Does consumption inequality track income inequality in Italy?

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ABSTRACT

This paper presents stylized facts on labor supply, income, consumption, wealth, and several measures of consumption and income inequality drawn from the 1980–2006 Survey of Household Income and Wealth (SHIW) conducted by the Bank of Italy. The SHIW provides information on consumption, income and wealth, and a sizable panel component that allows econometricians to estimate sophisticated income, consumption, and wealth processes and to analyze labor market and portfolio transitions. We find that over the sample period income inequality is higher and has grown faster than consumption inequality. Most of the increase in income inequality is related to an increase in the degree of earnings' instability rather than to shifts in the wage structure. We suggest that, in particular, the labor market reforms of the 1990s and 2000s are the most plausible explanation of the increased earnings inequality.

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1. Introduction

The two decades since the mid-1980s have witnessed dramatic changes in the Italian economy: population aging and falling fertility have been accompanied by a sequence of financial reforms that have liberalized credit markets, a series of labor market reforms that have eliminated indexation of wages and increased labor flexibility, and a major pension reform that has increased the retirement age and reduced retirement benefits for future generations. There have also been dramatic changes to fiscal and monetary policy. A period of rising national debt ended in 1992 with a debt stabilization and slow convergence to the Maastricht criteria, and responsibility for monetary policy was delegated to the European Central Bank, bringing an end to an era of sustained inflation. As a consequence, the current macroeconomic environment in which Italian households choose how much to work, how much to save, and how to allocate their savings among real and financial assets, is very different from the environment of only ten or fifteen years ago.

Increasingly, economists are relying on microeconomic data to analyze macroeconomic events and policy shifts; thus, given the rapid changes associated with policy reforms, the Italian economy represents an ideal context. This paper draws attention to some of the data that can be used by applied research to analyze these reforms by presenting some stylized facts on labor supply, income, consumption, and wealth drawn from the Survey of Household Income and Wealth (SHIW), a representative survey of the Italian population conducted by the Bank of Italy. This is an interesting case because, among the OECD countries, Italy ranks very high in terms of income inequality, second only to the US and the UK. In addition, income

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inequality increased substantially in the 1990s, but the education premium, which is often associated with a widening wage structure, has remained approximately constant.

The SHIW has several interesting features. First, it lends itself to the construction of income and consumption series based on microeconomic variables from 1980 to 2006. Second, it provides information also on wealth, and the three variables are available within the same dataset. Third, it has a sizable panel component that enables the estimation of sophisticated income and consumption processes, and analysis of labor market and portfolio transitions. Fourth, income, consumption, and labor supply measures of the SHIW track the corresponding National Accounts aggregate remarkably well. Finally, for each of the main variables of interest to macroeconomists, SHIW contains detailed breakdowns, allowing applied researchers to experiment with alternative measures of income (from labor, capital, transfers), consumption (durable, non-durables, imputed rents) and wealth (real assets, financial assets, debt, and components thereof).

The paper is organized as follows. Section 2 discusses the SHIW, including survey design, quality of data, and characteristics of the panel component. Section 3 describes the macroeconomic context in Italy for the period under analysis, and compares sample averages with national accounts statistics. Section 4 presents trends in hours and wage inequality and Section 5 presents the patterns of consumption and income inequality. We show that both measures of inequality increased over the sample period, but that income inequality has grown faster than consumption inequality, which is similar to the findings for the United States (Blundell et al., 2008) and the United Kingdom (Blundell and Preston, 1998). In Section 6 we discuss some possible explanations for these findings for Italy, and especially those related to the role of credit market reform and financial liberalization, labor market reforms, and changes in the nature of income shocks. Our analysis shows that after declining through most of the 1970s and 1980s, income inequality in Italy grew dramatically in the early 1990s and stayed at this higher level until very recently. We find that most of the increase in income inequality is due to an increase in the degree of instability of earnings and incomes rather than to shifts in the wage structure (consistent with the stability of the education premium). We suggest that the labor market reforms of the 1990s and 2000s may be at the basis of the increased earnings instability. While there is evidence of some increase in consumption inequality, this occurred at a much slower rate than the increased income inequality, in agreement with models of intertemporal choice in which consumers largely smooth transitory income shocks.

2. Household-level data for Italy

The main source of microeconomic data on Italy is the Bank of Italy SHIW, which collects detailed information on demographics, household consumption, labor supply, income, and real and financial wealth.[1] The availability in the same dataset of household data on income, consumption and wealth (as well as a panel component) is what makes the SHIW a unique reference for macroeconomic researchers interested in consumption, income, and wealth inequality, and their changes over time.

2.1. Survey design

The SHIW was conducted annually from 1965 to 1987 (with the exception of 1985). Up to 1984 the number of participant households in a typical year was around 4000. In 1986 the sample size doubled, and since 1987 the survey has been conducted every other year (with the exception of a three-year interval between 1995 and 1998). In 1987 the SHIW over-sampled rich households to collect more accurate statistics on asset holdings. Consumption data (on both durables and non-durables) are available from 1980, with the exception of 1986, when only total consumption information is available.[2] Income data are available for all years. Information on hours and other dimensions of labor supply are available from 1987. Wealth information is complete, starting from 1987, before which time only information on real assets is available. The last available survey year is 2006. We use data for the 1980–2006 period.

The SHIW is a representative sample of the Italian resident population. The sample design is consistent with that used by the Labor Force Survey conducted by ISTAT (the Italian national statistical institute).[3] Data are collected through personal interviews in the first months of the calendar year, thus flow income and consumption refer to the previous year, which in Italy coincides with the calendar year; wealth and debt variables are end-of-period values. Questions concerning the whole household are answered by the head of the family or by the person most knowledgeable about the family finances; questions on individual incomes are answered by each member, wherever possible. The unit of observation is the family, which is defined to include all persons residing in the same dwelling who are related by blood, marriage or adoption. Individuals selected as "partners or other common-law relationships" are also treated as families.

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[1] The full dataset is publicly available (with documentation in English) at the Bank of Italy's website, see http://www.bancaditalia.it/statistiche/ indcamp/bilfait/dismicro.

[2] For a few years, separate information on food expenditure and medical expenditure is also available. Durables spending is broken down into: vehicles, furniture, and jewelry.

[3] Sampling is carried out in two stages: the first consists of the selection of municipalities, the second the selection of households. Municipalities are categorized into 51 strata, defined by 17 regions and 3 classes of population size (over 40,000, 20,000–40,000, less than 20,000). All municipalities in the first group are included; those in the second and third groups are selected randomly with a probability proportional to their population size. In the second stage households are selected randomly from registry office records.

Table 1
Response rates in the Survey of Household Income and Wealth.

Year	Contacted families	Responses	Refusals	Absent units	Ineligible units	Gross response rate	Net response rate
1989	22,344	8274	9427	3855	788	37.0	38.4
1991	25,210	8188	6962	9481	579	32.5	33.2
1993	15,759	8089	3152	2761	1756	51.3	57.8
1995	15,606	8135	3653	2510	1308	52.1	56.9
1998	16,268	7147	6441	2680	1400	43.9	48.1
2000	20,882	8001	10,461	2420	802	38.3	39.8
2002	23,356	8011	14,179	1166	476	34.3	35.0
2004	22,018	8012	12,991	1015	549	36.4	37.3
2006	18,510	7768	6603	4139	304	42.0	42.7

Note. Ineligible units include the families of persons unknown, dead or emigrated. The gross response rate is the ratio of responses to contacted families. The net response rate is the ratio of responses to contacted families net of ineligible units.
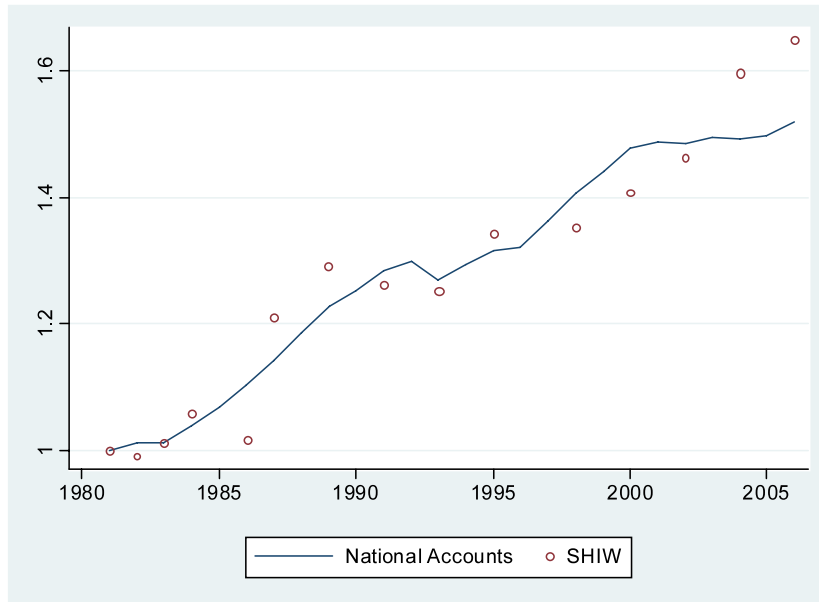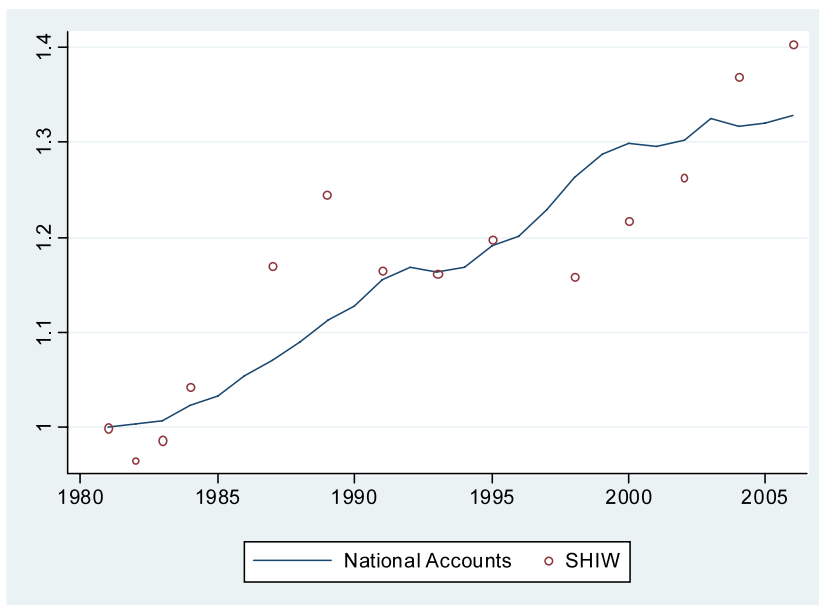

Fig. 1. Average per-capita total consumption in the SHIW and in the National Accounts. *Note.* Aggregate consumption expenditure is divided by total population. SHIW household consumption is divided by family size. Both variables are deflated using the CPI. SHIW averages are computed using sample weights. The source for aggregate consumption expenditures, population and CPI is the OECD National Accounts.

