

**The contribution of self-employment
to income inequality
A decomposition analysis of inequality measures
by sources and subgroups for Italy, 1998-2002**

Claudio Quintano[§]

Rosalia Castellano[‡]

Andrea Regoli^{**}

Summary: The aim of the paper is to investigate the role of income from self-employment in accounting for both the level and the change in the overall inequality among the Italian households from 1998 to 2002. The data come from the Survey of Household Income and Wealth (SHIW) conducted by the Bank of Italy. Through a decomposition analysis of Gini index by income source we find that in the more recent years the income from self-employment is the main disequalizing factor even if its effect is offset at the aggregate level by the forces played by the other sources. The Gini decomposition by population groups provides the evidence of widening gaps in the average income among the groups. Indeed a strong increase in the average income for managers and self-employed other than entrepreneurs and professionals has increased the segmentation of the different groups.

Keywords: Gini decomposition, Income from self-employment, Relative Economic Affluence.

[§] Dipartimento di Statistica e Matematica per la Ricerca Economica – Università degli Studi di Napoli Parthenope – via Medina, 40, 80133 NAPOLI (e-mail: quintcla@hotmail.com).

[‡] Dipartimento di Statistica e Matematica per la Ricerca Economica – Università degli Studi di Napoli Parthenope – via Medina, 40, 80133 NAPOLI (e-mail: lia.castellano@uniparthenope.it).

^{**} Dipartimento di Statistica e Matematica per la Ricerca Economica – Università degli Studi di Napoli Parthenope – via Medina, 40, 80133 NAPOLI (e-mail: andrea.regoli@uniparthenope.it).

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1. Introduction

In the first years of 2000 and in particular when the changeover from the National currency to the Euro took place, in Italy the disposable income from self-employment increased in real terms more than any other source. Consequently the composition of income has changed due to the growth of the share of earnings from self-employment, especially among the better-off units. When the relative weight of income from self-employment grows, an increase in the inequality of total income is expected, due to the high volatility of this income factor. Yet only a slight, not statistically significant, decrease in Gini index for total income is observed moving from 1998 to 2002 (Banca d'Italia, 2004). In short, along with a steady degree of concentration in aggregate income over time, what we observe is a horizontal redistribution of the resources (Brandolini, 2004) that brings a change in the relative positions of the different social groups. It is claimed that to have been in a position to take control over the prices of goods and services is what has really made the difference, letting the group of self-employed take more advantage of income redistribution than the other households.

The information on the consumer confidence index (from ISAE monthly survey on consumers) confirms that, beginning from the second half of 2001, the self-employed became more confident than the employees. Then, by the middle of 2002, the index declined sharply for both respondents.

This work aims first at investigating the contribution of income from self-employment to the overall inequality with a special attention devoted to the study of the relationship between the changes in inequality in the different income sources and the changes in total income inequality. Then the population of Italian households is partitioned according to the condition of the head of household in order to verify to what extent the inequality in the different subgroups of households (and in particular the inequality in the households of self-employed) contributes to the overall inequality and how these effects have evolved over time.

To these purposes we refer to the decomposition analysis of Gini index by income sources and population subgroups dating back to the studies of Bhattacharya and Mahalanobis (1967) and Rao (1969). When breaking down the inequality by subgroups, it is known that Gini index is decomposable in the sum of the inequality within groups and the inequality between groups plus the addition of a crossover term that takes into account the overlapping across subgroups. The inequality between different income distributions is measured through the concept of Relative Economic Affluence (*REA*) introduced by Dagum (1980, 1987), that accounts for the affluence of a richer group with respect to a poorer one.

The paper is organized as follows. The data source is presented in Section 2, where a special attention is devoted to the income data quality. The decomposition procedures of both inequality levels and changes by income source are presented in Section 3 while the empirical results are contained in Section 4. Section 5 deals with the decomposition approach by population subgroups whose empirical results are discussed in Section 6. Section 7 draws the conclusions.

