

Regional Growth, Regional Inequality and Access to Markets: The Habsburg Empire in the Late 19th Century

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Issues

- East-Central Europe characterized by profound regional differences in geography, resource endowments and income
- Habsburg Empire, especially Austria, ranked low in European *growth* league over 1820-1913
- Around 1800/1820, Austria (Cisleithania) probably ahead of Germany (in 1914 borders) in per capita income terms
 - by mid-C19th caught up with and by 1914 fallen behind dramatically (Schulze 2000)

Habsburg Econ Historiography

‘pessimists’

- political & institutional failure (Gerschenkron 1962, 1977)
- policy inconsistency, institutional stagnation and entrepreneurial retreat (Freudenberger 2003)

‘optimists’

- no serious institutional impediments to industrialization and growth in C19th
- origins of MEG in late C18th (as elsewhere) in W/NW and gradual diffusion E/SE over C19th
- intra-empire division of labour not unfavourable to growth (Good 1984; Komlos 1983, 1989)

Spatial dimension to Empire's relative aggregate performance?

- Europe's industrialization in C19th profoundly regional phenomenon (Pollard 1986)
- Despite Good's pioneering work in 1980s/ 1990s, little systematic quantitative analysis of *how* regional conditions shaped economic development
- Focus in related quantitative literature largely on growth and broad division of labour between intra-empire states of Austria and Hungary (Eddie 1989, Good 1984/1998, Gross 1973, Komlos 1983) but not on regions

- Econ Hist and Econ Dev literatures on growth and income differentials emphasize
 - institutions (broadly conceived)
 - resource endowments
 - techn. change
 - 'culture' etc.(e.g. Acemoglu et al 2005)
- Econ Geog literature emphasizes
 - proximity to markets: access to domestic and foreign purchasing power
 - market potential as central econ geography concept(Redding and Venables 2004, Mayer 2009)

New Economic Geography

- Agglomeration Benefits
- Market Potential
- Trade Costs
- Integration ('globalization') may imply divergence
- key insight: spatial structure of economies determined by interplay between costs of transaction across space and increasing returns to scale

Transport (trade) costs and the location of economic activity

- **Very high** or **very low**: everything dispersed
- **Intermediate**: centralization of industry based on location in larger market with increasing returns and external economies of scale
→ ‘pull of centrality’
- So NEG suggests that even with perfect institutions everywhere integration of markets may lead to divergence

In which ways does MP matter?

- (1) ease of access to large markets for firms to sell in provides advantage for industries with increasing returns to scale
- (1) proximity to suppliers of capital goods and intermediate goods affects firms' production costs

Globalization and the Inequality of Nations

(Krugman & Venables, 1995)

- **Manufacturing** goods are subject to **increasing returns** and are used both as final and as intermediate goods
- As transport costs fall, **self-reinforcing advantage of larger market** leads to country-specific (region-specific) external economies of scale and lower costs for manufacturing in **core** relative to **periphery**
- Eventually, if trade costs fall enough and/or wages in the core rise enough, manufacturing returns to (parts of) the periphery

Questions

- (1) Extent of regional income differentials across 22 regions and over time?
- (2) What do market potential calculations reveal about regions' centrality/peripherality?
- (3) Did differences in regional economic performance reflect differences in regions' market potential?

New estimates

- (1) regional GDP for both Austria and Hungary
coverage: 22 Habsburg regions (14 in Austria, 8 in Hungary)

- (2) market potential for all 22 regions
coverage: trade cost-weighted GDP of 15 foreign economies and 22 domestic regions

- (3) analysis: relationship between regional income pc and regional access to foreign and domestic markets

Key points

- (1) inter-regional differences in levels and growth of GDP pc far larger than thought previously; Eastern regions economically further behind WE
- (2) little evidence of intra-empire catch-up
- (3) decline relative transport cost favoured coastal regions in terms of their foreign MP, but
- (4) non-European MP of limited consequence – what mattered for regional GDPpc was access to markets nearby

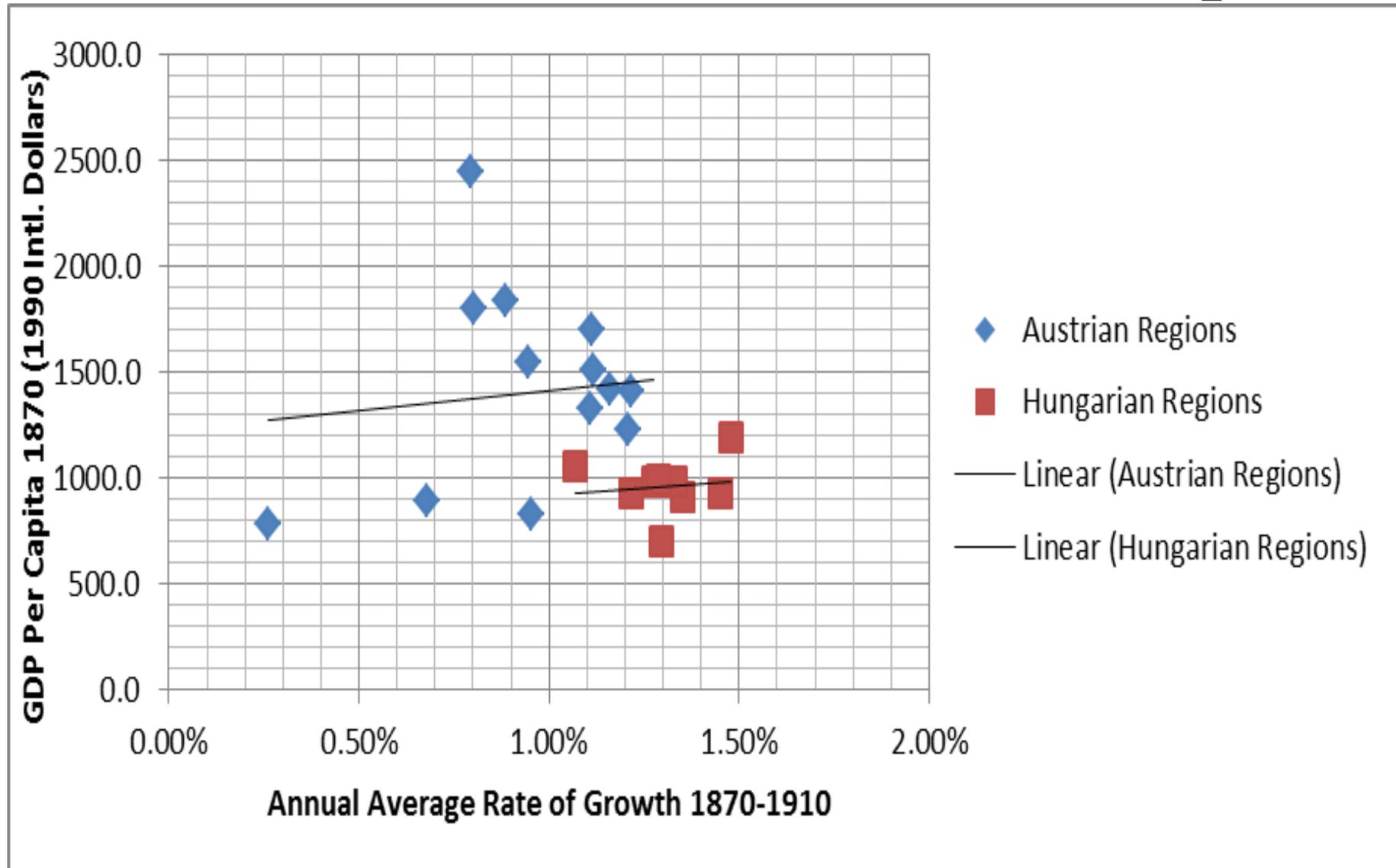
Methods & data: regional GDP

- 'standard' HNA-type state-wide GDP estimates (Schulze 2000, 2007) provide 'frame' of sectoral gross value-added
- not Geary-Stark (2002) as in Crafts (2005, 2007)
- **bottom up**: agriculture (A), mining, iron smelting (product levels); government, professional and personal services
- **top down**: regional shares in national sector and industry level output – agriculture (H), manufacturing, transport and communications, housing
- constant 1913 crowns and for 1870 to 1910 (at 10 year census intervals), converted into 1990 GK-\$

