Housing prices, wage and income differences in Italy

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Preliminary

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The paper in a nutshell

There are large regional differences in labor productivity in Italy

But nominal wages cannot adjust because of national union contracts and, given prices of traded products, real output cost is higher in the South.

We show that, as a consequence:

- Less productive South has high unemployment but low housing prices
- North has low real wages (because of high housing prices)
- South has high real wages (because of low housing prices)
- Real expected incomes and consumption are more equalised

It is surprising that policy makers (and Istat)

- pay so much attention to inflation "across time" and not "across space",

even if distributional and efficiency consequences are no less disturbing.

Data and methodology for wages

We use the Istat Quarterly Labor Force Survey to compute:

- average hourly wages for each Italian province (2009-2013);
- net of workers characteristics (education, experience, gender, etc.)

We use data from the Osservatorio Mobiliare Italiano to compute:

- the housing price per square meter (2004-2011)
- net of housing characteristics (size, zoning, etc)

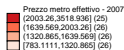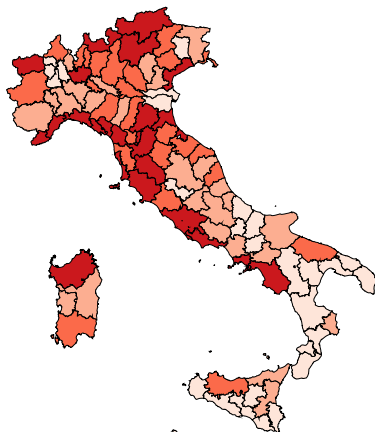We follow Moretti (2013) in computing a Consumer Price Index that

- gives to local housing prices their correct importance in the family consumption basket (34% in 2011 compared to 9% of Istat)
- adjust other local prices for the attraction effect of housing prices

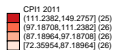This is the CPI that we use to deflate nominal variables.

Later we will consider the problem of amenities

Housing price and Consumer Price Index

Housing price

CPI
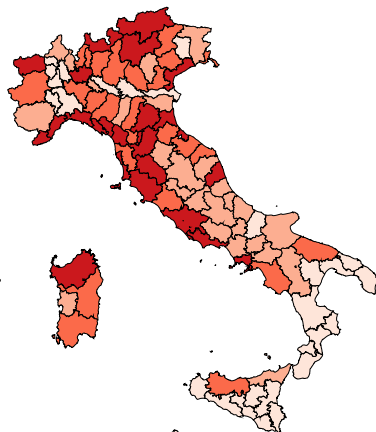
Average hourly nominal and real wage

Nominal wage

Real wage

NOMINAL UNIFORMED HOURLY WAGE - 2011
- (8.619697,9.242127] (25)
- (8.458204,8.619697] (26)
- (8.224624,8.458204] (26)
- [7.42864,8.224624] (26)

REAL (CPI2) UNIFORMED HOURLY WAGE - 2011
- (9.385253,10.89603] (25)
- (8.883622,9.385253] (26)
- (7.601536,8.883622] (26)
- [5.76511,7.601536] (26)
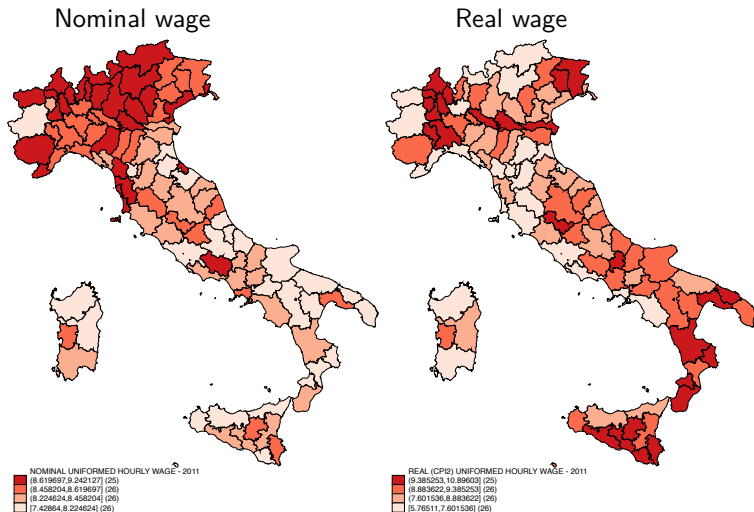
Provinces with highest nominal and real wages