2.2. Data quality

To gauge the quality of the data, we report survey response rates and compare levels and average trends computed from the micro data with the corresponding aggregates from National Accounts data. Table 1 reports response rates since 1989. Ineligible units include the families of persons unknown, dead, or emigrated. The gross response rate is the ratio of responses to contacted families. The net response rate is the ratio of responses to contacted families net of ineligible units. Response rates increase after 1991 because after this time individuals were asked about the willingness to participate in future surveys, reducing attrition in the panel component. The response rates then decline slightly after 1995 until the last two surveys when they increased. Useful information on the quality of SHIW data is reported in Brandolini and Cannari (1994) and Brandolini (1999).

We compare per-capita averages for disposable income and total consumption expenditures, for the SHIW and the National Accounts. To compare consumption and income trends, variables are preliminarily deflated using the Consumer Price Index (CPI) and (for the years before 1999) converted to Euros. Fig. 1 plots average per capita total consumption in the SHIW and the corresponding aggregate from National Accounts data.[4] Since in the survey consumption refers to households (not individuals), per capita national consumption in the SHIW is computed as $\sum(w_i c_i)/\sum(w_i p_i)$, where c_i is household consumption, p_i family size, and w_i the corresponding household sample weight. The sample weights given in the SHIW

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[4] The consumption variable is drawn from the ConIst database at ISTAT (the Central Statistical Office). Aggregate disposable income is from ISTAT, http://www.istat.it/conti/nazionali/Tavole-conti.xls (Table 6, Net National Disposable Income).

Fig. 2. Average per-capita non-durable consumption in the SHIW and in the National Accounts. *Note.* Aggregate non-durables consumption is divided by total population. SHIW household non-durables consumption is divided by family size. Both variables are deflated using the CPI. SHIW averages are computed using sample weights. The source for aggregate non-durables consumption expenditure, population and CPI is the OECD National Accounts.
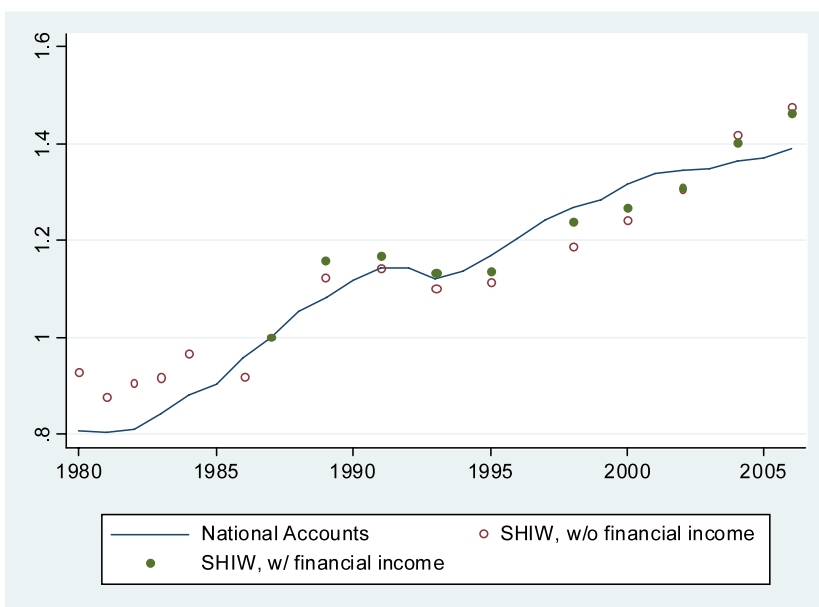
Fig. 3. Average per-capita disposable income in the SHIW and in the National Accounts. *Note.* Aggregate disposable income is divided by total population. SHIW household disposable income is divided by family size. Both variables are deflated using the CPI. SHIW averages are computed using sample weights. The source for aggregate disposable income, population and CPI is the OECD National Accounts.

take into account the probability of both sample inclusion and non-response. We generate the corresponding variable in the National Accounts by dividing real total domestic consumption by the end-of-year resident population. We normalize both series to equal 1 in the initial year (1981).

Fig. 1 shows that consumption growth data from the SHIW track the National Accounts equivalent fairly well, including 1993 drop in real terms. There is evidence of less-than-perfect tracking only in the last two waves. Fig. 2 repeats the exercise for consumption of non-durables (in the SHIW, our measure of non-durables consumption excludes payments in kind and imputed rents). Again, the tracking of growth rates in the series is quite good.
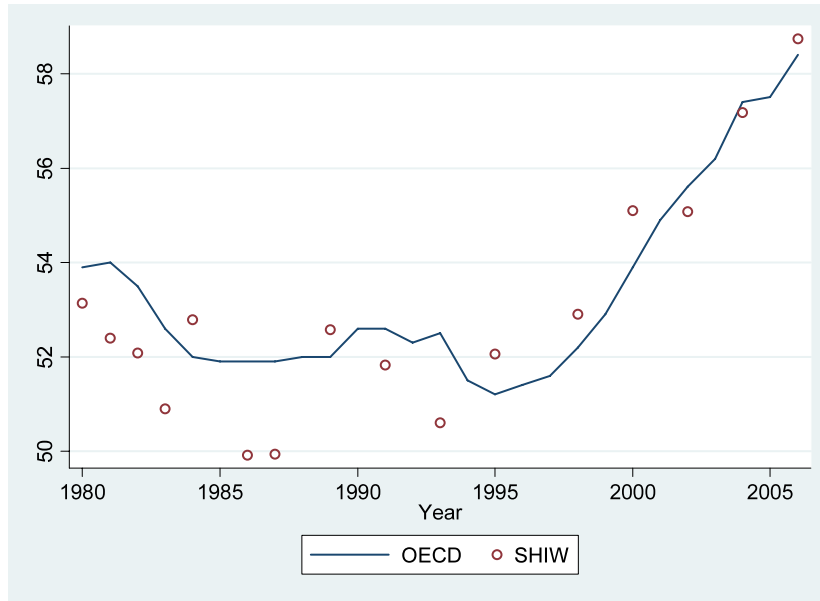
Fig. 4. Employment-population ratio (15–64 years old) in the SHIW and in OECD data. *Note.* SHIW statistics are computed using sample weights.

Trends in disposable income are depicted in Fig. 3. We generated the National Accounts measure by dividing real national disposable income by the end-of-year resident population. We compare it with two measures of the SHIW real disposable income series: excluding and including financial income (which in the SHIW is available only since 1987), and both expressed in per capita terms. We normalize the three series to equal 1 in 1987. The figure shows fairly good tracking in the income dimension.

While growth rates for per capita consumption and income match the National Accounts aggregate fairly well, the levels are underestimated. The shortfall for total disposable income is around 20 percent, while for consumption it is about 25 percent, but, as is evident from Figs. 1–3, these shortfalls have no particular time patterns. Validation studies suggest that the income shortfall is roughly in line with similar surveys in other countries. In particular, the SHIW slightly overestimates wages and salaries with respect to the National Accounts, while it underestimates self-employment income by 50 percent. Pensions fall short of the National Accounts figures by about a third. In terms of income from property, interest on financial assets is seriously underestimated, while rents are roughly in line with the National Accounts figures. Part of the difference for income and consumption is explained by the different definitions used in the survey and the National Accounts: consumption from own production, which is not recorded in the SHIW, and expenditure on valuables, see Brandolini and Cannari (1994) and Brandolini (1999).

To complete our analysis and comparison of trends in the relevant economic variables from the SHIW and aggregate data, Fig. 4 plots the employment-population ratio (the share of persons of working age – 15–64 – in employment) in the SHIW and in OECD data. The two series are similar in terms of levels and growth rates, especially after the increase in the sample size in the late 1980s. The SHIW series captures the declines in the early 1980s and early 1990s as well as the rapid increase in the most recent decade.

2.3. Panel component

Starting from 1989, each SHIW includes some households from a previous survey. Also, the panel component of the sampling procedure is determined by the selection of municipalities (from among those sampled in the previous survey) in a first stage, and re-interviewing of these households in a second stage. The panel component has increased gradually over time, and is now roughly 50 percent.[5]

Details on the structure of the SHIW panel are provided in Table 2, which reports the number of households interviewed in more than one survey. For example, of the 7768 households that make up the 2006 survey sample, 30 have been surveyed

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[5] It is well known that over time a fixed panel will become composed increasingly of different individuals to the ones initially selected, so the method of replacement crucially affects the quality of the panel. But since matching of lost units with new units is always less than perfect, sample attrition is a major problem with fixed panels, particularly when they extend over a long time span. Some of these problems can be reduced by rotating panels, which minimizes dropout and burnout (demanding too much of the same people) problems that arise in fixed panels. Furthermore, at each point in time information from all the panels can be pooled for cross-sectional analysis, and sample size can be changed easily over time. Finally, since fresh samples are obtained continuously, attrition is of less concern.

Table 2
Panel households of the SHIW, 1987–2006.

Year of first interview	Year of survey									
	1987	1989	1991	1993	1995	1998	2000	2002	2004	2006
1987	8027	1206	350	173	126	85	61	44	33	30
1989		7068	1837	877	701	459	343	263	197	159
1991			6001	2420	1752	1169	832	613	464	393
1993				4619	1066	583	399	270	199	157
1995					4490	373	245	177	117	101
1998						4478	1993	1224	845	636
2000							4128	1014	667	475
2002								4406	1082	672
2004									4408	1334
2006										3811
Cross-sectional sample size	8027	8274	8188	8089	8135	7147	8001	8011	8012	7768
Percentage of total sample		14.6	26.7	42.9	44.8	37.3	48.4	45.0	45.0	50.9

Note. The rows in the table report the number of households in the original cross-sectional sample, interviewed in subsequent years; the columns show the number of households in each round of the survey based on first year of interview. The last row reports the proportion of the households in the panel.

since 1987, 159 since 1989, 393 since 1991, and so on. The number of households interviewed for the first time in the 2006 survey is 3811. The last row of Table 2 shows how the panel component has increased over time: 15 percent of the sample was re-interviewed in 1989, 27 percent in 1991, and so on. In the 2006 survey more than half of the sample is panel households.

Previous attempts to exploit the panel dimension of the SHIW consumption and income data include studies of excess sensitivity of consumption (Jappelli and Pistaferri, 2000), impact of income shocks on saving (Pistaferri, 2001), infrequent durables stock adjustments (Bertola et al., 2005), relation between income and consumption mobility (Jappelli and Pistaferri, 2006), relation between income shocks and wealth (Krueger and Perri, 2009).

2.4. Sample selection

The sample selection for the empirical analysis is described below. We constructed two samples, one composed of individuals for the purpose of studying labor supply, wage trends and wage inequality, and one composed of households for studying trends and inequality in household consumption, income, and wealth. The original sample of individuals includes 316,530 units surveyed between 1980 and 2006. Given the focus on labor supply, we exclude people younger than 25 or older than 60. The purpose of this sample selection criterion is to select individuals that have finished school and are not yet retired. This reduces the sample to about 180,000 units. To reduce the impact of outliers, we eliminate those with an hourly wage below half of the minimum wage (which we take to be the average wage paid at a local McDonald's, see Ashenfelter and Jurajda, 2004). Given that hours worked is available only since 1987, this selection drops all data before 1987 and also units with missing wages due to non-participation. The sample includes 54,945 individuals – 33,572 males and 21,373 females – interviewed between 1987 and 2006.[6]

The original sample of households includes 106,990 units. We exclude households where the household head is younger than 25 or older than 60. We adopt the definition of household head used in the other countries studied in this project. Hence, in households formed by couples (i.e., households in which there is one member denoted as the head or reference person, and another denoted as the spouse), we treat the male in the couple as the household head. We eliminated households with coding errors in the family composition (multiple spouses, same-sex spouses), zero or negative non-durables consumption, and households where the household head receives an hourly wage below half of the minimum wage. The final sample includes 70,220 households interviewed between 1980 and 2006. Monetary variables in the SHIW are not top-coded. Detailed variable definitions are provided in Appendix A.

