

Roots of Gender Equality:  
the Persistent Effect of Beguinages  
on Attitudes Toward Women

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# The Beguinal Movement

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- Characteristics of the movement:
  - Organized, self-supporting, semi-religious communities of
  - **unmarried or widowed** women
  - **various socio-economic origins.**
- About the beguines:
  - Followed a religious life.
  - Did **charitable work**: nurses, caring for the needy, etc.
  - Did **remunerated work**: teachers, labourers, traders.
- Geographical scope: mostly in **Low Countries** and neighbouring regions in France and Germany.
- Temporal scope: beginning of the **13th century** onwards.

# The Beguinal Movement

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The beguines are considered as **an early movement of female emancipation**, since they:

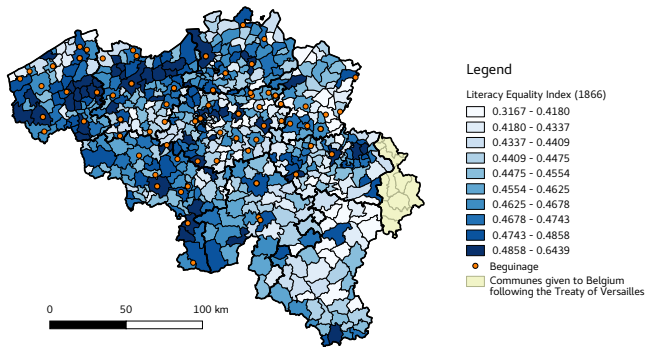
- **were independent** of any male authority;
- **did not** take vows, allowing them to
  - **keep and accumulate** property;
  - **leave the beguinage** and wed.

Beguinaiges:

- were **not officially recognized** by any religious institution.
- were **tolerated** by the Church and secular institutions.
- were integrated and **part of the urban economy**.

# Geographical Distribution

Figure: Beguinages in Belgium and measure of literacy equality



## Related Literature

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- Beguinage historiography:
  - Pye (2014),
  - Simons (2001),
  - de Moor (2013).
- Cultural transmission:
  - Bisin and Verdier (2001),
  - Galor and Moav (2002).
- Long-lasting effects of culture:
  - Qian (2008)
  - Alesina et al. (2013),
  - Andersen et al. (2015),
  - Valencia Caicedo (2015),
  - Galor and Ozak (2016),
  - Giuliano (2017).

## Beguinages and gender equality

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- Two mechanisms linking beguinages with gender equality:
  - Role modelling:  
constant exposition to independent women being successful without male intervention.  
Change in perceptions of women.
  - Increased opportunities beyond marriage and monastic life  
Better bargaining position for women leading to better outcomes.

## Research Question

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- We investigate the **long-run persistence of gender norms**.
- We examine the legacy of the beguine movement on culture taking into consideration other confounding factors.
- We consider the potential endogeneity of beguinage location.

### Research Question

Do we observe a more gender-equal culture today in regions exposed to the presence of beguinages in the Middle Age?

## Preview of the Results

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- Beguinage presence contributes to **reduce the wage gap** in agriculture between men and women.
- In municipalities with a beguinage, **literacy rate between men and women were more similar**.
- Results are strengthened when we use an instrumental variable approach controlling for the potential endogeneity of beguinage location.
- Results are robust to different sub-samples and the inclusion of additional covariates.



## Data and Methods

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Exploit **cross-section** variation in beguinage location to identify their effects on gender-related outcomes.

- One country: Belgium.
- Census data:
  - Earliest possible data: censuses of 1846 and 1866.
  - No individual data. Information is **aggregated** at the municipal level.
- We focus on two measures of gender equality:
  - Wage gap in agriculture.
  - Female literacy **compared** to male literacy.

## Data and Methods

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$$y_{i,r} = \alpha + \beta \text{beguinage}_{i,r} + X_{i,r}\gamma + \kappa_r + \epsilon_{i,r}C$$

- LHS - Outcomes of interest (measured in 1846 or 1866):
  - Wage gap in agriculture:  $\frac{\text{Wage of women}}{\text{Wage of men}}$
  - Literacy gap:  $\frac{\text{Number of literate women}}{\text{Number of literate men}}$
  - Female literacy share:  $\frac{\text{Number of literate women}}{\text{Number of literate women} + \text{Number of literate men}}$
  - Female literacy index:  $\frac{\text{Share of literate women}}{\text{Share of literate men}}$
- RHS - We use three indicators to account for beguinages:
  - Dummy variable - whether a city ever had a beguinage,
  - Exposure time to beguinage presence,
  - Five-level indicator combining presence and time.

