

# Benchmarking the Middle Ages. XV century Tuscany in European Perspective

Jan Luiten van Zanden | Utrecht University  
Emanuele Felice | Università "G. D'Annunzio" Chieti-Pescara

---

---

The Groningen Growth and Development Center (GGDC) 25th Anniversary Conference

**Groningen, 28-30 June, 2017**

## The big questions

- How wealthy was pre-industrial Europe?
- How rich was the South compared to the North-West
  - did the “Little Divergence” already start in the late Medieval Period?
- What are the reasons for Italy’s decline

## The debate about the “little divergence” and the Italian puzzle: available GDP figures / 1

### *The Italian GDP in international comparisons, 1400-1850 (1990 international Geary-Khamis*

<i>dollars)</i>	1400	1450	1500	1600	1700	1820	1850
<b><i>New estimates, 2014</i></b>							
<b>Italy (Centre-North)</b>	<b>1,751</b>	<b>1,826</b>	<b>1,533</b>	<b>1,363</b>	<b>1,476</b>	<b>1,511</b>	<b>1,481</b>
Netherlands	1,195	1,373	1,454	2,662	2,105	1,874	2,355
England	1,099	1,076	1,086	1,082	1,513	2,074	2,330
Spain	819	n.a.	846	892	814	n.a.	1,079
Japan	n.a.	527	n.a.	574	629	641	681
<b><i>Maddison, 2006</i></b>							
<b>Italy</b>	<b>n.a.</b>	<b>n.a.</b>	<b>1,100</b>	<b>1,100</b>	<b>1,100</b>	<b>1,117</b>	<b>1,350</b>
Netherlands	n.a.	n.a.	761	1,381	2,130	1,838	2,371
France	n.a.	n.a.	727	841	910	1,135	1,597
England	n.a.	n.a.	714	974	1,250	1,706	2,330
Germany	n.a.	n.a.	688	791	910	1,077	1,428
Spain	n.a.	n.a.	661	853	853	1,008	1,079
Former Ussr	n.a.	n.a.	499	552	610	688	n.a.
Turkey	n.a.	n.a.	600	600	600	643	n.a.
Egypt	n.a.	n.a.	475	475	475	475	n.a.
China	n.a.	n.a.	600	600	600	600	600
India	n.a.	n.a.	550	550	550	533	533
Japan	n.a.	n.a.	500	520	570	669	679
Latin America	n.a.	n.a.	416	438	527	691	n.a.

## The debate about the “little divergence” and the Italian puzzle: available GDP figures / 2

*The Italian GDP in international comparisons, 1400-1850 (2011 US dollars, multiple benchmarks)*

	1400	1500	1600	1700	1800	1820	1850
<i>Multiple benchmarks, 2017</i>							
<b>Italy</b>	<b>2,049</b>	<b>1,794</b>	<b>1,595</b>	<b>1,728</b>	<b>1,595</b>	<b>1,793</b>	<b>1,792</b>
United Kingdom	n.a.	n.a.	n.a.	1,803	2,498	2,396	2,993
Belgium	n.a.	1,971	2,135	1,847	1,956	n.a.	2,009
France	n.a.	n.a.	n.a.	n.a.	1,533	1,505	1,999
Germany	n.a.	1,485	1,047	1,217	1,279	n.a.	1,607
Sweden	n.a.	1,521	1,164	2,049	1,310	1,312	1,507
Spain	1,501	1,550	1,635	1,492	1,679	n.a.	1,856
Portugal	n.a.	1,523	1,552	1,300	1,365	1,236	1,244
Turkey	n.a.	1,155	n.a.	1,187	1,244	1,257	n.a.
Egypt	1,050	1,190	n.a.	n.a.	n.a.	432	n.a.
China	n.a.	n.a.	n.a.	n.a.	n.a.	832	715
Japan	n.a.	n.a.	766	840	856	n.a.	910

# The debate about the “little divergence” and the Italian puzzle:

## open issues

- Lack of consistency with the Italian economic history
  - Cipolla (1952, 1974) and the XVII century crisis
- ... and with international comparisons too
- The Little divergence
  - Allen (2001): differences in real wages

How were produced the Italian series?

- the agricultural product (from Federico and Malanima, 2004) + the non-agricultural product (Malanima, 2011)
  - Agricultural product: consumption (demand side): population \* urban and non-urban wages
    - Urban wages: 1285-1860 ten-year series of the salary of Florentine bricklayers
  - non-agricultural product: the urbanization rate and the relationship that, in the post-unification period (1861 to 1936), the share of the product in industry and services (out of total output) had with the rate of urbanization
- Malanima's **wages** are consistent with his GDP figures, also in international comparisons (Malanima, 2013)

## Our strategy

- To create an independent benchmark estimate of Tuscan GDP, and its composition, in 1427
- The Florentine Catasto of 1427
  - one of the most detailed, extensive and probably reliable quantitative sources available for Medieval Europe
  - It has detailed information on the composition, the occupations and assets of all 61,123 households in Tuscany
  - Already digitalized (Herlihy and Klapisch-Zuber, 1978, 1985)
  - used by other scholars (Lindert, 2008; Botticini, 1999, 2000; Akerberg and Botticini, 2000, 2002; Botticini and Siow, 2003), but never thus far to estimate GDP

**Catasto's limits:** Only about half the heads of households report their occupations

four groups:

1. the capital city Florence (9,879 h.)
2. the small cities (Pistoia, Prato, Pisa, Cortona, San Gimignano, Volterra) (9,483 h. )
3. the Contado of Florence (26,926 h.)
4. the rest of the countryside (14,835 h.)