3. The macroeconomic background

Our microeconomic data span the period 1980–2006. During this period, Italy suffered three recessions: one in 1981–83, a particularly deep one in 1992–93 (with consumption falling in real terms for the first time since the end of WWII), and a third in 2001–04. During the period studied the unemployment rate increased steadily until 1997 (from 5 percent in 1980 to 12 percent in 1997), and then declined in the second half of the period (reverting in 2006 to about 7 percent). The economic slowdown associated with these three episodes can be seen in the dynamics of consumption and disposable income (Figs. 1 and 3). Throughout the 1990s and 2000s, the Italian economy was characterized by slow or even negative productivity growth. Among the relevant institutional changes impacting on the macroeconomic background, there were at least two major pension reforms (the *Amato* reform of 1992 and the *Dini* reform of 1995, named after the prime ministers

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[6] The sample used to construct Fig. 7 does not exclude those with missing wages due to non-participation.

Fig. 5. Household wealth. *Note.* Total wealth includes real and financial assets, net of liabilities. SHIW statistics are computed using sample weights.

who signed them into law), aimed at reducing the imbalance in the social security system induced by the progressive aging of the population and the process of banking reform and financial liberalization culminating in accession to the Euro area in 1999.

Changes in indexation clauses and labor market institutions have had a deep effect on labor wage dynamics and labor market relations; in this respect the early 1990s represents a turning point away from policies favoring wage compression and reduction of inequalities towards policies associated with widening income disparities and greater wage instability. In the earlier period (1975–91) labor markets were tightly regulated, and wage indexation granted the same absolute wage increase to all employees in response to price changes. Using SHIW data, Manacorda (2004) argues that the indexation mechanism induced wage compression and reduction in wage inequality. Erickson and Ichino (1995) advance a similar explanation for the decline in wage inequality in Italy between the late 1970s and late 1980s.

The second, more recent period (1992–2006) starts with abolition of the indexation system in 1992, and extensive labor market reforms aimed at increasing the degree of flexibility of the labor market: in the 1990s fixed term contracts were gradually deregulated, which widened their use by temporary work agencies, and restrictions concerning fixed term contracts for unskilled workers were lifted. We show that changes in labor market institutions are the most plausible explanation for the dynamics of income inequality during the sample period.

The most recent decade studied also saw appreciation of the housing stock and massive privatization of state-owned firms and public utilities. These developments have affected the dynamics and composition of households' real and financial wealth. The top panels of Fig. 5 plot the median wealth–income ratio (left) and financial wealth–income ratio (right).[7] Wealth is the sum of primary residence, other real estate, business wealth and financial wealth, less financial liabilities. Financial wealth includes transaction accounts, CDs, bonds, stocks, mutual funds, investment accounts, defined contribution pensions, and the cash value of life insurance. There is a strong increase in the wealth–income ratio throughout the 1990s

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[7] Fig. 5 and subsequent ones plot both the original data points and those obtained applying a smoothness filter (local OLS regression implemented through the `lowess` command in Stata). The smoothed values are obtained by running a regression that uses only a small amount of data around each point. Each regression is weighted so that the central point gets the higher weight and points farther away receive less weight.
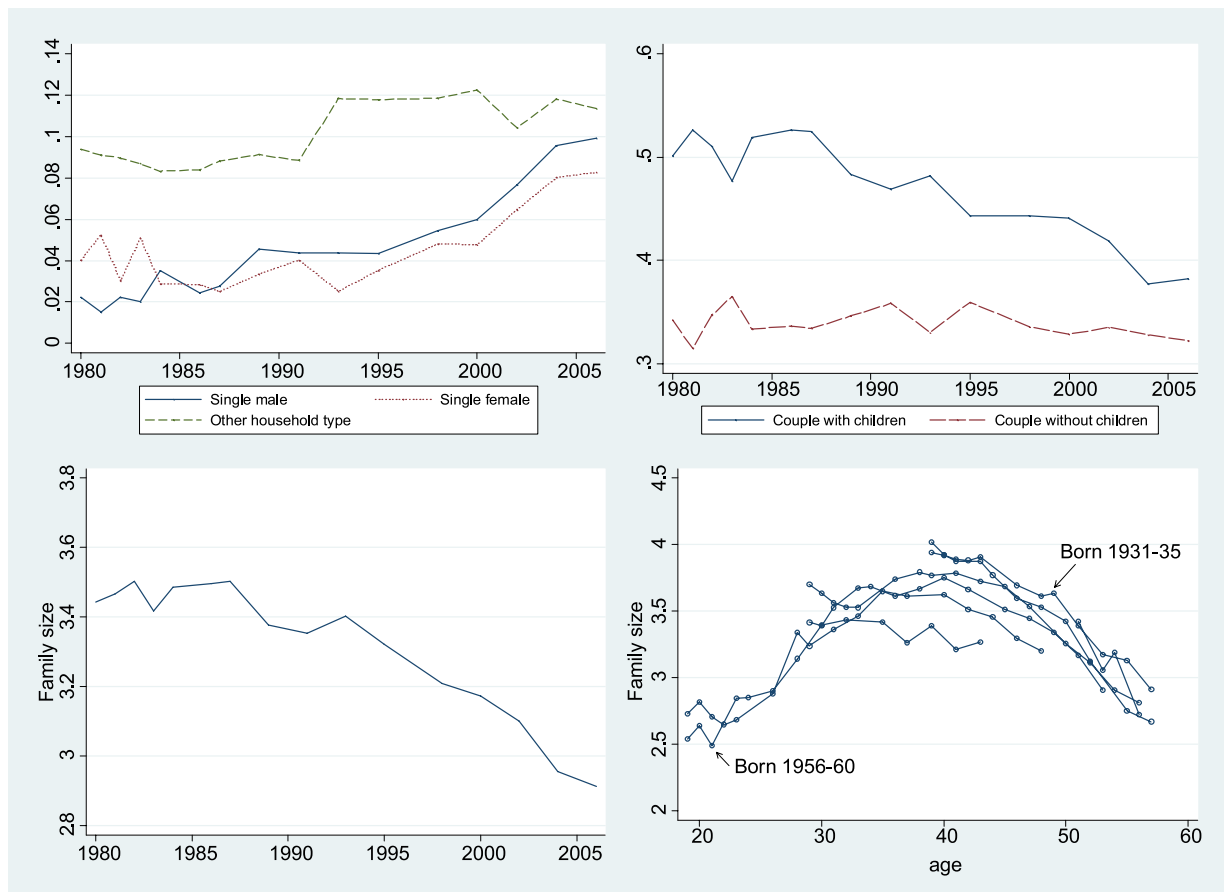
Fig. 6. The demographic transition. *Note*. All statistics are computed using sample weights.

and a slowdown in the 2000s. The increase reflects appreciation of the housing stock (about 75 percent of wealth is held in real estate), as well as appreciation of financial stocks. The slowdown is mostly due to falling prices and stock market participation after 2001. The increase in the wealth–income ratio in the 1990s also reflects higher rates of homeownership, depicted in the left bottom panel of Fig. 5.[8] Finally, in the right bottom panel we plot the Gini coefficients for total wealth and for financial wealth against time. The figure shows that while inequality in total wealth is fairly stable, inequality in financial wealth grew throughout the 1990s. As we shall see the level of wealth inequality is much higher than consumption or disposable income inequality (0.6–0.7 vs. 0.25–0.4).

Italy has undergone a rapid demographic transition in the last four decades. On the one hand, there has been accelerated aging of the population due in part to an increase in life expectancy, and in part to a dramatic fall in the fertility rate (from 2 in 1980 to 1.2 in 2004). But the demographic transition has also affected the structure of the population inducing dramatic changes in family size and composition. In the top panels of Fig. 6, we plot the proportion of single males and females (left) and couples with and without children (right). In 1980, couples represent about 85 percent of all household types. By 2006, they are about 70 percent. The decline is accounted for almost exclusively by a decline in the proportion of couples with children. In direct contrast, the proportion of single households triples, from 6 percent in 1980 to 18 percent in 2006. As a result of these trends, average household size has declined substantially (bottom left panel) and, at least from a visual inspection, there appear to be strong cohort effects underlying this decline (bottom right panel). In particular, relatively younger cohorts (e.g., those born in 1956–60) appear to have smaller families than older ones (e.g., born in 1931–35).

Demographic changes can affect household income and consumption inequality even if the distribution of individual incomes is unchanged. For instance, taxes and deductions affect the way couples file income tax returns, and the presence of children entitles low income families to claim deductions or government subsidies.

More importantly, there are economies of scale in consumption, so that a household's consumption is not simply the sum of the individual members' consumption. Therefore, in the empirical investigation of trends in income and consumption

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[8] Brandolini et al. (2004) describe the composition and distribution of household wealth in Italy and assess the characteristics and quality of the wealth data provided by the SHIW. They propose statistical tools to adjust for non-response, non-reporting and under-reporting. They find an increase in wealth inequality during the 1990s, and also that the increased concentration of financial wealth was an important determinant of this trend.
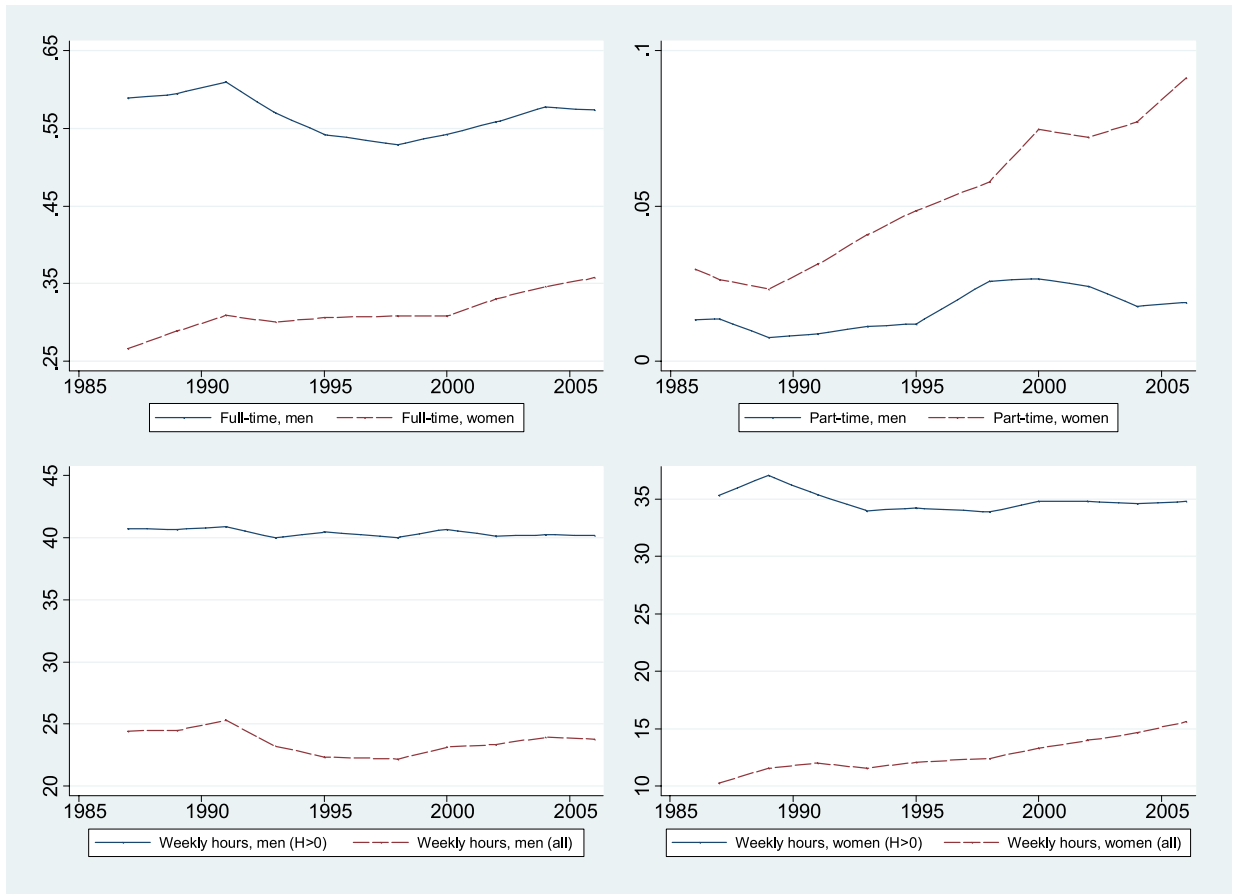
Fig. 7. Employment rates. *Note.* All statistics are computed using sample weights.