# Summary Statistics

Variable	Mean	Sd	Max	Min
Beg (0/1)	0.0274	0.163	1	0
Total time with a beg. (centuries)	0.142	1.097	22.44	0
No beguinage	0.973	0.163	1	0
1 beguinage, < 200 years	0.00783	0.0882	1	0
1 beguinage, > 200 years	0.0125	0.111	1	0
> 1 beguinage, > 200 years	0.00313	0.0559	1	0
> 3 beguinages, > 200 years	0.00392	0.0625	1	0
Total men, 1846 (thousands)	0.858	2.198	59.50	0.0190
Total women, 1846 (thousands)	0.862	2.361	64.37	0.0170
Total men, 1866 (thousands)	0.949	2.622	74.17	0.00900
Total women, 1866 (thousands)	0.944	2.909	83.74	0.00900
Population density, canton level	1962.0	4003.3	176825.3	245.9
Lit. equality index, 1866	0.822	0.137	1.808	0.236
Female lit. share, 1866	0.448	0.0424	0.644	0.191
Female lit. index, 1866	0.856	0.122	1.601	0.256
Wage equality index in agri., 1846	0.641	0.142	1.222	0.178
Fem. monasteries	0.0313	0.189	2	0
Masc. monasteries	0.0259	0.175	3	0
Other monasteries	0.0149	0.121	1	0
Distance to Leuven (km)	68.59	32.91	165.8	0.377
Min. distance to beguinage (km)	16.27	18.16	122.0	0
Min. distance to big town (km)	17.97	19.24	113.6	0
Potential caloric yield before 1550	2142.1	72.76	2305.8	1908.8
Potential caloric yield after 1550	8894.7	310.7	9780.8	8292.4
Distance to closest river (km)	9.082	8.757	52.40	0.00230
Steam engines per 1000 people	0.0715	0.689	12.49	0

# OLS Results: Agricultural Wages, 1846

Beguinaiges and the ratio of female-to-male wages in agriculture

	Ratio of female-to-male wages in agriculture, 1846					
	(1)		(2)		(3)	
Beg (0/1)	0.0228*	(1.93)				
No beg.			Ref.			
1 beg., <200 years			0.0186	(1.03)		
1 beg., >200 years			0.0238	(1.36)		
>1 beg., >200 years			0.0157	(0.52)		
>3 beg., >200 years			0.0566*	(1.69)		
Total time with a beg. (centuries)					0.00530**	(2.03)
Big town	-0.00639	(-0.99)	-0.00608	(-0.94)	-0.00545	(-0.84)
Potential caloric yield, pre-1550	0.000288	(1.50)	0.000288	(1.50)	0.000291	(1.52)
Potential caloric yield, post-1550	-0.0000180	(-0.45)	-0.0000180	(-0.45)	-0.0000189	(-0.47)
Distance to closest big municipality (log-km)	0.00245	(0.32)	0.00253	(0.33)	0.00240	(0.32)
Distance to closest river (log-km)	0.0126**	(2.53)	0.0127**	(2.54)	0.0127**	(2.56)
Population density, canton level	-0.000000531	(-0.30)	-0.000000505	(-0.28)	-0.000000444	(-0.25)
Steam engines per 1000 people	0.00239	(0.78)	0.00225	(0.73)	0.00238	(0.78)
Arrondissement FE	Yes		Yes		Yes	
Migration	Yes		Yes		Yes	
Observations	2507		2507		2507	

t statistics in parentheses. Standard errors clustered at the canton level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Incl. demographics (total men and women, literacy rate by gender and female nuptiality rate).