Table : TOP

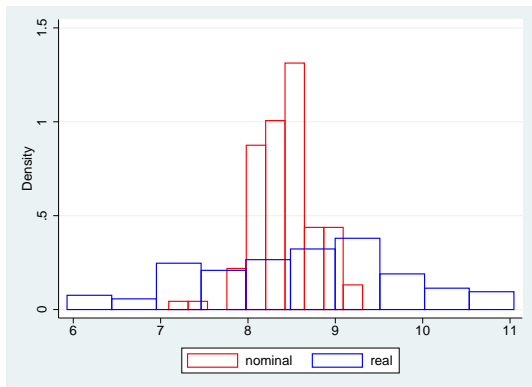| Italian provinces with highest nominal wage					Italian provinces with highest real(CPI2) wage				
Province	nominal	real	rank, nom.	rank, real	Province	nominal	real	rank, real	rank, nom.
Bolzano	9,24	7,07	1	92	Caltanissetta	8,39	10,90	1	57
Aosta	9,08	6,96	2	95	Crotone	8,09	10,68	2	95
Como	9,01	8,98	3	46	Enna	8,51	10,62	3	46
Trento	8,98	7,41	4	86	Siracusa	8,51	10,57	4	45
Bergamo	8,93	8,92	5	50	Biella	8,44	10,55	5	53
Pisa	8,88	8,09	6	69	Pordenone	8,57	10,49	6	37
Varese	8,88	9,79	7	13	Vercelli	8,71	10,39	7	15
Brescia	8,87	7,85	8	75	Taranto	8,62	10,31	8	27
Verbano-Cusio-Ossola	8,84	9,53	9	21	Vibo Valentia	8,01	10,24	9	98
Venezia	8,76	7,97	10	72	Mantova	8,75	10,13	10	11

Spearman's Rho=-0,0663 pvalue=0.5060

Provinces with lowest nominal and real wages

Table : Bottom

	Italian provinces with lowest nominal wage				Italian provinces with lowest real(CPI2) wage			
Province	nominal	real	rank, nom.	rank, real	Province	nominal	real	rank, real	rank, nom.
Bari	8,10	8,13	94	68	Sassari	8,22	6,98	94	80
Crotone	8,09	10,68	95	2	Aosta	9,08	6,96	95	2
Pescara	8,04	8,51	96	59	Milano	8,60	6,92	96	31
Matera	8,02	9,33	97	28	Salerno	8,27	6,91	97	70
Vibo Valentia	8,01	10,24	98	9	Firenze	8,31	6,63	98	68
Ragusa	7,97	9,47	99	24	Genova	8,57	6,62	99	38
Brindisi	7,93	9,51	100	22	Rimini	8,65	6,45	100	19
Nuoro	7,68	7,90	101	74	Imperia	8,75	6,32	101	12
Catanzaro	7,67	9,14	102	38	Savona	8,56	5,78	102	39
Trapani	7,43	9,30	103	29	Roma	8,14	5,77	103	88

Nominal and real wage dispersion, 2011

Nominal and real wage dispersion over time

	nominal (75-25) percentiles	real (75-25) percentiles	nominal (99-1) percentiles	real (99-1) percentiles
2009	105%	124%	119%	190%
2010	105%	124%	118%	186%
2011	105%	123%	118%	185%

What do we learn from the evidence on wages

Southern provinces are typically characterised by

- slightly lower nominal wages
- considerably higher real wages

For Italians who have a job:

- living and working in the South is better
- than living and working in the North

Example: a bank teller

- The nominal wage of a bank teller with 5 years of seniority in 2011 was
  - 7.5% higher

  in Milan than in Ragusa

- Given CPI differences across regions, the correspondent real wage was:
  - 27.3% lower

  in Milan than in Ragusa

- In order to have the same purchasing power of an equivalent worker in Ragusa, a bank teller in Milan would have had to earn nominally 37% more.

Example: primary school teacher

Nominal wages are even more compressed in the *public* than in the *private* sector

- The nominal wage of a primary school teacher with 5 years of seniority in 2011 was the same across regions: 1305€

- Given CPI differencs across regions, the correspondent real wage was
  - 32% lower

  in Milan than in Ragusa.

- In order to have the same purchasing power of an equivalent worker in Ragusa, a teacher in Milan should have earned nominally 48% more.

Why don't we see migration from the north to the south?

Housing is cheaper in the South:

$\Rightarrow$ Real wages are higher in the South

$\Rightarrow$ Those who have a job are better off in the South

Nevertheless, we do not see massive migration to the south because:

- nominal wage equality with differences in productivity cause
  $\Rightarrow$ higher unemployment in the South;

- taking wages, housing costs and employment probabilities into consideration:
  $\Rightarrow$ standard of living are not very different and if anything favour North

But all this implies striking distributional inequities and an inefficient allocation of resources that hamper growth

