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Inequality in Europe in the long run perspective (1300-1850): evidence from real wages

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Research question

How did workers fare in relative terms in pre-industrial Europe?

Measuring inequality

Standard measures of inequality:

- Gini coefficients (Milanovic, Lindert and Williamson 2011)
- Shares of top incomes (Atkinson et al 2011, Piketty and Saez 2014)
- Wealth/GDP ratios (Piketty and Zucman 2014)
- Factor shares - > distributional national accounts (Lindert-Williamson 2018, Piketty et al 2016 Bengtsson and Waldenstrom forthcoming)

Pre-industrial inequality

- Conventional wisdom is that pre-industrial societies were highly unequal, within the constraints of low GDP per capita
- Based on estimates of Gini coefficient inferred from
  - Social tables (Milanovic, Lindert and Williamson 2011, Allen forthcoming)
  - Tax records (Alfani and Ryckbosch 2016, Reis 2017)

Proxies for factor shares

- Factor shares proxied by ratio of (indexes of) wage/GDP (Williamson 1997) or wage/rent (O'Rourke and Williamson 2005)
- Ca 20% observations in data-base van Zanden et al (2014)
- But comparable only in time, not across countries

Our contribution

- Introducing a new framework for computing labour shares
  - comparable across countries and time
  - fully decomposable in the major drivers of inequality (wages, labour participation, working days, etc)
- Estimating shares for unskilled labour (including women) and return to human capital from the Middle Ages to the Industrial Revolution for 5 major countries

Computing the labour share (α) 1/3

From identity

$W^N * L = \alpha * Y^N$

With some manipulations (Angeles 2008), baseline definition

$\alpha = w/y * L/N * (d/365)$

Where w daily real wages, y yearly GDP per capita, L number workers, N population, d number days worked

Computing the labour share (α), 2/3

Expanded version

$\alpha = w^M/y * [\beta + \gamma - \gamma\,\beta] * \mu/2 * (\delta_M + \delta_F) * (d/365)$

Where w^M male real wage, β share males on workforce, γ ratio female/male wage, μ the share of working-age cohorts on total population, and δ is the activity rate

Computing the labour share (α), 3/3

If w^M male wage of unskilled workers, share is return to pure labour

Possible separate estimate of return to human capital as

$\alpha_{HC} = w^M/y^* \mu/2^*\delta_M^* \eta * \xi * (d/365)$

Where η share of skilled workers and ξ skill premium, so that <u>total</u> labour share

$\alpha_{TOT} = \alpha + \alpha_{HC}$

The wages (w)

- Real wages expressed in terms of Welfare Ratios (WR) –i.e. the number of bare-bone baskets which a male breadwinner can buy (Allen 2001)
- Bare-bone basket must provide 1,940 calories (and other nutrients) at minimum cost
- Household assumed to be two adults and two children= 3.15 baskets per day, including rent

Bare-bone baskets (kg.)

Item	USA	England and Wales	Holland	France	Centre-North Italy
Oats		155	155	155	
Maize	165				165
Rice					
Butter	3	3	3	3	3
Oil					
Meat	5	5	5	5	5
Beans	20	20	20	20	20

The wages, 2/2

To compute w/y, we convert the cost of a (bare-bones) basket in local prices (WR_{it}) into 2011 dollars (as Maddison GDP series)

