The Academic Market and the Rise of Universities in Medieval and Early Modern Europe (1000-1800)

David de la Croix
UCLouvain & CEPR

Frédéric Docquier
Liser (Luxemburg)

Alice Fabre
AMSE (Aix-Marseille)

Robert Stelter
U. Basel

Melbourne, October 2022

Universities

Universities: original creation of the Western civilization during the Middle-Ages

1. universities are corporations: rule-setting nonstate voluntary organization
2. *Universitas* meant community (of masters and/or of students)
3. subjects taught by plurality of masters ($\neq$ private tutoring).
4. invited students from all parts of Europe (large literature in history)
5. separate faculties of theology, medicine, law and arts
6. extremely stable and more persistent than States themselves.

Questions in this paper

Was there an **integrated** academic market since the Middle Ages? Did it matter ?

Should help to sustain a market:

- Political fragmentation of Europe preventing strong control from the top.
- Intellectual unity (use of latin).
- *licentia ubique docendi*, right to teach anywhere with a doctoral degree

Would allow to harness together universities and UTHC (upper tail human capital)

Background idea: integrated market + bottom-up institutions + UTHC $\rightarrow$ high rate of creation and dissemination knowledge (de la Croix, Doepke & Mokyr, QJE 2018)

▸ Type of knowledge taught

What we do

Build a database of tens of thousands of scholars from university sources
Includes both well-known and obscure scholars

Map the academic market in the medieval and early modern periods in Europe

Empirically determine in a location choice model:

- the presence of agglomeration forces
- Is mobility associated with individual quality? (positive selection)
- Are high quality scholars attracted by notable places? (positive sorting)

Those forces witness academic market integration

Simulate effects of these forces on (hypothetical) output of universities $\rightarrow$ gains?

Literature - Our project speaks to:

The "stagnation-to-growth" literature in which Upper Tail Human Capital (UTHC) may play a role (Galor & Moav 2002, Mokyr 2005, Squicciarini & Voigtländer 2015, Dittmar 2017)

The "institution and growth" literature on universities (Cantoni & Yuchtman 2014, Dittmar et al. 2019). We stress what makes universities operate better together with UTHC.

The migration literature in general and in historical contexts in particular:

- Positive or negative selection in the Age of Mass Migration (1850-1920) (Abramitsky, Boustan, Eriksson, AER 2012)
- Scholars are less sensitive to distance (Fink et al. 2013, Appelt et al. 2015)

Data

Universe: university scholars, Latin Europe, 1000 CE-1800 CE.
Size ? about 131000 scholars (ex: ▸ details), we have 31% of them (hope to get to 40%)

Originality:
– Starts from institutions data, and match them with biographical dictionaries
– European scope (needed to catch mobility patterns)

Universe is well defined, but two degrees of freedom:
–definition of university and starting date
–scholars intervening at the margin (Copernicus, Spinoza)

Types of sources

Comprehensive coverage

- Electronic catalogues of professors (ex: ▸ Catalogus Professorum Rostochiensium)
- Printed catalogues of professors (ex: ▸ Lebensskizzen der Professoren der Universität Jena)
- Printed list of professors matched with bio dictionaries (ex: ▸ Histoire de la faculté de médecine d'Avignon)

Broad coverage

- Books on history of university k matched with bio dictionaries (ex: ▸ Saumur, ▸ Provence, ▸ Salamanca)

Partial coverage

- Various Encyclopedia & Thematic biographies (ex: ▸ Medieval and Early Modern Jurists)

Descriptive statistics - institutions

127 institutions are retained in the analysis (with coverage Comprehensive or Broad)
Top places in terms of number of scholars (with known birthplace)

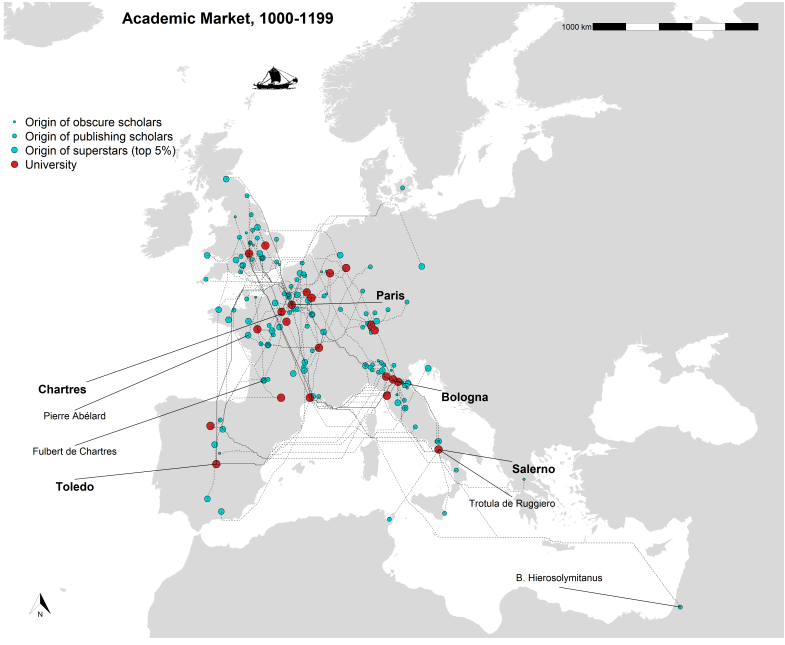
University	Start	# Obs.	Main sources	Coverage
Bologna	1088	3014	Mazzetti (1847)	C
Padua	1222	1922	Facciolati (1757), Del Negro (2015)	C
Pavia	1361	1515	Raggi (1879)	C
Heidelberg	1386	1167	Drull (1991, 2002)	C
Paris	1200	1228	Antonetti (2013), Hazon and Bertrand (1778), Féret (1904), Courtenay (1999), Studium	B
Cracrow	1364	1014	Pietrzyk and Marcinek (2000), Jagielónski (2019)	C
Pisa	1343	941	Fabroni (1791)	C
Ingolstadt	1459	800	von Schrottenberg (1978), Wolf (1973)	C
Mainz	1476	739	Benzing (1986)	C
Macerata	1540	684	Serangeli (2010)	C
Louvain	1425	701	Ram (1861), Nève (1856), Brants (1906), RAG	B

Summary statistics for professors

Periods τ	Nb. obs	Nb. univ	Birthpl. known (%)	Wiki. (%)	Worldcat(%)
0 (1000–1199)	289	17	73.4	49.8	49.5
1 (1200–1347)	1,874	33	63.8	20.5	19.9
2 (1348–1449)	4,404	49	70.2	9.6	9.1
3 (1450–1526)	6,447	69	66.4	11.1	15.5
4 (1527–1617)	8,242	140	73.1	22.6	37.5
5 (1618–1685)	6,861	154	71.7	22.7	41.8
6 (1686–1733)	5,036	148	69.1	23.5	46.2
7 (1734–1800)	7,396	159	76.8	35.9	57.9
Total	40,549	195	71.2	22.0	35.7

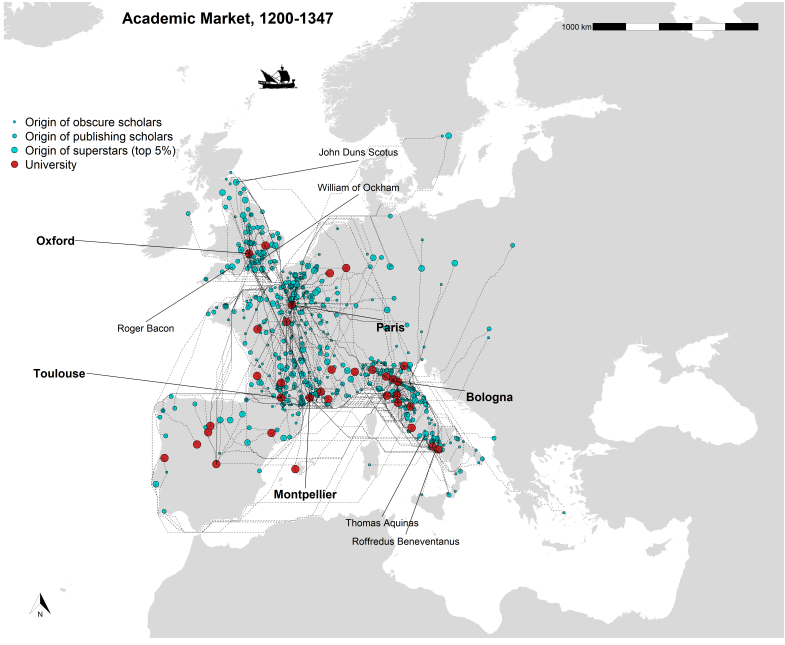
▸ Geo coverage ▸ Barycenter ▸ Fields ▸ Women? ▸ Quality of data