2. The data: income definitions and quality issues

The data that we use in this work come from the Survey of Household Income and Wealth (SHIW) conducted every two years by the Bank of Italy on a sample of about 8,000 Italian households. For every survey the sample is composed of households that have been already interviewed in previous years (panel households) and newly drawn households. In the 2002 survey the share of panel households is about 45 per cent of the whole sample (Banca d'Italia, 2004). The survey derives the annual household disposable income by adding up the incomes of each household member that come from every source. Each income item is observed after income tax and social security contributions.

Household disposable income is the amount of current resources for financing the consumption expenditure. It includes earned income as well as current transfers and flows of property income.

The earned income is made up of compensation of employees and income from self-employment. The compensation of employees includes payments in cash (wages and salaries, bonuses, special emoluments) as well as in kind (fringe benefits in the form i.e. of lunch vouchers or company cars).

Self-employment income is income earned from one's own business, professional enterprise, partnership or farm. It is derived as the surplus of revenues over expenses from the business activity, net of the depreciation of fixed capital. Any entrepreneurial income such as fixed compensation and/or distributed profits for the shareholders or partners of firms is then added. Self-employment includes a wide and heterogeneous set of operators: entrepreneurs, craftsmen, free lances, professionals, merchants, artists, members of family business, shareholders, contingent workers employed on none account, farmers and fishers. Some self-employed provide services, some other sell self-produced items. Some of them receive income on a regular basis, some other seasonally. The revenues from their work activity are therefore very different, both in kind and in size. For these reasons, the income from self-employment is usually the income source with the largest variability.

Current transfers include occupational pensions and other transfers such as unemployment benefits, economic assistance, food allowances, scholarship,

alimony. Income from property is made up of interest on financial assets and rents, both actual and imputed, from buildings.

Quality of income data is a crucial issue¹. The SHIW may be subject to sample errors as well as measurement errors. The error that is due to the sampling is measured by the standard error of the estimates: in 2002 survey, through a bootstrapping method the standard error of the mean household income has been evaluated as 1.1 percent of the estimate while in the previous survey the standard error has been 1.9 percent (Banca d'Italia, 2002; Banca d'Italia, 2004). Measurement errors may arise due to nonresponse and/or under-reporting². The rate of nonresponse to the SHIW (that includes both refusals and not contacted units) is high, above 60 percent at the more recent surveys. In order to cope with the bias that the differential nonresponses may introduce in the actual sample, a post-stratification procedure is adopted that accounts for some individual characteristics of the sample units. Even when the sample units decide to participate in the survey, they are likely not to answer the questions about sensitive topics such as income or else, even if they answer, they might underestimate their income. In the former case item nonresponses are generated which are treated in the data editing step by imputation techniques; these are needed especially for estimating the elementary components of income such as fringe benefits for employees or depreciation for self-employed (Banca d'Italia, 2004). In the latter case under-reporting takes place. The under-reporting is estimated to be remarkable for some sources such as income from self-employment or from capital (Brandolini, 1999; Quintano, Castellano, Regoli, 2004a).

A critical point is the presence of extreme income values, especially negative as well as very high income values.

Incomes reported as null or negative constitute a conceptual difficulty besides a practical problem for the derivation of adequate inequality measures. If household disposable income is thought to be an indicator of the well-being as "command over the resources", a non positive income is conceptually hard to maintain since it would imply null or negative resources available for consumption. Moreover some inequality indices are undefined in the presence of null or negative incomes. Yet, genuine negative incomes may be observed in the microdata for current transfers (when the transfers paid are higher than those received) as well as for self-employment income (when the expenses for the business activity are higher than the revenues) and income from financial assets (as a consequence of negative returns). Negative income components however are likely to be offset by other income sources thus generating a non negative value for the household

¹ For a review on the quality of income data from a selection of sample surveys, that includes SHIW, see Quintano, Castellano, Regoli (2004b)

² For an evaluation of the measurement errors in the variables collected in the SHIW, see Biancotti, D'Alessio, Neri (2004).

disposable income. In this study, in deriving household disposable income, negative income items have been first converted into null incomes. This means that a kind of winsorizing procedure has been applied just at the bottom end of the distribution of each income source by replacing any negative value with a zero value³.

