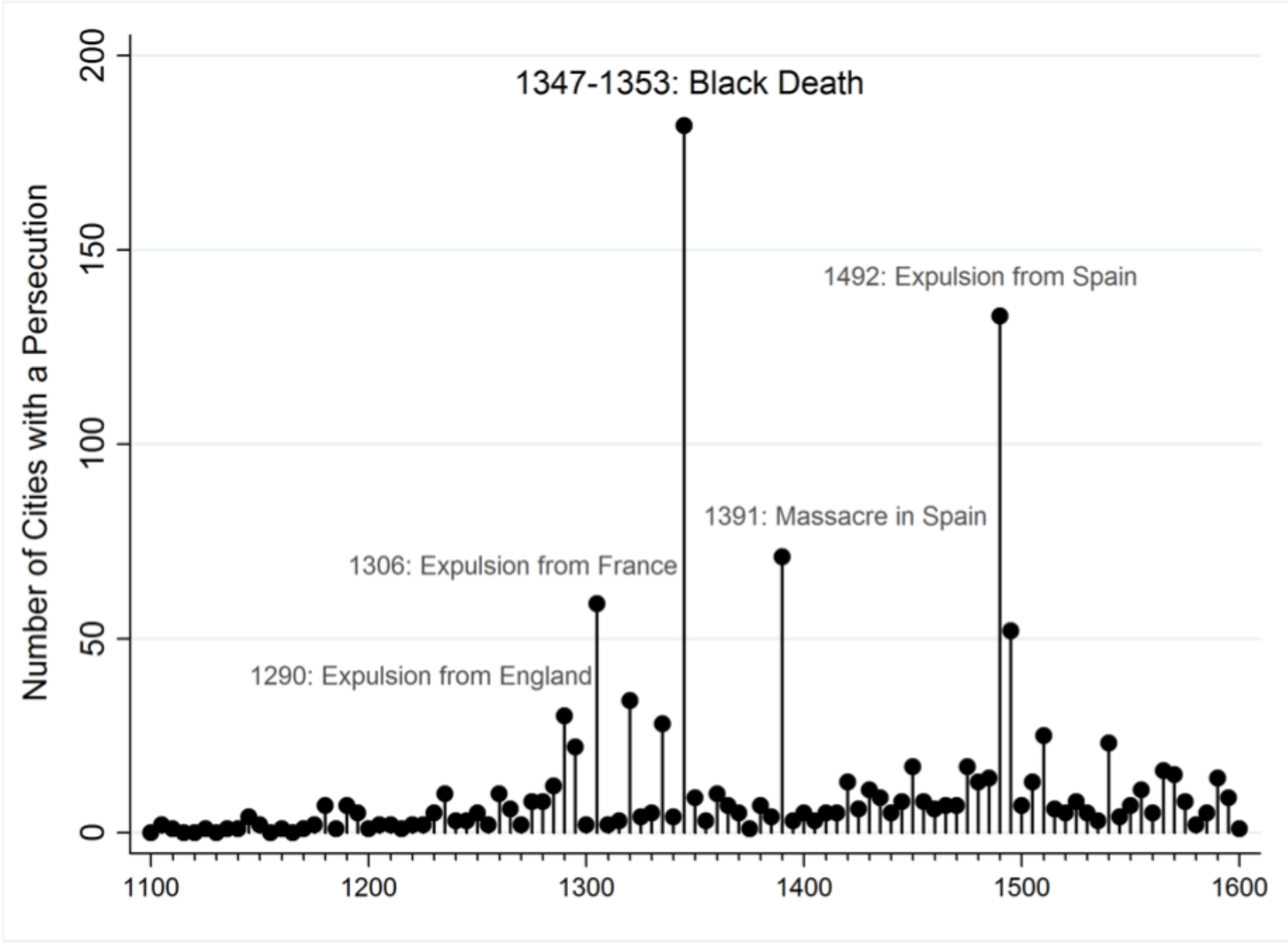
Conclusions

- Cities with Jewish communities grew faster than comparable cities without Jewish communities in Europe between 1400 and 1850.
- This growth advantage accelerated after 1600.
- We identify the causal effect of Jewish communities on city growth by creating an IV based on a spatial model of the Jewish network across Europe and exploiting 'nearby' expulsions.
- We provide evidence that cities with Jewish communities benefited more from market access on the intensive margin, but not on the extensive margin. Jewish communities were better able to translate greater *potential* market density into economic gains.
- We show that cities which emancipated Jewish communities grew faster.