	New			Good & Ma			(a)/(c)	(b)-((d)
	GDPpc	Δ GDPpc		GDPpc	Δ GDPpc			
	1870	1870/1910		1870	1870/1910			
	(a)	(b)	(c)	(d)				
Croatia-Slavonia	691.0	1.25		825.3	1.54		0.84	-0.29
Dalmatia	727.7	0.16		916.7	1.29		0.79	-1.13
Galicia	767.3	0.85		932.0	1.29		0.82	-0.44
Bukovina	841.2	0.52		970.4	1.29		0.87	-0.77
Tisza Left Bank	878.4	1.29		956.7	1.42		0.92	-0.13
Danube Right Bank	926.8	1.35		1004.9	1.58		0.92	-0.23
Carniola	943.5	1.23		1106.0	1.33		0.85	-0.10
Tisza-Maros Basin	948.8	1.35		976.6	1.46		0.97	-0.11
Transylvania	977.3	1.15		902.0	1.49		1.08	-0.34
Tisza Right Bank	999.4	1.31		1068.4	1.44		0.94	-0.13
Danube Left Bank	1053.0	1.09		1104.8	1.36		0.95	-0.27
Littoral	1130.8	1.23		1530.0	1.29		0.74	-0.06
Danube-Tisza Basin	1198.2	1.58		1367.3	1.54		0.88	0.04
Carinthia	1306.7	1.06		1411.0	1.21		0.93	-0.15
Styria	1408.0	1.13		1349.6	1.21		1.04	-0.08
Silesia	1413.0	1.23		1546.6	1.39		0.91	-0.16
Moravia	1508.7	1.11		1486.1	1.18		1.02	-0.07
Tyrol/Voralbg.	1534.2	0.90		1398.3	1.49		1.10	-0.59
Bohemia	1726.4	1.12		1665.2	1.29		1.04	-0.17
Upper Austria	1818.0	0.78		1391.1	1.15		1.31	-0.37
Salzburg	1860.9	0.88		1547.5	1.29		1.20	-0.41
Lower Austria	2639.4	0.83		2387.1	1.16		1.11	-0.33
<i>Habsburg Empire</i>	<i>1223.4</i>	<i>1.13</i>		<i>1253.6</i>	<i>1.37</i>		<i>0.98</i>	<i>-0.24</i>
<i>Imperial Austria</i>	<i>1421.2</i>	<i>1.01</i>		<i>1424.0</i>	<i>1.28</i>		<i>1.00</i>	<i>-0.27</i>
<i>Imperial Hungary</i>	<i>960.9</i>	<i>1.35</i>		<i>1027.5</i>	<i>1.53</i>		<i>0.94</i>	<i>-0.18</i>

Ranked by 1870 level of GDPpc (new estimates).

Levels and Growth of GDP Per Capita

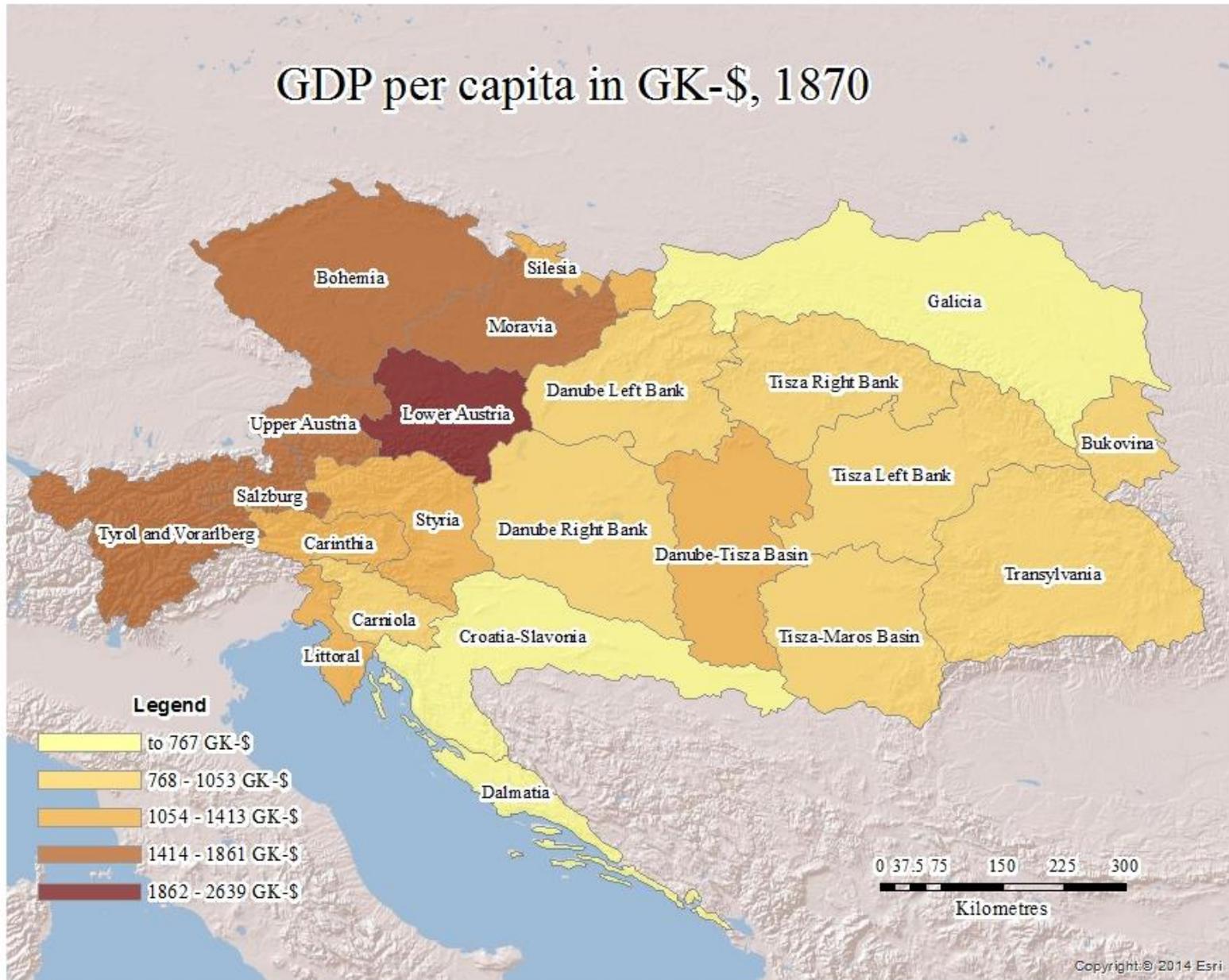


Results: regional GDP

- new estimates show major level differences in GDP compared with proxy approach (Good & Ma)
- level differences range between minimum of +/- 1.0 per cent (Salzburg 1910) and maximum of +/- 40 per cent (Dalmatia 1910)
- far more pronounced profile of regional product variations – proxy approach masks extent and persistence of regional development differentials
- higher c.v. in GDP per capita across all regions

- persistently lower growth in GDPpc
- stark inter-regional differences in growth
- contra Good & Ma (1998), little evidence of intra-empire catch-up (apart from Hungarian regions)
- in Austria, initially poorest regions in the East/South-East (Galicia, Bukovina, Dalmatia) were expanding at as low rates as three richest regions in the West (Lower Austria, Upper Austria, Salzburg)

