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Appendices

Appendix A

A.1 Data sources for constructing the concentric ring variables

Table A.1. Data sources for constructing the concentric ring variables

	Geographic unit	Number of geographic units	Year	Mean area in km ²	Data source
<i>Current employment</i>					
Netherlands	Four-digit postal code	3950	2010	8.86	LISA
Germany	Municipality	1445	2010	57.00	Statistik der Bundesagentur für Arbeit
Belgium	Municipality	589	2010	52.13	Vlaamse Arbeidsrekening
<i>Historical population</i>					
Netherlands	Municipality	1232	1840	26.38	CBS (Volkstellingen)
Germany	Municipality	1445	1867	57.00	See the next page
Belgium	Municipality	589	1846	52.13	Statistics Belgium

Notes: our dataset does not contain all German municipalities, but only those that belong to the Bundesländer Lower Saxony, Bremen and North Rhine-Westphalia. This is sufficient for our analysis.

Data sources of the German historical population counts

- Statistisches Bureau Preussen (1874). Die Gemeinden und Gutsbezirke des Preussischen Staates und ihre Bevölkerung: Nach den Urmaterialien der allgemeinen Volkszählung vom 1. December 1871 (11): Die Gemeinden und Gutsbezirke der Rheinprovinz und ihrer Bevölkerung: nebst einem Anhange, betreffend die Hohenzollerschen Lande. Berlin, Verlag des königlichen Statistischen Bureaus.
- Statistisches Bureau Preussen (1873). Die Gemeinden und Gutsbezirke des Preussischen Staates und ihre Bevölkerung: Nach den Urmaterialien der allgemeinen Volkszählung vom 1. December 1871 (8): Die Gemeinden und Gutsbezirke der Provinz Hannover. Berlin, Verlag des königlichen Statistischen Bureaus.
- Statistisches Bureau Preussen (1874). Die Gemeinden und Gutsbezirke des Preussischen Staates und ihre Bevölkerung: Nach den Urmaterialien der allgemeinen Volkszählung vom 1. December 1871 (9): Die Gemeinden und Gutsbezirke der Provinz Westfalen und ihrer Bevölkerung: nebst einem Anhange, betreffend die Fürstenthümer Waldeck und Pyrmont. Berlin, Verlag des königlichen Statistischen Bureaus.
- Statistisches Bureau (1871). Statistische Nachrichten über das Grossherzogtum Oldenburg (12): Ergebnisse der Volkszählung vom 3. December 1867. Oldenburg, Gerhard Stalling.
- Kraus, Antje (1980). In Köllmann, Wolfgang (Ed.), Quellen zur Bevölkerungs-, Sozial- und Wirtschaftsstatistik Deutschlands: 1815–1875, Bd. 1. Quellen zur Bevölkerungsstatistik Deutschlands 1815–1875, p. 329-335. Boppard am Rhein, Boldt.

A.2 Results on the basis of population counts

Table A.2. Concentric ring variables based on population counts

Column: Specification:	(1) All rings	(2) All rings	(3) Five rings	(4) Four rings	(5) Three rings	(6) Two rings	(7) One ring
Population 0 to 5 km	0.023* (0.012)	0.009 (0.015)	0.008 (0.015)	0.007 (0.015)	0.006 (0.015)	0.007 (0.014)	0.093*** (0.010)
Population 5 to 10 km	0.036*** (0.010)	0.050*** (0.015)	0.050*** (0.015)	0.051*** (0.015)	0.047*** (0.015)	0.089*** (0.011)	
Population 10 to 20 km	0.010** (0.004)	0.010 (0.006)	0.009 (0.006)	0.009 (0.006)	0.024*** (0.005)		
Population 20 to 40 km	0.006*** (0.002)	0.006*** (0.002)	0.006*** (0.002)	0.009*** (0.002)			
Population 40 to 80 km	0.002*** (0.001)	0.002** (0.001)	0.002** (0.001)				
Population 80 to 120 km	0.000 (0.001)	0.001 (0.001)					
IV	NO	YES	YES	YES	YES	YES	YES
<i>F</i> -statistic weak identification test		67.460	80.306	100.095	129.949	196.937	720.277
<i>p</i> -value Hansen <i>J</i> statistic		0.279	0.406	0.472	0.106	0.217	0.286
Max VIF [Mean VIF]	3.52 [2.61]	6.51 [3.84]	6.43 [4.10]	6.31 [4.14]	6.17 [4.20]	2.91 [2.91]	
<i>R</i> ²	0.053	–	–	–	–	–	–

Notes: 3,722 observations. Robust standard errors are in parentheses. Population is expressed as the total number of people in millions. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

A.3 First-stage IV regression results

Table A.3 reports the first-stage IV regression results for the model estimated in Table 2.3 column (2). The relevant instrumental variables are statistically significant at conventional levels and have the right sign. That is to say, population counts in 1840 and the total number of railway stations in 1870 within a particular distance interval are both positively associated with current employment levels within that same distance interval. Weak identification of individual endogenous regressors is tested by the reported Sanderson-Windmeijer *F*-statistic. This issue appears to be of no concern.