# OLS Results: Female Literacy

Beguinages and Literacy Equality Index					
	Literacy Equality Index, 1866				
	(1)	(2)	(3)		
Beg (0/1)	0.0781***	(4.69)			
No beg.			Ref.		
1 beg., < 200 years			0.0446**	(2.10)	
1 beg., > 200 years			0.111***	(4.44)	
> 1 beg., > 200 years			0.110***	(2.83)	
> 3 beg., > 200 years			-0.128	(-1.62)	
Total time with a beg. (centuries)					0.00811** (2.55)
Big town	0.0469***	(7.20)	0.0465***	(7.41)	0.0493*** (7.40)
Population density, canton level	-0.00000170	(-1.30)	-0.00000174	(-1.34)	-0.00000185 (-1.42)
Steam engines per 1000 people	0.00387	(0.97)	0.00505	(1.25)	0.00389 (0.97)
Wage equality index in agri., 1846	-0.0496**	(-2.17)	-0.0498**	(-2.16)	-0.0502** (-2.19)
Fem. monas.	0.0341**	(2.11)	0.0453***	(2.61)	0.0396** (2.34)
Masc. monas.	-0.0158	(-1.03)	-0.0125	(-0.85)	-0.0156 (-1.00)
Other monas.	-0.0113	(-0.55)	-0.0170	(-0.85)	-0.00836 (-0.40)
Schools per 10000 people, 1851	0.00903*	(1.92)	0.00898*	(1.91)	0.00907* (1.93)
Distance to Leuven (log-km)	0.0338***	(3.39)	0.0352***	(3.49)	0.0345*** (3.45)
Regional FE	Yes		Yes		Yes
Migration and Demography	Yes		Yes		Yes
Observations	2507		2507		2507

t statistics in parentheses. Standard errors clustered at the canton level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Demography: total men and women, literacy rate by gender and female nuptiality rate. Other controls: share of electors as % of the population. % of professors, % farmers and % industrialists among voters (provincial level).

# Robustness

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Findings are robust to:

- Sub-sample regressions:
  - Only towns 5 km, 10 km and 20 km away from a beguinage.
  - Removing municipalities with a population  $<3000$  from the sample.
  - Removing municipalities with an on-going beguinage at census time.
  - Placebo towns 5 km around a beguinage. True beguinages dropped.
- Inclusion of additional covariates:
  - Production capacity for several crops based on geographic and climatic characteristics to account for possible comparative advantage of women in given crops.
  - % of soil types (clayey, silty, sandy) around towns.
  - Municipal charter (instrument) as regressor.
- Propensity score matching.

# Endogeneity

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- Potential endogeneity of beguinage location.
- Selection of towns that were more favourable to women.
- Instrumental variable approach:
  - Binary variable indicating whether a town obtained a "municipal charter" before the 13th century.

# Municipal Charters

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- Municipal charters typically:
  - decentralized decision-making, granting municipal authorities power,
  - conveyed benefits for citizens: partial exemption from war and a municipal judicial system,
  - allowed towns to organize a market and establish guilds, and
  - signal prosperous towns: lords required a town to pay.
- Considering the secular occupations of beguines (education, spinning, trade), towns with a municipal charter are likely to attract them as they can be more economically dynamic (e.g. presence of a market).



# Endogeneity

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Exclusion restriction:

- The acquisition of a charter was not introducing any institution promoting gender equality.
- Towns granted a municipal charter could have grown larger and, thus, education would have been a more productive investment.
  - We cannot reject equal growth rate of towns between 1437 and 1866 for those with and without a municipal charter.
- The outcome of interest is **not literacy per se** but the comparison between male and female outcomes.

# Endogeneity

- We compare literacy outcomes among municipalities with and without a municipal charter for the subsample of municipalities with a beguinage

	Lit. equality index, 1866		Lit. share, 1866		Lit. index, 1866	
Charter granted before 13th century	-0.0113	(-0.33)	-0.00142	(-0.17)	-0.00617	(-0.27)
Big town	0.0218	(0.34)	0.00910	(0.57)	-0.0116	(-0.24)
Total men, 1866 (thousands)	-0.0203	(-0.66)	-0.00749	(-0.99)	0.0283	(1.45)
Total women, 1866 (thousands)	0.0199	(0.72)	0.00714	(1.05)	-0.0251	(-1.43)
Wage equality index in agri., 1846	-0.00408	(-0.03)	0.00634	(0.19)	0.0426	(0.42)
Fem. monas.	0.0384*	(1.95)	0.00871*	(1.87)	0.0216	(1.56)
Masc. monas.	-0.0542**	(-2.29)	-0.0119**	(-2.09)	-0.0427***	(-3.07)
Other monas.	-0.0174	(-0.32)	-0.00258	(-0.19)	-0.00387	(-0.10)
Schools per 10000 people, 1851	-0.0121	(-1.00)	-0.00193	(-0.63)	-0.000530	(-0.06)
Distance to Leuven (Km)	0.000555	(0.91)	0.0000812	(0.62)	-0.0000867	(-0.20)
Regional FE	Yes		Yes		Yes	
Observations	68		68		68	

t statistics in parentheses.  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Regression results for all three indexes of relative female literacy rates.