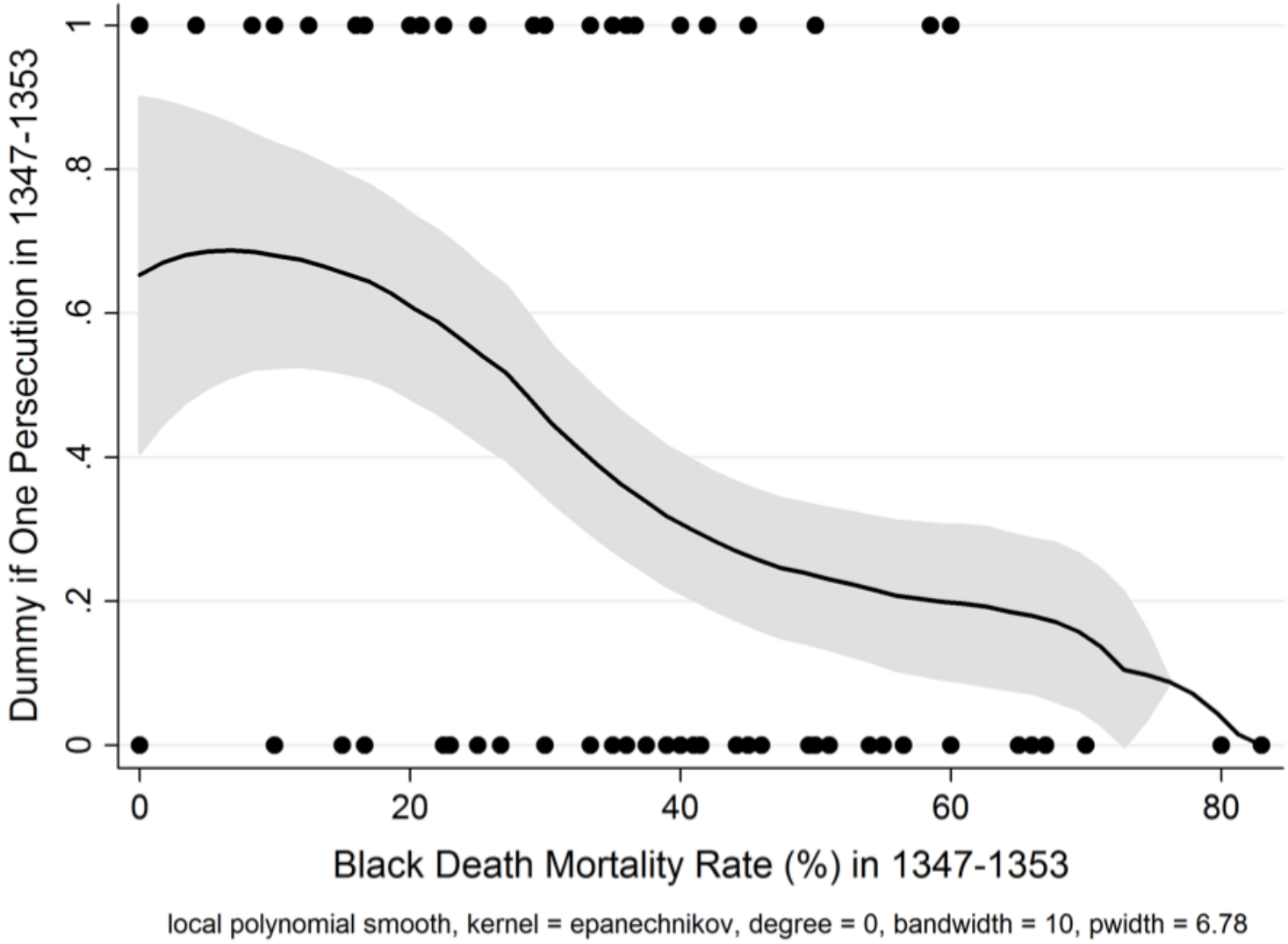
Extensions: Religious Tolerance and Economic Development