inequality we provide income and consumption measures expressed in terms of adult equivalent (or equivalized) using standard equivalence scales.

Macroeconomic and demographic developments and labor market reforms affect labor market participation and the structure of the labor force. We use the sample of individuals aged 25–60 to describe these trends. The sample extends from 1987 to 2006 because data on hours worked were not collected before 1987 (with the exception of information on part-time employment which exists since 1986). The top left panel in Fig. 7 plots the proportion of people reporting being employed full-time against the survey year. It is flat for men and increasing for women (a 30 percent increase over the last two decades). But despite the increased female participation, Italy still exhibits much lower activity rates than most other European countries. The right panel shows that the proportion of people reporting being employed part-time has increased for both groups, although for women the increase is much higher (three-fold from 3 percent to almost 10 percent). These trends are explained by a series of labor market reforms (especially the 1997 *Treu* package), which eased entry to the labor market of groups with low labor force attachment. The bottom panels plot average weekly working hours for men and women separately (conditioning on being employed and for all individuals). There is no clear trend for males, while for females conditional average weekly hours fall as an effect of the increased weight of part-time workers, while unconditional hours increase to reflect increasing labor market participation.

4. Hours and wages inequality

From the individual data set, we construct a measure of the hourly wage as annual earnings divided by annual hours; again, the data refer to 1987–2006. We collapse wage data for both males and females and compute four indexes of inequality: the 90th–50th percentile ratio, the 50th–10th percentile ratio, the Gini coefficient, and the variance of the logarithms of wages. The first two indexes measure inequality in different parts of the distribution (the top and bottom parts, respec-
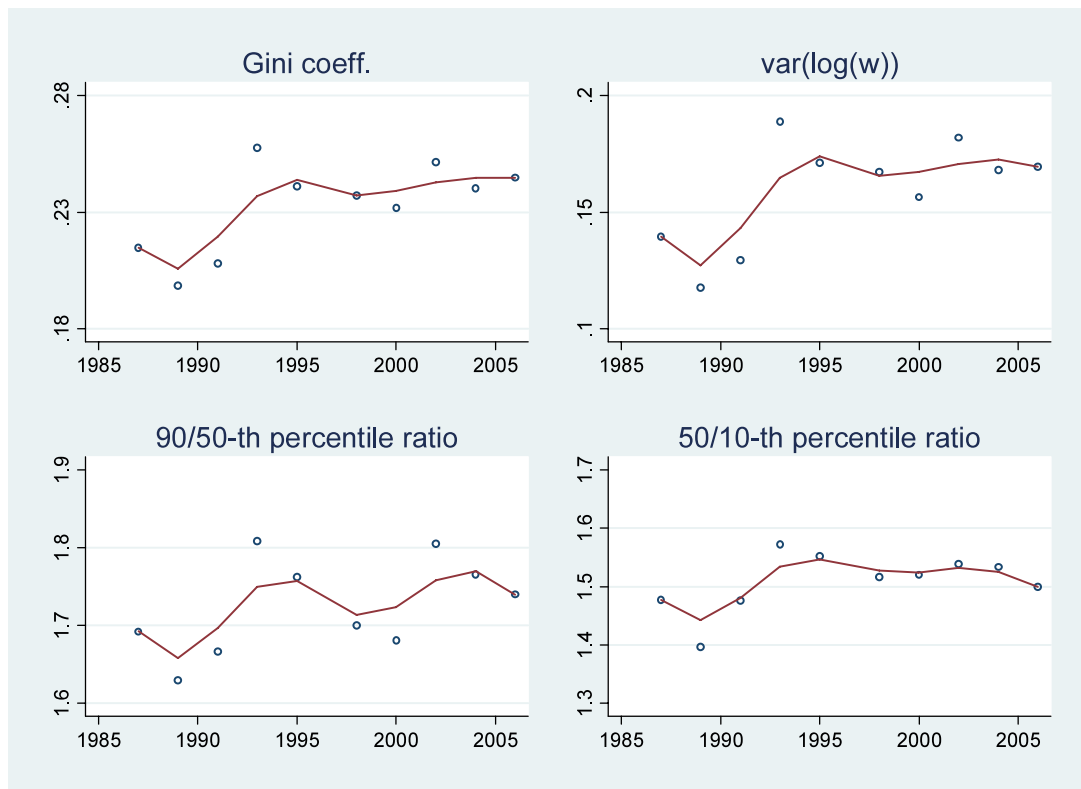
Fig. 8. Hourly wage inequality. *Note.* All statistics are computed using sample weights. The solid lines represent interpolation of the original data points using locally weighted OLS.

tively); the other two indexes are more traditional measures of inequality, with the variance of logs being particularly useful for its additivity in error component models.[9] The time trends of these four indexes are plotted in Fig. 8.

All inequality measures show a consistent pattern, recording a strong increase between 1989 and 1993, after which time all indexes are flat. The increase in wage inequality is not negligible. The Gini index increases by about 5 percentage points, and the variance of logarithms by about 7 points, from 12 to 19 percent. We show that these trends are common to all the measures of income we use (at household or individual level).

In Fig. 9 we plot three frequently used measures of labor market premia: the gender premium (the ratio of the average male and female wages), the education premium (ratio of college graduate average wage and non-graduate wage), and the experience premium (ratio of average wage received by males aged 45–55 and males aged 25–35). The fourth panel of Fig. 9 shows the evolution of residual wage inequality. This is obtained as the variance of the residual of a log wage regression, controlling for a fourth-order age polynomial, regional dummies (North, Center, South), a gender dummy, and years of schooling. The wage regression is run separately for each year providing a time series of residual inequality. When comparing labor market premia it should be remembered that they are conditional on labor market participation, hence they reflect endogenous selection into work.

The top-left graph shows that the gender premium does not display a clear-cut trend over the sample period, with the average premium ranging between 2 percent and 6 percent in most years.[10] The education (college) premium is about 60 percent along the sample, increasing slightly in the early 1990s and then flattening out or even slightly declining. Comi et al. (2000) note that returns to education have not changed much for Italy, in contrast with evidence for the US (Ashenfelter and Rouse, 1998).

In Italy in the 1980s, college education levels were generally much lower than in other European countries, but show a rise in the 1990s. One could speculate that the increased supply of college graduates offsets the increase in demand,

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[9] These indexes have various advantages and disadvantages for the measurement of inequality. See Cowell (2007) for an overview.

[10] A recent report from the National Council for Economic Affairs and Labor (CNEL, 2005) analyzes gender pay differentials in Italy between 1998 and 2002. It indicates that in 1998 men earned on average a quarter more per year than women, falling to 23.5 percent more in 2000 and 20.6 percent more in 2002. These differences are mainly determined by the smaller number of hours worked by women compared to men; the gap is significantly narrower if we consider hourly wages (4–5 percent). A study by the European Commission (2002) confirms that the wage gap in Italy is significant (10 percent for employees working at least 15 hours per week) and persistent over time, but lower than in other European countries (16.2 percent).

Fig. 9. Gender, education and experience premia. *Note.* The gender premium is computed as the ratio of male to female wages. The education premium is computed as the ratio of the wages of workers with and without college degrees. The experience premium is computed as the ratio of the average wage of males aged 45–55 and the average wage of males aged 25–35. Residual wage inequality is defined as the variance of the residuals of a regression (run separately for each year) of log earnings on a fourth-order age polynomial, regional dummies (North, Center, South), a gender dummy, and years of schooling. All statistics are computed using sample weights. The solid lines represent interpolation of the original data points using locally weighted OLS.

explaining the constant education premium observable in the data. Future research should investigate the reasons for and the underlying forces behind this stability. Finally, there is a strong, sustained increase in the experience premium and residual wage inequality throughout the 1990s. Similar to the unconditional variance for log wages, residual wage inequality appears to flatten out in the late 1990s/early 2000s.

Fig. 10 reports separate data for males and females, and characterizes the dynamics of wage and labor supply inequality. The upper panels plot the variance of log wages and log hours against time for males (the solid line) and for females (the dashed line). Of course, these graphs are conditional on labor market participation. Trends are similar for the two genders, confirming a general pattern of increased inequality in the early 1990s followed by a flattening out of the profiles. However, the levels for males and females are different. There is greater wage inequality and substantially more inequality in hours worked (reflecting differences in the intensive margin of the annual frequency) within the female group.

The bottom panels report time trends for the wage–hours correlation for males (left panel) and females (right panel). While both correlations are negative across the period, the estimation for females is growing in absolute value, while the estimation for males is basically flat. Most of the empirical literature agrees that labor supply is inelastic, at least for men, so that the correlation between hours and wages is likely to reflect a division bias (wages are the ratio of earnings and hours, hence there is a mechanical negative correlation between wages and hours if hours are measured with an error).

5. Income and consumption inequality

As explained in Section 2, SHIW provides income data for each individual in the household, allowing a measure of household-level disposable income to be constructed based on the sum of household-members earnings, transfers, pensions,

Fig. 10. Labor supply inequality. *Note.* In the legends $\log(w)$ and $\log(h)$ denote, respectively, the variance of wages and the variance of hours; $\text{corr}(h, w)$ denotes the sample correlation between hours and wages. The solid lines represent interpolation of the original data points using locally weighted OLS.

and income from capital. In this section we use these data to analyze the dynamics of inequality in household earnings and disposable income.[11]

Fig. 11 plots the trends for three different measures of variance of the log of household earnings, ranked in order of complexity: variance of log household earnings, variance of log equivalized earnings (obtained by dividing household earnings by the OECD equivalence scale),[12] and variance of residual earnings (obtained as the year-to-year residuals of a regression of log earnings on a fourth-order age polynomial, years of schooling, a dummy for gender, regional dummies, family size, and number of children).[13] It shows a clear ranking of inequalities. The variance of equivalized log earnings $\text{var}(\log(y/s))$ is higher than the variance of log raw earnings, which in turn exceeds the variance of residual log earnings. Each measure of inequality declines slightly in the 1980s, grows quite dramatically between 1989 and 1995, and is basically flat thereafter.