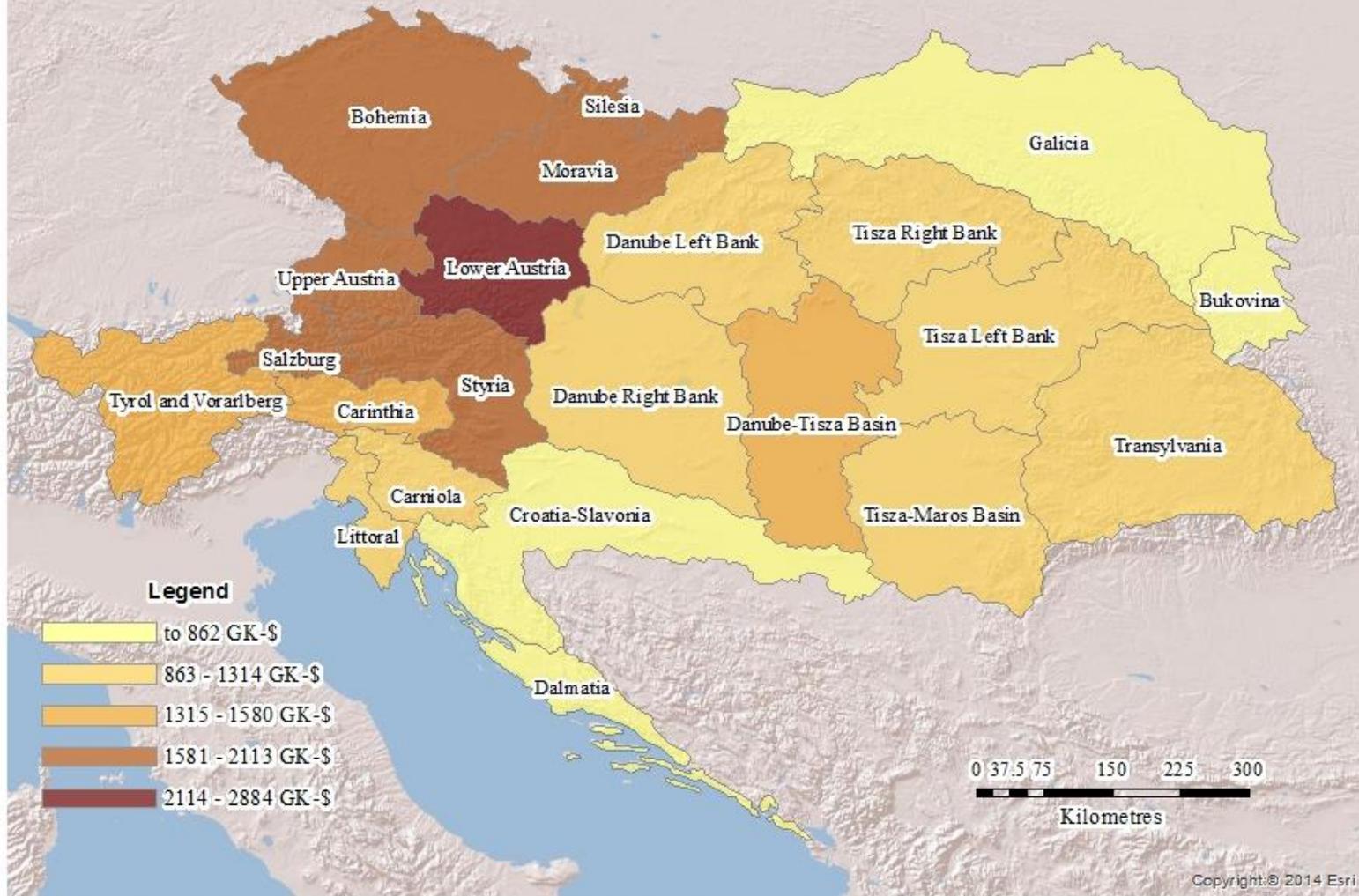
GDP per capita in GK-\$, 1870



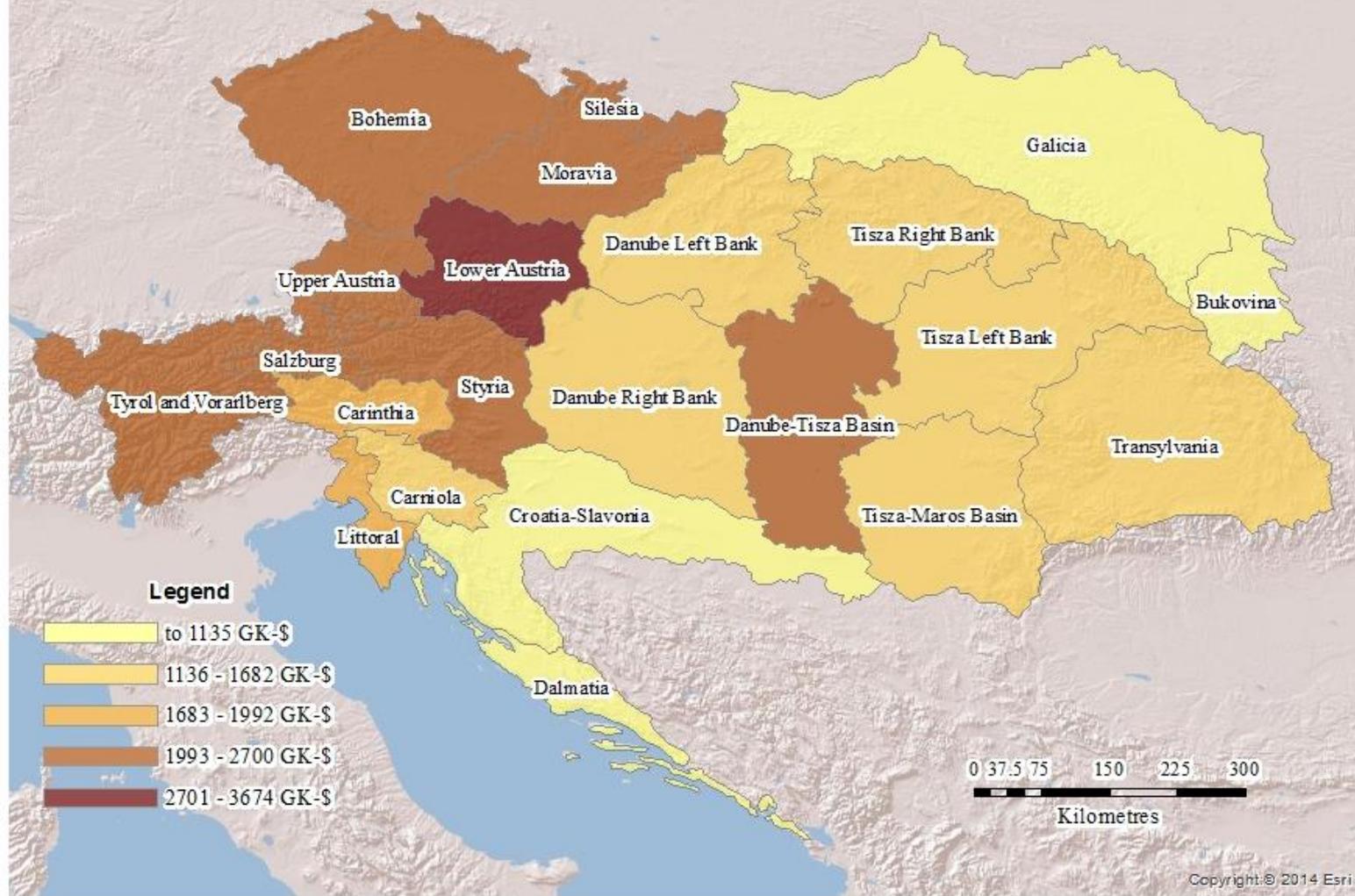
GDP per capita in GK-\$, 1880



GDP per capita in GK-\$, 1890



GDP per capita in GK-\$, 1910



Methods & Data: Regional MP

- MP depends on economic activity in given region and in other regions adjusted for proximity
- proximity depends on distance between regions/ countries over land and sea
- distances converted into equivalent measures using transport (trade) cost
- changes in MP result from either shifts in spatial distribution of activity, changes in relative transport cost or both

Market Potential (Harris-type)

$$MP_i = \sum_j GDP_j * D_{ij}^{\gamma}$$

- γ a distance weighting parameter set at -1
- augmented by 'own' distance measure D_{ii} (commonly approximated as a function of area size:
 $D_{ii} = 0.333\sqrt{(\text{area}_i/\pi)}$)
- here: transport cost plus tariff costs rather than simple distance
- deriving MP from gravity-equation not feasible (data)