$w_{it}=DC_{\$2011}*365*3*\ WR_{it}$

Three alternatives for coefficient $DC_{\$2011}$

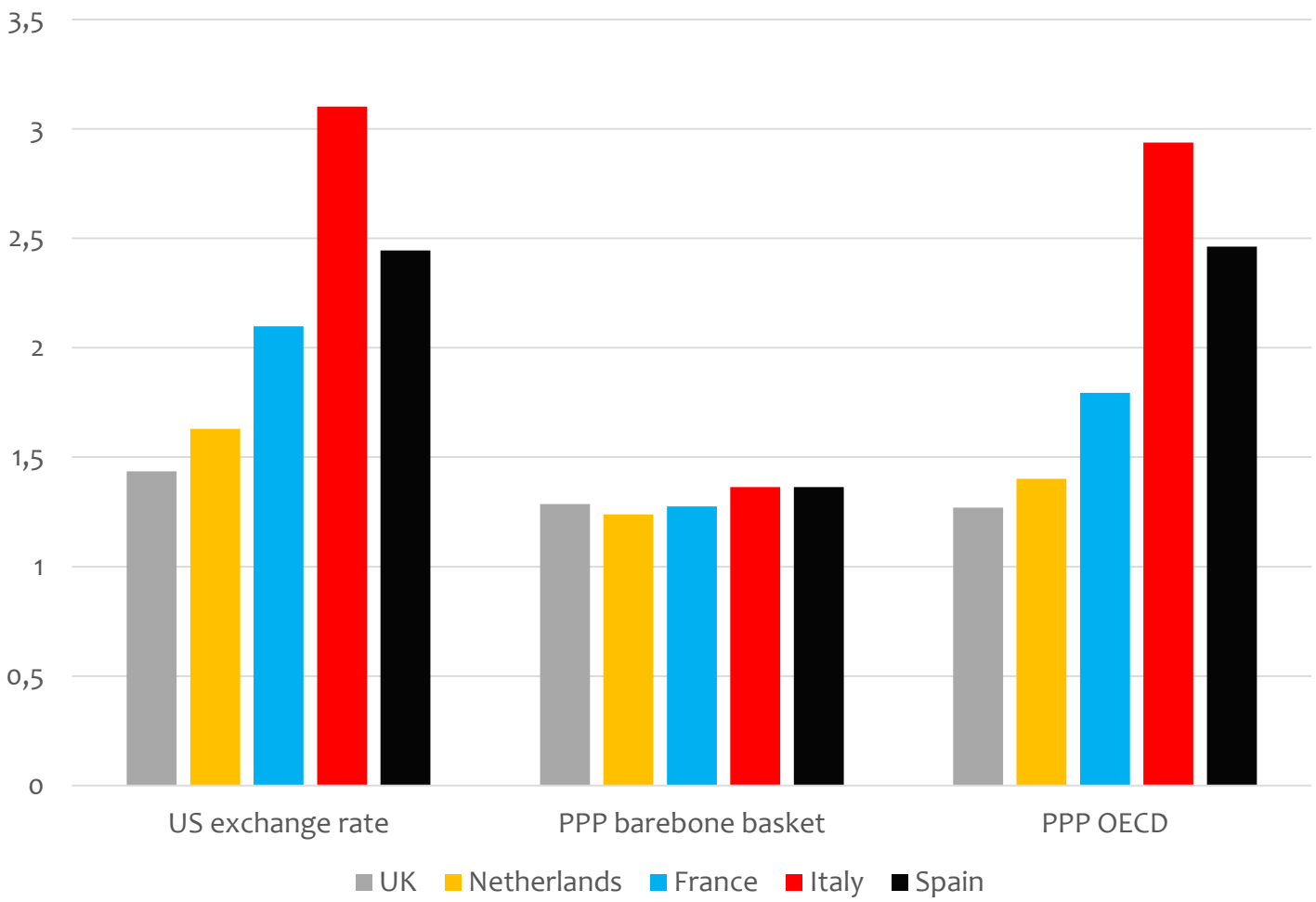
1. Market exchange rates (tradables)
2. ICP PPP (all goods)
3. Barebone PPPs (selected goods, with prices World Bank - ICP)