Note: events dividing the periods: 1200, Black death, Printing Press, Protestantism, 30 Year War, Revocation of the Edict of Nantes, First “enlightened” university

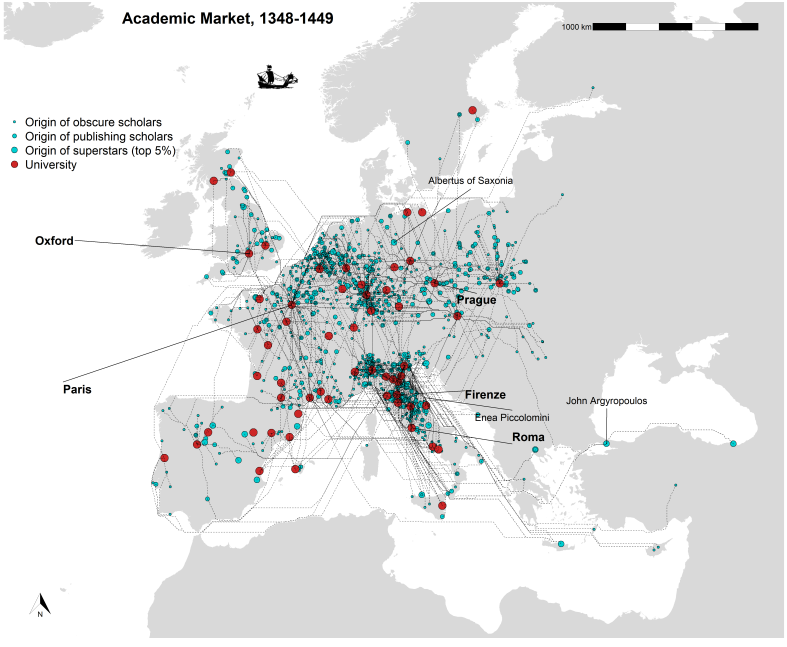


Period 1000-1199

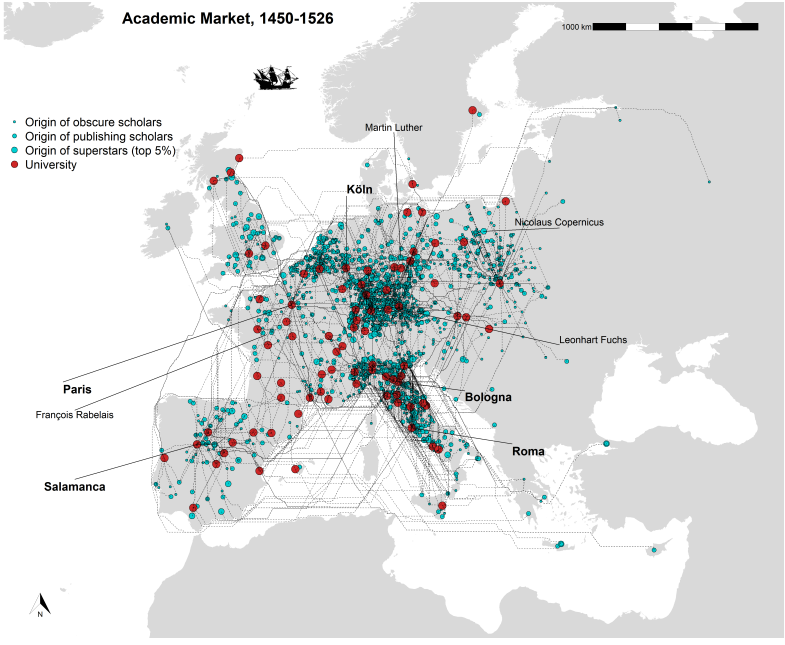
note: uses Ozak's human mobility index



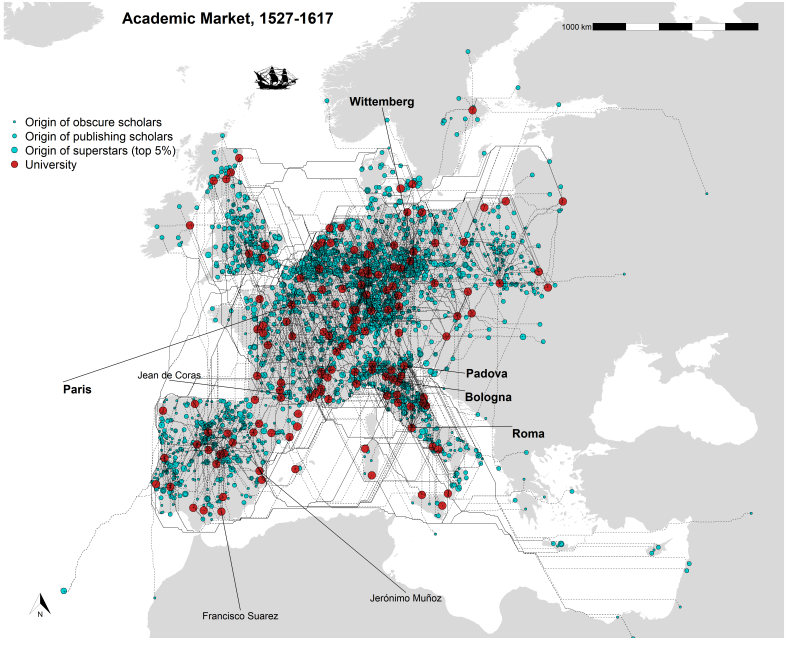
Period 1200-1347



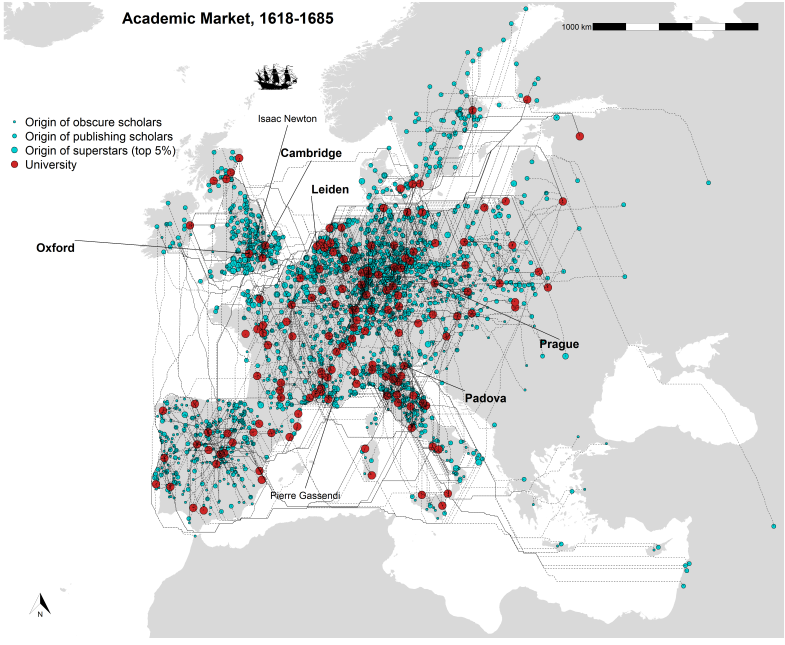
Period 1348-1449



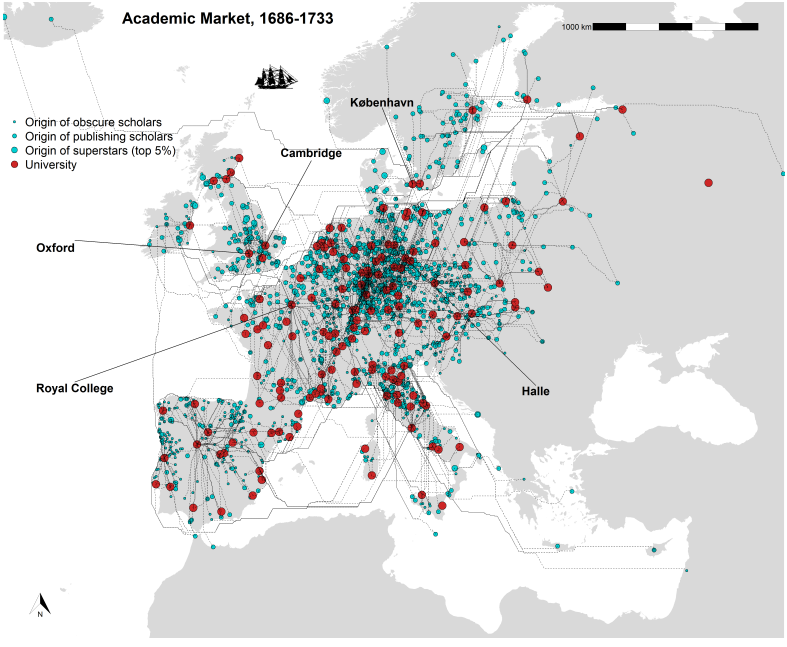
Period 1450-1526



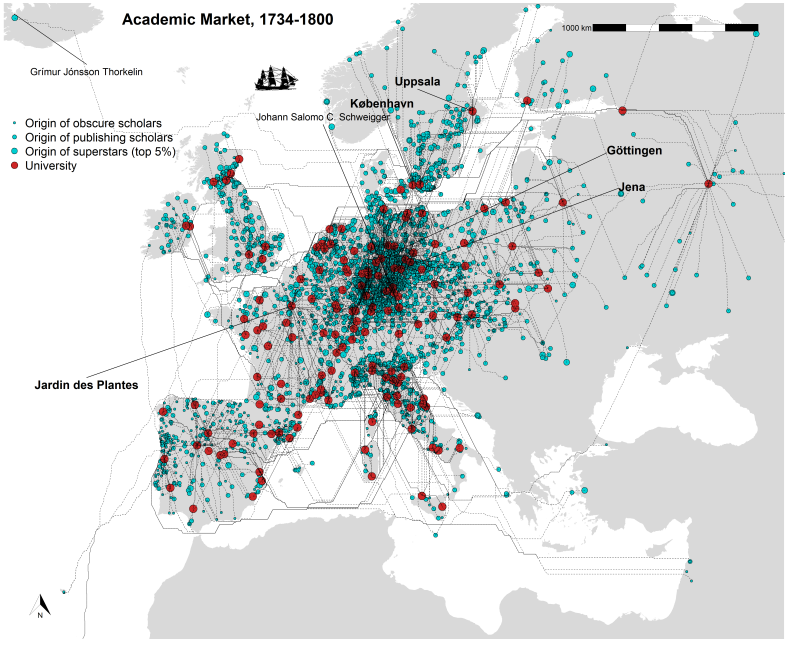
Period 1527-1617



Period 1618-1685



Period 1686-1733



Period 1734-1800

Three notions

Human capital of an individual q_i. Measured from the achievements of i as seen as today in Worldcat (publications from and about) and Wikipedia (for the service to society part)

Notability of university k, Q_{kt}, at time t, aggregation of the human capital of the best 5 scholars active during the 25 years preceding t, but not at t

Simulated university output of k, Y_{kt}: Aggregation of the human capital of all scholars working there at time t

Human capital of an individual

We take the first principal component of

- # characters $\in (60, 259k)$ of longest wikipedia page
- # languages $\in (1, 212)$ in which a Wikipedia page exists
- # of works (by or about) in Worldcat, $\in (1, 79k)$
- # of publication languages in Worldcat, $\in (1, 52)$
- # of library holdings in Worldcat, $\in (1, 093k)$

Individuals

The first Principal Component explains 3/4 of total variations in the variables ▸ Details

The resulting human capital index q_i is positively correlated with the few wages one can find in selected universities

Top Professors: Martin Luther (Wittenberg), Immanuel Kant (Königsberg), Friedrich von Schiller (Jena), Niccolo Machiavelli (Firenze), Giovanni Boccaccio (Firenze), Isaac Newton (Cambridge), Galileo Galilei (Pisa, Padova), Thomas Aquinas (Paris, Napoli), Johannes Calvin (Geneva), Desiderius Erasmus (Louvain, Freiburg, Cambridge), Baruch Spinoza (≈Leiden), Francis Bacon (Cambridge), David Hume (Edinburgh), Adam Smith (Glasgow, Edinburgh).

For obscure scholars $q_i = 0$ (no Worldcat, no Wiki)