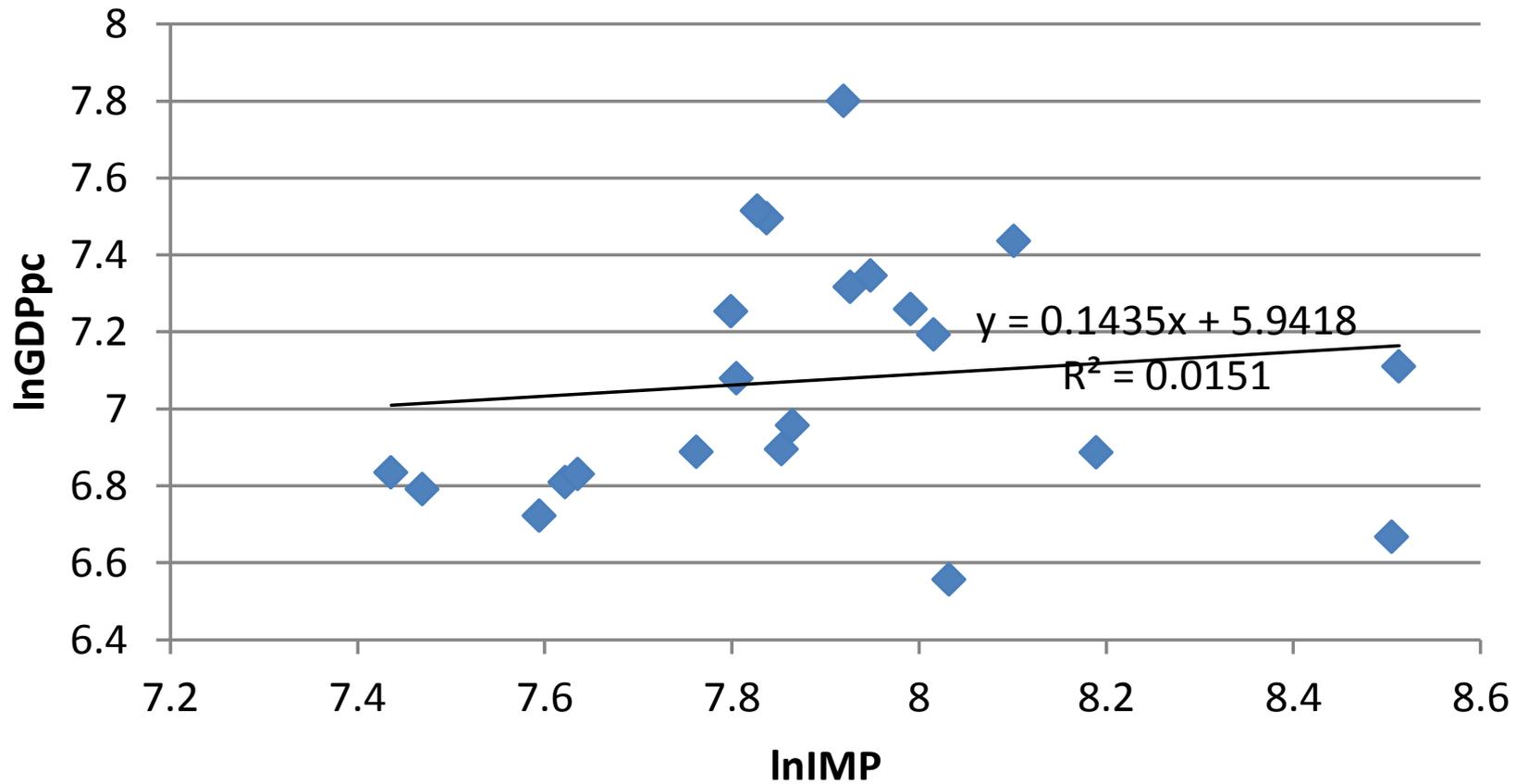
Summary: Changes in Regional MP

- composition of sample impacts strongly on measurement of regions' MP
- full sample: relative position of Littoral and Dalmatia high in 1870 and growing most rapidly up to 1910 (also Carniola, Croatia-Slavonia)
 - proximity to sea routes and benefit from lower and relatively faster declining shipping rates
 - effect somewhat exaggerated: nodes are both port cities
 - for essentially landlocked regions little change in relative MP over time

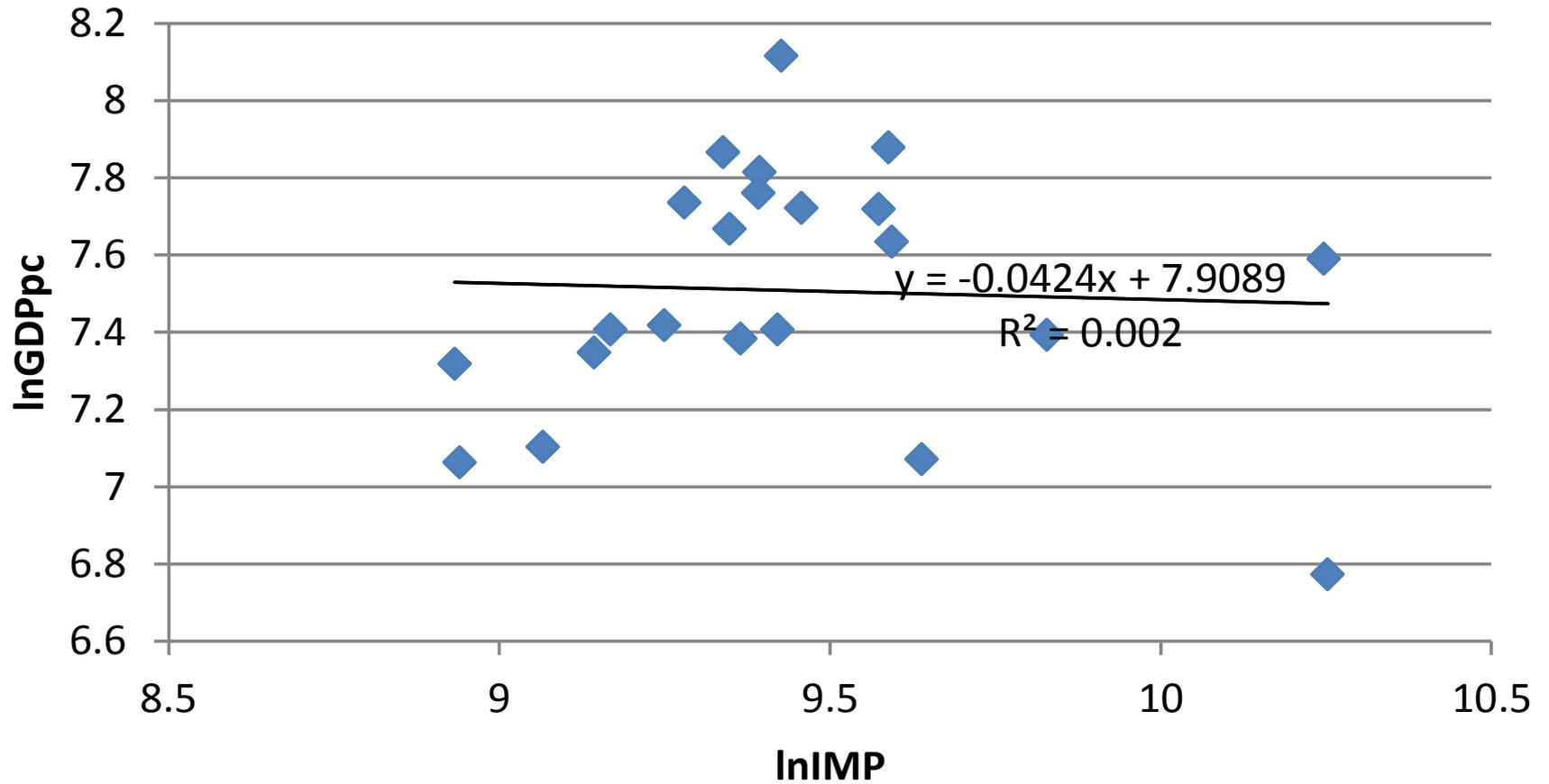
Regional Growth and Centrality

- MP: scope for region to benefit from economies of agglomeration, scale and specialization linked to market size
- Here: weaker association of regional GDP per capita with changes in broad (intl. & domestic) MP, stronger response to changes in European & domestic MP
- Some regions more successful in tapping into economic potential than others