Table A.3. First-stage IV regression results

Column: Ring variable:	(1) Employment 0–5 km	(2) Employment 5–10 km	(3) Employment 10–20 km	(4) Employment 20–40 km	(5) Employment 40–80 km	(6) Employment 80–120 km
Population in 1840 0–5 km	1.7970*** (0.0608)	0.9813*** (0.0322)	0.4408*** (0.0486)	0.3626*** (0.1135)	0.0756 (0.0817)	-0.1480 (0.1586)
Population in 1840 5–10 km	0.3916*** (0.0458)	1.9125*** (0.0532)	0.9055*** (0.0826)	-0.0347 (0.1105)	0.6243*** (0.0959)	0.1812 (0.1892)
Population in 1840 10–20 km	0.0103 (0.0122)	0.2008*** (0.0239)	2.3963*** (0.0386)	0.5142*** (0.0665)	0.6236*** (0.0692)	0.0921 (0.1113)
Population in 1840 20–40 km	0.0033 (0.0054)	-0.0118 (0.0077)	0.1334*** (0.0172)	2.7577*** (0.0324)	0.8329*** (0.0497)	0.2375*** (0.0521)
Population in 1840 40–80 km	0.0186*** (0.0033)	0.0317*** (0.0037)	0.0558*** (0.0082)	0.1017*** (0.0170)	3.2781*** (0.0306)	0.4520*** (0.0340)
Population in 1840 80–120 km	0.0098*** (0.0026)	0.0109*** (0.0039)	0.0452*** (0.0077)	0.0906*** (0.0168)	0.4549*** (0.0256)	3.0629*** (0.0331)
No. of railway stations in 1870, 0–5 km	0.0085*** (0.0006)	-0.0003 (0.0006)	0.0037*** (0.0010)	0.0059** (0.0021)	0.0113*** (0.0040)	-0.0093** (0.0037)
No. of railway stations in 1870, 5–10 km	0.0001 (0.0003)	0.0052*** (0.0004)	0.0024*** (0.0007)	0.0071*** (0.0014)	0.0119*** (0.0025)	-0.0256*** (0.0025)
No. of railway stations in 1870, 10–20 km	0.0003** (0.0001)	0.0012*** (0.0002)	0.0068*** (0.0004)	0.0042*** (0.0007)	0.0023 (0.0014)	-0.0190*** (0.0013)
No. of railway stations in 1870, 20–40 km	-0.0001 (0.0001)	0.0001 (0.0001)	0.0007*** (0.0002)	0.0100*** (0.0004)	-0.0055*** (0.0007)	-0.0180*** (0.0007)
No. of railway stations in 1870, 40–80 km	0.0002*** (0.0000)	0.0002*** (0.0000)	0.0004*** (0.0001)	0.0012*** (0.0002)	-0.0012*** (0.0004)	-0.0078*** (0.0005)
No. of railway stations in 1870, 80–120 km	-0.0002*** (0.0000)	-0.0004*** (0.0001)	-0.0008*** (0.0001)	-0.0006** (0.0003)	-0.0007* (0.0004)	0.0011** (0.0005)
Sanderson-Windmeijer <i>F</i> -statistic	168.38	167.86	312.27	1060.29	1483.62	3418.72

Notes: 3,722 observations. Robust standard errors are in parentheses. Employment/population is expressed as the total number of jobs/people in millions. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