Tomb of Bonandrea de Bonandreis, lectured on canon law at Bologna in 1321-22 – no publication from him survived →

← Gothic house built by Antoine de Dorne, lectured on law at Valence 1520-1551 – no publication from him survived

Measuring the university notability

Given unequal sampling rates, taking sums, means, medians of individual human capital would be biased

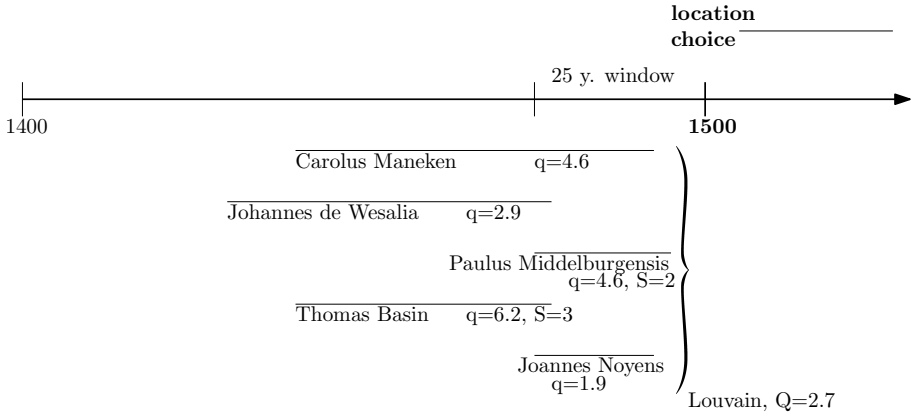
For a given time t, We define the notability of an institution k as a function of the human capital of the top 5 individuals i being retired or death at t but having spend time there in the last 25 years:

$$Q_{kt} = f(q_1, q_2, q_3, q_4, q_5)$$

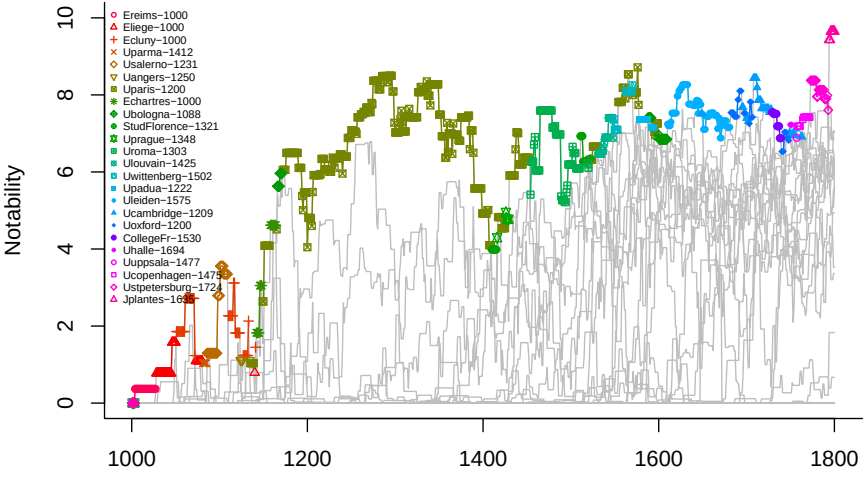
For $f(\cdot)$, we require $f(a, b, c, d, 0) > 0$, and
$f(a, b, c, 0, 0) + f(0, 0, 0, d, e) < f(a, b, c, d, e)$

In practice, we use a CES production function with high substitution ($\sigma = 2$)

Example on how Q_{kt} is built: University of Louvain in 1500



Top institutions



Individual location choice

Matching models (AKM, 1999) identify workers (scholars) and firms (universities) fixed effect $\rightarrow$ measure sorting

- but require match specific outcomes (e.g. wages) to identify firms fixed effect from repeat movers
- we do not observe such outcomes

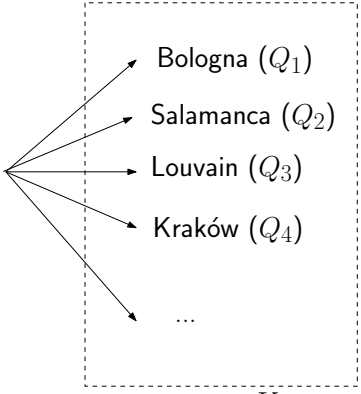
Discrete choice model where professors decide where to locate in Europe

- require supply to be elastic: universities have a fixed number of chairs but a large number of other very flexible positions (e.g. the fellows in Oxbridge, the *professores designati*, the "survivanciers" (designated successor))
- supply side elements introduced as benefits and costs for i of locating at k

Discrete choice model

Consider a discrete choice model where professors decide where to locate in Europe.

scholar with q_i



CHOICE SET K_i

Discrete choice model - Specificities

Compared to literature on migration, three specificities:

Geolocalization. Individual data with geo-localized origin and destination.

Varying choice set K_i. As new universities are created (or abandoned) over time, the portfolio of options depend on when each individual lived.