Prices, unemployment and non-employment

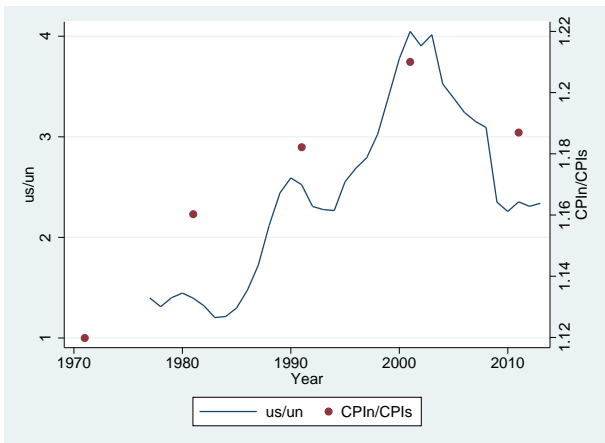CPI — Unemployment — Non-employment
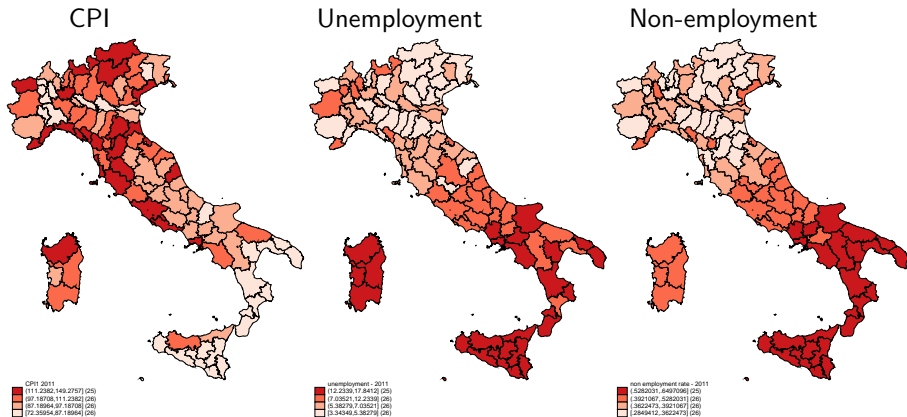
Unemployment and CPI: North vs. South (recent data)
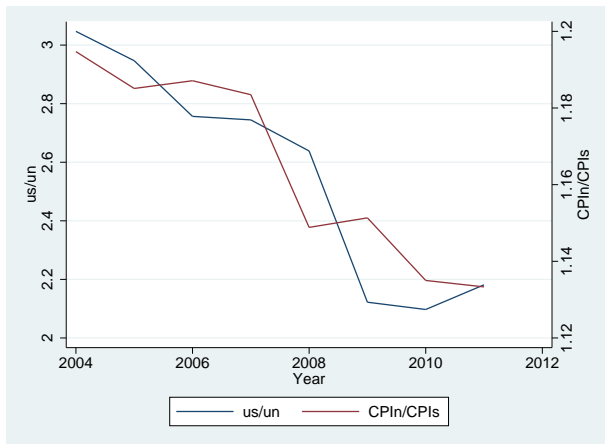
Source: CPI2 from authors' calculations. ISTAT for unemployment.

Unemployment and CPI: North vs. South (historical data)

Source: Vecchi "In ricchezza e in povertí£ · . Il benessere degli italiani dall'Unití£ · a oggi." for CPI.
ISTAT for unemployment.

What about nominal and real incomes?

In the South:

- Employed workers gain a lot.
- Non-employed workers loose a lot

Families mix employed workers who gain and non-employed workers who loose

Non-employment reverses the southern real wage advantage when we look at:

- nominal and real family income
- nominal and real family consumption

as shown in the next slides.

Data and methodology for incomes

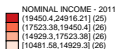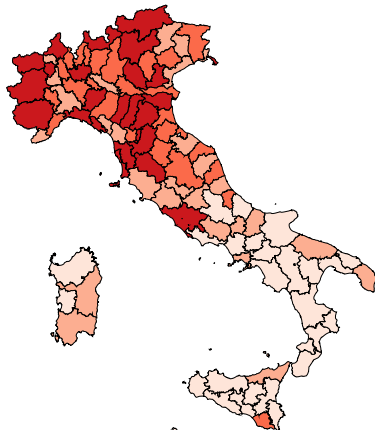We use the Istat Eusilc Survey to compute:

- average family income for each Italian province (2005-2011);
- normalised with family members equivalence scales (ISEE).

Same methodology as in the case of wages to compute:
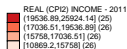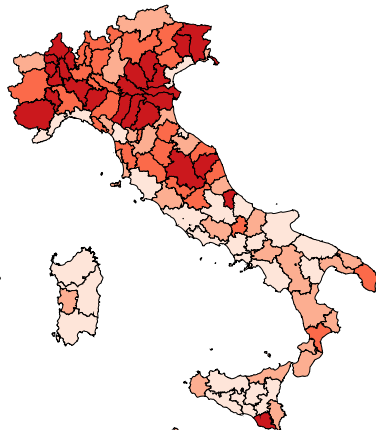
- Housing prices
- Consumer Price Index

Average nominal and real incomes

Nominal income

Real income

NOMINAL INCOME - 2011
(19450.4,24916.21] (25)
(17523.38,19450.4] (26)
(14929.3,17523.38] (26)
[10481.58,14929.3] (26)

REAL (CPI2) INCOME - 2011
(19536.89,25924.14] (25)
(17036.51,19536.89] (26)
(15758,17036.51] (26)
[10869.2,15758] (26)
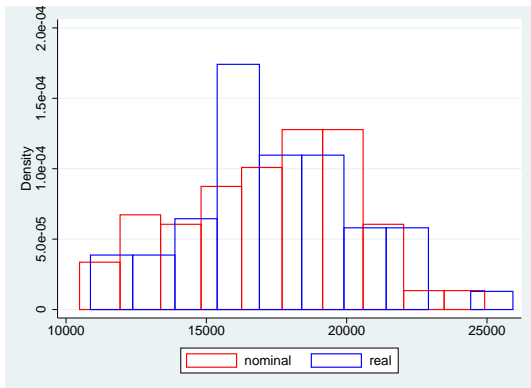
Nominal and real income dispersion, 2011