- Black Death, Labour Scarcity and Jewish Persecutions (with Remi Jedwab and Mark Koyama)
- Temperature Shocks and Jewish Persecutions (with Mark Koyama)
- Book Project: The Birth of Religious Liberty (with Mark Koyama)

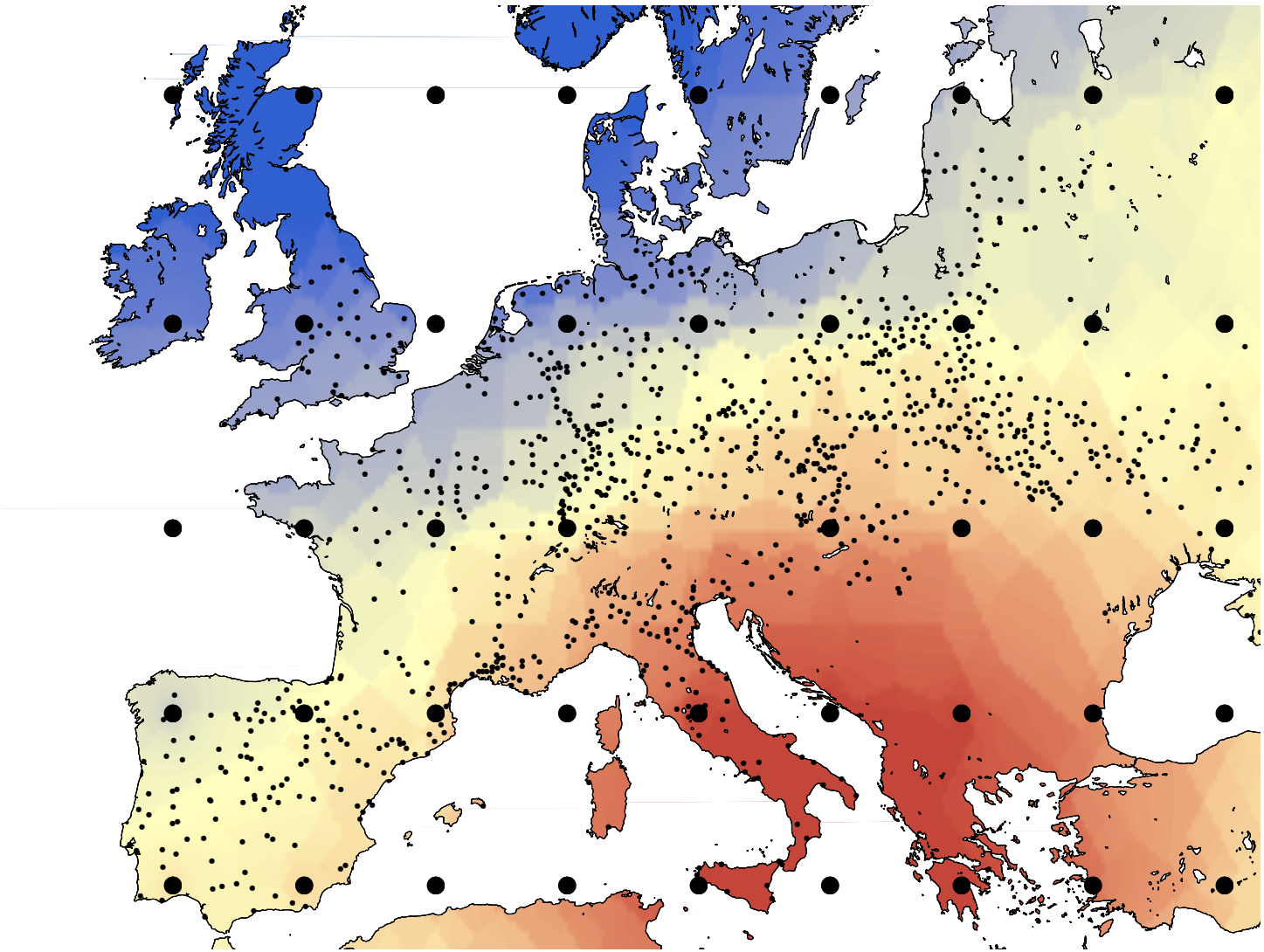
Black Death, Labour Scarcity and Jewish Persecutions