A.4 Graphical representation of the concentric ring variables

Figure A.4a. Concentric ring variables measuring domestic employment

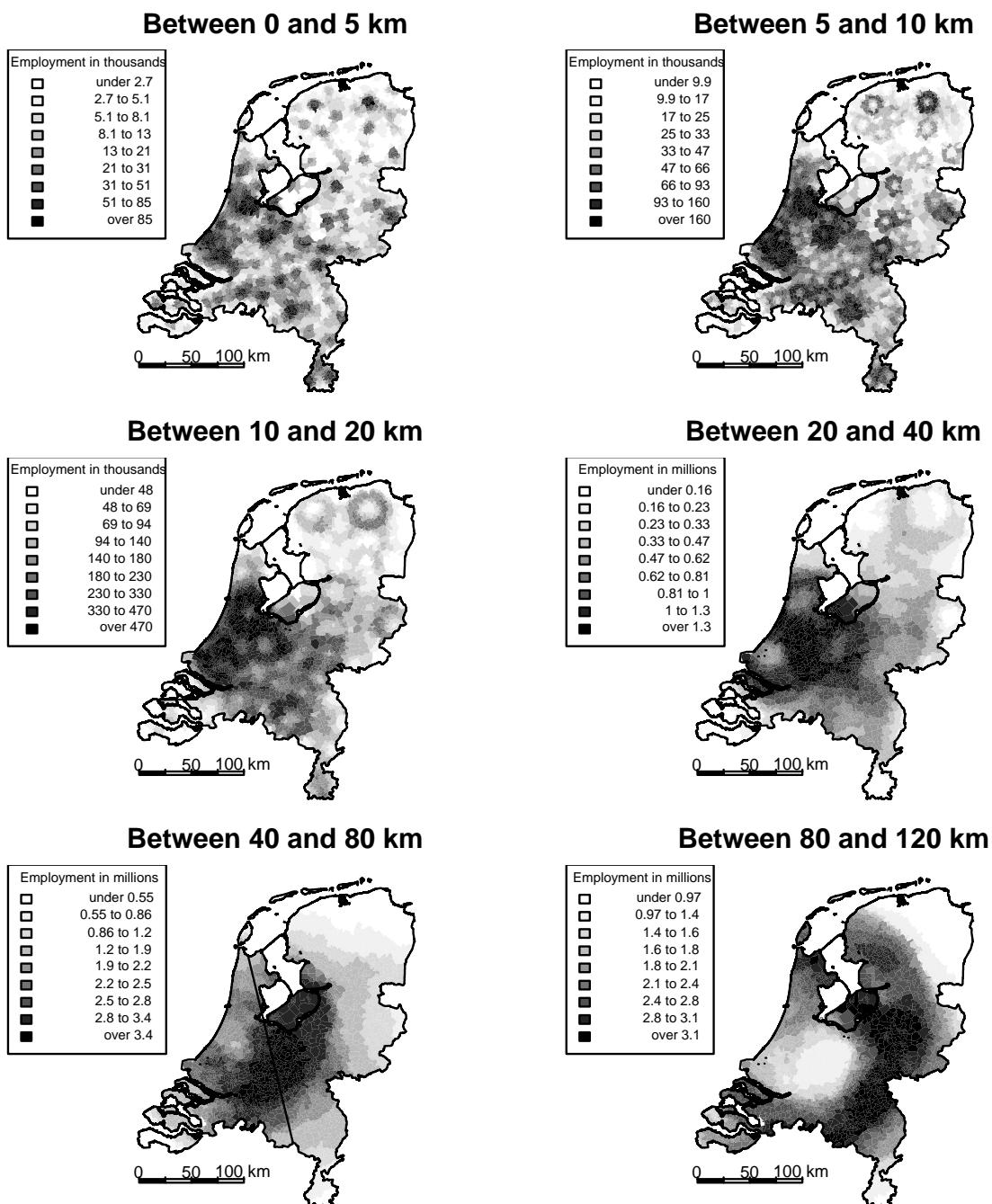
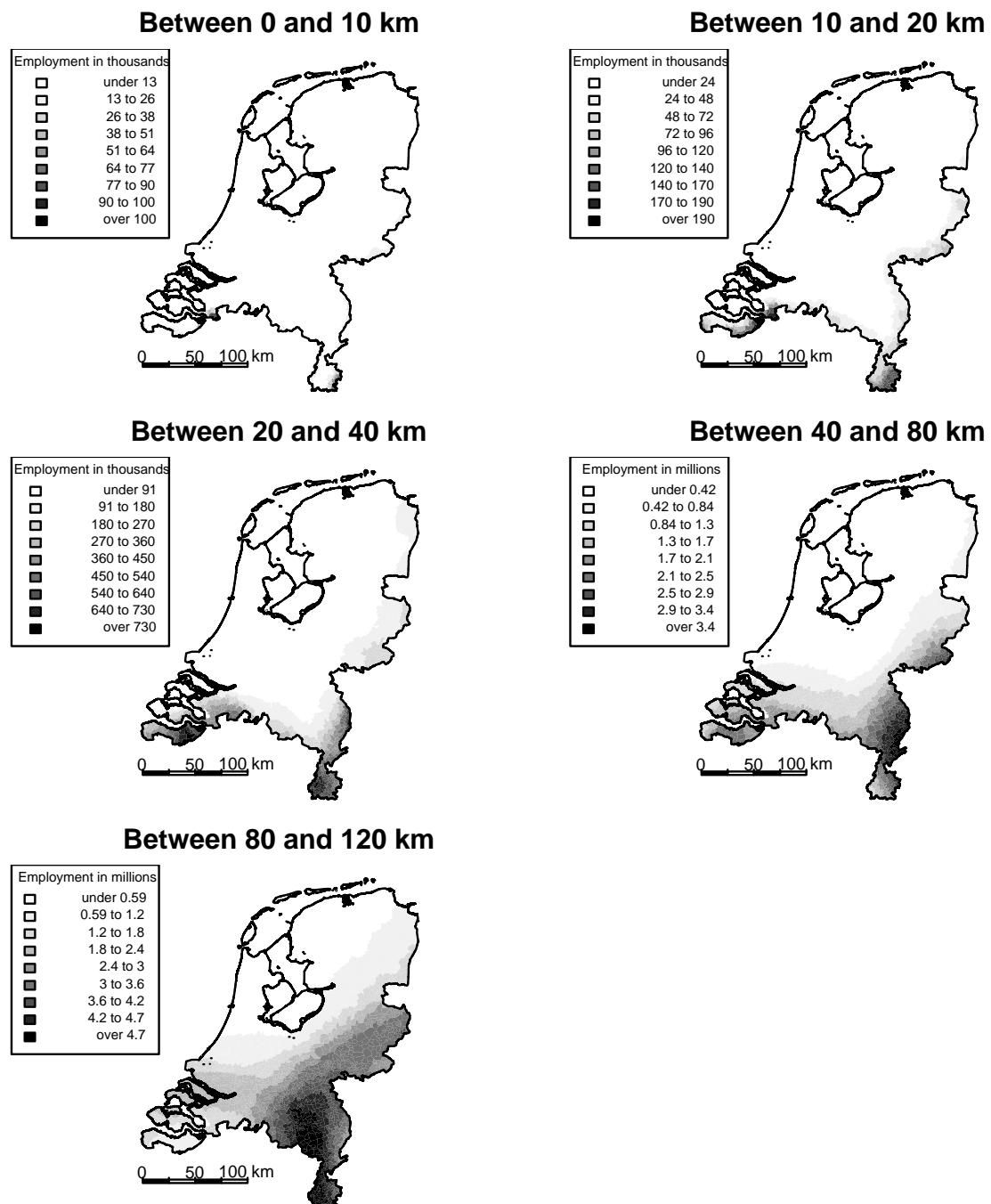
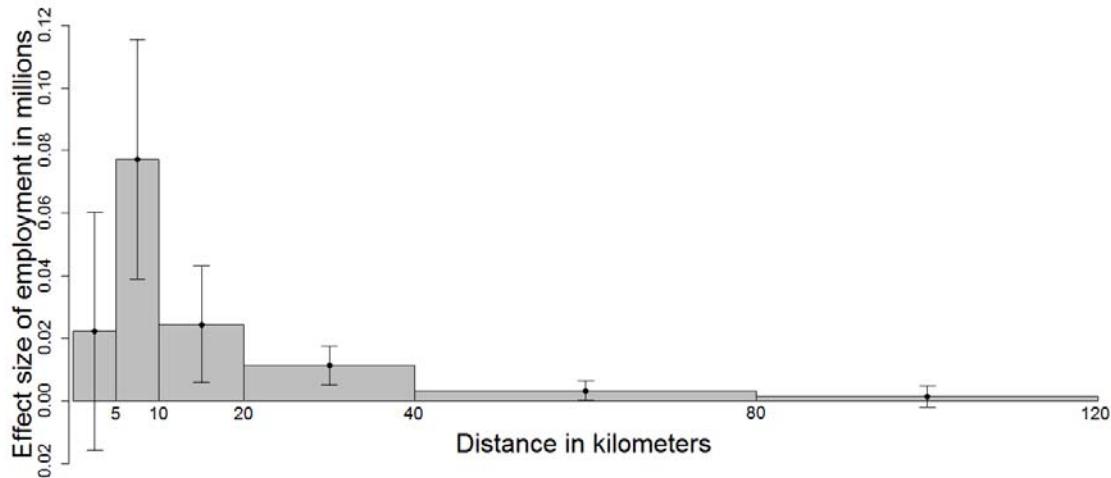


Figure A.4b. Concentric ring variables measuring foreign employment

A.5 Graphical representation of the main results

Figure A.5. Graphical representation of the spatial scope of agglomeration economies



Notes: The height of the bars represents the point estimates of the concentric ring's parameter (see Table 2.3, column 2). The bar's width represents the corresponding distance intervals. The error bars show the 95 percent confidence interval.

A.6 Three agglomeration measures

Figure A.6. Three measures of agglomeration