Repeat movers. 12% of individuals make multiple choices / repeated choices. We do not necessarily know the timing of choices. ▸ Example

Model

The utility that a professor i would obtain from locating in university $k \in K_i$:

$$U_{isk} = V_{ik} + \varepsilon_{isk} = \beta \boldsymbol{x}_{ik} + \varepsilon_{isk}, \tag{1}$$

$V_{ik} = \beta \boldsymbol{x}_{ik}$: deterministic component of utility
$\boldsymbol{x}_{ik}$: vector of observable variables
ε_{isk} captures random taste shocks. s: "stage" of career.

Multinomial logit: $\varepsilon_{isk} \sim$ Extreme Value Type-1 distribution.
The probability university k represents the utility-maximizing choice for professor i (McFadden, 1974):

$$p_{isk} \equiv \text{Prob}\left[U_{isk} = \underset{k' \in K_i}{\text{Max}} U_{isk'}\right] = \frac{\exp(\beta \boldsymbol{x}_{ik})}{\sum_{k' \in K_i} \exp(\beta \boldsymbol{x}_{ik'})}.$$

Components of utility

U_{isk}: difference between benefits from and costs for i of locating at k

In a simple **gravity** model:

Costs for i of going to k is increasing in distance from place of birth d_{ik} (distance from family/ language difference)

And depends on the mass of k: Universities fixed effects f_k

Market mechanisms

Additional Benefits: bigger cities ($P_{kt(i)}$) & highly notable universities ($Q_{ikt(i)}$) might pay higher wages (▸ Anecdote 1) [agglomeration]

Recruitment policy of best/richest universities involved efforts to attract international talent ($q_i Q_{ikt(i)}$). (▸ Anecdote 2) [positive sorting]

High-ability professors have a higher market value in general ($d_{ik} q_i$), making them less sensitive to distance. (▸ Anecdote 3) [positive selection]

$\rightarrow \boldsymbol{x}_{itk} = (f_k, d_{ik}, Q_{ikt(i)}, P_{kt(i)}, D_{kt(i)},\ d_{ik} q_i,\ q_i Q_{ikt(i)})$

Parameter Estimates (2,694,139 dyads, 31,478 links, 127 institutions)

Distance:					
d_{ik}	-1.733***	-1.729***	-1.824***	-1.727***	-1.818***
	(0.006)	(0.006)	(0.009)	(0.006)	(0.009)
Agglomeration:					
$Q_{ikt(i)}$		0.150***	0.152***	0.115***	0.119***
		(0.005)	(0.005)	(0.006)	(0.006)
$P_{kt(i)}$		0.118***	0.116***	0.119***	0.117***
		(0.019)	(0.019)	(0.019)	(0.019)
$D_{kt(i)}$		0.171***	0.177***	0.165***	0.171***
		(0.035)	(0.036)	(0.035)	(0.036)
Selection:					
$d_{ik}\,q_i$			0.046***		0.045***
			(0.003)		(0.003)
Sorting:					
$Q_{ikt(i)}\,q_i$				0.017***	0.015***
				(0.001)	(0.001)

Note:
estimated by maximum likelihood

university fixed effect included

$q_i \in [0, 12]$

Results

Main results:

- Gravity: coefficient of distance above 1 (today: 0.5 for all migrants, 0.3 for college grads, < 0.2 for scientists)
- Agglomeration: important
- Selection: significant but small (effect of d_{ik} $\downarrow$by 15% when $q_i \approx 10$)
- Sorting: significant and large ($\times 2$ agglom effect when $q_i \approx 10$)

Size of effects ?

Effect on total academic output?

Constancy of the effect of distance ?

Is the coefficient of distance stable over time?

Specification with distance interacted with a period dummy.

The estimated coefficients are: -1.225, -1.301, -1.684, -1.737, -1.698, -1.816, -1.843, and -1.850.

Lower during the Middle Ages:
–reflects weaker national states, common religion,
–little progress in the quality of roads until very late in the 18th century,
–maritime travel across Europe was quite stationary before the invention of steamboats

Size of effects – Two case studies

Thomas Aquinas (1225-1274), born in Roccasecca, taught theology at Paris (1252-72), Naples (1272-74)
$q = 11.66$ (9th), $\#K = 20$

Roffredus Beneventanus (1170-1243), born in Benevento, taught law at Naples (1224-28)
$q = 2.83$ ($\approx$ median), $\#K = 17$

Compare predictions of full model *vs* model without agglomeration, selection and sorting

Thomas Aquinas

	Estimated	No agglom	No selec.	No sorting	None
Ubologna-1088	32.2%	22.4%	27.7%	18.3%	8.1%
Unapoli-1224	17.7%	21.6%	34.1%	25.5%	44.7%
Uparis-1200	13.9%	6.2%	6.7%	5.6%	0.9%
Upadua-1222	11.7%	15.1%	10.7%	16.8%	14.7%
Upisa-1343	11.1%	14.4%	10.8%	16.2%	15.2%
Usalerno-1231	2.5%	4.4%	4.0%	3.6%	7.7%
Umontpellier-1289	1.6%	2.1%	1.0%	2.3%	1.4%
Others (13)	9.2%	13.9%	5.8%	11.7%	7.4%

removing agglomeration & sorting:
- spreads probabilities across all destinations
- lowers attractiveness of famous universities (Paris)

Beneventanus Roffredus

	Estimated	No agglom	No selec.	No sorting	Nothing
Unapoli-1224	36.0%	37.3%	38.5%	37.4%	40.9%
Usalerno-1231	24.0%	25.3%	27.2%	23.5%	27.7%
Ubologna-1088	12.5%	8.5%	10.9%	11.2%	6.5%
Upadua-1222	11.8%	12.9%	10.4%	12.3%	11.6%
Upisa-1343	8.5%	9.4%	7.5%	8.9%	8.4%
Uparis-1200	2.6%	1.1%	1.9%	2.1%	0.7%
Umontpellier-1289	1.3%	1.2%	1.0%	1.3%	1.0%
Others (10)	3.2%	4.2%	2.5%	3.4%	3.3%

Same features, but less strong, as Beneventanus Roffredus is not as good as Aquinas

Methodology to measure the effect on total academic output

Going beyond specific cases: contribution of market forces to academic output ?

Simulating model leads to **probabilities p_{ikt}** that each scholar i will go to university k during his active life

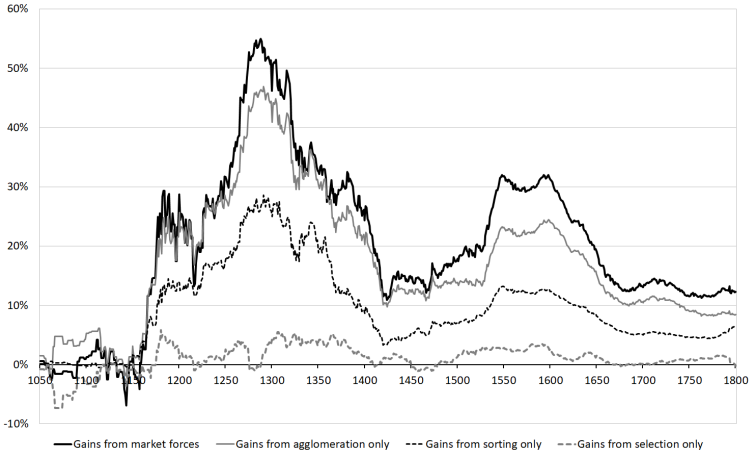
Hypothetical output of university k (for each period):

$$Y_{kt} = \left(\sum_i p_{ikt} q_i^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}}$$

$\rightarrow$ Simulate $Y_t = \sum_k Y_{kt}$ shutting down market forces one by one

If $\sigma = \infty$, changing the p_{ikt} does not affect total output
For σ finite, agglomeration of best people leads to gains

Effect of agglomeration, selection and sorting (benchmark ML with $\sigma = 2$)



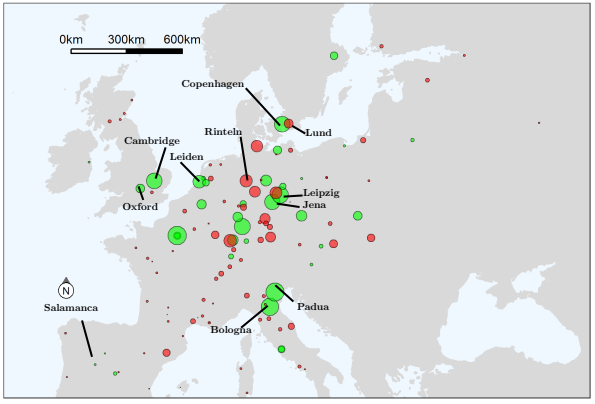
Sorting & agglomeration important until the Scientific Revolution (1550-1650).

Static gains $\approx 30\%$.