No adjustment has been made at the top tail of the distribution because we have no arguments for believing that the extreme income values at the right tail are the result of nonsampling errors rather than accurate measures of well-being. Further inspection of the data, with special reference to the panel section of the survey, could provide useful insights as to the plausibility (in the sense of time consistency) of some very large values, it being understood that some income components such as income from self-employment and from property are likely to be subject to even high fluctuations over time. Moreover, for these components generally the reverse problem is observed, in the specific instance usually income from self-employment and income from property are likely to be underreported. As a consequence the removing or else the replacement of top incomes by some threshold values would imply a loss of information. Very high outlying income values may have a large influence on Gini inequality measure but even any adjustment for top incomes is likely to produce a great impact on Gini coefficient.

The household total income obtained as the sum of all the income components is then converted into equivalent income in order to take into account the different size and composition of the households: to this end, we use the equivalence scale which is known as OECD modified scale⁴.

3. Inequality decomposition by income source

Let income Y be decomposed into a number of F factors or sources Y_f ($f=1, \dots, F$) such that

$$Y = \sum_{f=1}^F Y_f . \quad (1)$$

Yao (1997, 1999) shows that the Gini coefficient G of total income can be written as the weighted average of factor concentration ratios C_f :

³ In our data in the period under observation, the transfers display the highest share of negative incomes ranging from 1.2 to 1.7 percent. Van Kerm (2007) has found that when a small percentage of incomes at the bottom end is winsorized, the impact on Gini coefficient is very slight.

⁴ This scale calculates, for each household, the number of equivalent adults by giving a coefficient equal to 1 to the head of household, 0.5 to every other adult member in the household (over 14 years old) and 0.3 to the members under 14 years.

$$G = \sum_{f=1}^F w_f C_f . \quad (2)$$

The factor concentration ratio C_f is calculated as the Gini index for factor income Y_f (that is as a function of cumulative population shares and cumulative income shares) when incomes are ordered according to total income Y instead of factor income Y_f . Fei, Ranis and Kuo (1978) call the factor concentration ratio a Pseudo-Gini measure. If the ordering of the units (households or individuals) according to Y_f is the same as the one according to Y , then C_f is exactly the Gini index G_f calculated for the factor income Y_f (Pyatt, Chen, Fei, 1980). When the orderings are different, it follows that $C_f < G_f$ and C_f may also be negative.

The weight w_f is the factor income share in total income, that is the ratio of the mean income of factor f (μ_f) over the mean of total income (μ):

$$w_f = \mu_f / \mu . \quad (3)$$

By the ratio of the factor concentration ratio C_f over the Gini coefficient G of total income, the relative concentration coefficient g_f is defined:

$$g_f = C_f / G . \quad (4)$$

An income factor is said to be “inequality-increasing” if its relative concentration coefficient is greater than 1. If instead a relative concentration coefficient is smaller than 1, the corresponding income factor is “inequality-decreasing”.

The relative contribution of factor f to the overall inequality is measured by the value of

$$s_f^G = w_f g_f \quad (5)$$

so that

$$\sum_{f=1}^F s_f^G = 1 . \quad (6)$$

Therefore for every factor f , the inequality weight depends on its income share as well as its relative concentration ratio.

When inequality is measured over time, the interest may also lie in the decomposition of inequality change by income sources in order to identify the sources that play a primary role in accounting for the change in inequality. Indeed the income source with the largest contribution to the inequality level in a given year may not be the dominant contributor to changes in inequality, and vice versa.