Black Death, Labour Scarcity and Jewish Persecutions

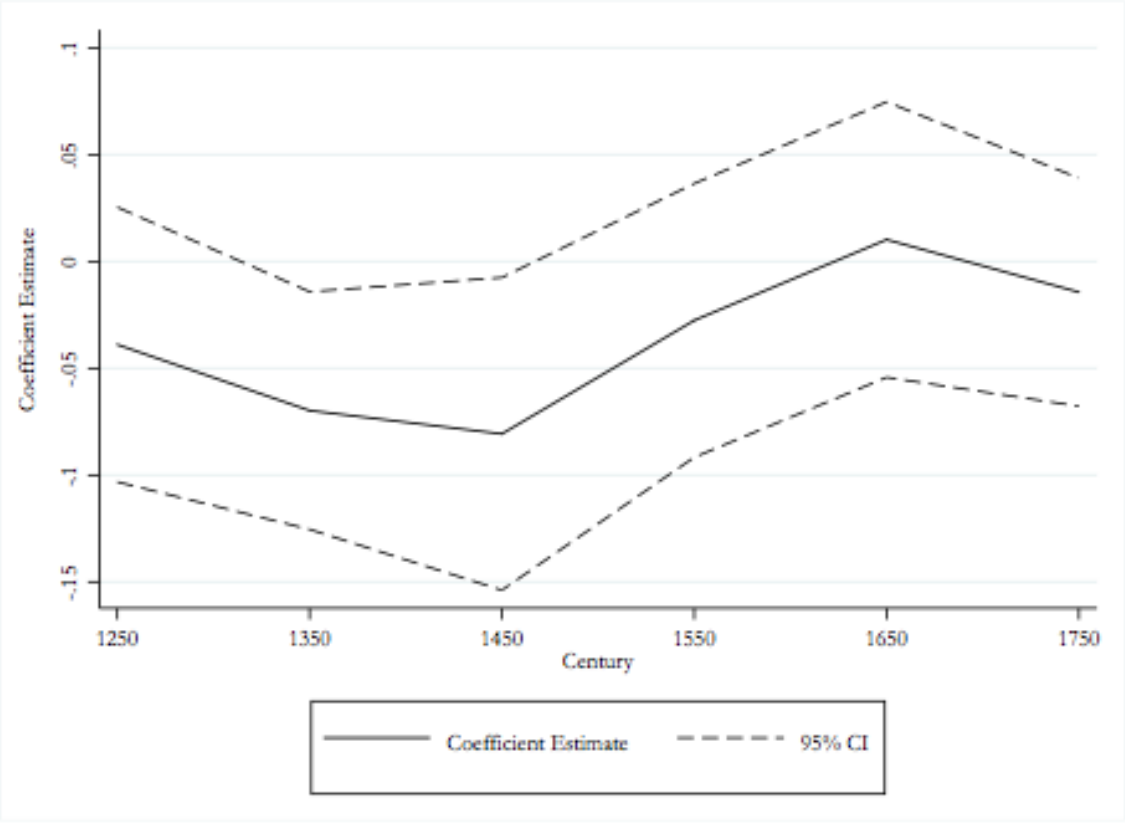


Temperature Shocks and Jewish Persecutions



Temperature Shocks and Jewish Persecutions

Figure 4:
The Effect of Temperature on Persecution Probability Over Time



Notes. Plots coefficients estimate by century of the baseline DID regression. Specification discussed in the text.