Importance of medieval roots in initiating academic output accumulation

Winners and losers from a globalised academic market

Gainers and losers in Period 6



1618-1685

Red: losers
Green: winners

size of circle proportional to gain/loss

Many losers were closed down

Systematic losers which were permanently closed down:
Altdorf (closed in 1809)
Bamberg (closed in 1803)
Cahors (closed in 1751)
Cervera (closed in 1821)
Dorpat (closed in 1710)
Harderwijk (closed in 1811)
Pont-à-Mousson (closed in 1768)
Rinteln (closed in 1809)
Siguenza (closed in 1807)
Valence (closed in 1793)

Some winners were closed down too:
Erfurt (closed in 1816)
Frankfurt (Oder) (closed in 1811)

Econometric issues

- Heterogeneity in of selection and sorting ?
  $\rightarrow$ run estimates by periods, fields, and country of origin ▸ Details
- Our sample might not be random. Biased estimation ?
  $\rightarrow$ add scholars with unknown birth place; add universities with low coverage
  ▸ Details
- Panel dimension not taken into account (repeat movers)
  $\rightarrow$ estimate a mixed logit in panel and check if it is different ▸ Details
- Individual quality q_i can be endogenous to location choice
  $\rightarrow$ endogeneity bias is mitigated in a nested logit model ▸ Details
- Robustness to arbitrary choice of σ ▸ Details

Conclusion - main result

Location pattern of European scholars over the period 1000-1800 using new database

What have we learned ?

Market integration forces are at work for allocating scholars to universities:
– agglomeration: scholars are attracted by notability of university, size of city, communal freedom
– sorting: the more talented scientists are attracted by best places

Simulations show that market forces bolstered universities at the dawn of the Scientific revolution

First step towards rooting in micro data a human capital driven growth model

Conclusion - some little surprises

If anything, mobility was greater in the Middle Ages than in the Early Modern period

An integrated academic market might have contributed to the Scientific Revolution rather than to the Industrial Revolution

There are gainers and losers from integration (but we knew that already)

What knowledge are we talking about?

An academic market may have contributed to the greatness of Medieval Universities, which

- revived of Roman Law, better suited to regulate complex economic transactions than prevailing customary rules
- translated and expanded the philosophical and scientific works from Classical Arabic and Greek.
- developed scientific thinking in Europe (e.g. Ockham's parcimony principle, Duns Scotus' logic, Roger Bacon's empiricism)
- promoted the nuclear family view & monogamy (theology)
- initiated interest in natural sciences (e.g. botanic gardens in medical faculties)

▸ Back

Size of the universe ?

Estimation based on University of Heidelberg, 414 years of existence, 1,205 scholars
$\rightarrow$ 2.91 persons per y.
195 universities. 51,582 years of existence. $\rightarrow$ 150,136 scholars
Mean number of appointments per scholar: 1.14. $\rightarrow$ 131,698 unique scholars

Current coverage of sample: 40,549 $\div$131,698 = **30.8%**

▸ Back

Positive selection

In biology: Positive natural selection is the force that drives the increase in prevalence of advantageous traits

In migration literature: Better people migrate more often

In our location choice model: Better people are less sensitive to distance from birthplace

Sorting

In common sense: Sorting is any process of arranging items systematically, and has two common, yet distinct meanings:

- ordering: arranging items in a sequence ordered by some criterion;
- categorizing: grouping items with similar properties.

In migration literature: households with better attributes are concentrated in the region where returns are higher

Here: Better people are more likely to settle in more prestigious universities and/or in more attractive cities

Example of web-catalogues: *Catalogus Professorum Rostochiensium*

Krantz, Albert(us)

Lebensdaten: * 1448 in Hamburg
† 07.12.1517 in Hamburg
Prof. in Rostock: 1481-1486
zuletzt: Philosophische Fakultät

Chytraeus, David

Lebensdaten: * 26.02.1530 in Ingelfingen
† 25.06.1600 in Rostock
Prof. in Rostock: 1551-1600
zuletzt: Professor der Theologie (Primarius, herzoglich)
zuletzt: Theologische Fakultät

Chytraeus, Nathan

akadem. Titel: Prof.
Lebensdaten: * 15.03.1543 in Menzingen
† 25.02.1598 in Bremen
Prof. in Rostock: 1564-1593
zuletzt: Professor der Poesie (herzoglich)
zuletzt: Philosophische Fakultät

▸ Back

Example of printed catalogues of professors

Lebensskizzen

der

Professoren der Universität Jena

seit 1558 bis 1858.

Eine Festgabe

zur dreihundertjährigen Säcularfeier der Universität

am 15., 16. und 17. August 1858

von

Dr. Johannes Günther.

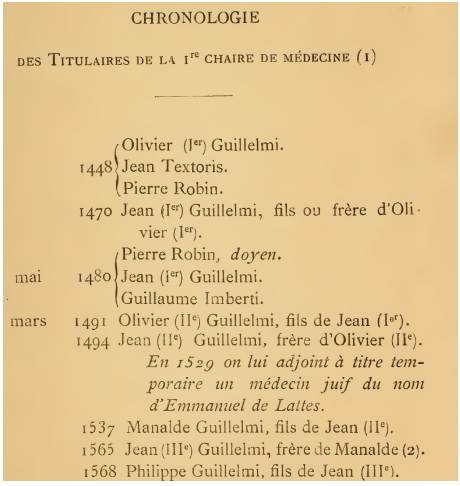
Martin Mirus,

geboren zu Weida 1532, wurde vom Kurfürsten Christian I. als Hofprediger nach Dresden berufen, erhielt aber bald seine Entlassung. Er ging nun 1588 als Superintendent und Professor der Theologie nach Jena, blieb aber auch hier nur kurze Zeit, worauf er sich nach Helmstädt wendete, bis ihn die Wittwe des Kurfürsten Christian I. wieder zurückrief und zum Kirchenvisitator des meißener Kreises ernannte. Er starb auf dem Schlosse Caverdiz (Karditz) bei Oschatz am 14. August 1593.

Seine Schriften sind in Chr. G. Jöcher, Allg. Gel.-Lex. 3. Th. S. 554 aufgezählt. Vgl. Adr. Beier, Syll. rect. et prof. Jenae etc. p. 470.

Back

Example of list of professors



CHRONOLOGIE

DES TITULAIRES DE LA Ire CHAIRE DE MÉDECINE (1)

1448 Olivier (Ier) Guillelmi.
1448 Jean Textoris.
1448 Pierre Robin.
1470 Jean (Ier) Guillelmi, fils ou frère d'Olivier (Ier).
mai 1480 Pierre Robin, *doyen*.
mai 1480 Jean (Ier) Guillelmi.
mai 1480 Guillaume Imberti.
mars 1491 Olivier (IIe) Guillelmi, fils de Jean (Ier).
1494 Jean (IIe) Guillelmi, frère d'Olivier (IIe).
En 1529 on lui adjoint à titre temporaire un médecin juif du nom d'Emmanuel de Lattes.
1537 Manalde Guillelmi, fils de Jean (IIe).
1565 Jean (IIIe) Guillelmi, frère de Manalde (2).
1568 Philippe Guillelmi, fils de Jean (IIIe).

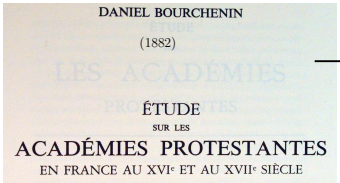
To be completed with entries from biographical dictionaries:

+Jean Guilhelmi [Guilhermi, Guillelmi, Guillermi]. — Originaire du diocèse de Cahors, bachelier en médecine de Montpellier, il était, dès 1442, établi à Avignon, où il fut reçu maître en médecine, 1452 [1]. Il habitait près du Vieux Sextier.

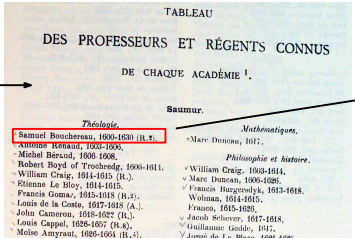
from Ernest Wickersheimer, Dictionnaire biographique des médecins en France au Moyen Age

▸ Back

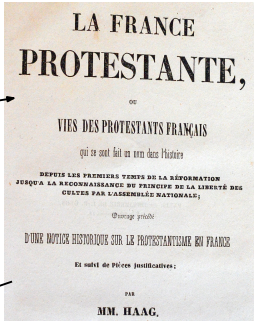
Matching book on history of university with bio dictionary



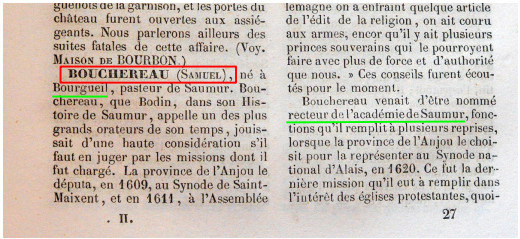
book on French protestant universities



list of professors for university of Saumur



Life of French protestants (10 vol.)


gueuois de la garnison, et les portes du château furent ouvertes aux assiégeants. Nous parlerons ailleurs des suites fatales de cette affaire. (Voy. MAISON DE BOURBON.)