Regressions only consider municipalities that ever had a beguinage. Our main variable of interest is whether the same municipality also enjoyed a municipal charter before the 13th century. Standard errors are **not** clustered.

## IV Results: Agricultural Wages, 1846

	Ratio of female-to-male wages in agriculture, 1846			
	(1)		(2)	
Beg. (0/1)	0.0546*	(1.79)		
Total time with a beg. (centuries)			0.00812	(1.58)
Total men, 1846 (thousands)	0.00969	(0.61)	0.0123	(0.77)
Total women, 1846 (thousands)	-0.00943	(-0.64)	-0.0141	(-0.91)
Big town	-0.00642	(-1.01)	-0.00533	(-0.84)
Share of literate men, 1866	-0.0387	(-0.73)	-0.0400	(-0.76)
Share of literate women, 1866	0.0220	(0.48)	0.0218	(0.48)
Female nuptiality, 1846	0.0351	(0.37)	0.0350	(0.37)
Potential caloric yield pre-1550	0.000289	(1.52)	0.000293	(1.55)
Potential caloric yield post-1550	-0.0000172	(-0.43)	-0.0000190	(-0.48)
Distance to closest big municipality (log-km)	0.00325	(0.43)	0.00275	(0.36)
Distance to closest river (log-km)	0.0127***	(2.60)	0.0130***	(2.63)
Population density, canton level	-0.000000408	(-0.23)	-0.000000305	(-0.17)
Steam engines per 1000 people	0.00250	(0.82)	0.00240	(0.80)
1st stage F-stat	63.70		29.97	
Arrondissement FE	Yes		Yes	
Migration	Yes		Yes	
Use of land	Yes		Yes	
Observations	2507		2507	

*t* statistics in parentheses. Standard errors clustered at the canton level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

In Column 1, Probit first-stage including controls measured during the 13th-16th centuries. Column 2, standard 2SLS.

## IV Results: Female Literacy

	Literacy equality, 1866		Literacy share, 1866		Literacy index, 1866	
Beg (0/1)	0.0853*** (3.58)		0.0248*** (3.14)		0.0308 (1.21)	
Total time with a beg. (centuries)		0.0201*** (2.93)		0.00587*** (3.04)		0.00834 (1.61)
Big town	0.0469*** (7.24)	0.0490*** (7.30)	0.0145*** (7.68)	0.0151*** (7.79)	0.0188*** (3.31)	0.0194*** (3.44)
Steam engines per 1000 people	0.00388 (0.98)	0.00374 (0.97)	0.000935 (0.84)	0.000892 (0.82)	-0.00261 (-0.81)	-0.00268 (-0.85)
Wage equality index in agri., 1846	-0.0497** (-2.18)	-0.0509** (-2.22)	-0.0151** (-2.10)	-0.0154** (-2.14)	-0.0157 (-0.71)	-0.0161 (-0.73)
Fem. monas.	0.0325* (1.77)	0.0272 (1.31)	0.00763 (1.61)	0.00610 (1.17)	0.0303* (1.86)	0.0273* (1.66)
Masc. monas.	-0.0162 (-1.07)	-0.0173 (-1.16)	-0.00340 (-0.79)	-0.00369 (-0.87)	-0.0163 (-1.61)	-0.0168* (-1.68)
Other monas.	-0.0121 (-0.59)	-0.0139 (-0.67)	-0.00283 (-0.46)	-0.00331 (-0.54)	-0.000448 (-0.03)	-0.00152 (-0.09)
Schools per 10000 people, 1851	0.00903* (1.93)	0.00898* (1.92)	0.00301* (1.95)	0.00300* (1.94)	0.00468 (1.01)	0.00465 (1.01)
Distance to Leuven (km)	0.0338*** (3.40)	0.0356*** (3.52)	0.0106*** (3.45)	0.0112*** (3.55)	0.0302*** (2.93)	0.0309*** (2.98)
First-stage F-stat	61.74	30.20	61.74	30.20	61.74	30.20
Region FE	Yes		Yes		Yes	
Migration	Yes		Yes		Yes	
Observations	2507		2507		2507	