Starting from the Gini index written as in the formula (2) above, Wan (2001) writes the absolute change in G index from t to $t+1$ as follows:

$$G_{t+1} - G_t = \sum_{f=1}^F (w_{f,t+1} C_{f,t+1} - w_{f,t} C_{f,t}) . \quad (7)$$

Then, introducing the following notations:

$$\Delta G = G_{t+1} - G_t \quad (8)$$

$$\Delta w_f = w_{f,t+1} - w_{f,t} \quad (9)$$

$$\Delta C_f = C_{f,t+1} - C_{f,t}, \quad (10)$$

he breaks down the absolute change ΔG into the sum of three components:

$$\begin{aligned} \Delta G &= \sum_{f=1}^F [(w_{f,t} + \Delta w_f)(C_{f,t} + \Delta C_f) - w_{f,t}C_{f,t}] = \\ &= \sum_{f=1}^F C_{f,t}\Delta w_f + \sum_{f=1}^F w_{f,t}\Delta C_f + \sum_{f=1}^F \Delta C_f \Delta w_f \end{aligned} \quad (11)$$

The first term accounts for changes in income shares w_f , the second term accounts for changes in factor concentration ratios C_f , while the third one is the interaction effect. Changes in income shares reflect structural effects due for example to shifts from employment, while changes in factor concentration ratios represent the pure inequality effects. Every component in turn results from the sum of each source's contributions.

4. The contribution of income from self-employment to the inequality

In 2002 the income from self-employment, while accounting for just 13.8 percent of the average disposable equivalent income, contributes 23.8 percent of the income inequality measured by Gini index (Table 1). Both its share in aggregate income and notably its contribution to income inequality have been increasing since 2000⁵.

With reference to the decomposition of G index, in 1998 wages/salaries and property income each account for about 1/3 of the inequality in aggregate income. In the following years the contribution of income from property declines while income of employees keeps on playing the dominant role. Its large weight is due to the highest value of the income share w_f , indicating for 2002 that 36.4 percent of aggregated equivalent income comes from wages and salaries. The largest relative concentration ratio g_f is for self-employment income. On the whole in 2002 the earned income (of both employees and self-employed) contributes 57.6 percent of the overall G index. In the most recent year the income from transfers is 27.3 percent of total income but its relative weight on the total inequality is nearly halved (13.5 percent).

⁵ The growth in the weight of self-employment income has been larger in the upper quintile group (that is the group of 20 percent of households with the highest incomes), where the share of income from self-employment increased to 21.2 percent in 2002 from 18.8 percent in 1998.

Table 1. *Decomposition of equivalent income inequality by income source*

Income factor f	factor income share w_f	Gini decomposition		
		factor concentration ratio C_f	relative concentration ratio $g_f=C_f/G$	relative inequality contrib. s_f^G
<i>1998</i>				
Wages and salaries	.348	.329	.948	.330
Income from self-employm.	.133	.545	1.570	.209
Pensions and transfers	.269	.166	.478	.128
Property income	.249	.462	1.331	.332
<i>2000</i>				
Wages and salaries	.365	.319	.971	.354
Income from self-employm.	.134	.509	1.548	.208
Pensions and transfers	.268	.147	.449	.120
Property income	.233	.447	1.362	.317
<i>2002</i>				
Wages and salaries	.364	.299	.928	.338
Income from self-employm.	.138	.554	1.721	.238
Pensions and transfers	.273	.159	.495	.135
Property income	.224	.415	1.287	.288

Source: Elaborations from SHIW data

Between 2000 and 2002 the equivalent income distribution became less unequal. The Gini index of aggregated equivalent income fell by 1.9 percent. The decomposition of the inequality change described by formula (11) above is summarized in Table 2. As for the Gini decomposition, we have derived the percentage contributions of every factor f to the change rate in inequality $\Delta G/G$. A positive sign for the contribution of a given source means that the corresponding source has a disequalizing effect, while a negative contribution denotes an equalizing effect for that factor. The decomposition of the change in G index between 2000 and 2002 shows that the slight decrease in inequality is due to the equalizing effects of both property income and income of employees. On the contrary, the contribution to the inequality change is positive for self-employment income and for transfers. The inequality trend is driven primarily by the pure concentration effect rather than by the structural effect: for every factor f the component that accounts for changes ΔC_f in factor concentration ratio is much larger than the other ones.