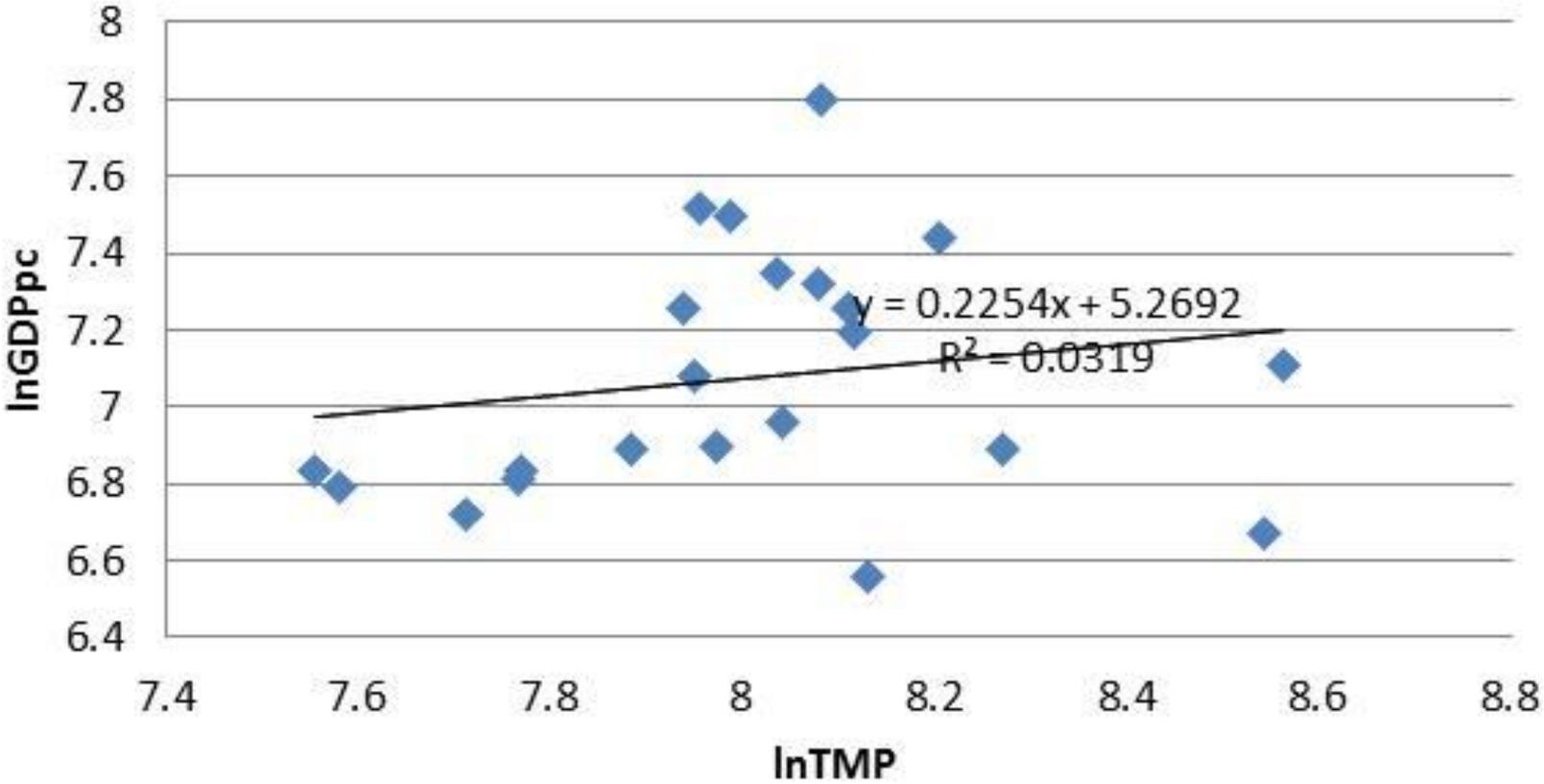
Regional GDP per capita and IMP, 1870



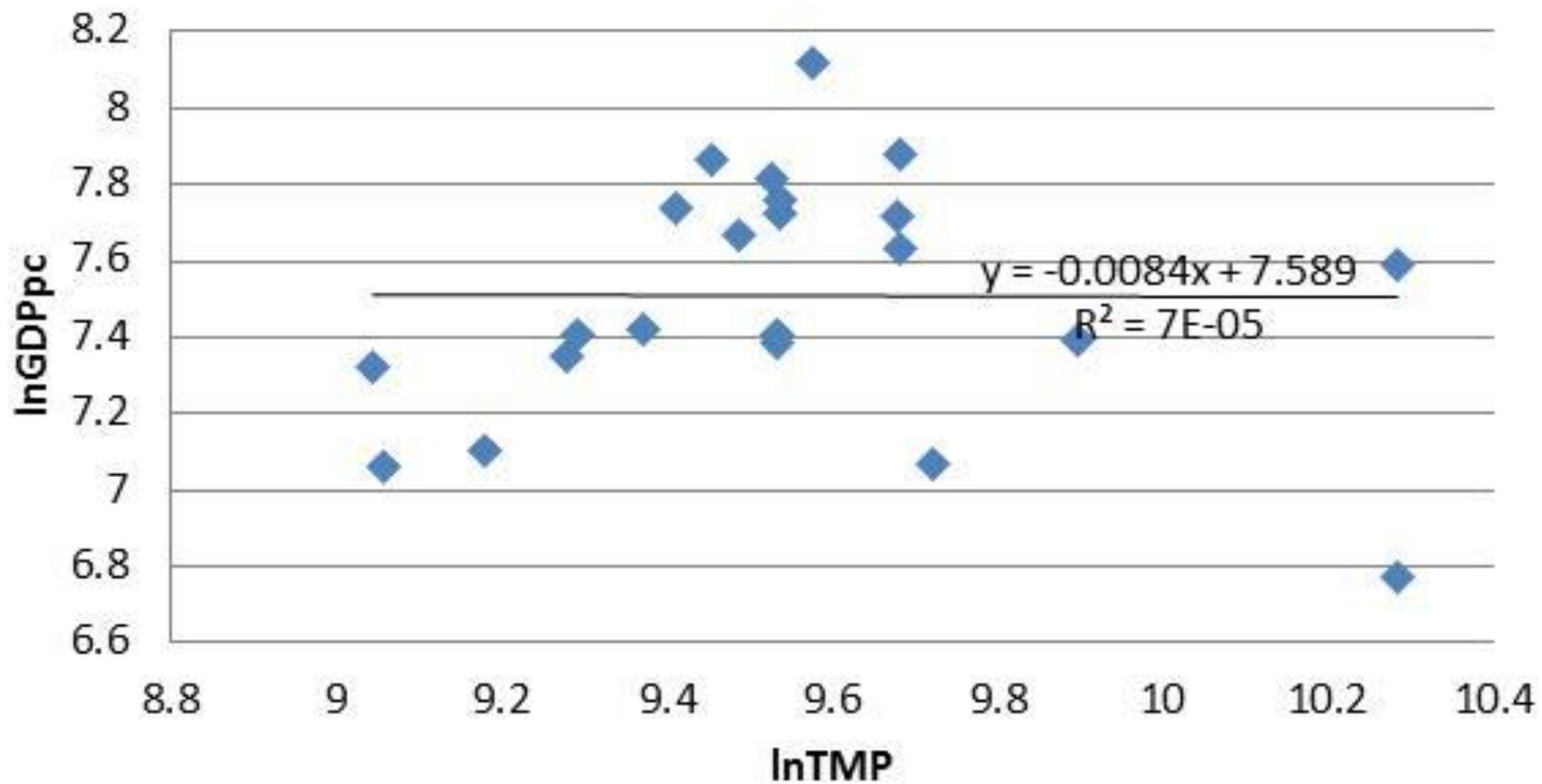
Regional GDP per capita and IMP, 1910



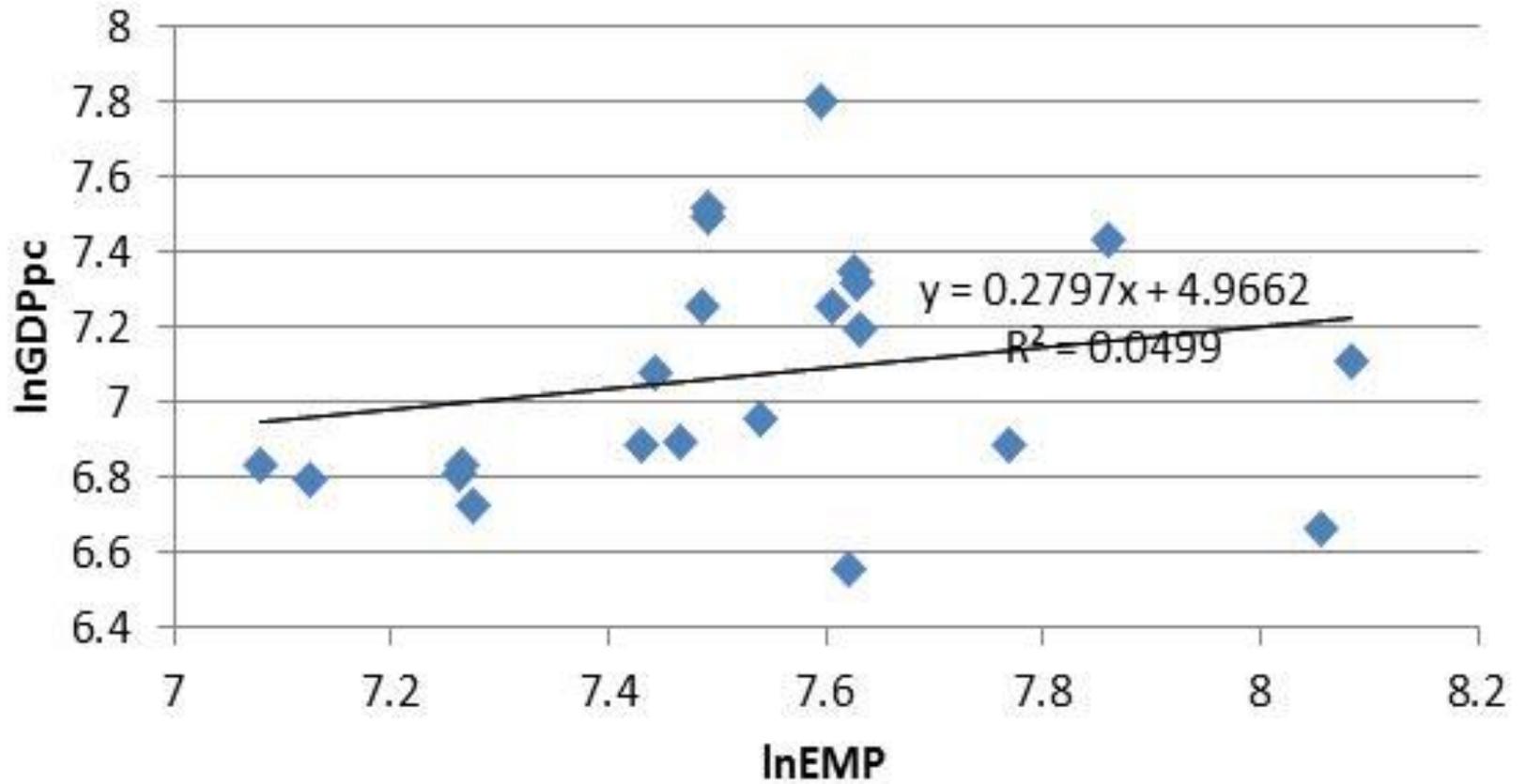
Regional GDP per capita and TMP, 1870



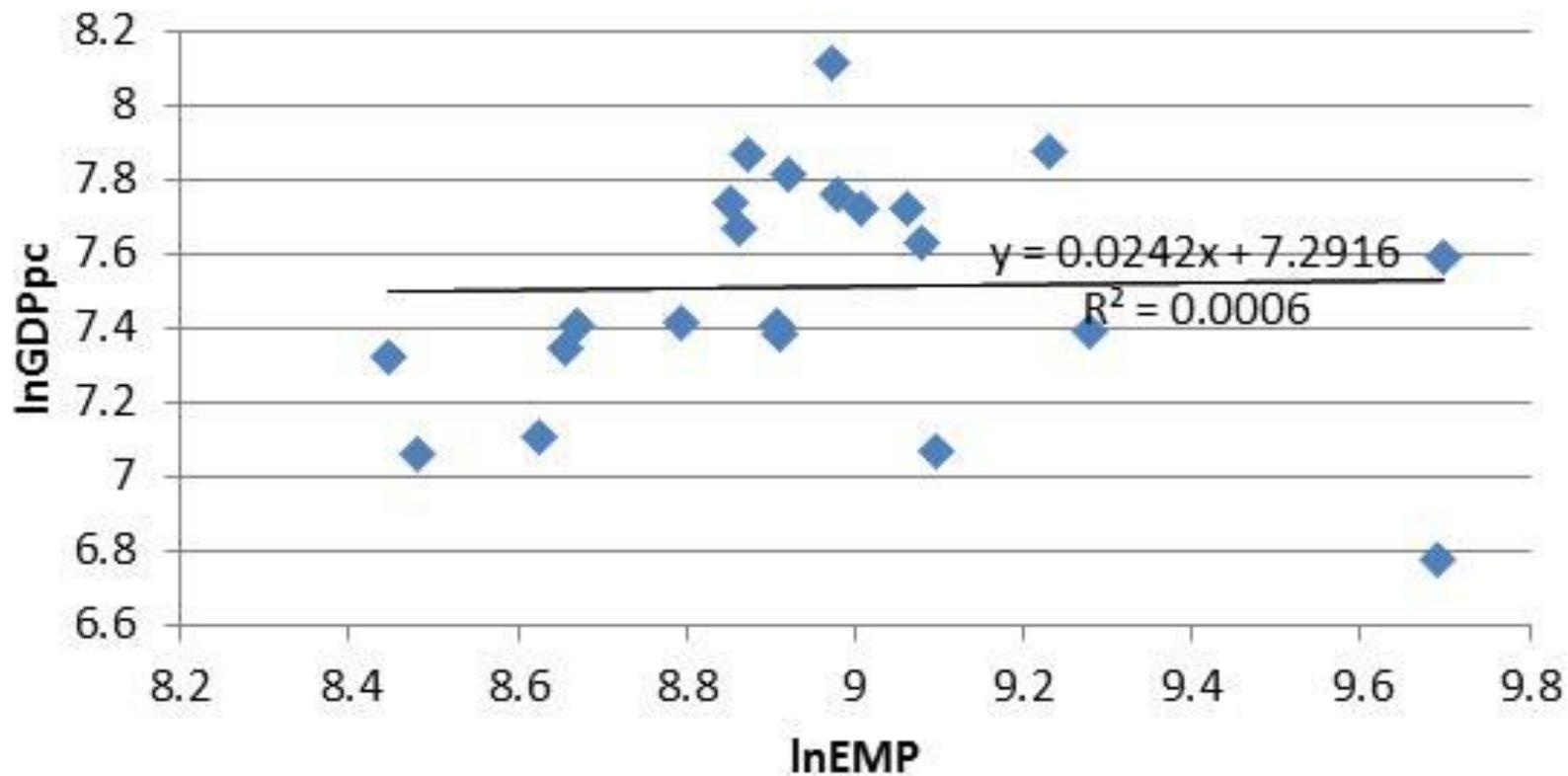
Regional GDP per capita and TMP, 1910



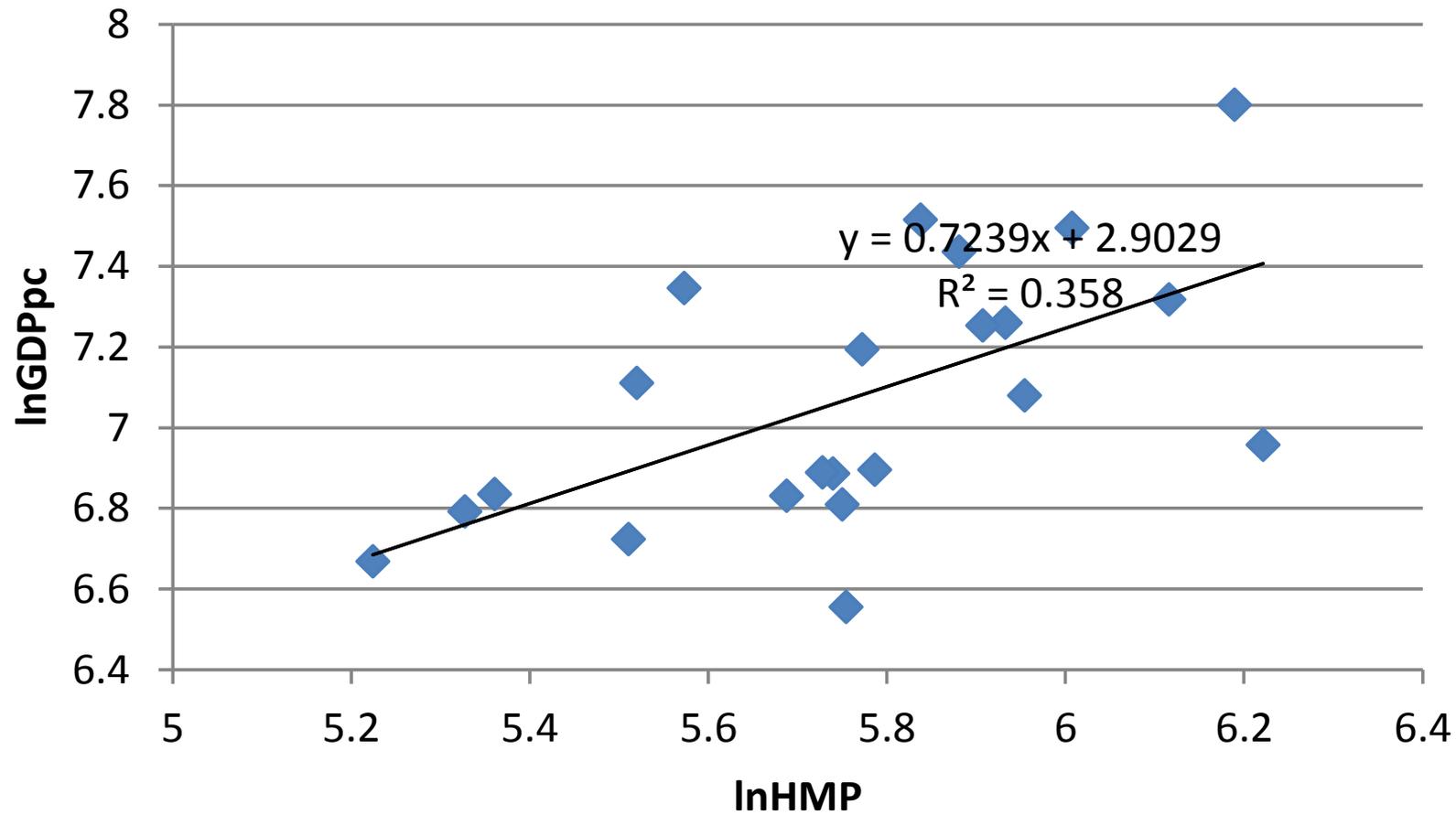
Regional GDP per capita and EMP, 1870



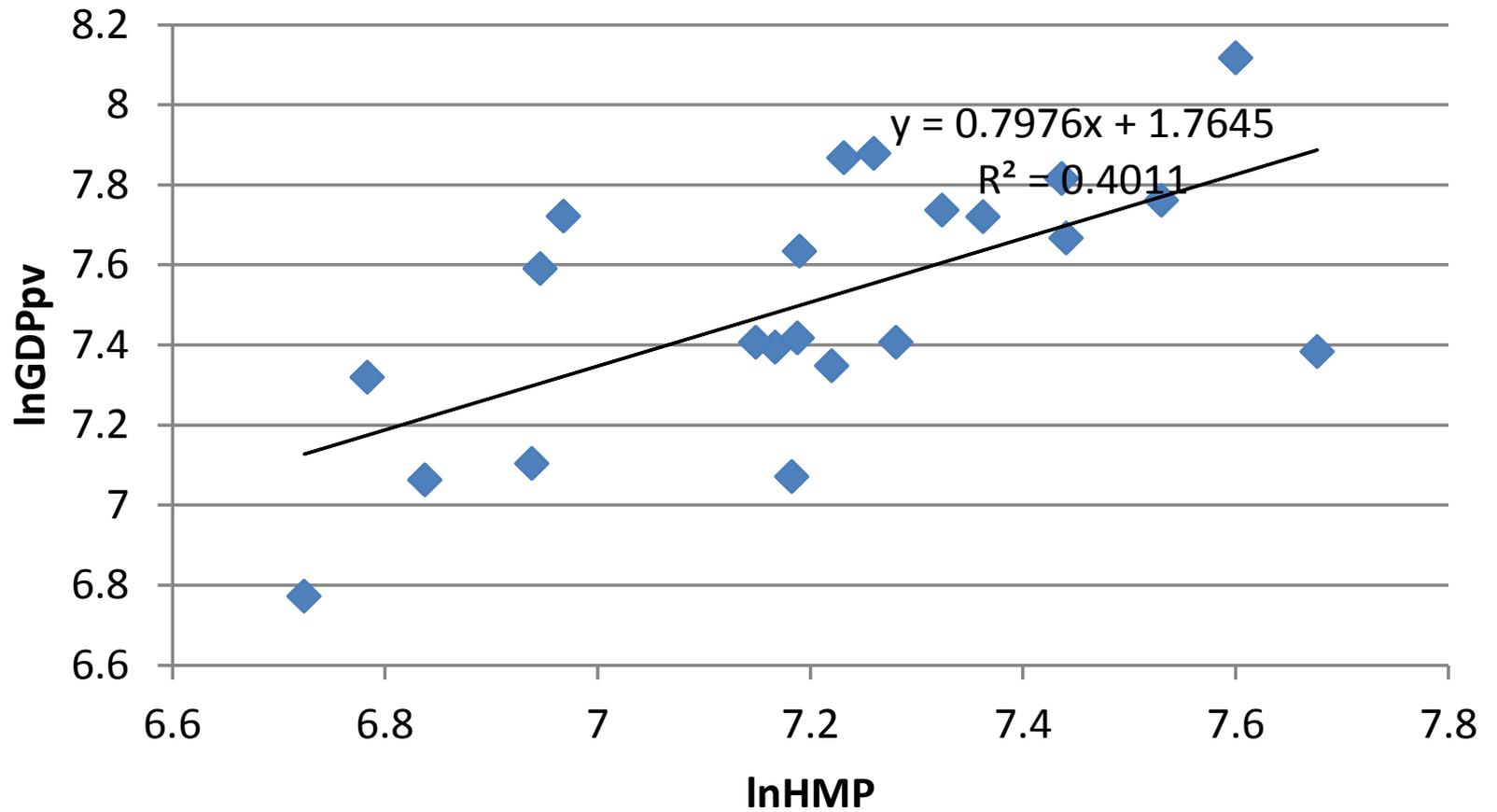
Regional GDP per capita and EMP, 1910



Regional GDP per capita and HMP, 1870



Regional GDP per capita and HMP, 1910



Basic Associations: OLS, GDPpc and Market Potential

Ln(GDPpc)	(1)	(2)	(3)
LOG(INT_MP+HOME_MP)	0.2973 ***		
	<i>0.0257</i>		
LOG(EUROPE_MP+HOME_MP)		0.3157 ***	
		<i>0.3157</i>	
LOG(HOME_MP)			0.2976 ***
			<i>0.0243</i>
Region FE	yes	yes	yes
N	110	110	110
Adj. R-2	0.969		0.972

* Statistically significant at 10% level, ** at 5 % level, *** at 1 % level. Robust standard errors clustered by region in italics. Constant not reported.

Potential Endogeneity Problems