Italian provinces with the highest nominal and real income

Table : Top Income

Italian provinces with highest nominal income				Italian provinces with highest real income (CPI2)			
Province	nominal	rank, nominal	rank, real	Province	real	rank, real	rank, nominal
Modena	24916	1	2	Biella	25924	1	12
Milano	23702	2	33	Modena	24905	2	1
Bologna	23237	3	22	Mantova	22424	3	27
Siena	22161	4	31	Reggio nell'Emilia	22372	4	8
Bolzano/Bozen	21634	5	61	Verbano-Cusio-Ossola	22294	5	13
Trieste	21260	6	9	Ferrara	22009	6	24
Pisa	21201	7	30	Ragusa	21681	7	49
Reggio nell'Emilia	21065	8	4	Novara	21617	8	26
Roma	20903	9	88	Trieste	21497	9	6
Trento	20889	10	49	Rovigo	21431	10	46

Spearman's Rho= 0.64 pvalue=0.0 ISEE equivalence scaling

Italian provinces with lowest nominal and real income

Table : Bottom income

Italian provinces with lowest nominal income				Italian provinces with lowest real (CPI2) income			
Province	nominal	rank, nominal	rank, real	Province	real	rank, real	rank, nominal
Siracusa	12773	94	76	Enna	13083.67	94	103
Vibo Valentia	12622	95	69	Caserta	12850.25	95	99
Crotone	12609	96	56	Napoli	12744.82	96	75
Palermo	12154	97	100	Savona	12538.44	97	44
LâĂŹAquila	11966	98	98	LâĂŹAquila	12034.42	98	98
Caserta	11867	99	95	Benevento	11932.12	99	100
Benevento	11771	100	99	Palermo	11895.44	100	97
Caltanissetta	11235	101	89	Sassari	11859.94	101	84
Agrigento	11147	102	92	Imperia	11298.21	102	71
Enna	10482	103	94	Salerno	10869.2	103	92

Nominal and real income dispersion over time

	nominal (75-25) percentiles	real (75-25) percentiles	nominal (99-1) percentiles	real (99-1) percentiles
2005	134%	128%	220%	200%
2006	129%	136%	211%	246%
2007	133%	132%	220%	234%
2008	124%	125%	198%	224%
2009	130%	125%	215%	238%
2010	131%	127%	205%	217%
2011	130%	124%	213%	220%

Data and methodology for non-housing consumption

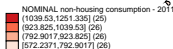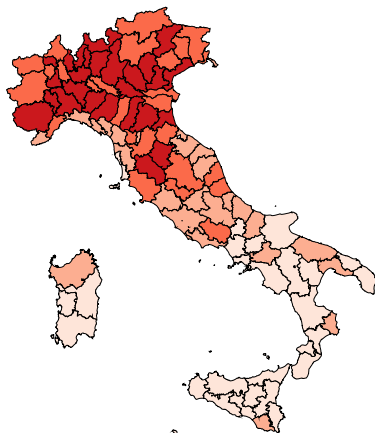We use the Istat Survey on Household Consumption to compute:

- average family non housing consumption for each Italian province (2005-11);
- normalised with family members equivalence scales (ISEE).

Same methodology as in the case of wages to compute:

- Housing prices
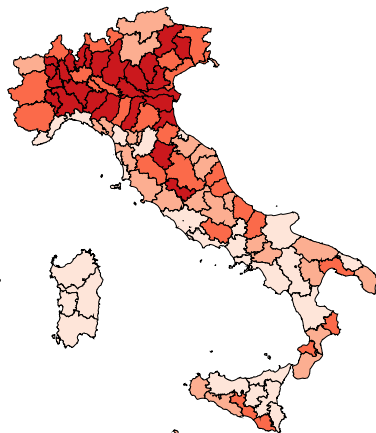- Consumer price index

Average nominal and real non-housing consumption

Nominal Consumption

Real Consumption

NOMINAL non-housing consumption - 2011
(1039.53,1251.335] (25)
(923.825,1039.53] (26)
(792.9017,923.825] (26)
[572.2371,792.9017] (26)

REAL (CPI2) non-housing consumption - 2011
(1073.828,1234.637] (25)
(897.4885,1073.828] (26)
(802.3596,897.4885] (26)
[562.1918,802.3596] (26)

Provinces with the highest nominal and real non-housing consumption

Table : Top non-housing Consumption

Italian provinces with highest nominal non-housing consumption				Italian provinces with highest real non-housing consumption (cpi2)			
Province	nominal	rank, nominal	rank, real	Province	real	rank, real	rank, nominal
Bergamo	1269.455	1	1	Bergamo	1269.127	1	1
Brescia	1198.972	2	21	Vercelli	1251.481	2	11
Ravenna	1185.047	3	22	Varese	1207.427	3	6
Piacenza	1173.873	4	4	Piacenza	1180.013	4	4
Lecco	1154.926	5	11	Alessandria	1162.882	5	14
Varese	1138.884	6	3	Asti	1162.237	6	18
Parma	1137.073	7	24	Mantova	1161.961	7	25
Verona	1135.815	8	10	Pordenone	1154.274	8	35
Como	1135.042	9	13	Rovigo	1152.734	9	27
Sondrio	1132.836	10	32	Verona	1144.088	10	8