$t$  statistics in parentheses. Robust standard errors clustered at the canton level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Other controls: % electors. % of professors, % farmers and % industrialists among voters (provincial level). Population density (canton level)

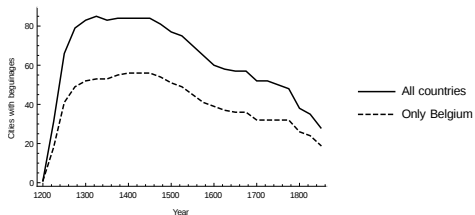
## Concluding Remarks

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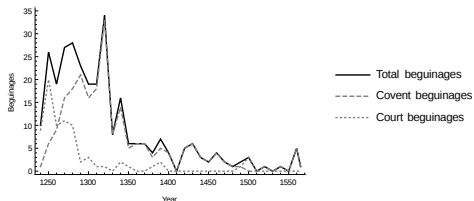
- Investigating a **unique historical movement**, we provide **new evidence** of the long-lasting effect institutions have on gender-related outcomes.
- We find that towns that held a beguinal community were **more favourable towards women**:
  - wage differentials across genders were smaller, and
  - literacy rates were more similar.
- We derive a **causal effect** between the presence of beguinal communities and improved female outcomes.

# APPENDIX

# Evolution of Beguinages



Total number of cities with at least one beguinage.



Number of new beguinages created per decade.

Source: *Simons (2010), p. 256*

# OLS Results: Female Literacy

	Female Literacy Share, 1866					
	(1)		(2)		(3)	
Beg (0/1)	0.0220***	(5.25)				
No beg.			Ref.			
1 beg., < 200 years			0.0148**	(2.38)		
1 beg., > 200 years			0.0300***	(5.61)		
> 1 beg., > 200 years			0.0275***	(2.86)		
> 3 beg., > 200 years			-0.0325	(-1.51)		
Total time with a beg. (centuries)					0.00213**	(2.53)
Big town	0.0143***	(7.64)	0.0142***	(7.80)	0.0150***	(7.87)
Pop. density ( $\times 1000$ ), canton level	-0.000528	(-1.35)	-0.000543	(-1.39)	-0.000578	(-1.47)
Steam engines per 1000 people	0.000991	(0.89)	0.00130	(1.16)	0.000999	(0.89)
Wage equality index in agri., 1846	-0.0162**	(-2.26)	-0.0162**	(-2.25)	-0.0163**	(-2.28)
Fem. monas.	0.00834**	(2.09)	0.0114***	(2.70)	0.0100**	(2.41)
Masc. monas.	-0.00278	(-0.64)	-0.00195	(-0.47)	-0.00271	(-0.61)
Other monas.	-0.00396	(-0.69)	-0.00542	(-0.96)	-0.00307	(-0.53)
Schools per 10000 people, 1851	0.00304**	(1.98)	0.00304**	(1.98)	0.00306**	(2.00)
Distance to Leuven (km)	0.000169***	(2.85)	0.000171***	(2.88)	0.000170***	(2.87)
Regional FE	Yes		Yes		Yes	
Migration and Demography	Yes		Yes		Yes	
Other controls	Yes		Yes		Yes	
Observations	2507		2507		2507	

t statistics in parentheses. Standard errors clustered at the canton level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Demography: total men and women, literacy rate by gender and female nuptiality rate.

Other controls: share of electors as % of the population. % of professors, % farmers and % industrialists among voters (provincial level).