To check whether the time pattern of inequality depends on the use of the variance of logs as our preferred measure of inequality, Fig. 12 reports additional insights into the dynamics of the distribution of earnings. All measures of earnings are equivalized in these graphs, using the OECD equivalence scale (different measures provide similar patterns). The picture painted by the variance of log earnings in the top left panel (which reproduces the same variance of log earnings in Fig. 11)

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[11] Brandolini (1999) provides the most comprehensive analysis of the income inequality and its historical trends (1947–1995) for Italy, using several datasets: early surveys conducted by the Doxa Institute in 1947–48, the Bank of Italy SHIW, the Euro-Panel, and the Italian Central Statistical Office, on personal incomes distribution. The quality of the surveys is assessed via evidence on differential response rates and misreporting, and by comparing grossed-up survey results with aggregate figures from the labor force survey and the national accounts. The evidence suggests a slow decline in income inequality – as measured by the Gini index – from the early 1970s to the end of the 1980s.

[12] The OECD equivalence scale is defined as $E = 1 + 0.5 \times$ (no. of children) $+ 0.7 \times$ (no. of adult members $- 1$). A child is any household member aged 16 or under. The relation between the variance of equivalized log earnings and the variance of raw log earnings is $\text{var}(\log(y/s)) = \text{var}(\log(y)) + \text{var}(\log(s)) - 2\text{cov}(\log(y), \log(s))$. The fact that $\text{var}(\log(y/s)) > \text{var}(\log(y))$ suggests that changes in demographic composition of the household make only a modest contribution to overall inequality.

[13] Demographic variables absorb a large part of the variability in income (the R^2 of the regression is in the 0.35–0.4 range).
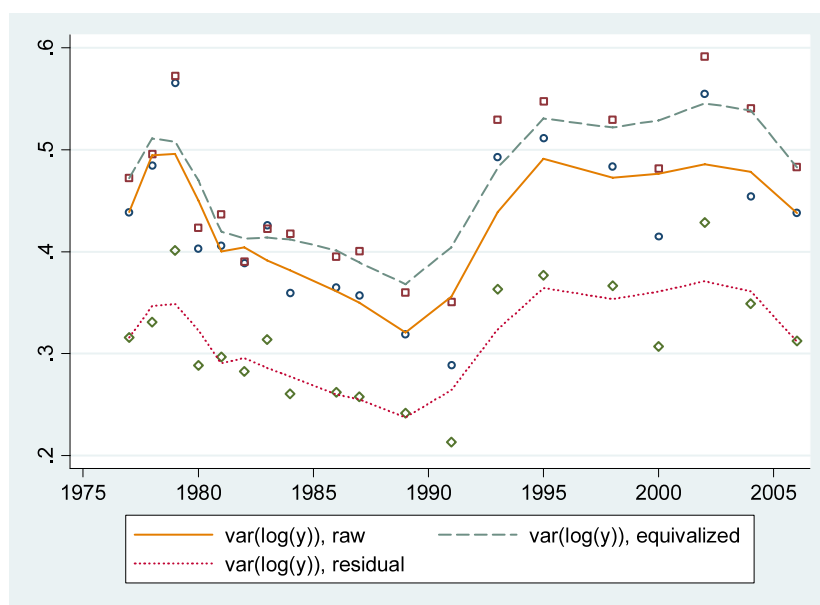
Fig. 11. The variance of log household earnings. *Note.* In the figure "var(log(y)), raw" is the variance of log earnings, "var(log(y)), equivalized" is the variance of log earnings per adult equivalent, "var(log(y)), residual" is the variance of the residuals in regressions, run separately for each year, of log earnings on a fourth-order age polynomial, regional dummies (North, Center, South), a gender dummy, and years of schooling. The solid lines represent interpolation of the original data points using locally weighted OLS.
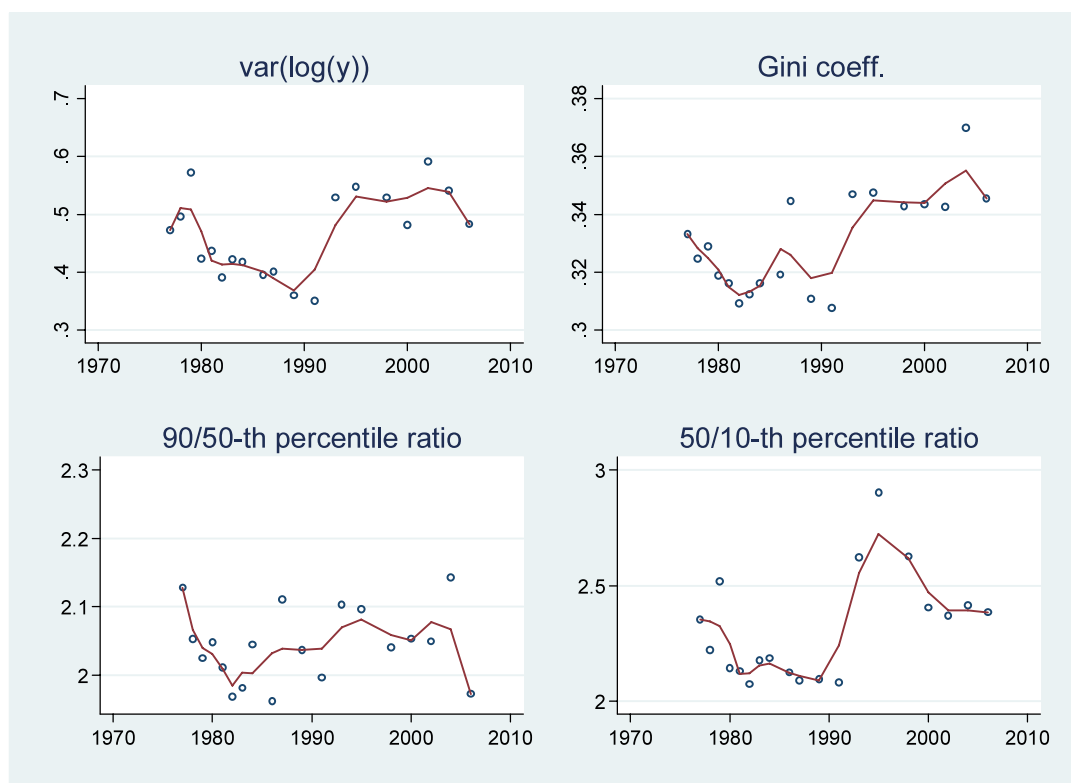
Fig. 12. Household earnings inequality. *Note.* All statistics are computed using sample weights. The solid lines represent interpolation of the original data points using locally weighted OLS.
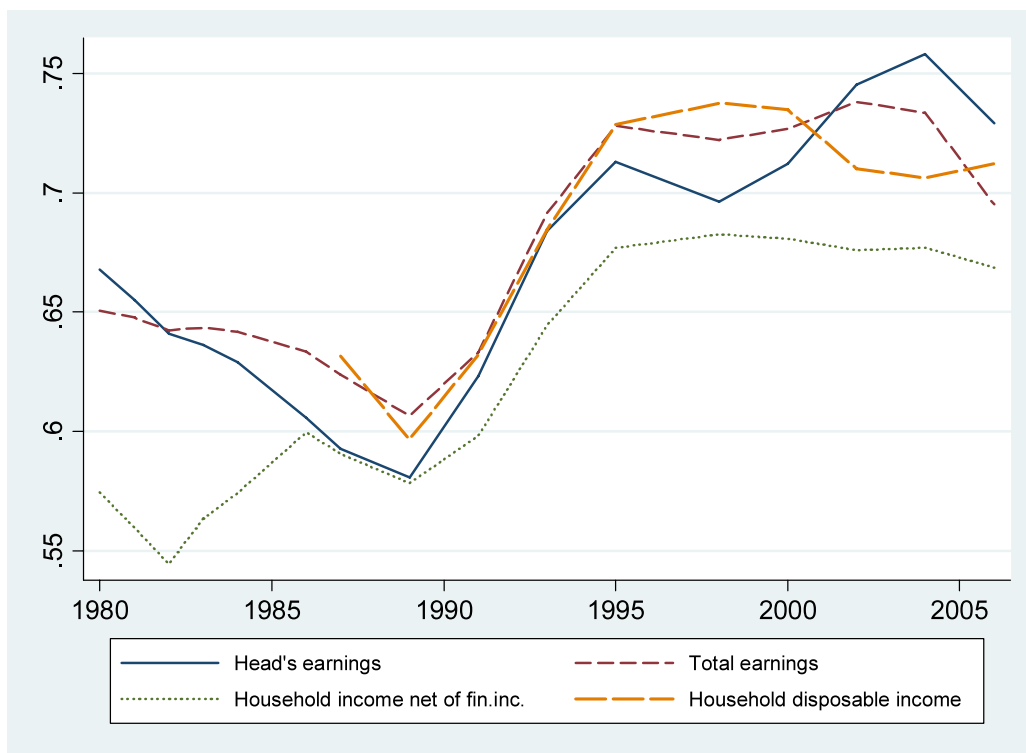
Fig. 13. From household head's earnings inequality to household disposable income inequality. *Note.* All statistics are computed using sample weights. The lines represent interpolation of the original data points using locally weighted OLS.

does not change if we use the Gini coefficient (top right panel). In both cases the pattern is declining in the 1980s, strongly increasing in the early 1990s, and flattens out at the newly reached higher levels in the final part of the sample period.[14]

The two graphs in the lower part of Fig. 12 plot the 90th–50th and 50th–10th percentile ratios, and provide information on which part of the distribution is responsible for the increase in inequality. Each of the measures of inequality starts to increase in the early 1990s. In particular, the top portion of the distribution begins to pull out from the median (from 2 in 1991 to 2.1 in 1995, then reverting to lower values). The lower portion of the distribution highlights strong rising inequality over the same period (from 2.1 in 1991 to 2.9 in 1995), before reverting to values around 2.4. This suggests that in 1993–95 there was a temporary increase in inequality both at the top and at the bottom of the distribution, although the latter appears larger.

Fig. 13 shows how inequality changes from head's earnings to household earnings, disposable income net of financial income, and disposable income. Since financial income is not available before 1987, the household disposable income series is shorter than the other three series. All measures are again scaled using the OECD equivalence scale. There are several things to note. First, the variance of log household head's earnings is lower than the variance of log household earnings, implying that family labor supply is not important in reducing inequalities.[15] Second, the difference between the variance of log household earnings and the variance of log disposable income net of financial income suggests that government and family transfers (not taxes, because all measures of income are after-tax) reduce income disparities (the variance of disposable income is about 5 percentage points lower than the variance of earnings). Third, given the skewed distribution of financial assets, income net of financial wealth has lower variance then household disposable income.