BOUCHEREAU (SAMUEL), né à Bourgueil, pasteur de Saumur. Bouchereau, que Bodin, dans son Histoire de Saumur, appelle un des plus grands orateurs de son temps, jouissait d'une haute considération s'il faut en juger par les missions dont il fut chargé. La province de l'Anjou le députa, en 1609, au Synode de Saint-Maixent, et en 1611, à l'Assemblée

lemagne on a enfraint quelque article de l'édit de la religion, on ait couru aux armes, encor qu'il y ait plusieurs princes souverains qui le pourroyent faire avec plus de force et d'authorité que nous. » Ces conseils furent écoutés pour le moment.

Bouchereau venait d'être nommé recteur de l'académie de Saumur, fonctions qu'il remplit à plusieurs reprises, lorsque la province de l'Anjou le choisit pour la représenter au Synode national d'Alais, en 1620. Ce fut la dernière mission qu'il eut à remplir dans l'intérêt des églises protestantes, quoi-

Back

Matching book on history of university with bio dictionary

HISTOIRE

DE

L'ANCIENNE UNIVERSITÉ

DE PROVENCE

OU

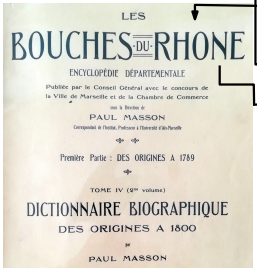
HISTOIRE DE LA FAMEUSE UNIVERSITÉ D'AIX

d'après les manuscrits et les documents originaux

PAR

F. BELIN

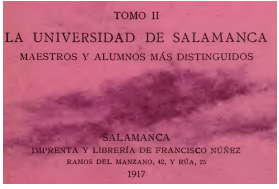
(1) Me Biçais fut nommé médecin du Roi le 23 mai 1641. Voir « Provision de l'office de médecin du Roy pour Me Honoré Biccays, docteur et professeur en médecine en l'Université d'Aix ». (*Archives des Bouches-du-Rhône*, série B, Reg. 98, fo 371 vo). — Son fils Michel Biçais, comme lui « professeur en médecine » dans l'Université d'Aix, a laissé un ouvrage curieux, aujourd'hui rare, intitulé : « *La manière de régler la santé par ce qui nous environne, par ce que nous recevons, et par les exercices ou par la gymnastique moderne* », et imprimé à Aix en 1669.



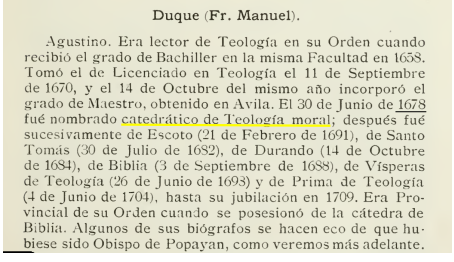
Bicaïs (Honoré), né à Oraison (Basses-Alpes) vers 1590, mort à Aix, régent en médecine à l'Université d'Aix, se distingua pendant les pestes de 1629 et de 1649. Père de Michel Bicaïs, qui lui succéda dans sa chaire et dans sa réputation.

Back

Example of matching



list of professors

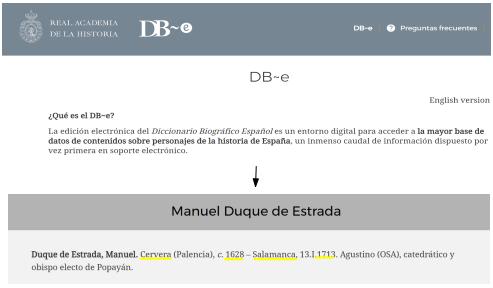


Duque (Fr. Manuel).

Agustino. Era lector de Teología en su Orden cuando recibió el grado de Bachiller en la misma Facultad en 1658. Tomó el de Licenciado en Teología el 11 de Septiembre de 1670, y el 14 de Octubre del mismo año incorporó el grado de Maestro, obtenido en Avila. El 30 de Junio de 1678 fué nombrado catedrático de Teología moral; después fué sucesivamente de Escoto (21 de Febrero de 1691), de Santo Tomás (30 de Julio de 1682), de Durando (14 de Octubre de 1684), de Biblia (3 de Septiembre de 1688), de Vísperas de Teología (26 de Junio de 1693) y de Prima de Teología (4 de Junio de 1704), hasta su jubilación en 1709. Era Provincial de su Orden cuando se posesionó de la cátedra de Biblia. Algunos de sus biógrafos se hacen eco de que hubiese sido Obispo de Popayan, como veremos más adelante.

nomination date

field



vital dates, place of birth, other info (no printed here)

note: no Wikipedia, no Worldcat entry

Back

Example of thematic biographies

Medieval and Early Modern Jurists: A Bio-Bibliographical Listing

Detail from Tomb of Mondino de' Liuzzi († 1326), sculpted by Roso (Boso) da Parma, Church of San Vitale, Bologna

With the support of the Ames Foundation (http://amesfoundation.law.harvard.edu/), this site is being completely revamped during this academic year (2011 to the present). The results are now available at the link above. We are expanding the chronological coverage to 1750 and will (slowly) include civilian jurists in our data base. This site was first put online in 1993 and was compiled for the History of Medieval Canon Law project with the support of the National Endowment for the Humanities (1989-1996), the Gerda Henkel Stiftung (1988-1992), the Werner Reimers Stiftung (1990-1991), and the Alexander von Humboldt Stiftung (1993-1996). It now continues with the generous support of the Ames Foundation.

The entries are still being up-dated regularly. If you have additions or corrections, please send them to Ken Pennington pennington@cua.edu

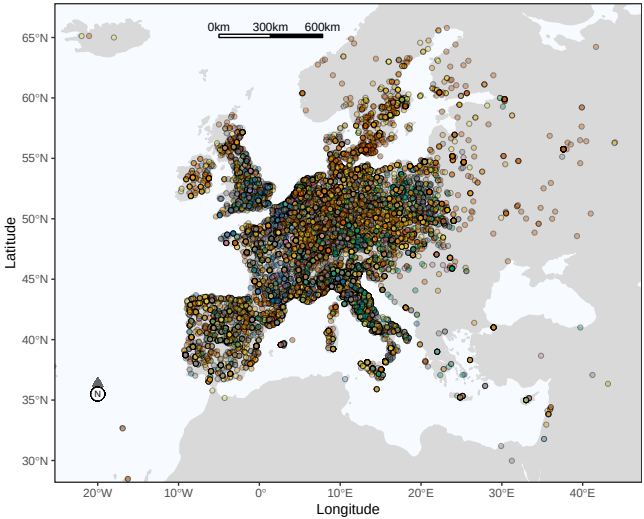
The listings are divided into two parts, 1140-1298 and 1298-1500. Collections are listed by their most common title and the canonists are alphabetized by their first names. The abbreviations are those used by the Bulletin of Medieval Canon Law and can be found in the List of Abbreviations of that journal.

Collections and Jurists: 1140-1298	Collections and Jurists: 1298-1500
A-Z	A-Z

Back

Origin of birth of scholars

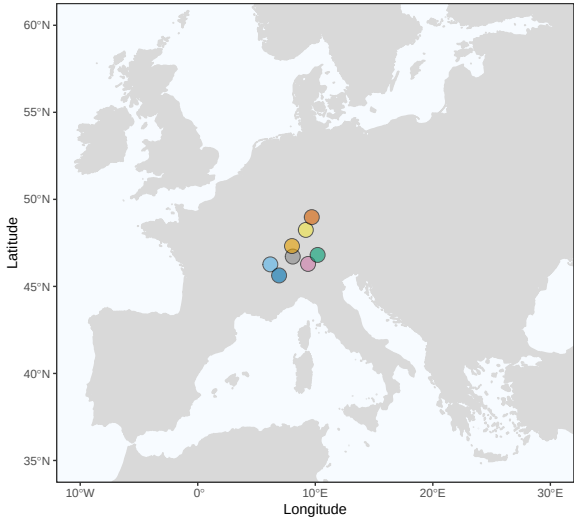
All universities / Sat Mar 26 13:32:18 2022



▸ Back

barycenter of places of birth

All universities / Thu Jul 08 10:17:12 2021



▸ Back

Scholars were mostly male, with a few exceptions

Trotula de Ruggiero (11^{th} century) and a few others in Salerno

Novellà Calderini was so beautiful that she had to teach hidden from behind a curtain (in Bologna around 1340).