# OLS Results: Female Literacy

	Female Literacy Index, 1866					
	(1)		(2)		(3)	
Beg (0/1)	0.0266**	(2.20)				
No beg.			Ref.			
1 beg., < 200 years			0.0141	(0.88)		
1 beg., > 200 years			0.0378**	(2.21)		
> 1 beg., > 200 years			0.0405	(1.25)		
> 3 beg., > 200 years			-0.0417	(-1.26)		
Total time with a beg. (centuries)					0.00360	(1.46)
Big town	0.0185***	(3.25)	0.0184***	(3.26)	0.0193***	(3.43)
Population density, canton level	-0.00000132	(-0.92)	-0.00000134	(-0.93)	-0.00000134	(-0.93)
Steam engines per 1000 people	-0.00245	(-0.76)	-0.00205	(-0.64)	-0.00245	(-0.76)
Wage equality index in agri., 1846	-0.0176	(-0.79)	-0.0177	(-0.79)	-0.0179	(-0.80)
Fem. monas.	0.0312**	(2.20)	0.0348**	(2.32)	0.0322**	(2.23)
Masc. monas.	-0.0149	(-1.47)	-0.0137	(-1.39)	-0.0149	(-1.47)
Other monas.	-0.00381	(-0.24)	-0.00579	(-0.36)	-0.00321	(-0.20)
Schools per 10000 people, 1851	0.00512	(1.12)	0.00513	(1.13)	0.00515	(1.13)
Distance to Leuven (km)	0.000397**	(2.10)	0.000399**	(2.12)	0.000398**	(2.11)
Regional FE	Yes		Yes		Yes	
Migration and Demography	Yes		Yes		Yes	
Other controls	Yes		Yes		Yes	
Observations	2507		2507		2507	

t statistics in parentheses. Standard errors clustered at the canton level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Demography: total men and women, literacy rate by gender and female nuptiality rate.

Other controls: share of electors as % of the population. % of professors, % farmers and % industrialists among voters (provincial level).

# Mechanisms

	(1)	(2)	(3)	(4)
	Wage equ. in agri., 1846	Lit. equ. index, 1866	Fem. lit. share, 1866	Fem. lit. index, 1866
Masc. monas.	0.0232 (1.27)	0.0116 (0.87)	0.00384 (0.95)	-0.00761 (-0.63)
Fem. monas.	0.00867 (0.72)	0.0228 (1.10)	0.00653 (1.19)	0.0309 (1.57)
Other monas.	0.00380 (0.23)	-0.00246 (-0.13)	0.0000201 (0.00)	-0.000910 (-0.05)
Total men, 1846/1866	0.00132 (0.04)	-0.296*** (-4.71)	-0.0814*** (-4.16)	-0.00116 (-0.05)
Total women, 1646/1866	-0.0137 (-0.45)	0.301*** (4.66)	0.0832*** (4.13)	0.00952 (0.47)
Big town	0.00120 (0.17)	0.0339*** (5.36)	0.0109*** (5.74)	0.0142** (2.38)
Female nuptiality, 1846/1866	0.0260 (0.27)	-0.464*** (-5.87)	-0.141*** (-5.97)	-0.121* (-1.70)
Share of literate men, 1846/1866	-0.0498 (-0.92)			
Share of literate women, 1846/1866	0.0311 (0.66)			
Potential caloric yield after 1550	-0.0000213 (-0.52)			
Potential caloric yield before 1550	0.000309 (1.58)			
Distance to closest big municipality (km)	-0.00205 (-0.23)			
Distance to closest river (km)	0.0136*** (2.66)			
Population density, canton level (×1000)	-0.000570 (-0.31)	-0.00197 (-1.47)	-0.000650 (-1.60)	-0.00148 (-1.01)
Steam engines per 1000 people	0.00451 (1.33)	0.00549 (1.20)	0.00142 (1.11)	-0.00308 (-0.87)
Wage equality index in agri., 1846		-0.0429* (-1.91)	-0.0134* (-1.87)	-0.0133 (-0.59)
Schools per 10000 people, 1851		0.00803* (1.68)	0.00275* (1.74)	0.00463 (0.98)
Distance to Leuven (km)		0.0373*** (3.80)	0.0118*** (3.78)	0.0333*** (3.06)
Region FE	Yes	Yes	Yes	Yes
Migration	Yes	Yes	Yes	Yes
Other controls	No	Yes	Yes	Yes
Observations	2439	2439	2439	2439

*t* statistics in parentheses. Standard errors clustered at the canton level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## Size of the Effects