Between 1998 and 2000 all factors but wages and salaries contribute to the decline in Gini index. The largest contribution is for property income and this reflects more a decrease in the factor share than a decrease in the factor concentration. However nearly all the relative change in G index is accounted for by changes in factor inequality.

Table 2. *Decomposition of change in equivalent income inequality by income source*

Income factor Y_f	Gini decomposition			factor f total contribution to $\Delta G/G_t$ (%)
	$C_{ft} \Delta w_f/G_t$ (%)	$w_{ft} \Delta C_f/G_t$ (%)	$\Delta w_f \Delta C_f/G_t$ (%)	
<i>1998-2000</i>				
Wages and salaries	1.6	-1.0	0.0	0.5
Income from self-employm.	0.2	-1.4	0.0	-1.2
Pensions and transfers	0.0	-1.4	0.0	-1.5
Property income	-2.2	-1.0	0.1	-3.2
Total equivalent income	-0.5	-4.9	0.0	-5.4
<i>2000-2002</i>				
Wages and salaries	-0.1	-2.2	0.0	-2.3
Income from self-employm.	0.6	1.9	0.1	2.5
Pensions and transfers	0.2	1.0	0.0	1.2
Property income	-1.2	-2.3	0.1	-3.4
Total equivalent income	-0.4	-1.7	0.2	-1.9

Source: Elaborations from SHIW data

To summarize, at least a couple of remarks is needed.

The former has to do with the income from property whose role seems to be crucial for the downward trend in inequality. In 1998 income from property was the main determinant of the overall Gini inequality. In the following years the contribution of this factor to the total inequality reduces strongly. Moreover the property income shows the largest (equalizing) effects on the inequality changes. These results reflect the steady decrease over time in real average and inequality of this income factor as well as in its correlation with the total income. We remind that income from property includes returns from rents and from financial assets. The real average of income from financial assets has dramatically fallen due to the decrease in returns of securities and to the dramatic fall in the share prices since 2000, so the relative weight of this kind of income in the household income composition has decreased. The fall in the inequality is a consequence also of the increase in the late 90's in the percentage of households owning financial assets (notably bonds and shares).

The latter remark refers to income from self-employment. Between 2000 and 2002 an increase in real average and inequality of income from self-employment is associated with a less unequal distribution of aggregated income. In these years self-employment income is the source with the largest disequalizing contribution to the inequality change. In the rest of the paper, through the inequality decomposition by subgroups, we want to investigate whether some sections of self-employed have taken more advantage of the economic situation than others.

5. Inequality decomposition by population subgroups

The Gini index is determined not only by the income of the units but also by their ranking. When the G index is broken down by subgroups, account must be taken of the overlapping among the groups. Two groups overlap each other if the lowest income of the richer group is lower than the highest income of the poorer group. In the presence of overlapping groups, unlike the Generalized Entropy measures, the Gini index for the total population can not be additively decomposed in the sum of within-inequality and between-inequality components. Indeed, a third term (interaction term) is to be added, that reflects the extent of overlapping between the income distributions of the different groups.

The interaction term is interpreted in a different way by the several approaches for decomposing G index by population subgroups. In this work we follow Dagum's method (Dagum, 1997), that allows to define also the Relative Economic Affluence (*REA*).

In a population of size n partitioned in k groups of size n_j ($j=1, \dots, k$), let μ be the mean income of the population and μ_j the mean income of the j -th group. The total Gini index can be decomposed as follows:

$$G = G_w + G_{nb} + G_t. \quad (12)$$

The within component G_w measures the contribution of the inequality within the groups to the overall inequality:

$$G_w = \sum_{j=1}^k G_{jj} p_j s_j. \quad (13)$$

It is calculated as the weighted average of Gini ratios of the different groups G_{jj} :

$$G_{jj} = \Delta_{jj} / (2\mu_j), \quad (14)$$

where Δ_{jj} is the Gini mean difference of the j -th group.