Spearman's Rho=0.9075 pvalue=0.0000

Provinces with the lowest nominal and real non-housing consumption

Table : Bottom non-housing consumption

Italian provinces with lowest nominal non-housing consumption				Italian provinces with lowest real non-housing consumption (cpi2)			
Province	nominal	rank, nominal	rank, real	Province	real	rank, real	rank, nominal
Trapani	730.51	94	75	Siracusa	746.26	94	102
Oristano	728.79	95	90	Cagliari	734.92	95	85
Foggia	720.77	96	88	Sassari	733.26	96	76
Agrigento	720.64	97	80	Caserta	729.51	97	99
Enna	696.96	98	84	Roma	696.04	98	64
Caserta	695.40	99	97	Salerno	690.19	99	86
Cosenza	687.30	100	89	Imperia	684.08	100	70
Napoli	684.83	101	103	Livorno	679.36	101	87
Siracusa	657.63	102	94	Napoli	611.29	102	101
Palermo	590.36	103	103	Palermo	582.61	103	103

A model of two regions with artificially equalised wages

Consider two regions $i = \{n, s\}$

The product price is normalised to 1 (similar in the two region for traded goods) and the nominal wage is artificially kept the same in the two regions:

$$W_n = W_s = W$$

But N has higher productivity and higher labor demand for given wage

$$E_n(W) > E_s(W)$$

Non-employment rates

In the absence of mobility, labor force is fixed in the North (Ln) and in the South (L_s).

The wage (artificially equalised across regions) ensures full employment in the north but, causes non-employment in the south

$$\frac{L_n - E_n(W)}{L_n} = U_n = 0$$

$$\frac{L_s - E_s(W)}{L_s} = U_s > 0$$

Mobility between regions

The income of non-employed workers is normalised to zero.

Workers derive utility Ω_i from expected real incomes.

$$\Omega_i = (1 - U_i)\frac{W}{P_i}$$

where P_i is the CPI, which differs across regions.

The marginal worker is indifferent between the two regions if

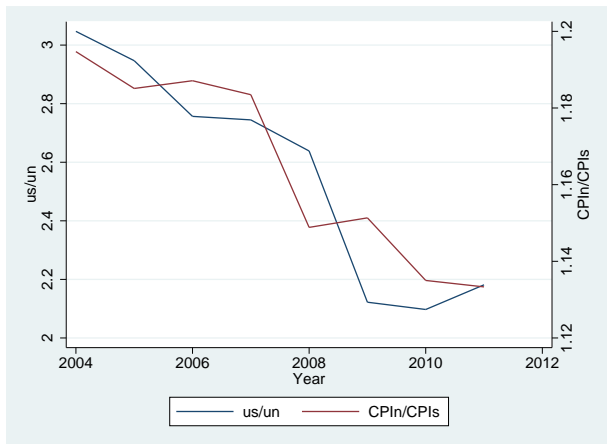$$\Omega_n = \frac{W}{P_n} = (1 - U_s)\frac{W}{P_s} = \Omega_s$$

Equilibrium

The indifference equilibrium condition simplifies to

$$\frac{P_s}{P_n} = (1 - U_s)$$

The N/S ratio between housing prices is negatively related to the unemployment rate in the south
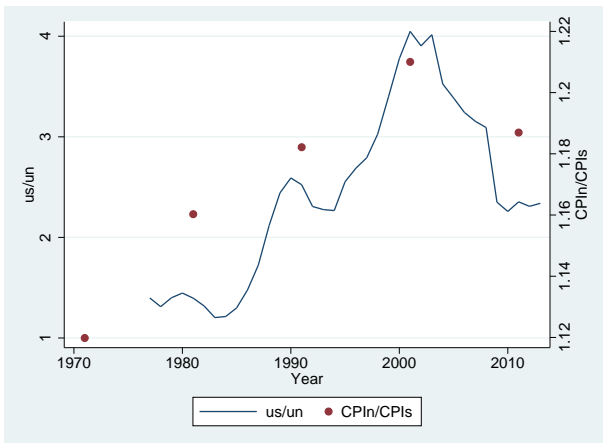
Unemployment in the south is the counterpart of high housing prices in the north

Unemployment and CPI: North vs. South (recent)

Source: CPI2 from authors' calculations. ISTAT for unemployment.

Unmployment and CPI: North vs. South (historical)

Source: Vecchi "In ricchezza e in povertì£ · . Il benessere degli italiani dall'Unitì£ · a oggi." for CPI.
ISTAT for unemployment.