Converting welfare ratios: bare-bones PPPs

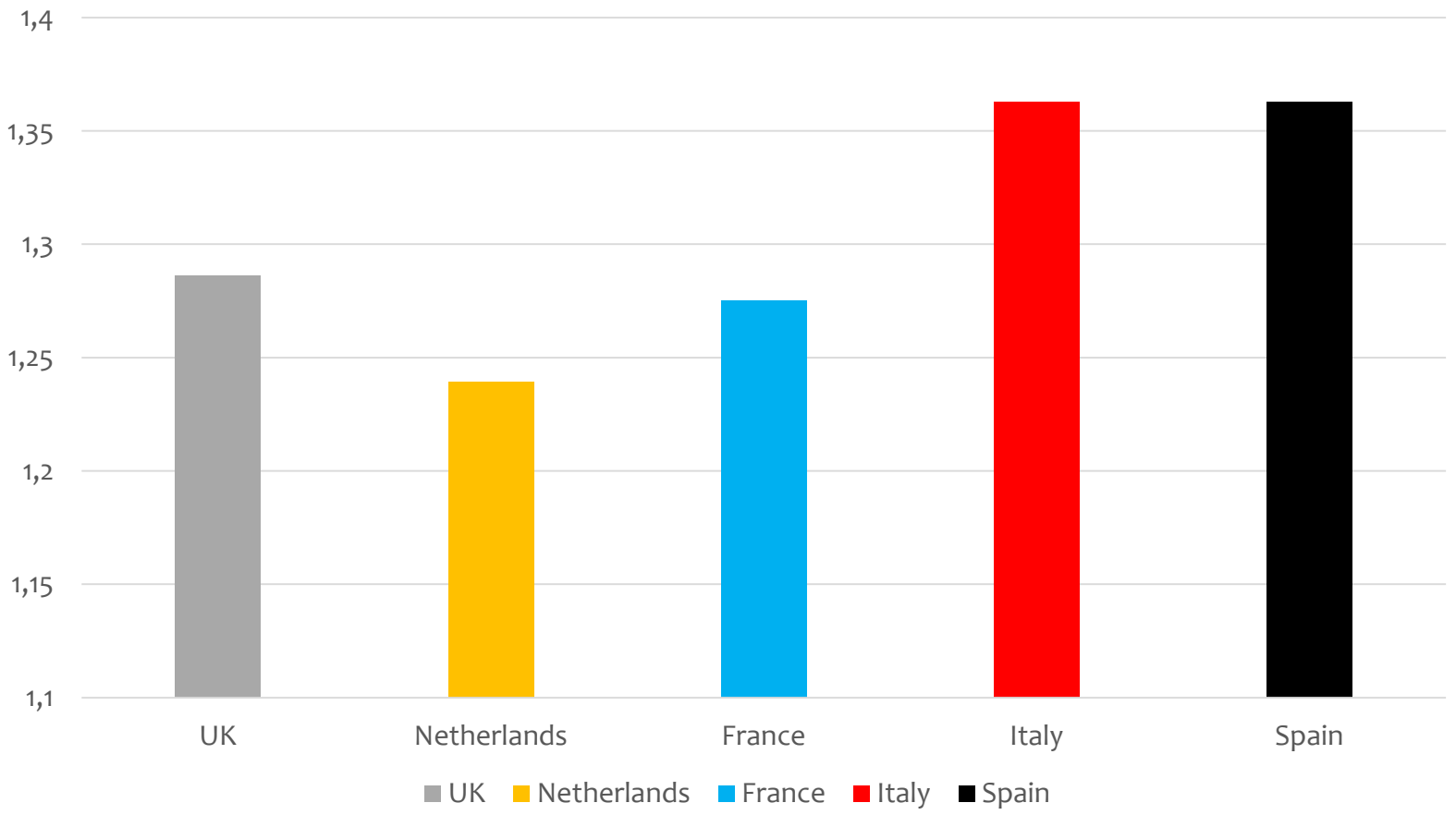
The formula (Geary-Khamis dollars):

$$P_{jk}^{F} = \left[\frac{\mathbf{p}_k' \mathbf{q}_j}{\mathbf{p}_j' \mathbf{q}_j} \times \frac{\mathbf{p}_k' \mathbf{q}_k}{\mathbf{p}_j' \mathbf{q}_k} \right]^{\frac{1}{2}}$$

Daily costs of bare-bone baskets (2011 US$)



Daily costs of PPP bare-bone baskets (2011 US$)