The weights are given by the product of the population share p_j times the income share s_j of the same group:

$$s_j = n_j \mu_j / (n\mu) \quad (15)$$

$$p_j = n_j / n. \quad (16)$$

The remaining terms (G_{nb} and G_t) define the between inequality. This depends both on the differences in the group mean incomes – through the former component G_{nb} – and on the differences in variability and asymmetry between groups – through the latter component G_t –, which is called interaction component or “transvariation” (Deutsch, Silber, 1997). So two groups having the same average income may contribute anyhow to the between inequality component if their distributions differ in dispersion and/or in shape.

The G_{nb} component measures the net contribution of the inequality between the groups to the total Gini index. The G_t component reflects the contribution of the intensity of transvariation to the overall inequality or in other words the weight of the inequality between the groups that is due to their overlapping.

The sum of the two terms $G_{nb} + G_t = G_{gb}$ is a measure of the gross contribution of the inequality between the groups to the total Gini index.

If the k groups have all the same mean income, even if they differ in variability and/or asymmetry, then $G_{nb}=0$ and $G=G_w+G_t$.

If the income distributions of the k groups do not overlap, then $G_t=0$ and $G=G_w+G_{nb}$.

Both components of the inequality between the groups depend on the extended Gini coefficients between groups G_{jh} and on the Relative Economic Affluence (*REA*) D_{jh} :

$$G_{nb} = \sum_{j=1}^k \sum_{\substack{h=1 \\ h>j}}^k G_{jh} (p_j s_h + p_h s_j) D_{jh} \tag{17}$$

$$G_t = \sum_{j=1}^k \sum_{\substack{h=1 \\ h>j}}^k G_{jh} (p_j s_h + p_h s_j) (1 - D_{jh}). \tag{18}$$

The extended Gini coefficient between groups G_{jh} is the generalization of the Gini coefficient G for the overall population when this is calculated as half the Gini relative mean difference. When considering all pairs of units (the former belonging to the j -th group, the latter to the h -th group) the extended Gini coefficient between subgroup j and subgroup h is defined as:

$$G_{jh} = \Delta_{jh} / (\mu_j + \mu_h), \tag{19}$$

where Δ_{jh} is the Gini mean difference between the j -th and the h -th group, μ_j the mean income of the j -th group and μ_h the mean income of the h -th group.

In order to define the *REA* between the j -th group and the h -th group, Dagum (1987) introduces a partial strict ordering over the set of pairs of groups by means of the relation “more affluent than”: the j -th group is said to be more affluent than the h -th group if the mean income of the former group is higher than the mean income of the latter group, that is $\mu_j > \mu_h$.

The *REA* is an asymmetric measure that answers the following question: How richer the j -th group is with respect to the h -th group, given that the former is more affluent than the latter?

In detail, the *REA* is defined as the ratio between the net economic affluence and its maximum value. The net economic affluence in turn is the difference between the gross economic affluence d_{jh} and the first-order moment of transvariation p_{jh} . The gross economic affluence d_{jh} is the weighted average of the income differences $y_{ji} - y_{hr}$ between each unit in the

j -th group and every unit in the h -th group when these differences are positive, that is for all pairs of observations that meet the condition $y_{ji} > y_{hr}$, when $\mu_j > \mu_h$.

The first-order moment of transvariation p_{jh} is the weighted average of the income differences $y_{ji} - y_{hr}$ between each unit in the j -th group and every unit in the h -th group when these differences are negative, that is for all pairs of observations that meet the condition $y_{ji} < y_{hr}$, when $\mu_j > \mu_h$.

The term p_{jh} is 0 if and only if the income distributions of the two groups do not overlap.

$d_{jh} = p_{jh}$ if and only if $\mu_j = \mu_h$.