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Variable	Mean	Sd
<i>Wage gap in agriculture, 1846</i>	0.6411	0.1417
Beguinage (0/1), OLS	0.0413	
Beguinage (0/1), IV	0.0736	
Total time with beguinage (centuries), OLS	0.00889	
Total time with beguinage (centuries), IV	0.0130	
<i>Literacy eq. index, 1866</i>	0.8220	0.1365
Beguinage (0/1), OLS	0.0789	
Beguinage (0/1), IV	0.0841	
Total time with beguinage (centuries), OLS	0.00784	
Total time with beguinage (centuries), IV	0.0199	
<i>Lit. women / total lit. pop</i>	0.4489	0.042
Beguinage (0/1), OLS	0.0220	
Beguinage (0/1), IV	0.0242	
Total time with beguinage (centuries), OLS	0.00213	
Total time with beguinage (centuries), IV	0.00579	
<i>Share lit. women / share lit. men</i>	0.8559	0.1222
Beguinage (0/1), OLS	0.0266	
Beguinage (0/1), IV	0.0293	
Total time with beguinage (centuries), OLS	0.00360	
Total time with beguinage (centuries), IV	0.00813	

## Robustness: Buffers around beguinages (1)

	Female-to-male wage in agriculture, 1846					
		(1)	(2)	(3)		
	Beguinage < 5km	Beguinage < 10km	Beguinage < 20km	Beguinage < 20km		
Beg. (0/1)	0.0330 (1.64)	0.0209 (1.45)	0.0189 (1.41)			
No beg.	Ref.	Ref.	Ref.			
1 beg., < 200 years	0.0313 (1.20)	0.0180 (0.81)	0.0214 (1.04)			
1 beg., > 200 years	0.0305 (1.11)	0.0239 (1.24)	0.0156 (0.87)			
> 1 beg., > 200 years	0.0536 (1.62)	-0.00355 (-0.11)	0.00806 (0.25)			
> 3 beg., > 200 years	0.0730 (1.42)	0.0663 (1.57)	0.0584 (1.42)			
Total time with a centuries. (beg)	0.00624*	0.00491*	0.00462*			
Observations	365	1097	2033			

t statistics in parentheses. Standard errors clustered at the canton level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Regressions include all previous controls

## Robustness: Buffers around beguinages (2)

		Female-to-male literacy, 1866					
		(1)		(2)		(3)	
Fem. Eq. Index	Beg. (0/1)	0.0830***	(3.44)	0.0870***	(4.70)	0.0798***	(4.77)
	No beg.	Ref.		Ref.		Ref.	
	1 beg., $\leq 200$ years	0.0678**	(2.33)	0.0578**	(2.21)	0.0554**	(2.33)
	> 1 beg., > 200 years	0.0947***	(3.05)	0.108***	(4.30)	0.102***	(4.24)
	> 1 beg., > 200 years	0.102	(1.62)	0.132***	(3.11)	0.112***	(2.90)
	> 3 beg., > 200 years	-0.0177	(-0.29)	-0.0758	(-1.14)	-0.0843	(-1.22)
Total time with a beg. (centuries)	0.0113**	(2.48)	0.0126***	(3.68)	0.00947***	(3.02)	
Fem. Lit. Share	Beg. (0/1)	0.0231***	(3.51)	0.0249***	(5.17)	0.0223***	(5.17)
	No beg.	Ref.		Ref.		Ref.	
	1 beg., < 200 years	0.0206**	(2.49)	0.0188**	(2.45)	0.0176**	(2.52)
	1 beg., > 200 years	0.0249***	(2.95)	0.0291***	(4.82)	0.0271***	(4.85)
	> 1 beg., > 200 years	0.0293*	(1.84)	0.0385***	(3.51)	0.0306***	(3.01)
	> 3 beg., > 200 years	-0.000617	(-0.04)	-0.0181	(-1.04)	-0.0215	(-1.17)
Total time with a beg. (centuries)	0.00321***	(2.67)	0.00364***	(4.09)	0.00263***	(3.14)	
Fem. Lit. Index	Beg. (0/1)	0.0198	(1.01)	0.0288**	(2.20)	0.0263**	(2.26)
	No beg.	Ref.		Ref.		Ref.	
	1 beg., $\leq 200$ years	0.0303	(1.22)	0.0282	(1.36)	0.0260	(1.43)
	1 beg., > 200 years	0.0142	(0.59)	0.0293	(1.65)	0.0273	(1.62)
	> 1 beg., > 200 years	0.0266	(0.45)	0.0588	(1.46)	0.0462	(1.27)
	> 3 beg., > 200 years	-0.0368	(-0.82)	-0.0624	(-1.43)	-0.0326	(-0.96)
Total time with a beg. (centuries)	0.00241	(0.59)	0.00445	(1.57)	0.00365	(1.47)	
Observations		365		1097		2033	

t statistics in parentheses, clustered at the canton level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Regressions include all previous controls.