Wages and GDP data

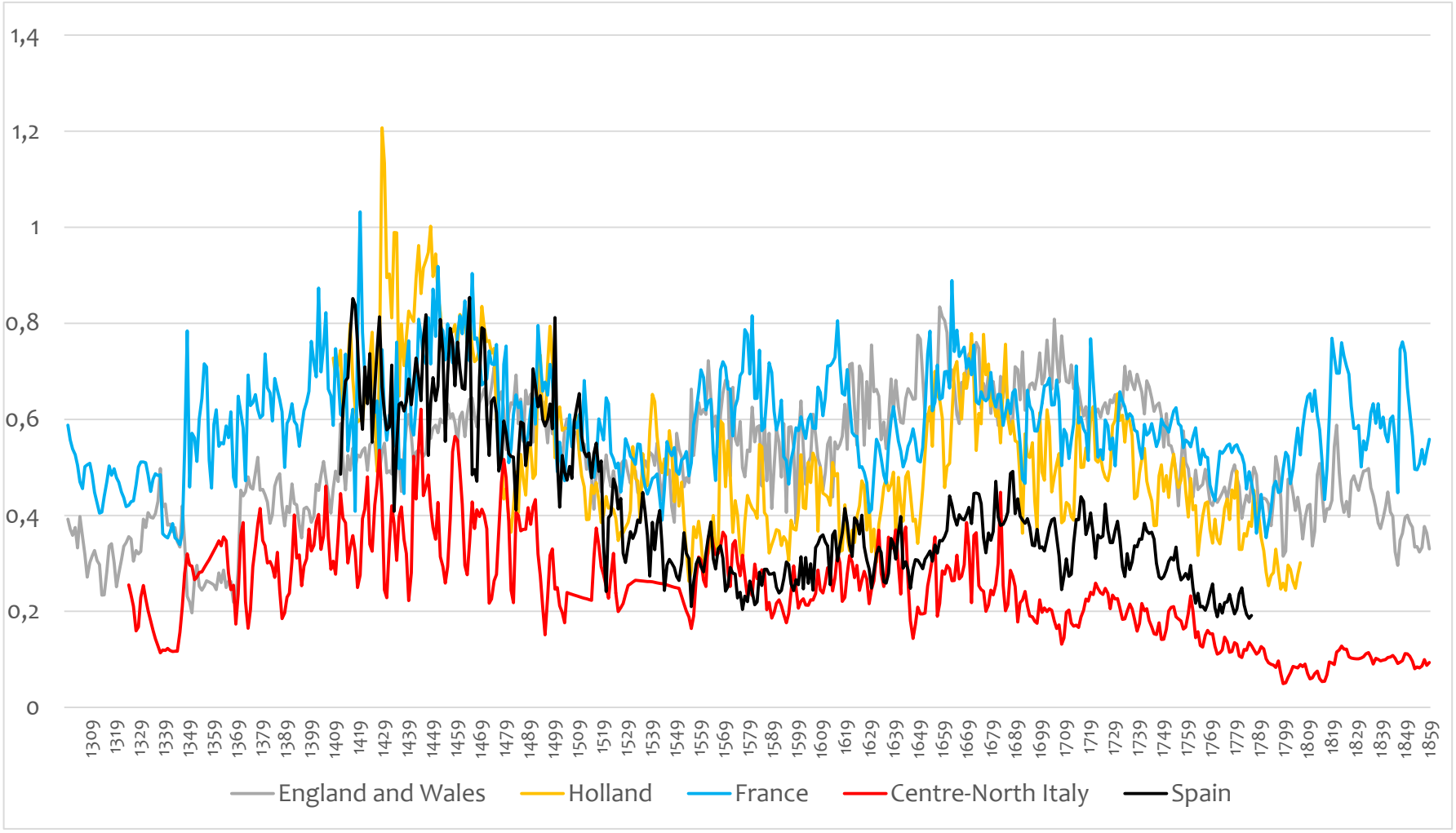
Sample for five European countries in early modern period:

	GDP	wages
England and Wales (1301-1850)	Maddison (Broadberry et al)	Allen [London]
Holland (1432-1807)	Maddison (van Luewen and van Zanden)	Allen [Amsterdam]
France (1301-1850)	Maddison (Ridolfi)	Ridolfi [Paris]
Centre-North Italy (1326-1850)	Maddison (Malanima)	Allen [Milan/Florence]
Spain (1413-1787)	Prados de la Escosura	Allen [Valencia]