- Reverse causation: possibility of 'feedback loops'
- Hence: instruments (sum of inverse distances to all European and Habsburg nodes to avoid explicit imposition of a centre, cf. Head & Mayer 2006)

Controls

- Measures of regions' primary resource endowments per capita (e.g. Redding & Venables 2004): arable land, energy access (calorific content weighted measure of lignite, anthracite, oil)
- Proxy for broadly conceived 'social capabilities' and institutional quality: HE-ratio of tertiary AYS over primary and secondary AYS (regional AYS derived from Schulze & Fernandes 2009)

Controls and IV: TSLS, GDPpc and MP

	IV-2: GDPpc		IV-2: GDPpc		IV-2: GDPpc		IV-2: GDPpc		IV-2: GDPpc		IV-2: GDPpc	
	(1)		(2)		(3)		(4)		(5)		(6)	
ln(EUROPE_MP+HOME_MP)	0.3424 ***		0.4212 ***		0.4318 ***		0.4528 ***		0.4626 ***		0.4467 ***	
	<i>0.0402</i>		<i>0.0495</i>		<i>0.0490</i>		<i>0.0560</i>		<i>0.0528</i>		<i>0.05438</i>	
Ln(ARABLE/POP)			0.4187 ***		0.4093 ***		0.5868 ***		0.5894 ***		0.5299 **	
			<i>0.1413</i>		<i>0.1403</i>		<i>0.2058</i>		<i>0.2017</i>		<i>0.2187</i>	