Beatriz Galindo in Salamanca (Renaissance)

Dorothea Christiane Erxleben in Halle (1754)

Back

Data: often precise, but many (early) cases are not

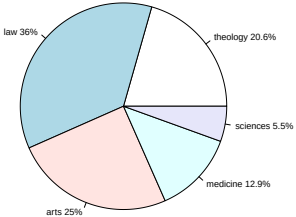
Benevenutus of Jerusalem: Ophthalmologist. life is unknown (between 1100 and 1290) Might be born in Jerusalem (Latin kingdom (1099–1187)).

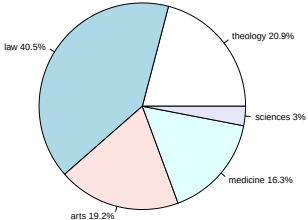
Book immensely influential – many translations

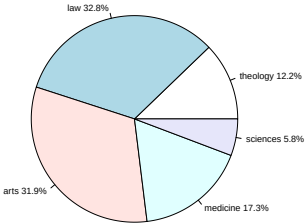
Acquainted with the medical schools of Salerno, and Montpellier

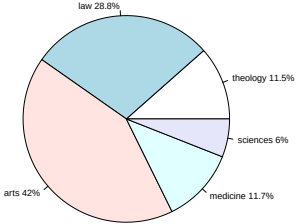
"considerable disparity between the fragility of the documentary basis for the Montpellier inscription and the robustness of the stone on which it was engraved." (Kedar 1995) ▸ Back

What are they teaching? Fields for the first four periods



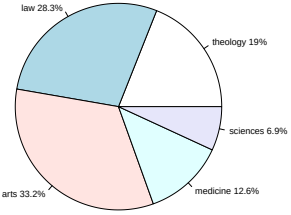


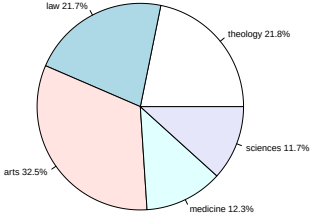


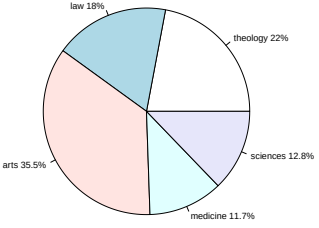


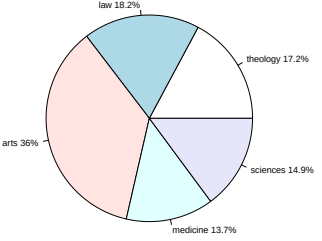
Note: Mostly based on teaching. A person may act in more than one "field".

What are they teaching? Fields for the last four periods



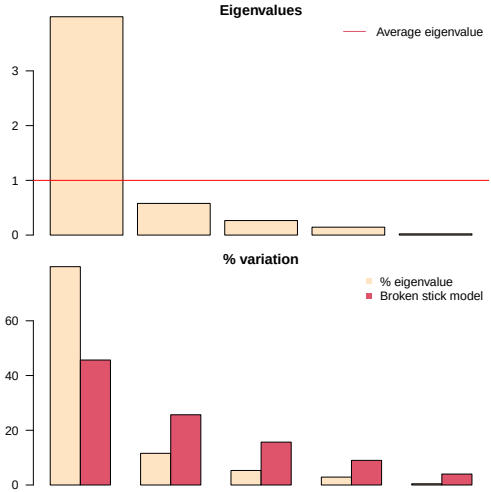






Back

Principal component analysis



Disregarding Wikipedia leads to similar results
(correlation of 1st PC with and without Wiki $= 0.96$)

Separating "publications by" and "publications about" does not add much
(correlation of 1st PC with and without such distinction $= 0.99$)

Back

Jean de Coras (1513-1572)

French jurist. We find him teaching in Padova, Toulouse, Ferrara, Valence.

According to Taisand (1721) also in Orléans, Paris, and Angers. We do not know in which order

Anecdote: He was the judge who instructed the famous trial of Martin Guerre, at the basis of the movie "the return of Martin Guerre" with Gérard Depardieu Back

Repeat movers in general

12% of scholars are linked to more than one university

76% of repeat movers have at least one recorded publication, as opposed to 41% for one-time movers

Focusing on scholars with publications, average q of repeat movers is 25% greater than that of one-time movers

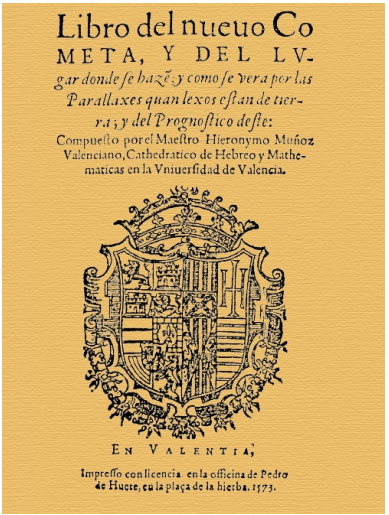
The shares of repeat movers in the population in periods 0 to 7 are equal to 18%, 16%, 8%, 9%, 13%, 12%, 14% and 11%.

The share of repeat movers varies from 5% in Denmark to 18% in the Netherlands, and 17% in Great-Britain.. ▸ Back

Attraction force of bigger cities/more notable universities

Jeronimo Munoz moved from Valencia to Salamanca in 1578. "Although Munoz was one of the best paid professors at the University of Valencia, his salary was considerably lower than those paid at universities in Castille. The prestige of the University of Salamanca, and its greater proximity to the seat of royal power, was probably also a factor in Munoz' decision to accept the offer made to him by Salamanca."

in The cultivation of Astronomy in Spanish Universities in the latter half of the 16th Century, by Navarro Brotons, 2006 ▸ Back


Libro del nueuo Co
META, Y DEL LV-
gar donde se haze, y como se vera por las
Parallaxes quan lexos estan de tier-
ra; y del Prognostico deste:
Compuesto por el Maestro Hieronymo Muñoz
Valenciano, Cathedratico de Hebreo y Mathe-
maticas en la Vniuersidad de Valencia.
EN VALENTIA,
Impresso con licencia en la officina de Pedro
de Huete, cu la plaça de la hierba. 1573.

Efforts to attract talents

In 1583, the university of Valence was searching for a well-known scholar in law. They send a messenger to convince a famous lawyer of Grenoble, Lescure, to join the university. The latter reported that he would be willing to come for a salary of 1500 pounds, and provided his moving costs and house rental cost were covered by the university. They finally agreed on 1200 pounds plus the house, partly paid by four merchants of the city.

Later on, his colleague Josserand became jealous of Lescure's treatment, threatened to go elsewhere, and finally obtained a pay rise.

Histoire de l'Université de Valence, by Nadal, 1861, p120–122

▸ Back

High-ability professors have a higher market value in general

Septalius (Lodivico Settala, 1552-1633).

Born and living in Milan, he taught medicine at the Univ. of Pavia and received offers from:

- the King of Spain,
- the Duke of Bavaria,
- the Duke of Tuscany,
- the city of Bologna,
- and the Senate of Venice,

He enjoyed receiving them as tokens of well-deserved honors, but accepted none. He preferred the company of his fourteen children to the luster of these foreign residences. (Dictionnaire historique de la médecine, by Eloy, 1755)

Back

Heterogeneity in Selection and Sorting ?

	Gravity d_{ik}	$Q_{ikt(i)}$	Agglomeration $P_{ikt(i)}$	$D_{ikt(i)}$	Selection $d_{ik}q_i$	Sorting $Q_{ikt(i)}q_i$	Nb of obs.
	Distance d_{ik}	$Q_{kt(i)}$	Agglomeration $P_{ikt(i)}$	$D_{ikt(i)}$	Selec $d_{ik}q_i$	Sorting $Q_{kt(i)}q_i$	Nb of obs.
Benchmark	-1.818***	0.119***	0.117***	0.171***	0.045***	0.015***	31,478
	By period (τ)						
1000-1526	-1.787***	0.216***	-0.019	0.545***	0.072***	0.006**	9,320
1200-1617	-1.819***	0.171***	0.118***	0.341***	0.065***	-0.004**	15,736
1348-1685	-1.837***	0.113***	0.117***	0.293***	0.051***	0.000	19,792
1450-1733	-1.849***	0.067***	0.258***	0.397***	0.047***	0.012***	20,471
1527-1800	-1.820***	0.027***	0.252***	0.461***	0.038***	0.025***	22,093
	By field						
W/o Theology	-1.819***	0.124***	0.172***	0.245***	0.047***	0.014***	25,017
W/o Law	-1.833***	0.106***	0.124***	0.093**	0.040***	0.018***	22,535
W/o Medicine	-1.797***	0.116***	0.126***	0.194***	0.041***	0.015***	26,753
W/o Sciences	-1.833***	0.131***	0.102***	0.173***	0.048***	0.012***	28,043
	By region of origin						
W/o Benelux	-1.799***	0.123***	0.089***	0.174***	0.045***	0.016***	29,818
W/o Germany	-1.782***	0.164***	0.073***	0.190***	0.041***	0.009***	23,655
W/o France	-1.772***	0.109***	0.098***	0.169***	0.039***	0.019***	27,838
W/o Italy	-1.774***	0.079***	0.241***	0.070	0.033***	0.020***	21,473
W/o UK/Irl	-1.808***	0.108***	0.063***	0.156***	0.053***	0.015***	29,827