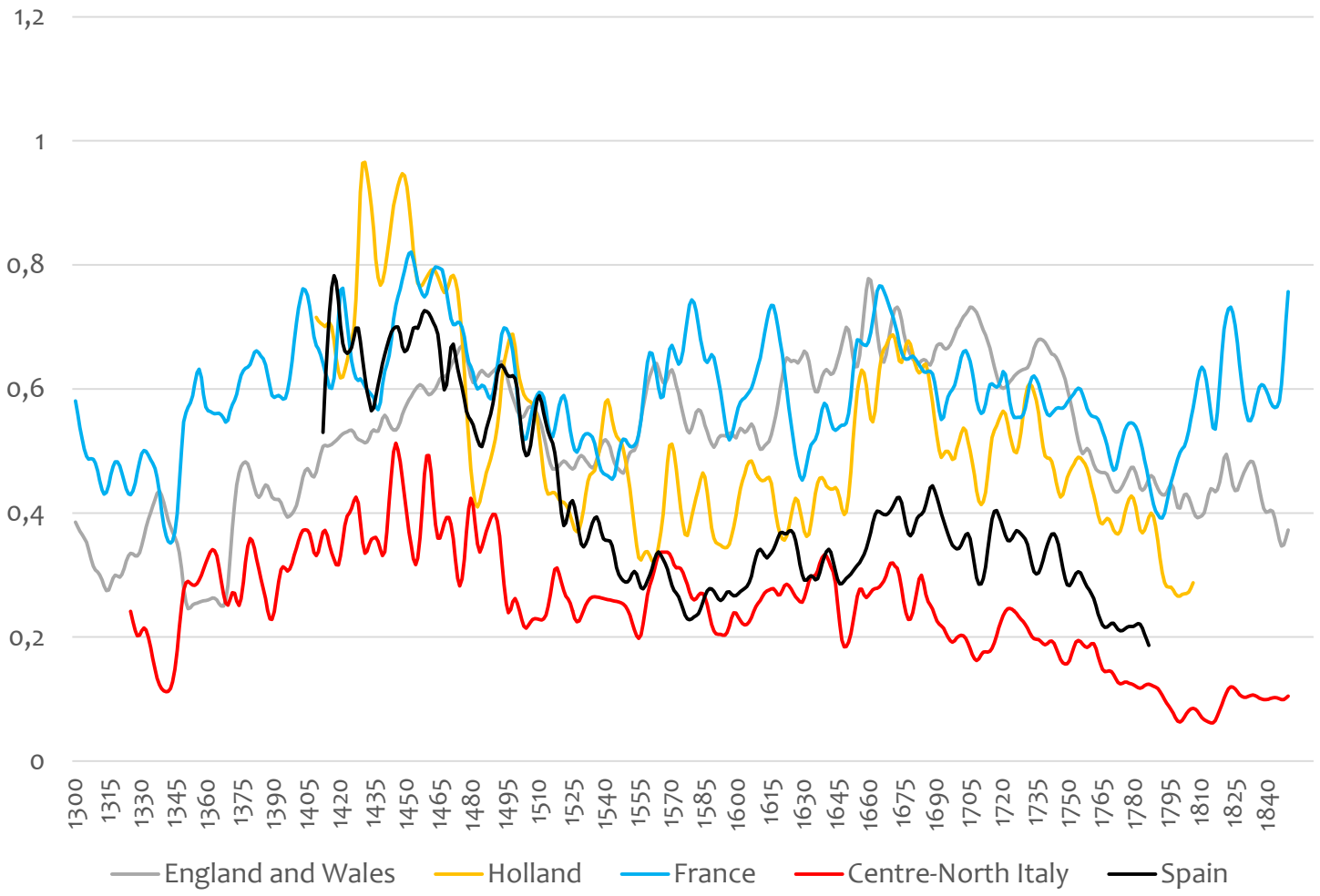
Four series of labour share

- Baseline (labour)
- Lower bound: women did not work
- Upper bound: women paid as much as men
- Total (including return to human capital)

Labour share 1301-1850 (baseline)



Labour share 1301-1850 (baseline) HP filtered



A new history of European inequality (1300-1850)?

- 1300-1350: sizeable decline before the Black Death
- 1350-1450: Black Death upswing
- 1450-1550: Black Death backlash
- 1550-1650: small divergence (a silent "golden age" for English and French workers?)
- 1650-1750: small divergence continued (the Dutch poor join the club)
- 1750-1850 the Age of Revolutions (generalized worsening, but post revolutionary France)

The proximate causes: levels (1413-1787)

	England	Holland	France	Italy	Spain
Wages	**0.19**	0.30	0.06	**-0.33**	-0.22
GDP	-0.14	**0.46**	**-0.28**	0.29	**-0.32**
Days	-0.08	0.06	0.00	0.05	-0.03
Participation	0.04	0.20	0.01	0.01	-0.27
Gender wage gap	-0.05	-0.01	-0.07	0.04	0.09

The proximate causes: change (England)

	W	Y	participation	Working days	Gender wage gap
1305-1450	**0.61**	0.23	0.00	0.01	-0.04
1450-1550	**-0.37**	0.00	-0.02	0.30	-0.07
1550-1650	0.04	-0.02	0.07	**0.18**	0.01
1650-1750	0.31	**0.53**	0.09	0.01	0.02
1750-1850	0.02	**0.48**	-0.11	0.15	-0.09