Ln(ENERGY_UNIT/POP)					-0.0097				-0.007		-0.0081	
					<i>0.0092</i>				<i>0.0099</i>		<i>0.0098</i>	
ln(HE_ratio)											0.0208	
											<i>0.0254</i>	
Region FE	yes		yes									
Period Dummies	yes		yes									
N	110		110		110		110		110		110	
Adj. R-2	0.969		0.974		0.975		0.9729		0.973		0.974	
F-stat	134.076 ***		143.74 ***		140.668 ***		151.27 ***		150.532 ***		143.75 **	
Cragg-Donald F-stat	277.468 ***		217.03 ***		210.08 ***		38.38 ***		25.814 n/a		20.444 n/a	
IV-1: sum inv. distances												
Adj. R-2	0.971		0.972		0.972		0.971		0.971		0.972	
F-stat	154.548 ***		152.99		145.55 ***		147.6 ***		140.235 ***		142.54 ***	
IV-1: arable/area												
Adj. R-2							0.988		0.989		0.989	
F-stat							372.25 ***		368.403 ***		370.608 ***	
IV-1: energy_unit/area												
Adj. R-2									0.999		0.989	
F-stat									31533.7 ***		31708.0 ***	

* Statistically significant at 10% level, ** at 5 % level, *** at 1 % level. Robust standard errors clustered by region in italics.