To put Italian income inequality in perspective, Fig. 14 reports the Gini indexes for 16 selected OECD countries plus Russia (a country also analyzed in this special issue). The statistics are computed by Brandolini and Smeeding (2008) using the 2007 version of the Luxembourg Income Study database and standardized based on the Italian value. Measured by international standards, Italy has high income inequality. In 2000, the Gini index for Italy is 0.33, ranking Italy just below high-inequality countries such as the United Kingdom, the United States and Spain.

We focus next on the variance of log non-durables consumption. As for Fig. 11, we plot the trends over time for three measures of inequality (raw, equivalized, and residual). Fig. 15 shows that the finding that the variance of the equivalized

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[14] To check that the increase in inequality is not particular to the SHIW, we compute earnings inequality in the INPS (Istituto Nazionale per la Previdenza Sociale) dataset, covering only private sector employees. We find similar trends in inequality as reported in Fig. 11.

[15] This means roughly that the earnings of different household members do not exhibit strong negative covariance.
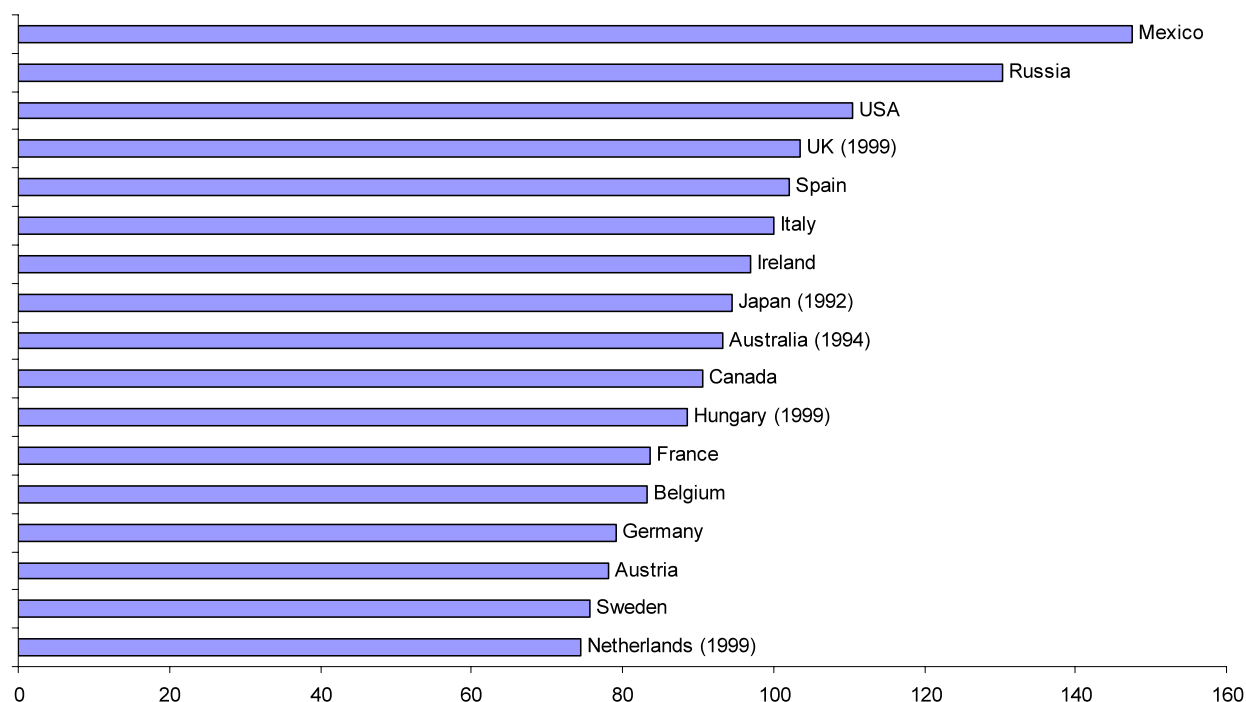
Fig. 14. International comparison of Gini index. *Note.* Countries' Gini indexes are standardized based on the Italian value (0.333 in 2000). The income measure used is disposable income. It is adjusted for household size, bottom-coded at 1 percent of the mean, and top-coded at 10 times the median. Values are computed using the 2007 version of the Luxembourg Income Study and refer to 2000 (unless otherwise stated), with the exception of France, where data come from the European Community Household Panel database, Waves 1–8. Source: Brandolini and Smeeding (2008).
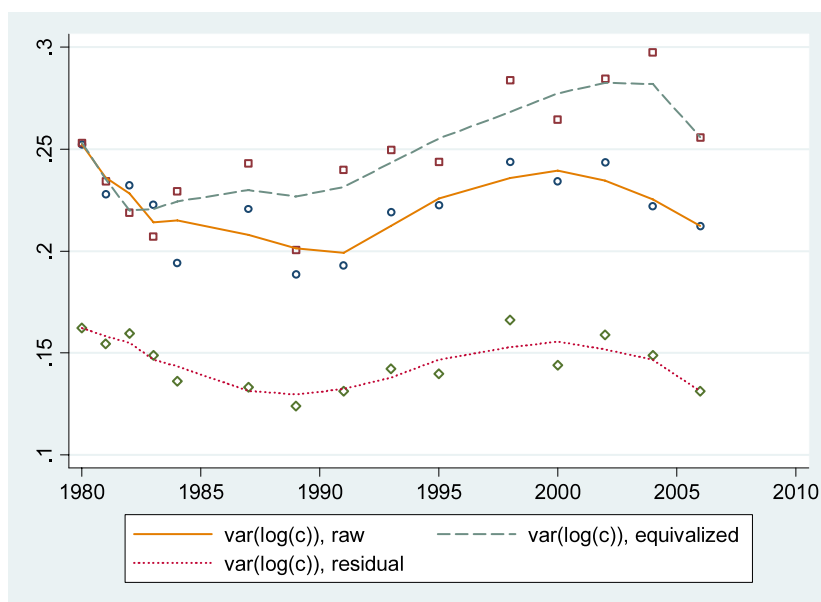
Fig. 15. The variance of log consumption. *Note.* In the figure "var(log(*c*)), raw" denotes the variance of log total consumption, "var(log(*c*)), equivalized" is the variance of log total consumption per adult equivalent, "var(log(*c*)), residual" is the variance of the residuals for regressions run separately for each year of log consumption on a fourth-order age polynomial, regional dummies (North, Center, South), a gender dummy, and years of schooling. The solid lines represent interpolation of the original data points using locally weighted OLS.
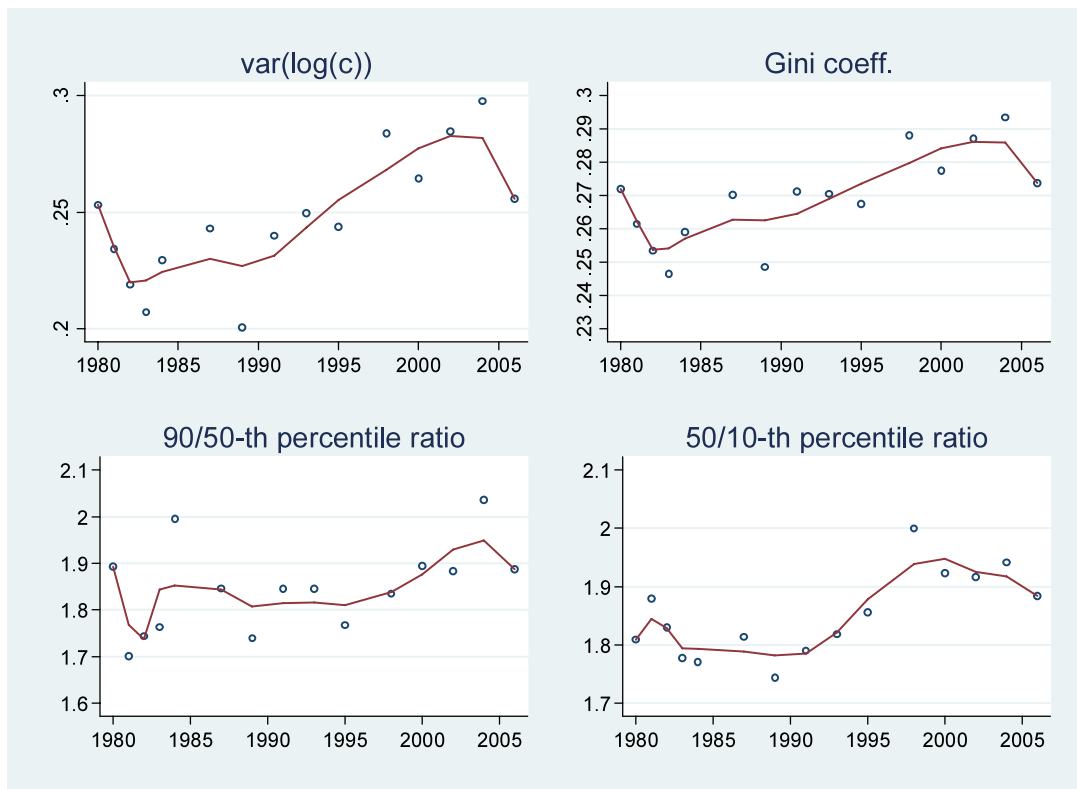
Fig. 16. Consumption inequality. *Note.* Consumption is defined as non-durable expenditures. Sample statistics are computed using sample weights. The solid lines represent interpolation of the original data points using locally weighted OLS.

measure ranks above the raw and residual measures, is confirmed. While the trends in consumption inequality are similar to the corresponding measures of income, the swings are much less pronounced: there is a slight decline in the 1980s, a mild increase in the 1990s, and a period of stability afterwards. At the end of our sample the variance of log consumption is about the same as in the initial periods, ranging between 20 and 25 percent for the raw and equivalized measures, and 12 to 15 percent for residual inequality. Fig. 15 also shows that the swings in consumption inequality are more pronounced for residual inequality than if we were to use raw or equivalized measures.

For further insights into the evolution of the consumption distribution, Fig. 16 plots the variance of log consumption, the Gini coefficient and the 90th–50th and 50th–10th percentile ratios. In each case, we use OECD equivalized measures. Each of the four measures of inequality follows a similar trend: a period of stability in the 1980s, followed by an increase in the 1990s, and a slight decline in 2006.

6. The link between consumption and income inequality

To conclude our descriptive analysis, Fig. 17 depicts information on income and consumption inequality combined. The solid lines represent income and the dashed ones consumption. The left axis is income and the right is consumption, but both series are plotted on the same scale to highlight different trends. Income is measured as disposable income net of income from assets, and consumption is non-durables spending. Both measures are equivalized using the OECD equivalence scale. The main message from this graph is that, regardless of the measure of inequality, income inequality is higher than consumption inequality, and over the sample period income inequality has grown faster than consumption inequality.

We can provide a deeper perspective on consumption and income inequality by tracking over time a sample of individuals born in the same year, rather than the sample of the general population tracked so far. Deaton and Paxson (1994) show that this approach is suitable for studying consumption and income inequality within a life-cycle framework.