Cell in bold indicates the main driver of change in the sub-period

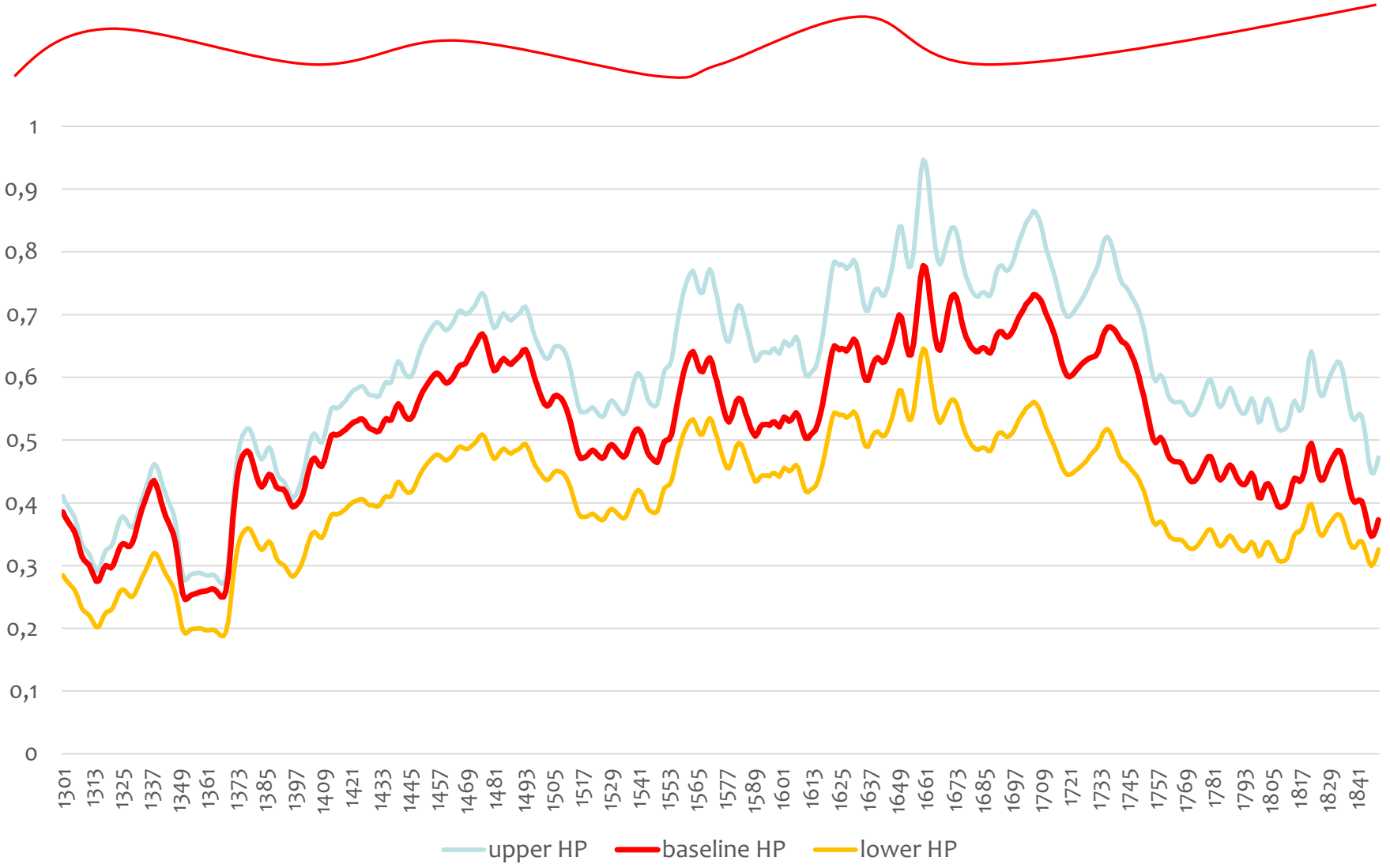
The proximate causes: change (**Summary**)

	England	Holland	France	Italy	Spain
Initial year-1450	w	w	w	w	w
1450-1550	w	w	w	w	w
1550-1650	d	y	w	w	w
1650-1750	y	w	w	w	w
1750-Final year	y	w	y	w	w