Some Conclusions

- Regional differences in income levels and growth far larger than thought previously
- Eastern parts of empire economically further behind WE
- Limited intra-empire catch-up
- Eastern regions: 'poor', slow growth, low MP
- Main finding: market access (within empire, within Europe) had major impact on region's absolute and relative per capita income levels, even after controlling for resource endowments and basic institutional characteristics

Implications

- locus of empire's regions important in explaining empire's overall catch-up failure: the costs of distance were substantial, c.p. being on geographical periphery meant being on economic periphery in late C19th
- limited scope for policy?

'spares'

Total MP

	Lower Austria = 100					1870 = 100				
	1870	1880	1890	1900	1910	1870	1880	1890	1900	1910
Lower Austria	100	100	100	100	100	100	140	196	279	445
Upper Austria	91	92	91	95	95	100	142	197	291	466
Salzburg	88	90	89	88	88	100	143	198	280	447
Styria	103	109	110	110	111	100	148	210	300	479
Carinthia	103	110	111	111	111	100	149	210	299	478
Carniola	121	134	137	138	138	100	155	222	318	507
Littoral	162	190	198	205	203	100	165	241	355	559
Tyrol & Vorarlberg	96	97	96	96	96	100	143	198	280	448
Bohemia	113	111	108	109	111	100	138	187	270	438
Moravia	100	98	95	95	96	100	138	187	265	430
Silesia	87	86	83	83	85	100	139	188	267	436
Galicia	69	68	66	66	67	100	139	188	266	434
Bukovina	61	60	58	58	59	100	138	188	268	437
Dalmatia	158	189	197	204	203	100	167	245	360	570
Danube Left Bank	96	96	96	96	96	100	140	195	278	445
Danube Right Bank	90	94	95	95	96	100	147	209	297	476
Danube-Tisza Basin	88	90	91	91	91	100	144	205	290	464
Tisza Right Bank	82	82	80	79	81	100	140	191	270	441
Tisza Left Bank	73	74	74	74	74	100	143	201	283	455
Tisza-Maros Basin	73	75	75	75	75	100	144	203	286	459
Transylvania	59	59	59	58	59	100	141	196	276	443
Croatia-Slavonia	105	113	115	115	116	100	151	216	307	491

Sources : See text.

European and Domestic MP

	Lower Austria = 100					1870 = 100				
	1870	1880	1890	1900	1910	1870	1880	1890	1900	1910
Lower Austria	100	100	100	100	100	100	132	182	258	399
Upper Austria	89	90	89	93	93	100	133	183	268	417
Salzburg	86	88	87	86	86	100	135	183	257	399
Styria	96	102	103	103	103	100	140	194	275	427
Carinthia	96	102	103	102	102	100	140	194	273	423
Carniola	108	119	121	122	121	100	146	204	290	448
Littoral	141	166	172	177	175	100	156	222	323	497
Tyrol & Vorarlberg	94	95	94	93	93	100	134	182	257	398
Bohemia	119	118	114	116	117	100	130	174	250	394
Moravia	101	100	97	97	99	100	131	175	248	391
Silesia	87	87	84	84	86	100	131	176	249	395
Galicia	68	68	66	66	67	100	131	175	247	390
Bukovina	59	58	57	57	58	100	131	175	250	397
Dalmatia	135	162	168	173	172	100	158	226	331	509
Danube Left Bank	96	96	96	96	97	100	132	181	257	401
Danube Right Bank	84	88	90	89	89	100	139	194	274	426
Danube-Tisza Basin	85	87	89	88	89	100	136	191	269	418
Tisza Right Bank	81	81	78	78	80	100	132	177	250	397
Tisza Left Bank	70	72	72	72	72	100	135	187	262	409
Tisza-Maros Basin	70	72	72	72	72	100	136	188	265	412
Transylvania	57	57	56	56	56	100	133	181	254	395
Croatia-Slavonia	95	103	104	104	104	100	143	199	281	435

Sources: See text.

Domestic MP

	Lower Austria = 100					1870 = 100				
	1870	1880	1890	1900	1910	1870	1880	1890	1900	1910
Lower Austria	100	100	100	100	100	100	128	195	271	410
Upper Austria	83	84	82	83	85	100	128	191	270	418
Salzburg	70	70	68	67	69	100	128	188	260	403
Styria	77	78	77	77	79	100	129	193	271	418
Carinthia	66	66	65	65	66	100	129	191	266	413
Carniola	64	64	63	63	65	100	129	192	267	417
Littoral	51	52	50	50	52	100	129	192	267	416
Tyrol & Vorarlberg	54	54	52	52	53	100	127	189	261	404
Bohemia	73	73	73	72	71	100	127	194	268	397
Moravia	93	93	92	92	93	100	128	193	267	411
Silesia	75	76	74	74	76	100	128	192	264	412
Galicia	51	51	52	51	52	100	127	201	272	417
Bukovina	42	42	44	44	47	100	128	201	284	453
Dalmatia	38	39	41	39	42	100	131	209	280	448
Danube Left Bank	103	104	104	105	108	100	129	196	276	429
Danube Right Bank	67	67	71	71	73	100	129	207	289	445
Danube-Tisza Basin	79	80	84	84	85	100	128	207	288	442
Tisza Right Bank	63	63	65	64	66	100	128	200	275	431
Tisza Left Bank	64	65	67	66	68	100	128	202	279	435
Tisza-Maros Basin	61	61	62	62	64	100	128	201	277	431
Transylvania	44	43	44	43	44	100	127	195	268	415
Croatia-Slavonia	65	65	65	64	66	100	129	195	270	417

Sources: See text.

Agriculture

Austria

- Crop production: regional output of > 20 products valued at 1913 prices (Sandgruber, 1978)
- Livestock, dairy output: estimates based on animal stocks, slaughter weights, milk yields etc. (Sandgruber 1978)

Hungary

- Estimate of total agricultural output based on regional area cultivated, regional agricultural labour force, share and size of agriculture in total labour force, terrain slope (ruggedness) and soil quality
- Drawing on coefficients estimated from Austrian data

Mining & iron smelting

A, H

- Regional quantities for full range of mining products at 1913 prices (Bergbaustatistik, Huettenwesen 1870-1913)

Wrought iron and steel

A, H

- Regional distribution as for cast iron and pig iron – matches labour force distribution (Censuses 1870-1910)

Manufacturing, construction

Austria

- Regional wage and employment data extracted from workers' accident insurance system (Unfallstatistik 1889-1911)
- 12 major industries, 38 branches
- Gross-value added derived drawing on industry-specific wagesum/gross output ratios and value-added proportions from Fellner (1916)
- Adjusted using regional gross output per worker and regional employment (corrected Census data)
- 1870, 1880: regional shares based on weighted 1890 regional output per worker *relatives*, 1870 (1880) overall industrial output per worker and 1870 (1880) regional industrial employment levels

Hungary

- Assumption that *within* each of 12 industries no major regional variation in output per worker in given year
- 1890-1910: output at *individual* industry level distributed across regions by regional employment shares (Census)
- 1870, 1880: weighted 1890 regional output per worker *relatives*, 1870 (1880) overall industrial output per worker and 1870 (1880) regional industrial employment

Tertiary sector

A,H

- a) trade, finance, communications:
labour force (corrected Census data) and
regions' *relative* productivities in other sectors

- b) government, professional and personal
services:
average 1913 wages for each - army, domestic
service, government and professional services
(Kausel 1979, Waizner1928), and labour force
(corrected Census data)