Adjustment to equilibrium

Suppose that we start from an initial condition in which housing prices are identical in the two regions and N has a positive productivity shock:

- immediately after the shock

$$\frac{P_s}{P_n} = 1 > (1 - U_s)$$

$$\Omega_n > \Omega_s$$

- workers begin to move from South to North

- housing price increase in the North and decrease in the South until equilibrium is restored, utilities are equalised and mobility stops

Implications

- Housing prices are lower in the south

$$P_s < P_n$$

- Real wages for employed workers are higher in the south $\frac{W}{P_s} > \frac{W}{P_n}$

- Unemployment is higher in the south

$$U_s > U_n = 0$$

- Real expected incomes and utilities are the same in the two regions

$$\Omega_n = \frac{W}{P_n} = (1 - U_s)\frac{W}{P_s} = \Omega_s$$

Comparison with the US

- Italy is an exception: local salaries do not depend on local productivity

- In other countries: salaries are aligned with productivity and therefore
  unemployment differences are smaller

- Example: Workers are more productive in San Francisco than in Dallas.
  - Nominal salaries are 50% higher in San Francisco.
  - Unemployment rate is about the same.
  - Cost of housing is 125% higher in San Francisco

- Example: Workers are more productive in Milano than in Ragusa.
  - Nominal salaries are 24% higher in Milano.
  - Unemployment rate is more than twice as large in Ragusa than in Milan.
  - Cost of housing is 147% higher in Milano

Public-private wage compression
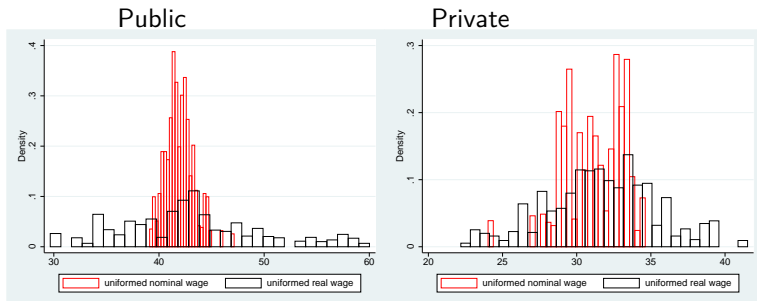
Public

Private

More severe distortions in the public sector

Nominal wage compression is more severe in the public sector.

In order to have the same purchasing power in Milan and Ragusa:

- the nominal wage of private sector bank teller in Milan should increase by 37%

- the nominal wage of public sector primary teacher in Milan should increase by 48%

This difference is suggestive of how larger are distortions in the public sector because of the greater nominal wage compression

Pay differences in sectors not covered by collective bargaining

The nominal wage of full-time employees in lawyer's office with 4 to 6 years of experience in 2011 was

- 1583 € in the North
- 1351 € in the South

This 17% differential in favor of workers in the North compensates almost fully a 18.5% difference in the costs of living, between the two macro-areas

In the case of a bank teller differences in nominal wages compensate only 1/6 of the differences in the costs of living

Amenities

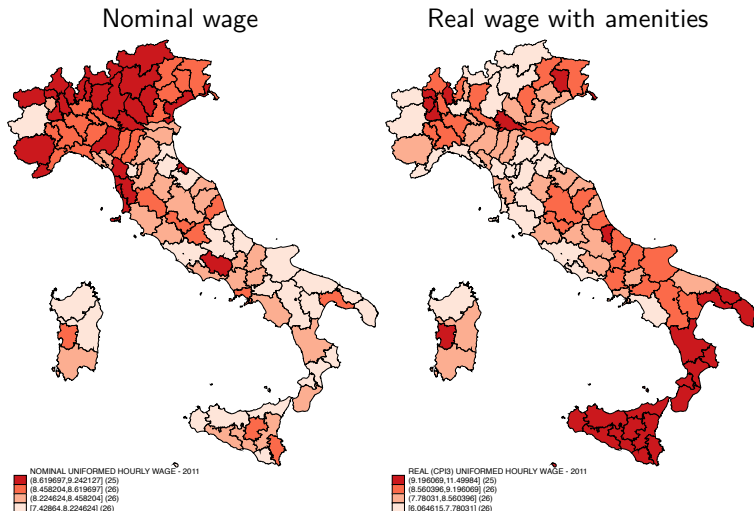We estimated a housing price equation controlling for "measurable amenities" of the town in which the housing unit is located, notably

1. population-size
2. housing density
3. coastal or mountain dummies

Using a CPI measure that takes amenities into account, our results are unaffected

We plan to do more work in the future to control for a larger set of amenities

Nominal wage and real wage controlling for amenities

Nominal wage

Real wage with amenities

NOMINAL UNIFORMED HOURLY WAGE - 2011
(8.619697,9.242127] (25)
(8.458204,8.619697] (26)
(8.224624,8.458204] (26)
[7.42864,8.224624] (26)

REAL (CPI3) UNIFORMED HOURLY WAGE - 2011
(9.196069,11.49984] (25)
(8.560396,9.196069] (26)
(7.78031,8.560396] (26)
[6.064615,7.78031] (26)

Real wage with and without controlling for amenities

Real wage without amenities
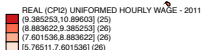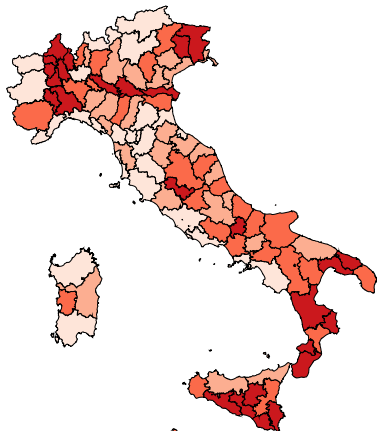
Real wage with amenities