Book Project: The Birth of Religious Liberty

The Birth of Religious Freedom: Liberalism, Rule of Law, and State Capacity, 1100–1800

Mark Koyama, assistant professor in the Economics Department and Mercatus Center Senior Scholar, will present the annual Fenwick Fellow Lecture on Wednesday, April 8, 2015 in 228 Gateway Library, Johnson Center at 2 p.m. He will present his findings on "The Birth of Religious Freedom: Liberalism, Rule of Law, and State Capacity, 1100–1800" which examined Western Europe as the birthplace of modern ideas of political freedom and religious toleration. His study used a combination of new historical data and approaches from modern political economy. Professor Koyama's research project was part of a larger endeavor, in collaboration with Professor Noel Johnson, Economics Department and Center for Study of Public Choice. They hope to publish the resulting monograph in 2016.

Wednesday
April 8, 2015
2 p.m.

228 Gateway Library
Johnson Center
Fairfax Campus

George Mason University | University Libraries

Image: *The Massacre of the Innocents*, Pieter Bruegel, c. 1565-7
Source: Erich Lessing/ART RESOURCE, N.Y.

Jewish Urban Populations

- Approximately: 2.5% of the population of the Netherlands, around 1% of the Habsburg empire, 0.6% of the population of Germany, 0.3% of the population of Britain and 0.16% of the population of France (Katz, 1974; Maddison, 2003).
- Among largest was in Amsterdam where Aschkenazim community was approximately 5,000 in 1674 or 2.5% of the total city population. By 1795 or approximately 10%.
- Frankfurt's community was 3,000 in 1610. Prague was 6,000 in 1600 and over 11,500 by 1702 (Bell et al., 2008, 36).
- At its peak Jewish pop of Venice was 4800. Most Italian communities numbered in the hundreds.

Return

Spatial Distribution of Jewish Communities

- England after 1655 was the only European country where Jews were free to settle where they wished.
- In virtually all other places, restrictions on settlement. For example, Jews were excluded from Utrecht, Gouda, and Deventer (Katz, 1974, 10-12)
- 17th c French monarchy permitted Jews in regions conquered from Holy Roman Empire and allowed Sephardic communities in Bordeaux and Rouen, but not permitted to settle in Paris (Attali, 2010, 285)

Return

Rent-Seeking and Extractive Institutions?

Illustration showing Jews receiving a charter of privileges from Emperor Henry VII in 1312. *Source*: Codex Baldvini; Koblenz, Municipal Archives.

Figure 3. A Jewish moneylender with his family in the background negotiating with a peasant and a townsman. A woodcut from Foltz, *Die Rechnung Kolpergers von dem Gesuch der Juden*, Nuremberg, 1491.

A Jewish money lender with his family in the background negotiating with a peasant and a townsman. Woodcut from Foltz: Die Rechnung Kolpergers von dem Gesuch der Juden – 'The billing of Kolpergers from the request of the Jews'. Nuremberg 1491

Generalized Tolerance and Jewish Presence in Cities

- West European society increasingly abandoned *identity rules* around the seventeenth century (Johnson and Koyama, 2015).
- Part of this meant that Jews were more welcome in places were Identity Rules were being abandoned towards the end of the early modern period.
- Also, the abandonment of *identity rules* meant that Jews were more mobile than previously.
- This could either mean that greater religious freedom generates growth and Jewish communities are simply a marker for those cities. Or, Jewish communities could be directly contributing to growth.
- Or, probably, both.