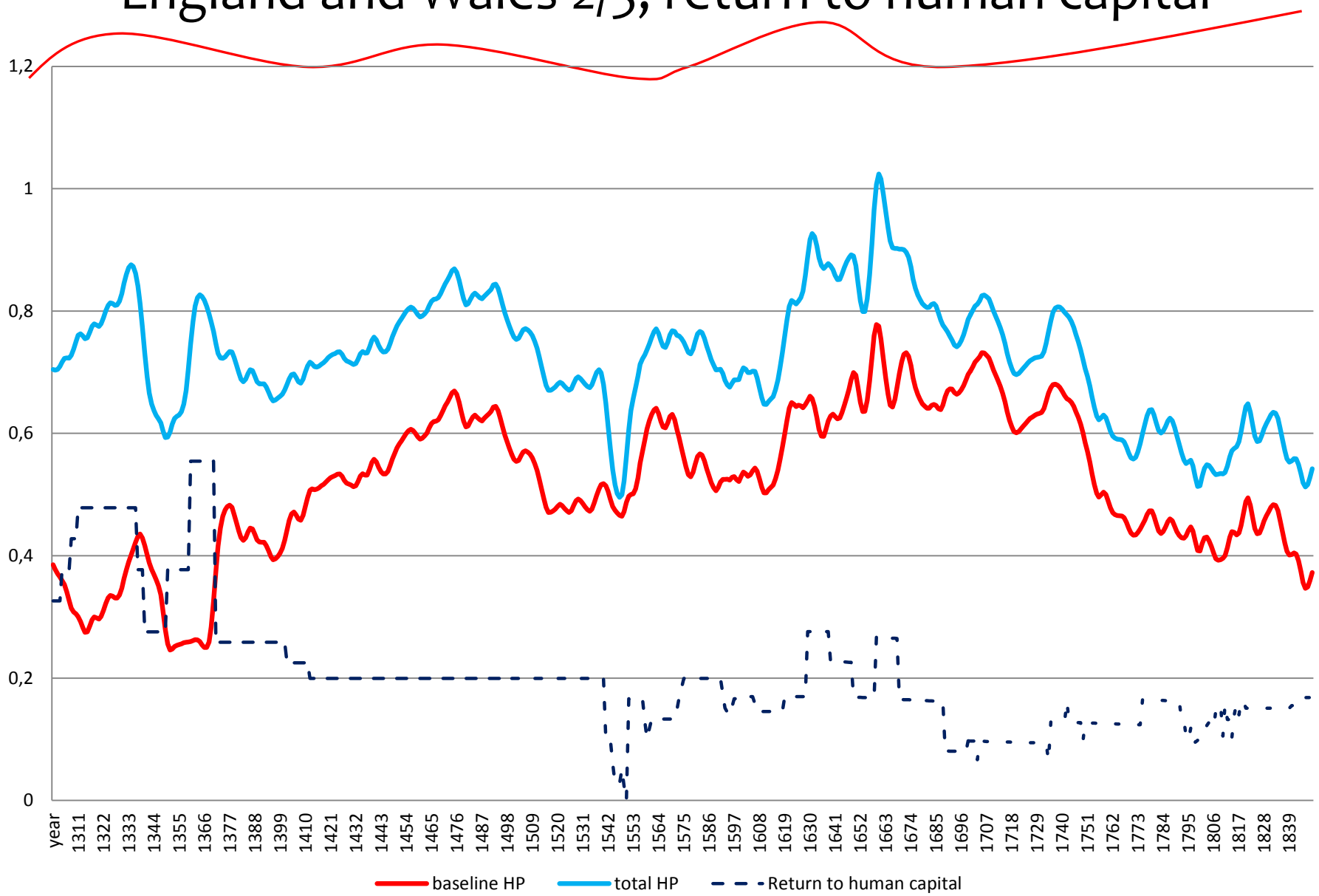
The differences

- Wages and GDP determine both levels and trends of α, with one only exception - the increase in working days England 1550-1650 (an early Industrious Revolution?)
- Caveat: the coefficients for participation, days (d) and gender wage gap (γ) are sometimes assumed fixed for lack of data, and thus their contribution to changes might be underestimated

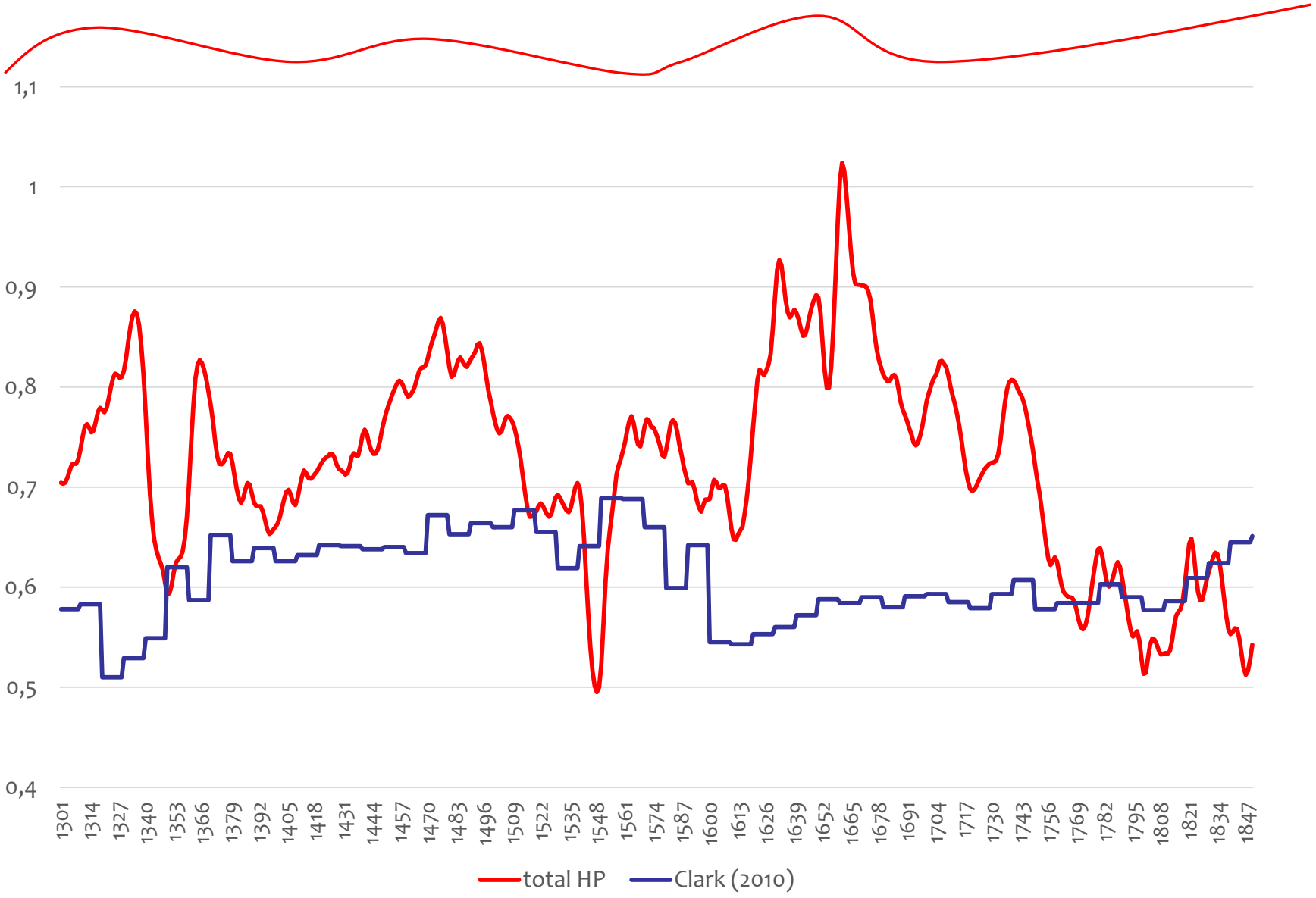
England and Wales 1/3, robustness checks