The maximum value of the net economic affluence is given by the mean difference Δ_{jh} between groups. Therefore the Relative Economic Affluence (*REA*) of the j -th group with respect to the h -th group is:

$$D_{jh} = \frac{d_{jh} - p_{jh}}{\Delta_{jh}} = REA[jh]. \quad (20)$$

$D_{jh}=0$ when $\mu_j = \mu_h$; $D_{jh}=1$ if the two distributions do not overlap. If they do overlap, $0 < D_{jh} < 1$. When D_{jh} grows, the power to discriminate between the two distributions increases.

6. The contribution of households of self-employed to the inequality

The population of households is partitioned according to the work status of the head of household. The households where the head is a self-employed are about 1/7 (14 percent, Table 3).

Such a share is nearly constant over the years from 1998 to 2002. These households receive a little more than 18 percent of the overall equivalent income. Their income is mostly but not fully made up of revenues from self-employment. Over time the proportion of income from self-employment in their total income has increased steadily, shifting from 58.6 percent in 1998 to 63.2 percent in 2002.

When attention is focused on the units in the upper quintile group (20 percent of the households with the highest equivalent income) it has to be noted that over time the share of households of self-employed in the group of the better-off units has grown. In the most recent survey year 1 household out of 4 belonging to the upper quintile group is headed by a self-employed. Moreover their income is 28.8 percent of the equivalent income of all the units in the upper quintile group.

Table 3. *Households where the head is self-employed*

Total distribution						
Year	household share	income share	income from self-employ. (%)			
1998	.145	.196	.586			
2000	.144	.184	.606			
2002	.142	.187	.632			

Lower quintile group			Upper quintile group			
Year	household share	income share	income from self-employ. (%)	household share	income share	income from self-employ. (%)
1998	.108	.114	.700	.233	.285	.572
2000	.125	.126	.736	.247	.277	.577
2002	.113	.110	.693	.251	.288	.632

Source: Elaborations from SHIW data

The households of self-employed are then split up into households headed by an entrepreneur or a member of arts or professions and households headed by another self-employed⁶. The former can be regarded as the economically stronger subgroup, that is the higher-income section of self-employed. Between 1998 and 2000 the real median equivalent income of entrepreneurs/professionals increased about as fast as the median income of all the households, while the median equivalent income of the other self-employed decreased by 1.9 percent (Table 4). Between 2000 and 2002 a reverse trend is observed: the median income of entrepreneurs and professionals fell by 2.1 percent while the median income of the other self-employed grew by 6.6 percent⁷.

⁶ The need of further disaggregations within the set of households of self-employed is in conflict with the constraints imposed by the sample size.

⁷ Between 1998 and 2002 the growing weight of self-employed households in the upper quintile group is due to the increase in the share of households of other self-employed (and of their income) rather than to changes in the share of households of entrepreneurs and professionals. In the group of the richest households the share of the former grew to 10.4 percent from 8.6 percent and the share of their income shifted to 11.0 percent from 8.8 percent, while the incidence of the latter remained unchanged around 14 percent and their income share declined to 17.8 percent from 19.7 percent.

Table 4. *Real change in median equivalent income by subgroups of households*

Households where the head is:	Real change (%)	
	1998-2000	2000-2002
Manager, cadre	-4.6	8.0
Blue-collar worker, office worker	3.9	0.8
Sole proprietor, member arts/prof	3.1	-2.1
Other self-employed	-1.9	6.6
Not employed	0.8	3.5
All households	3.3	2.3

Source: Elaborations from SHIW data

Within the employees, we separate households of managers and cadres from households of workers and clerks. Unlike the self-employed, in the years 2000-2002 the gap between the richest section (managers and cadres) and the poorest section (workers and clerks) of employees widened. The real median income grew by 8.0 percent for the former and only by 0.8 percent for the latter.

The estimates of the decomposition of G index for the year 2002 indicate that the intragroup (within) component accounts for 28.2 percent of the overall inequality (Table 5).