Provinces with highest nominal and real wages controlling for amenities

Table : Top

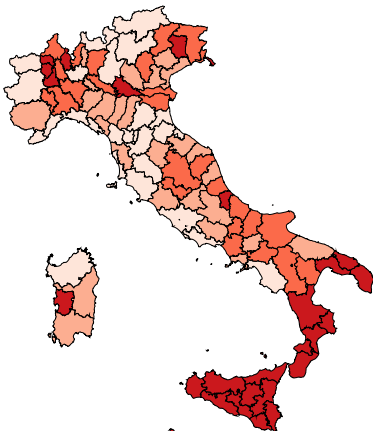| Italian provinces with highest nominal wage					Italian provinces with highest real(CPI3) wage				
Province	nominal	real	rank, nom.	rank, real	Province	nominal	real	rank, real	rank, nom.
Bolzano	9,24	7,08	1	96	Crotone	8,09	11,50	1	95
Aosta	9,08	7,04	2	97	Siracusa	8,51	11,16	2	45
Como	9,01	8,64	3	48	V. Valentia	8,01	10,97	3	98
Trento	8,98	7,39	4	87	Taranto	8,62	10,81	4	27
Bergamo	8,93	8,81	5	44	R. Calabria	8,32	10,71	5	67
Pisa	8,88	7,96	6	74	Caltanissetta	8,39	10,56	6	57
Varese	8,88	9,44	7	21	Cosenza	8,38	10,32	7	61
Brescia	8,87	7,56	8	81	Agrigento	8,26	10,29	8	71
Verbano-C.-O.	8,84	9,20	9	26	Catanzaro	7,67	10,17	9	102
Venezia	8,76	8,26	10	64	Ragusa	7,97	10,05	10	99

Spearman's Rho=-0.2315 pvalue=0.0000

Provinces with lowest nominal and real wages controlling for amenities

Table : Bottom

| Italian provinces with lowest nominal wage | | | | | Italian provinces with lowest real(CPI3) wage | | | | |
Province	nominal	real (CPI3)	rank, nom.	rank, real	Province	nominal	real (CPI3)	rank, real	rank, nom.
Bari	8,10	8,36	94	60	Lucca	8,64	7,10	94	21
Crotone	8,09	1,15	95	1	Rimini	8,65	7,10	95	19
Pescara	8,04	9,71	96	16	Bolzano	9,24	7,08	96	1
Matera	8,02	9,03	97	34	Aosta	9,08	7,04	97	2
Vibo Valentia	8,01	1,10	98	3	Siena	8,54	7,00	98	43
Ragusa	7,97	1,01	99	10	Bologna	8,46	6,98	99	52
Brindisi	7,93	9,76	100	15	Imperia	8,75	6,76	100	12
Nuoro	7,68	8,51	101	53	Firenze	8,31	6,53	101	68
Catanzaro	7,67	1,02	102	9	Roma	8,14	6,33	102	88
Trapani	7,43	9,96	103	12	Savona	8,56	6,06	103	39

Distances between provinces with and without controlling for amenities

Table : Not controlling for amenities

	nominal (75-25) percentiles	real (75-25) percentiles	nominal (99-1) percentiles	real (99-1) percentiles
2009	105%	124%	119%	190%
2010	105%	124%	118%	186%
2011	105%	123%	118%	185%
Variation 2009-2011	-0,1%	-0,4%	-2,7%

Table : Controlling for amenities

	nominal (75-25) percentiles	real (75-25) percentiles	nominal (99-1) percentiles	real (99-1) percentiles
2009	105%	119%	119%	186%
2010	105%	118%	118%	178%
2011	105%	118%	118%	176%
Variation 2009-2011	-1,1%	-0,4%	-5,1%

Quality of public services

An important amenity is the quality of public services, like health and education.

- They are typically considered of lower quality in the South
- Can this fact alone reverse our conclusions on real wages?

Let S_i be (quality adj.) public services and γ their share in the consumption basket

For the quality of public services to compensate for lower real wages in the north

$$S_n^\gamma \frac{W_n}{P_n} = S_s^\gamma \frac{W_s}{P_s}$$

$$\left(\frac{S_n}{S_s}\right)^\gamma = \left(\frac{\frac{W_s}{P_s}}{\frac{W_n}{P_n}}\right)$$

$$\Delta\% S = \frac{1}{\gamma}\Delta\%\frac{W}{P}$$

Example: health services and schooling

How much better should quality of services be in Milano to offset the higher real wage in Ragusa?

- Real wages are 38% higher in Ragusa than in Milan
- The share of health spending over GDP is 7.3%
- The share of education spending over GDP is 4.5%
- Thus γ is 11.8%

In order to offset the higher real wage in Ragusa, the quality of health services and schooling would have to be

$$\frac{0.38}{0.118} \approx 3.2$$

times better in Milano

Moreover...