*Average wealth per household in four regions and three economic sectors (in fl.)*

Value of all assets per household	Agriculture	Industry	Services	No stated occupation	Total
Florence	197	245	1233	1480	1026
Small Cities	107	200	508	243	265
Contado	55	130	204	63	68
Rest countryside	96	183	242	57	80
Total	70	208	731	290	257

1. the 'no' group in the services sector
2. the 'no' group distributed equally over industry and services
- 3-4- the 'no' group distributed over the three sectors according to the known occupations  
(data on cattle suggest that the 'no' group is not entirely agricultural)

*Estimates of the structure of the labour force (heads of households)*

No. Households	Agriculture	Industry	Services	Total
Florence	24	3139	6716	9879
Small cities	1078	4226	4179	9483
Contado	22364	2381	2181	26926
Rest countryside	12735	1051	1048	14835
Total	36201	10798	14124	61123
Share (%)	59	18	23	

Then we have to assign income levels to the occupational groups

Capital income (mostly through data on the Catasto)

Except residential buildings, assumed from Lindert (2008)

Wage income: data on salaries and wages in Florence in the 1420s (various sources)

As a general rule, the assumptions do not lead to an underestimate of these incomes



*Estimates of  
size and  
composition of  
income in  
Tuscany in  
1427*

		House- holds	Populatio n	Total Wage Income	Total Capital Income	Total Income	Income per capita
Florence	Agricult.	24	96	640	456	1,096	11
	Industry	3,139	12,637	152,670	81,506	234,176	19
	Services	6,716	25,789	476,225	810,198	1,286,423	50
	Total	9,879	38,522	540,575	892,160	1,432,734	37
Small cit.	Agricult.	1,078	6,037	34,137	12,131	46,267	8
	Industry	4,226	16,322	205,537	102,404	307,942	19
	Services	4,179	16,671	273,535	154,677	428,212	26
	Total	9,483	39,030	463,894	269,212	733,106	19
Contado	Agricult.	22,364	109,894	708,194	165,980	874,174	8
	Industry	2,381	10,767	115,814	30,307	146,121	14
	Services	2,181	8,465	130,846	39,159	170,005	20
	Total	26,926	129,126	831,127	235,446	1,066,574	8
Rest Countryside	Agricult.	12,735	55,784	403,278	107,839	511,116	9
	Industry	1,051	4,662	51,139	14,494	65,634	14
	Services	1,048	3,976	62,908	18,357	81,265	20
	Total	14,835	64,423	448,392	140,691	589,082	9
Total	Agricult.	36,201	171,811	1,146,248	286,406	1,432,654	8
	Industry	10,798	44,389	525,160	228,711	753,872	17
	Services	14,124	54,901	943,513	1,022,392	1,965,905	36
	Total	61,123	271,101	2,614,921	1,537,509	4,152,430	15
Clergy		6,000	11,000	360,000	105,000	465,000	42
Soldiers		12,000	20,000	357,360		357,360	18
Total		79,123	302,101	3,332,281	1,642,509	4,974,790	16.5

*The GDP of  
Tuscany in  
comparison  
with England  
and Holland*

	England	Tuscany	Holland
	1423/32	1423/32	1510/14
GDP pc in local currency	2,02	16,5	28,9
Silver weight	212,38	31,1	18,8
GDP pc in grammes of silver	429	513	544
PPP consumption basket			
Allen	1	0,8	0,7
Malanima	1	1,05	
Real GDP pc			
Allen	100	145	181(140)*
Malanima	100	110	

\* (140) Holland refers to the 1423/32 years

## *Relative income/productivity of agriculture, industry and services*

	Tuscany: income per head	Tuscany: output per head	England 1381	England 1522	Holland 1514
Agriculture	53	67	80	71	80
Industry	113	113	150	165	103
Services	213	167	109	104	136
Total	100	100	100	100	100

In Tuscany, large income streams from agriculture to the cities  
and in particular to **Florence**

This increases the income of the urban elite and depresses rural  
incomes.

the elite also spends its income on the conspicuous consumption that  
gives rise to the Renaissance

## The main result...

- In 1427, Tuscany was in per capita GDP (in real terms) only slightly above England, and about at the same level with Holland
- Fundamental institutional differences
- Florence was characterized by high extractive rates in favor of the capital city
  - to the detriment of the subdued cities and, most of all, of the countryside
- and by subsequent market blockades
- Epstein (1991, 1994)
  - Florence did not face serious non-urban opposition, coming from seigneurial power in the countryside
  - outside Florence economic and fiscal structures were left untouched (as long as they did not harm the interests of the Florentine's government)
  - these in turn favored the elites of the other towns, to the detriment of their countryside laborers

## ... and the Italian puzzle

- Our results may explain:
- 1) why previous estimates probably overestimated GDP
  - they were partly based on the construction wages in Florence (within the ‘privileged’ economy)
- 2) The decline of Italy (of Florence, in the XV century)
  - Epstein (1991), institutional inefficiencies and blockades
    - *versus* a cultural explanation (Romano 1972, Jones 1978)
- 3) perhaps, the exceptional artistic blossoming of XV century Florence
  - despite only a small lead in average GDP

Thank you!

Emanuele Felice

Jan Luiten van Zanden