Descriptive Statistics: Matched Sample

Variable		Mean	Std. Dev.	Min	Max	Observations
Jewish Community	overall	.5127674	.4999232	0	1	N = 2898
	between		.3541913	0	1	n = 501
	within		.3705829	-.3443754	1.36991	T-bar = 5.78443
Log Population	overall	2.326069	1.060052	0	7.712444	N = 2898
	between		.8371366	.6931472	6.080888	n = 501
	within		.6105844	-1.011015	5.601595	T-bar = 5.78443
Cereal Suitability	overall	4.603533	.6931208	2.206897	7.229167	N = 2898
	between		.7073488	2.206897	7.229167	n = 501
	within		0	4.603533	4.603533	T-bar = 5.78443
University Dummy	overall	.0565908	.2310988	0	1	N = 2898
	between		.213777	0	1	n = 501
	within		0	.0565908	.0565908	T-bar = 5.78443
Distance to Any Seas	overall	155625.6	141886.3	59.27785	595701.6	N = 2898
	between		142704	59.27785	595701.6	n = 501
	within		0	155625.6	155625.6	T-bar = 5.78443
Distance to Rivers	overall	43207.66	63046.33	13.90545	424386.9	N = 2898
	between		62416.76	13.90545	424386.9	n = 501
	within		0	43207.66	43207.66	T-bar = 5.78443
Distance to Medieval Road	overall	61806.81	87412.81	0	587681.3	N = 2898
	between		87291.18	0	587681.3	n = 501
	within		0	61806.81	61806.81	T-bar = 5.78443
lnIV100k	overall	2.564789	.3475631	1.544984	3.965279	N = 2898
	between		.2407785	1.769223	3.361853	n = 501
	within		.2548653	2.044283	3.260309	T-bar = 5.78443
lnIV100k_exp	overall	-.1367952	1.674243	-3.708967	3.12836	N = 2898
	between		.7032697	-2.314129	1.846383	n = 501
	within		1.585774	-3.857035	2.804551	T-bar = 5.78443
Market Access	overall	6.760998	.6861903	4.848538	9.571323	N = 2898
	between		.4733557	5.752997	9.029807	n = 501
	within		.5593701	5.543598	8.042022	T-bar = 5.78443

...

Descriptive Statistics: Full Sample

Variable		Mean	Std. Dev.	Min	Max	Observations
Jewish Community	overall	.1760664	.3808992	0	1	N = 8440
	between		.2984941	0	1	n = 1791
	within		.2171272	-.6810765	1.033209	T-bar = 4.71245
Log Population	overall	1.94619	.90446	0	7.712444	N = 8440
	between		.6477614	0	6.080888	n = 1791
	within		.5491849	-1.390894	5.221716	T-bar = 4.71245
Cereal Suitability	overall	4.61671	.7978876	1.826087	7.666667	N = 8440
	between		.8115572	1.826087	7.666667	n = 1791
	within		0	4.61671	4.61671	T-bar = 4.71245
University Dummy	overall	.0194313	.1380433	0	1	N = 8440
	between		.1150137	0	1	n = 1791
	within		0	.0194313	.0194313	T-bar = 4.71245
Distance to Any Seas	overall	114603.8	128064.5	0	625888.1	N = 8440
	between		125425.4	0	625888.1	n = 1791
	within		0	114603.8	114603.8	T-bar = 4.71245
Distance to Rivers	overall	76661.34	105268.9	13.90545	459098.5	N = 8440
	between		98839.89	13.90545	459098.5	n = 1791
	within		0	76661.34	76661.34	T-bar = 4.71245
Distance to Medieval Road	overall	104706.5	139548	0	607741.8	N = 8440
	between		133667	0	607741.8	n = 1791
	within		0	104706.5	104706.5	T-bar = 4.71245
Market Access	overall	6.918485	.6762469	4.848538	9.571323	N = 8440
	between		.4833272	5.301613	9.029807	n = 1791
	within		.515232	5.701086	8.433955	T-bar = 4.71245