Fig. 18 sorts the data by year of birth for four cohorts (born in the 1930s, 1940s, 1950s, and 1960s) and tracks the inequality of equivalized disposable income and equivalized non-durables consumption over the median age of each cohort over the sample period. For instance, people born in 1950 were 34 years old in 1984 and 56 years old in 2006, the last year of our sample. Thus, given the length of our sample, cohort analysis is able to track consumption and income over a substantial portion of the life-cycle. The average cell sizes are 1123, 1339, 1082, and 728, respectively for the cohort born in the 1930s, 1940s, 1950s, and 1960s.
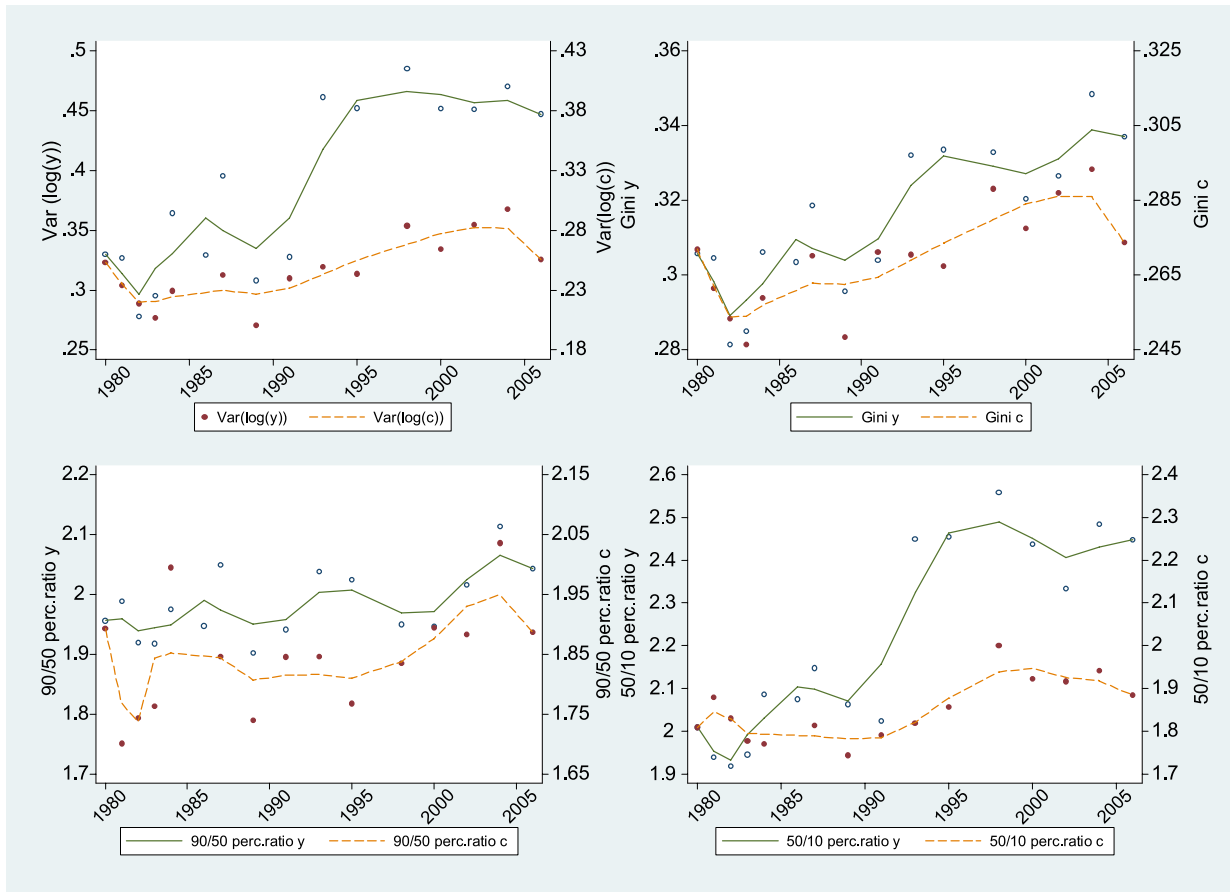
Fig. 17. Consumption and income inequality. *Note.* The variable var(log(y)) is disposable income net of income from assets; var(log(c)) is non-durables consumption expenditure. Both variables are equivalized using the OECD equivalence scale. Sample statistics are computed using sample weights. The solid lines represent interpolation of the original data points using locally weighted OLS.

The stylized facts that emerge from the analysis of the total sample are confirmed by the results of the cohort analysis: (1) income inequality is substantially higher than consumption inequality; (2) both inequalities grow as cohorts age; (3) for every cohort, over the 1990s, income inequality grows more than consumption inequality. For example, the variance of log disposable income for the cohort born in the 1950s grows between 1987 and 1998 by 0.14 units, while the variance of log consumption increases by about 0.06 units over the same time interval.

To explain the diverging cohort dynamics of the income and consumption inequalities we could exploit a model that incorporates a time-constant borrowing limit, incomplete market, finite life, and an income process with transitory and very persistent components with stationary variance (Storesletten et al., 2004). Suppose that the income for each cohort is the sum of a random walk process and an i.i.d. error. In such a model, the variances of income and consumption grow over the life-cycle. But since consumers smooth transitory income shocks, the variance of consumption grows less than the variance of income. At first glance, the cohort data are not inconsistent with this view.

However, one cannot rule out that the consumption response to income shocks or the income process itself may have changed over time. In terms of the consumption process, in the 1990s Italian households may have been more able to smooth income shocks, due to financial market reforms and improved access to credit.[16] With regard to the income process, it is possible that the labor market reforms of the 1990s increased the transitory component of inequality relative to the permanent component. To the extent that transitory shocks are easier to insure than permanent shocks, one would observe consumption inequality tracking less income inequality.

In the 1990s there were a number of credit market reforms: the 1993 banking reform, which increased competition among banks; the vast process of privatization of the banking sector of the early 1990s; the process of financial market integration brought about by EMU, which allowed competition from foreign banks; the increased choice in financial products, which resulted in longer mortgage maturities and higher loan-to-value ratios; and improvement to the credit infrastructure

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[16] We stress the role of credit market rather than government-provided insurance because during the sample period social insurance is stable, if not declining.
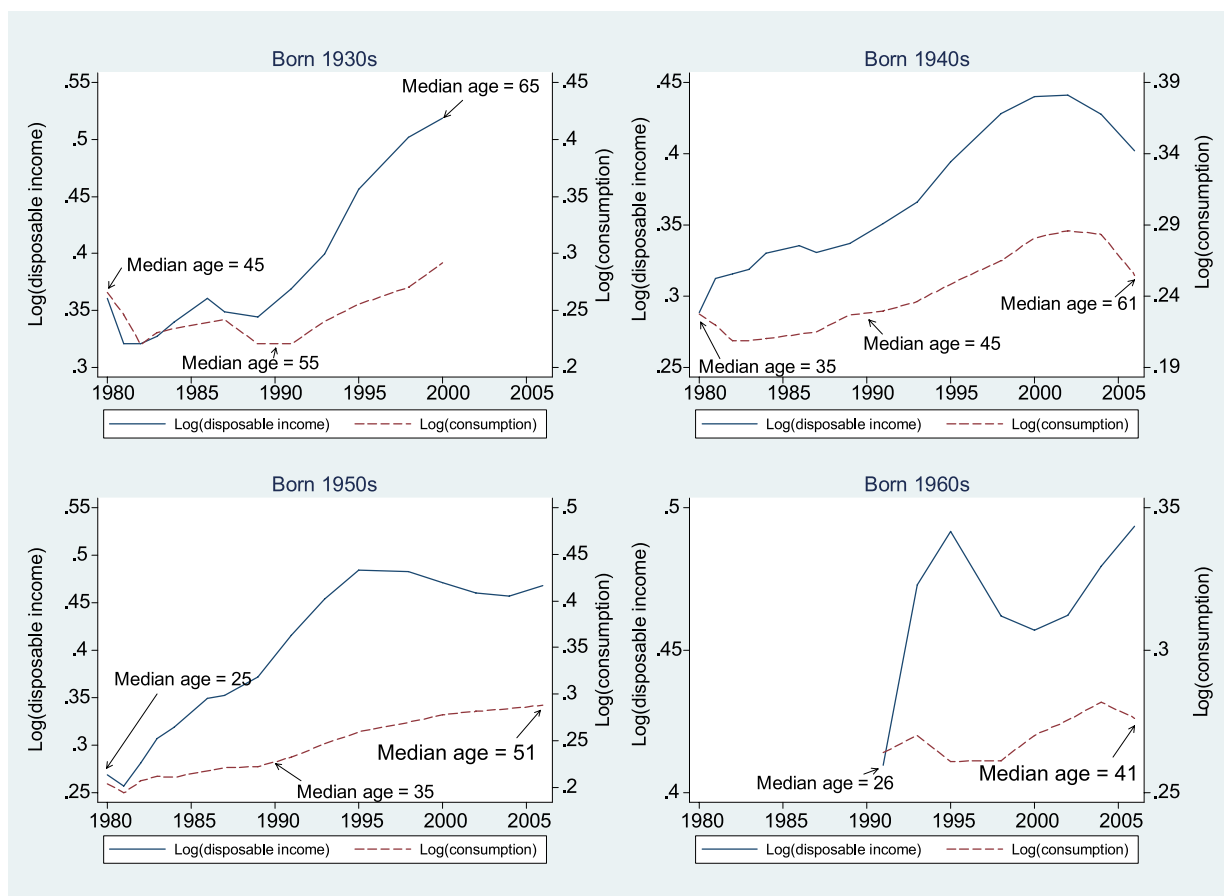
Fig. 18. Income and consumption inequality by cohort. *Note.* Income is defined as disposable income net of income from assets, and consumption as nondurables expenditure. Both variables are equivalized using the OECD equivalence scale. Sample statistics are computed using sample weights. The solid lines represent interpolation of the original data points using locally weighted OLS. The average cell sizes are 1123, 1339, 1082, and 728, respectively for the cohort born in the 1930s, 1940s, 1950s, and 1960s.

due to the creation of information sharing institutions (the first Italian credit bureau began operations in 1991). The outcomes of these reforms were a strong decline in interest rates following EMU, sharp increases in the propensity to borrow and the fraction of people borrowing, and a reduction in borrowing constraints.

Fig. 19 plots the national unemployment rate for the 1970–2009 period. Unemployment rises sharply from 1980 to 1987, stays above 10 percent for about 10 years, and declines after 1999. Interestingly, during the period of rapid increase in inequality (the early nineties) unemployment is roughly constant; instead, when the unemployment rate starts to fall inequality levels off. This suggests that changes in income inequality are unlikely to be driven by changes in unemployment rates. Rather, they may be related to structural changes in the labor market, and particularly to the developments of the late eighties and nineties. In 1987, the use of Fixed Term Contracts (FTC) was extended through collective agreements, although their use continued to be heavily regulated. The wage-compressing indexation mechanism was eliminated in 1992. In 1997 the Treu package increased the number of cases eligible for FTC, and these expanded further in 2001. Temporary Work Agency (TWA) operations which started in 1998, were extended in 2000 and 2003 to include unskilled workers. Overall, these reforms increased the flexibility of the labor market substantially. As a result, the OECD index of Employment Protection Legislation (EPL) was 3.6 in the late 1980s, 2.7 in the late 1990s, 1.9 in 2003 (the value for the US is still a far off 0.2). These labor market reforms increased wage flexibility and job turnover, increasing what Gottschalk and Moffitt (2005) term "income instability".