England and Wales 2/3, return to human capital



England and Wales 3/3, a comparison with Clark (2010)



Conclusions, 1/2

- New method for computing shares of labour and human capital on GDP as a measure of inequality
- Contrary to conventional wisdom of an uniformly inequal pre-industrial society, we find significant differences in time and across countries

Conclusions, 2/2

In particular

- Inequality always higher in Mediterranean countries than Northern ones (and France)
- Malthusian cycle around the Black Death (1300-1550)
- Further increase gap between Northern countries and Mediterranean ones (1550-1650)
- Generalized rise of inequality (post 1750) but in France after the Revolution

Decomposition of yearly growth rates of the labour share (%): **Holland**

	W	Y	L/N	Working days	Female adjustement
1415-1450	**1.16**	0.41	0.00	0.00	0.00
1450-1550	**-0.46**	0.18	-0.01	0.00	0.00
1550-1650	0.05	**0.35**	0.13	0.18	-0.01
1650-1750	**0.05**	0.04	-0.03	0.00	0.00
1750-1802	**-0.80**	0.13	-0.02	0.00	-0.01

Cell in bold indicates the main driver of change in the sub-period

Decomposition of yearly growth rates of the labour share (%): **France**

	W	Y	L/N	Working days	Female adjustement
1306-1450	**0.39**	0.06	0.00	-0.03	0.00
1450-1550	**-0.62**	-0.19	-0.02	0.00	0.00
1550-1650	**0.16**	0.11	0.04	0.04	0.00
1650-1750	**-0.06**	-0.01	0.00	0.07	0.00
1750-1850	0.39	**0.41**	-0.02	0.09	0.00

Cell in bold indicates the main driver of change in the sub-period

Decomposition of yearly growth rates of the labour share (%): **Italy**

	W	Y	L/N	Working days	Female adjustement
1326-1450	**0.55**	0.05	0.00	0.11	0.00
1450-1550	**-0.75**	-0.10	-0.02	0.10	0.00
1550-1650	**-0.23**	-0.06	0.07	0.02	0.00
1650-1750	**-0.14**	0.09	-0.02	-0.01	0.00
1750-1850	**-0.50**	-0.05	-0.02	-0.08	0.00

Cell in bold indicates the main driver of change in the sub-period

Decomposition of yearly growth rates of the labour share (%): **Spain**

	W	Y	L/N	Working days	Female adjustement
1413-1450	**0.03**	0.03	0.00	0.00	0.00
1450-1550	**-0.74**	0.07	-0.02	0.00	0.00
1550-1650	**-0.18**	-0.10	0.07	0.00	0.00
1650-1750	**0.10**	0.04	-0.02	0.00	0.00
1750-1787	**-0.93**	0.15	-0.09	0.00	0.00

Cell in bold indicates the main driver of change in the sub-period