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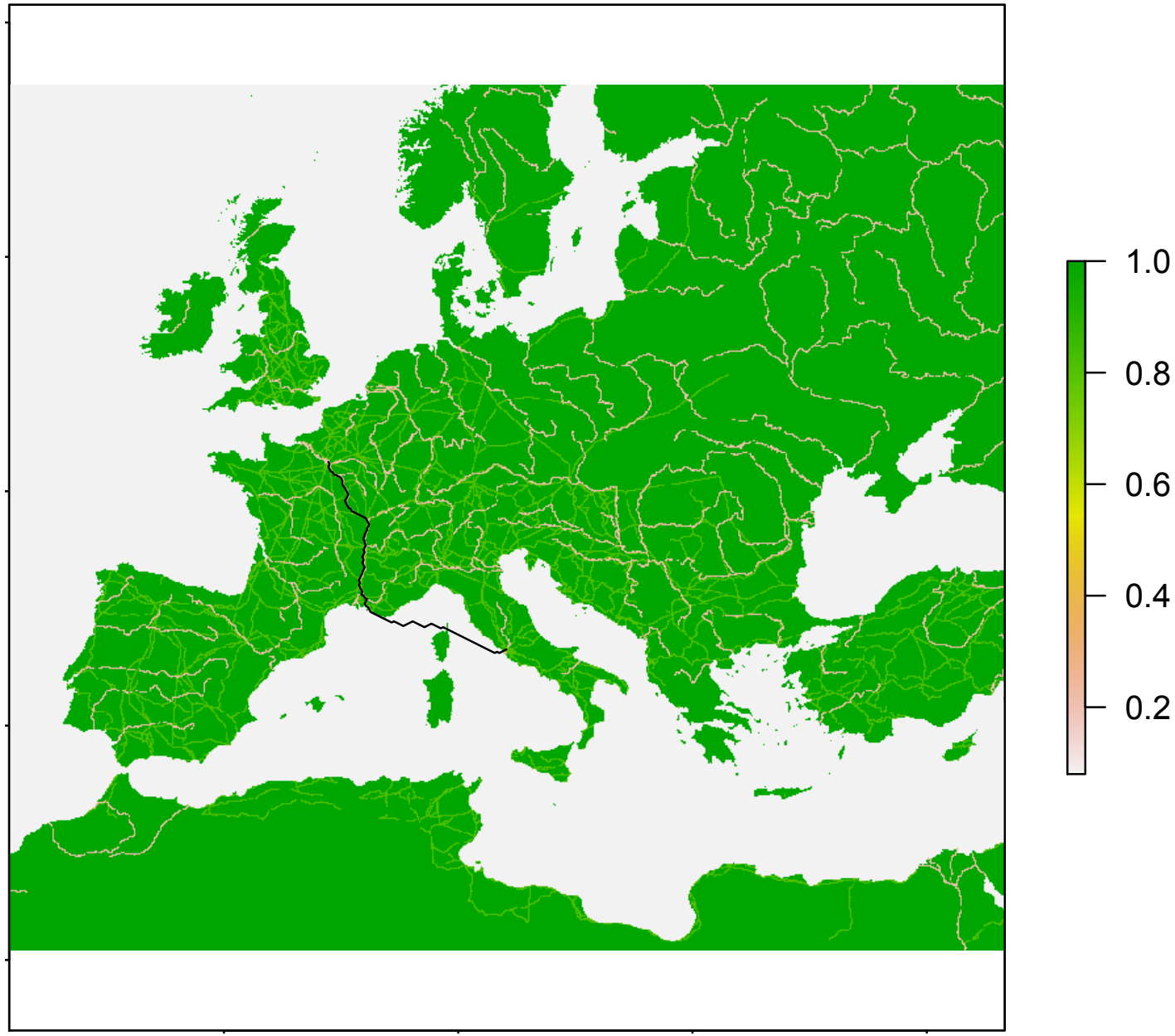
Paris to Rome



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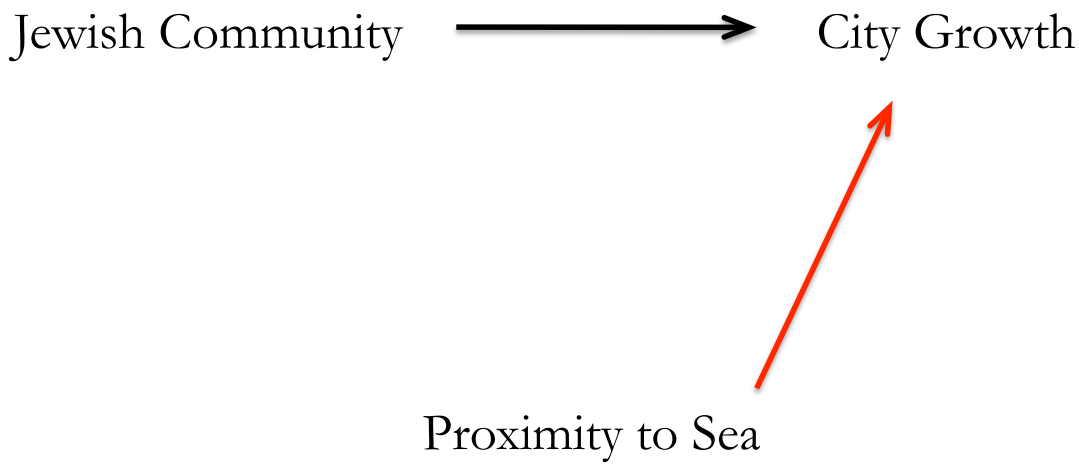
The Identification Problem