The effects of labor market reforms on income inequality can be studied estimating a flexible income process given by:

$$\ln y_{it} = X'_{it}\beta + P_{it} + \varepsilon_{it}$$
$$P_{it} = P_{it-1} + \zeta_{it} \tag{1}$$

where P is the permanent component (with innovation ζ), and ε the transitory component. Defining $g_{it} = \Delta(\ln y_{it} - X'_{it}\hat{\beta})$, the residual in first differences, Meghir and Pistaferri (2004) show that the variance of the two shocks can be identified using:
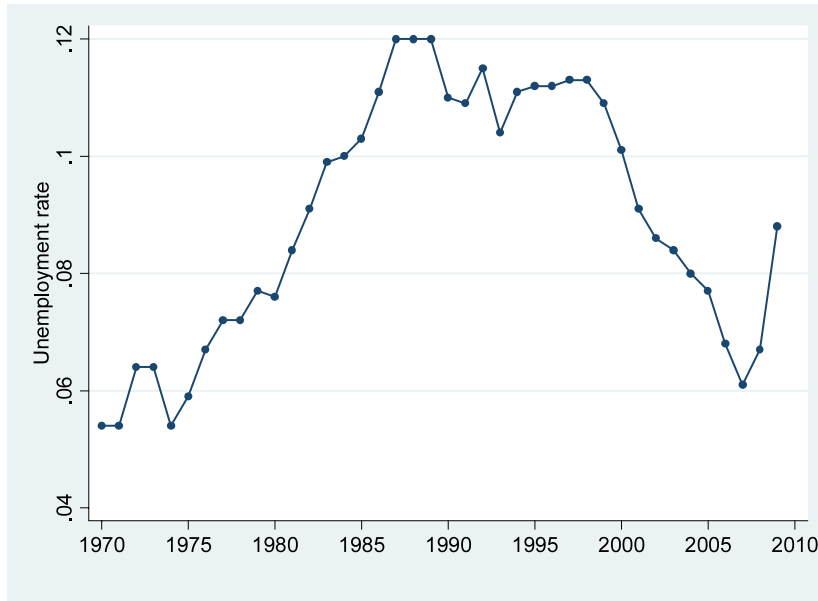
Fig. 19. Unemployment rate. *Note.* The unemployment rate is drawn from the Italian Labor Force Survey.

$$E\big(\varepsilon_{it}^2\big) = -E(g_{it}g_{it+1})$$
$$E\big(\zeta_{it}^2\big) = E\big(g_{it}(g_{it-1} + g_{it} + g_{it+1})\big) \qquad (2)$$

Estimates of the variances (with 95% confidence bands) are obtained by pooling all SHIW data from 1989 to 2006. Fig. 19 shows that the increase in income inequality reported in Fig. 13 is largely due to an increase in the variance of transitory shocks. Indeed, the variance in transitory shocks more than triples over 1989–98, while the variance of permanent shocks increases only in 1993 (coinciding with a recession year), and is flat afterwards. This evidence casts some doubt on the validity of intertemporal consumption models with income processes that are stationary over time.

To study the role of changes in the smoothing abilities of consumption and the income inequality mix, Jappelli and Pistaferri (2008) use SHIW cohort data to decompose the variance of consumption growth into two components, one depending on the variance of permanent income shocks and one depending on the variance of transitory shocks. They then estimate the degree of consumption smoothing with respect to permanent and transitory shocks, and test whether it has changed over time. The estimates suggest that consumers react strongly to permanent income shocks, and slightly less so to transitory shocks, pointing to a response of consumption to transitory income shocks that exceeds that predicted by the permanent income model.[17] Also, the ability of consumers to smooth income shocks does not change over the sample period, which challenges the hypothesis that financial liberalization affects the degree of consumption smoothing. Thus, the trend towards divergence of income and consumption inequality is more likely explained by the fact that increased income inequality is primarily due to an increase in transitory inequality.

7. Conclusions

This paper has presented some stylized facts on labor supply, income, consumption, wealth, and several measures of consumption and income inequality drawn from the Bank of Italy's SHIW. SHIW provides information on consumption and income from 1980 to 2006, and includes a sizable panel component that allows econometricians to estimate income, consumption and wealth processes and to analyze labor market and portfolio transitions. Given the population changes associated with the demographic transition and policy reforms that have occurred in Italy over the last two decades, the data represent an ideal context for applied macroeconomic study.

Our analysis shows that after declining through most of the 1970s and 1980s, income inequality in Italy grew dramatically in the early 1990s and stayed at this higher level until very recently. Most of the increase is transitory, i.e., it is related to a variety of economic phenomena that increase the degree of instability of earnings and incomes rather than to shifts in

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[17] The evidence of excess response is broadly consistent with previous work that studies the effect of transitory income shocks on consumption expenditure. Using CEX quarterly panel data, Souleles (1999) and Parker (1999) examine the response of household consumption respectively to income tax refunds and to predictable changes in Social Security withholdings. Souleles finds evidence that the marginal propensity to consume is at least 35 percent of the refunds within a quarter; Parker finds that consumption reacts significantly to changes in tax rates. Browning and Crossley (2001) survey several other studies reporting evidence that consumption overreacts to anticipated income innovations.
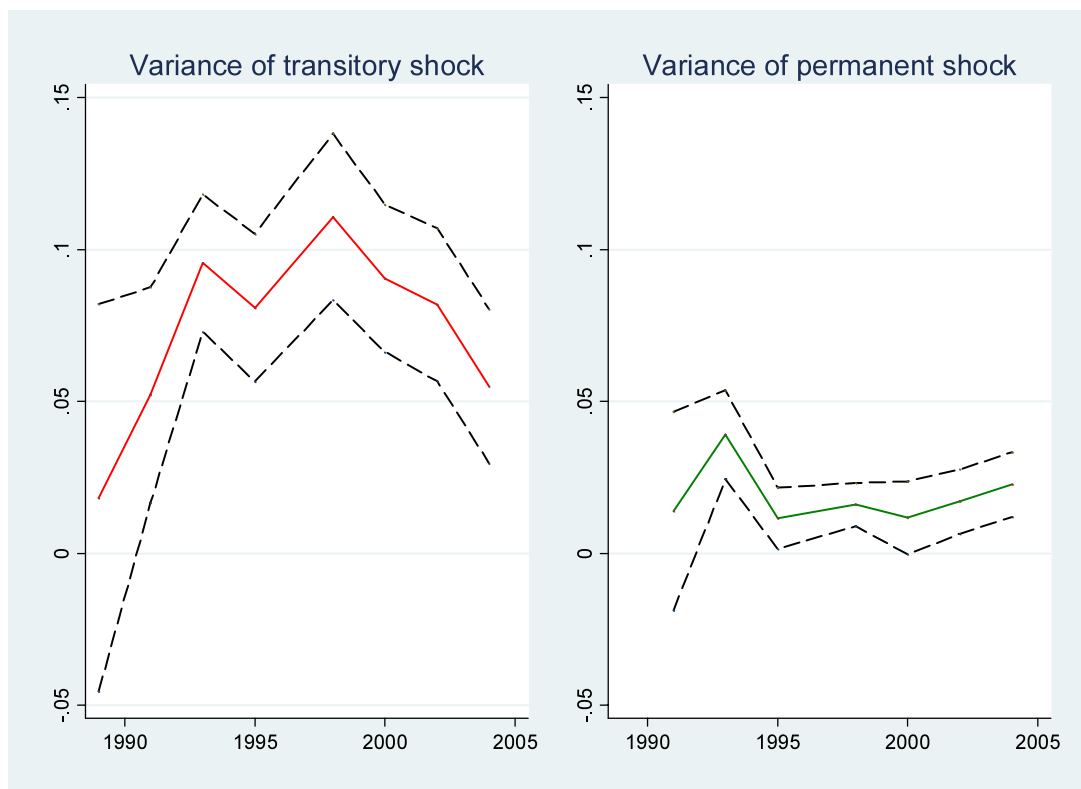
Fig. 20. Variances of transitory and permanent income shocks. *Note.* Variances of the two shocks are computed using the panel section of the SHIW. Income is defined as disposable income net of financial assets. The lines represent interpolation of the original data points using locally weighted OLS.

the wage structure, which appear either to be episodic (during the 1993 recession) or pick up only in the most recent years. While there is evidence of some increase in consumption inequality, this occurred at a much slower rate than the increased income inequality.

We can interpret this through the lens of a standard life-cycle permanent income hypothesis framework, in which consumers respond very strongly to permanent shocks, and much less completely to transitory shocks (unless credit market imperfections produce excess sensitivity). As shown in Fig. 20, the variance of permanent shocks has not changed significantly over the sample period, while the variance of transitory shocks has increased. This means that consumption inequality increases, but not as much as it would have grown if most of the increase in income inequality had been due to changes in the wage structure.

Acknowledgments

Appendix A. Definitions of variables

Labor supply. Hours worked and participation (full-time, part-time) are available for each household member, from 1987. Individuals are asked how many hours they work on average each week (including separate information for overtime), and for how many weeks per year. On the basis of this information, and annual earnings data we impute a value for hourly wages.

Consumption. Consumption is the sum of durables and non-durables expenditure; the latter includes imputed rents from owner-occupied housing. SHIW includes only a few questions on consumption. Non-durable goods except food are included in a broad question on average monthly expenditure on all items except a few listed durable goods; there is also a question on monthly expenditure on food only. Battistin et al. (2003) assess the quality of this expenditure data for 1995 to data from the corresponding diary based survey run by the Italian National Statistical Institute (ISTAT). They find that recall expenditure questions do not suffer from excessive item non-response, or at least display similar item non-response to

recall questions on household income or earnings. Also, the degree of difficulty experienced by respondents in answering such questions varies with the characteristics of the respondent. Finally, the recall total expenditure questions encompass considerable heaping and rounding. This is a familiar problem and there are ways of dealing with it; so for most analyses this is a relatively minor difficulty (Heitjan and Rubin, 1990).

Earnings. Earnings is the sum of wages and salaries and self-employment income, less income taxes. Wages and salaries include overtime bonuses, fringe benefits and payments in kind, and exclude withholding taxes. Self-employment income is net of taxes and includes income from unincorporated businesses, net of depreciation of physical assets. Capital income includes imputed rents for owner-occupied housing.

Disposable income. Disposable income is the sum of household earnings, transfers, pension benefits, capital income and income from financial assets, net of taxes and social security contributions. Validation studies report that disposable income is under-reported by 25 percent with respect to national accounts data, while consumption is under-reported by 30 percent.

Real assets. Real asset values are reported at the end of each year and are elicited directly, without the use of bracketing. For real assets, the SHIW reports information on primary residence, real estate investments, business wealth, stock of durable goods (jewelry, gold coins, objects d'art, valuable furniture, and other valuables).

Financial assets. Calculation of amounts held in financial assets is the sum of transaction and savings accounts, certificates of deposit, treasury bills, long-term government bonds, corporate bonds, listed and non-listed stocks, mutual funds and investment accounts.

Liabilities. Liabilities is the sum of mortgage and other real estate debt, consumer credit, personal loans and credit card debt.

Net worth. Is defined as the sum of real and financial assets, net of liabilities.

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