## Robustness: including male literacy rate

		Benchmark			Including male literacy rate		
		(1)	(2)	(3)	(4)	(5)	(6)
OLS	Beg (0/1)	0.0742***	0.0206***	0.0257*	0.0653***	0.0176***	0.0169
	No beg.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
	1 beg., < 200 years	0.0321*	0.0108**	0.00871	0.0298*	0.00998**	0.00647
	1 beg., > 200 years	0.114***	0.0305***	0.0400*	0.102***	0.0266***	0.0288
	> 1 beg., > 200 years	0.0964***	0.0254***	0.0409	0.0767**	0.0187**	0.0288
	> 3 beg., > 200 years	-0.123	-0.0339*	-0.0460	-0.136*	-0.0386**	-0.0595*
	Total time with a beg. (centuries)	0.00759*	0.00203*	0.00363	0.00541	0.00129	0.00150
IV	Beg (0/1)	0.0862***	0.0254***	0.0303	0.0740***	0.0211***	0.0177
	Total time with a beg. (centuries)	0.0199***	0.00582***	0.00818*	0.0181**	0.00521**	0.00640
Observations		2507	2507	2507	2507	2507	2507

1 and 4: Literacy equality index in 1866; 2 and 5: Literate women over total literate population; 3 and 6: Share lit. women / share lit. men. All regressions include regional fixed effects and control for relative size of the municipality, total population, distinguishing between men and women, the composition at the town level in terms of migrants, agricultural wage index, presence of monasteries, the number of schools per 10000 people and distance to Leuven. IV: `etregress` for the endogenous binary variable "Beg (0/1)"; `ivregress` for the endogenous continuous variable "Total time with a beg".

# Robustness: soil, on-going begunages and treatment

	Lit. Eq. (1)		Lit. Share (2)		Lit. Index (3)	
Panel A: Soil types as additional regressor						
Beg (0/1)	0.0802***	(4.19)	0.0220***	(4.59)	0.0272**	(2.19)
No Beg.	Ref.		Ref.		Ref.	
B=1, $T < 200$	0.0332	(1.47)	0.0112*	(1.72)	0.0135	(0.81)
B=1, $T > 200$	0.113***	(4.05)	0.0301***	(4.81)	0.0395**	(2.32)
$B > 1, T > 200$	0.115**	(2.47)	0.0303**	(2.47)	0.0380	(1.14)
$B > 3, T > 200$	-0.0276	(-0.45)	-0.00929	(-0.55)	-0.0451	(-1.16)
Exposure	0.0103***	(3.08)	0.00266***	(2.98)	0.00320	(1.26)
Observations	2519		2519		2519	
Panel B: No on-going begunage						
Beg (0/1)	0.0724***	(3.76)	0.0200***	(4.22)	0.0264**	(2.08)
No Beg.	Ref.		Ref.		Ref.	
B=1, $T < 200$	0.0459**	(2.14)	0.0148**	(2.38)	0.0142	(0.89)
B=1, $T > 200$	0.116***	(3.29)	0.0303***	(4.16)	0.0433**	(2.13)
$B > 1, T > 200$	0.103***	(2.82)	0.0275***	(2.82)	0.0421	(1.31)
$B > 3, T > 200$	-0.121	(-1.50)	-0.0329	(-1.49)	-0.0395	(-1.17)
Exposure	0.00488	(1.27)	0.00126	(1.22)	0.00330	(1.23)
Observations	2497		2497		2497	
Panel C: Municipalities close to a begunage as begunage						
Treatment	-0.00431	(-0.41)	-0.000926	(-0.28)	-0.00112	(-0.10)
Observations	2439		2439		2439	

t statistics in parentheses, clustered at the canton level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Panel A) adds soil types as additional regressor. Panel B) removes on-going begunages at census time.

Panel C) begunages from the sample and treats towns less than 5km from a begunage as having had one.