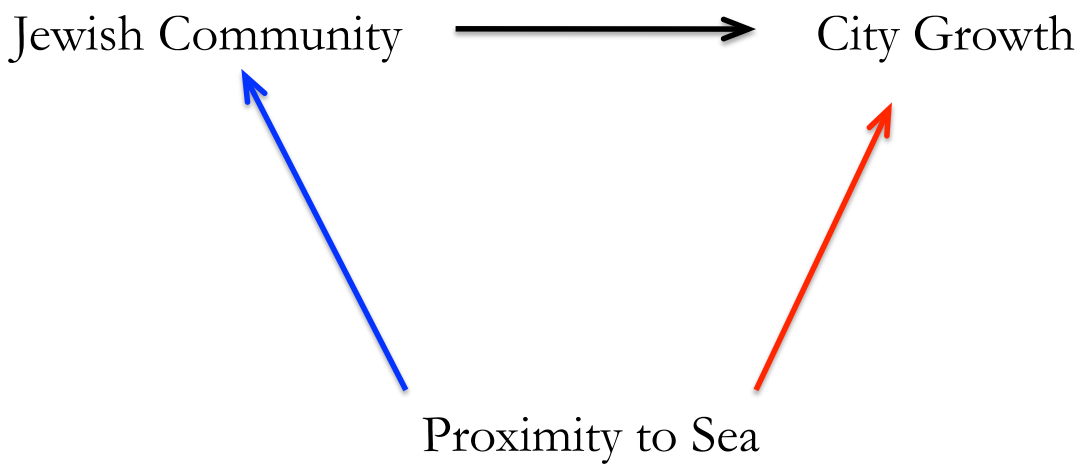
The Identification Problem

Proximity to Sea

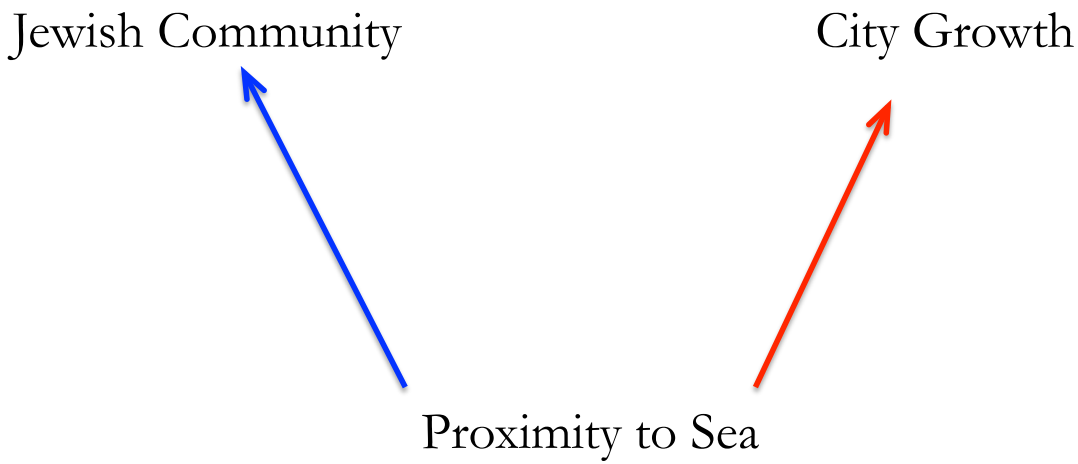
The Identification Problem



The Identification Problem



The Identification Problem



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