Note that the cost of basic health services in the South is lower than in the North:

- e.g., blood tests cost, on average, about 68% of the average price in the North according to the Ministry of the Economic Development

Thus prices already compensate the lower quality of services in the Mezzogiorno

Bottom line:

- there are differences in the quality of public services,
- but they cannot be large enough to change our findings concerning real wages
- and to some extent they are already accounted for in the prices of services that have a market

Rural urban differences

Differences in the cost of living may be more pronounced within provinces than across provinces.

In low-density areas in the north, real wages may be relatively high, just while service amenities are much higher than in the South

Can this modify our conclusions on real wages?

Unlikely: urban/rural divide accounts for too small of a fraction of the north-south CPI variation

Uniformed wage, allowing for within province variation

Nominal   Real amenities   Real controlling for rural areas
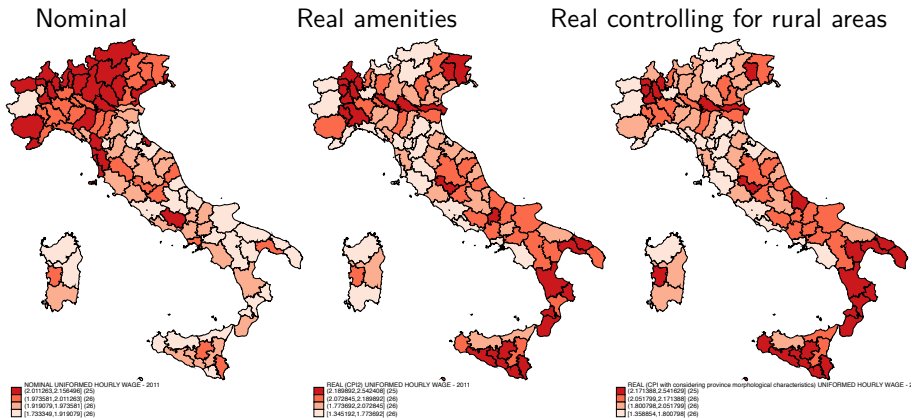
House prices versus rents (per bedroom) across 39 macro areas

Rents from Survey of Household Consumption vs OMI House Prices,2009 (Italy=100)
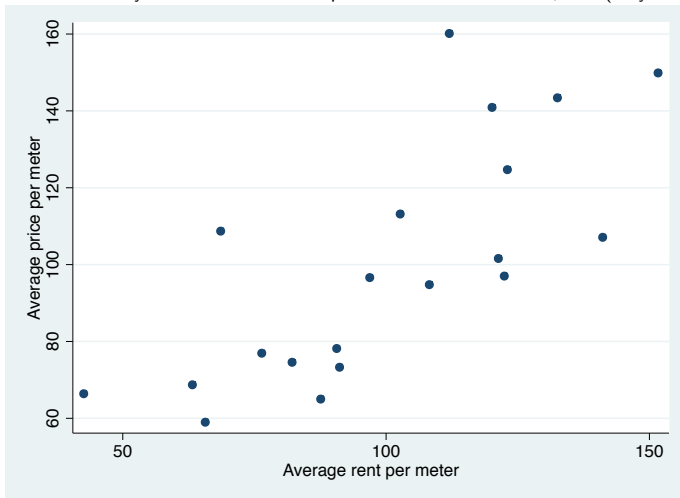
Correlation coefficient .74; Spearman ρ .77

Comparisons with previous studies

Average housing price in percent of the national average

Area	Our Calculation	Cannari-Iuzzolino
North-West	111	138
North-East	102	122
Centre	121	129
South	78	67.8

Conclusions

- Nominal wage compression and higher productivity in the North generates
  - higher housing prices in the North
  - higher unemployment in the South
  - real wage inequality in favour of South
  - reverse income and consumption inequality in favour of North

- Distributional consequences are relevant and not necessarily desirable:
  - a significant gain for employed workers in the South
  - a significant gain for house owners in the North

  creating coalitions that hamper growth without improving the prospects of southern regions

Inequity and inefficiency

What is most disturbing is that the equalisation of nominal wages, even if possibly desirable given collective preferences for equality, generates *de facto*

- inequites, rents, loosers and winners

- inefficient allocation of human resources, that are kept artificially far away from more productive working opportunities

These outcomes

- escape public control,

- cannot be desirable

- cannot even be a *known* cost that society is willing to pay in exchange for other benefits!

Suggestions for the policy debate

- Excessive emphasis on *quantity* labor adjustments in the Italian policy debate

- *Price* adjustments are typically ignored

- Bargaining structures must produce a closer link between pay and productivity

- Two-tier bargaining is not the solution because it can not undo national bargaining outcomes

- Plant-level agreements must be allowed to dominate over national agreements

- National agreements applying to firms where no plant-level bargaining takes place should allow for productivity-wage differentials across areas

A different perspective on housing markets

- Heated discussion on the housing market, *taken in isolation*

- The problems of the housing market are in the labor market

- However, as equilibrium is achieved via housing prices, substantial rents are gained by house-owners in the North (and in amenity areas)

- As long as workers in the North coincide with house-owners, they may be "house rich" and "wage poor"

- Taxes on house ownership should make housing a more liquid asset (reduce taxes on house transactions rather than on ownership)

- More generally: we need more transparency in adjustments market by market, to avoid hidden and undesirable distortions