Identifying the effect of D relies mostly on the first periods and on the Italian professors
Identifying sorting relies on the last four periods

▸ Back

Parameter Estimates for Different Samples

	Benchm	Sample Unknown	Adding partial cov.	Limited cov. $\Lambda_{kt} \geq 20$
	(1)	(2)	(3)	(4)
d_{ik}	-1.818***	-1.964***	-1.775***	-1.855***
	(0.009)	(0.008)	(0.008)	(0.014)
$Q_{kt(i)}$	0.119***	0.136***	0.122***	0.064***
	(0.006)	(0.006)	(0.006)	(0.009)
P_{kt}	0.117***	0.128***	0.138***	0.005
	(0.019)	(0.018)	(0.018)	(0.031)
D_{kt}	0.171***	0.191***	0.152***	-0.065
	(0.036)	(0.035)	(0.034)	(0.042)
$d_{ik} q_i$	0.045***	0.071***	0.039***	0.048***
	(0.003)	(0.002)	(0.002)	(0.004)
$Q_{kt(i)} q_i$	0.015***	0.015***	0.012***	0.026***
	(0.001)	(0.001)	(0.001)	(0.002)
FE	yes	yes	yes	yes
N. Obs.	31,478	42,597	32,918	19,728

Sampling depends on availability of information for each university

We make sample less selective by adding the persons from unknown origin $\rightarrow$ Assume they are locals $\rightarrow$ Reinforces the positive selection and gravity effects.

We can remove universities with low coverage $\rightarrow$ Reinforces sorting.

Back

Panel Dimension due to Repeated Choices

Assume coefficients β_i vary in the population (mixed logit) rather than being fixed (multinomial logit).

Individuals with several career spells keep the same β_i.

$\rightarrow$ accounts for individual unobserved preference factors common to all career spells.

Mixed logit Results

	Benchm	Removing repeat movers	Repeat movers linked to 1 univ.	Mixed logit
	(1)	(2)	(3)	(4)
d_{ik}	-1.818***	-1.953***	-1.873***	-2.103***
	(0.009)	(0.011)	(0.009)	(0.014)
$Q_{kt(i)}$	0.119***	0.135***	0.146***	0.124***
	(0.006)	(0.007)	(0.006)	(0.006)
P_{kt}	0.117***	0.122***	0.118***	0.106***
	(0.019)	(0.023)	(0.021)	(0.020)
D_{kt}	0.171***	0.262***	0.272***	0.220***
	(0.036)	(0.041)	(0.039)	(0.039)
$d_{ik} q_i$	0.045***	0.015***	0.023***	0.050***
	(0.003)	(0.004)	(0.003)	(0.003)
$Q_{kt(i)} q_i$	0.015***	0.022***	0.011***	0.017***
	(0.001)	(0.002)	(0.002)	(0.002)
Log Likelihood	-67,106	-44,153	-54,074	-66,236

Mixed logit Results

Individual-specific β_i drawn from Normal distribution.

Agglomeration and sorting are preserved.

Six additional parameters (the s.e. of the six coefficients - not reported), a likelihood ratio test would prefer the mixed logit formulation.

Drawbacks: estimation by simulation, & depend on assumption regarding the distribution of the β_i

Back

When individual quality is endogenous to location choice

Endogenous human capital: $q_i = \bar{q}_i + \theta Q_{ik^\star t(i)}$ with $\bar{q}_i$ innate ability; $Q_{ik^\star t(i)}$ quality of chosen university.

Consider simple case with sorting / no selection:

$$V_{ik} = \cdots + \beta_4 q_i Q_{ikt(i)}$$

note: q_i does not enter alone (not destination specific)
$\rightarrow$ endogeneity bias is proportional to $Q_{ikt(i)}$

Individual prefers k to k' if:

$$\bar{V}_{ik} + \varepsilon_{ik} > \bar{V}_{ik'} + \varepsilon_{ik} + \beta_4 \theta (Q_{ik't(i)} - Q_{ikt(i)}) Q_{ik^\star t(i)}$$

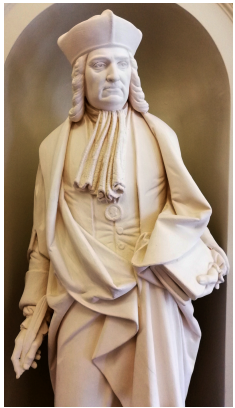
$\bar{V}_{ik}$ denotes the V_{ik} where q_i has been replaced by $\bar{q}_i$.

$\rightarrow$ violation of the IIA property, as the choice now depends on $Q_{ik^\star t(i)}$

Solution: nested logit model (building on Bertoli and Moraga, 2015)

- we define four nests as groups of universities sharing similar levels of notability
- we add a nest specific random shock implying a correlation between terms within nests
- choice becomes: choice between nests, choice of university within chosen nest
- In each nest, the choice is unbiased because $(Q_{k't(i)} - Q_{kt(i)})$ is small.

$\rightarrow$ this is a way to mitigate the bias caused by the possible endogeneity of q_i



scholar with q_i

nest top (ψ_1)

- Bologna (Q_1)
- Salamanca (Q_2)
- Louvain (Q_3)

nest medium (ψ_2)

- Kraków (Q_4)
- Napoli (Q_5)

nest bottom (ψ_3)

- Linz (Q_6)
- Palermo (Q_7)

Nested logit Results

	Benchmark	Nested
d_{ik}	-1.818***	-1.370***
	(0.009)	(0.011)
$Q_{ikt(i)}$	0.119***	0.084***
	(0.006)	(0.005)
P_{kt}	0.117***	0.075***
	(0.019)	(0.014)
D_{kt}	0.171***	0.129***
	(0.036)	(0.028)
$d_{ik}q_i$	0.045***	0.042***
	(0.003)	(0.002)
$Q_{ikt(i)}q_i$	0.015***	0.010***
	(0.001)	(0.001)
ψ_4 (low)	0.626***	
	(0.013)	
ψ_3	0.618***	
	(0.008)	
ψ_2	0.611***	
	(0.008)	
ψ_1 (high)	0.694***	
	(0.008)	

$\rightarrow$ Significance is not altered.

The $\psi_m = \sqrt{}$(1-correlation within nest) are all less than one

To infer implications on sizes, we need to simulate the model

Simulation of the nested logit. Y_t

Effects of agglomeration and sorting are similar.

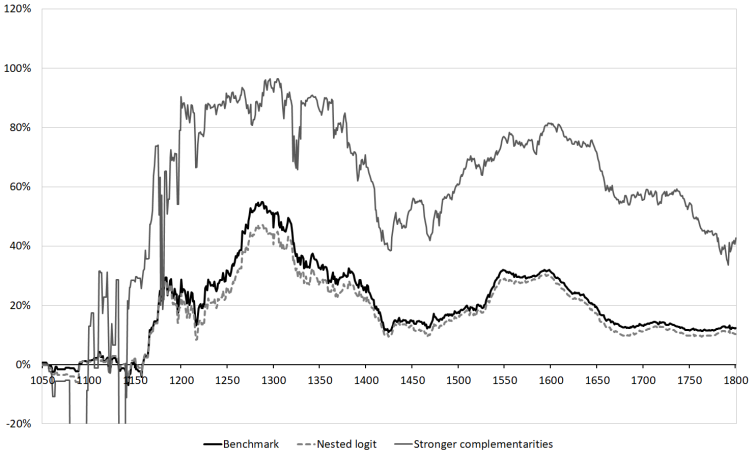
▸ Back

Estimation with high complementarity ($\sigma = 1.2$)

	Benchm	$\sigma = 1.2$
d_{ik}	-1.752***	-1.752***
Q_{kt}	0.184***	0.185***
P_{kt}	0.168***	0.166***
D_{kt}	0.142***	0.144***
$d_{ik}\, q_i$	0.030***	0.030***
$Q_{ikt(i)}$	0.015***	0.014***
FE	yes	yes

Estimation unchanged

Simulation with $\sigma = 1.2$. Y_t



With $\sigma = 1.2$, agglomeration effects are larger

▸ Back