Table 5. *Gini decomposition by subgroups*

Year	Gini total	Gini within	%	Gini net between	%	Gini transvariation	%
1998	.347	.101	29.1	.096	27.7	.150	43.1
2000	.328	.094	28.8	.085	25.8	.149	45.4
2002	.322	.091	28.2	.093	28.8	.138	42.9

Source: Elaborations from SHIW data

Although the households headed by a self-employed (either entrepreneur or other self-employed) show the highest values of the inner inequality, the income disparities among them have a small weight on the overall inequality. Indeed the contribution of the inequality within each group depends on the Gini index among the units of that group, on income share and population share of the group, see (13) above. The groups of self-employed are small in terms of both population share and income share. Hence, even if they show the highest Gini coefficient, their contribution to the total inequality is however very small.

The net intergroup inequality (explained by the differences in the average income between groups) is responsible for 28.8 percent of the total inequality while the intergroup inequality explained by the overlapping of the distributions (the intensity of transvariation) contributes the remaining 42.9 percent of the overall inequality. The latter is a substantial contribution, being evidence of a notable overlapping of the groups distributions. We recall that the partition of the population has created subgroups of

households for whom the income source of the head does not represent the only revenue of the household⁸.

On the whole the differences in income distributions among the groups have a large weight in accounting for the total inequality (more than 70 percent).

Between 2000 and 2002 the net between component has increased its weight on the overall inequality. Indeed a strong increase in the average income for managers and other self-employed has increased the segmentation of the different groups. Changes in the variability as well as in the skewness of income distributions of the groups have brought about a decrease in the contribution of the transvariation term to the inequality.

Table 6. *REA matrix*

		manager /cadre [2]	other self- employed [3]	blue-collar /office worker [4]	not employed [5]
	1998 2000 2002	REA[j2]	REA[j3]	REA[j4]	REA[j5]
sole propr. /professional [1]	REA[1h]	.070 .054 .138 ^(*)	.641 .587 .500	.780 .735 .736	.744 .710 .724
manager /cadre [2]	REA[2h]		.672 .593 .620	.836 .759 .833	.778 .721 .812
other self- employed [3]	REA[3h]			.200 .128 .264	.221 .126 .298
blue-collar /office worker [4]	REA[4h]				.053 .085 .068

Source: Elaborations from SHIW data

(*) In 1998 and in 2000 the sole proprietors and professionals were on average the most affluent group. In 2002 the mean income of the manager/cadres exceeded the mean income of sole proprietors/professionals. As a consequence REA[12] for 1998 and 2000 is to be read as the relative affluence of the entrepreneurs with respect to the managers, while the REA[12] for 2002 is to be interpreted as the relative affluence of the managers with respect to the entrepreneurs.

⁸ In 2002, among the households of self-employed, the self-employment income share in total income is 63.2 percent. For the households of employees, wages and salaries are 72.7 percent of aggregated equivalent income. Among the households whose head is not employed, income arises by transfers for a share of 64.3 percent and by property for a share of 27.9 percent.

In order to study in greater detail the differences among groups, the measures of the Relative Economic Affluence $REA[j/h]$ have been calculated for pairs of groups. They are presented in a matrix-form (Table 6), where each entry indicates the economic affluence of the group on the row ($j=1,\dots,4$) with respect to the group on the column ($h=2,\dots,5$). The groups are ordered and numbered according to their average income from sole proprietors and professionals (the most affluent ones) to the unemployed and retired (the least affluent ones).

Between 1998 and 2000 the managers got closer to the entrepreneurs until they got ahead of them in 2002, becoming on average the most affluent group and increasing their affluence with respect to all the other groups. Between 1998 and 2002 the other self-employed gained ground with respect to the entrepreneurs (the REA of entrepreneurs relative to other self-employed fell to 0.500 from 0.641) and in 2002 they outstripped still further the groups that follow them in the affluence-based ranking (workers/clerks and not employed).

7. Conclusions

Between 2000 and 2002 in Italy the real income from self-employment rose faster than any other income source. A growing share of self-employment income in total equivalent income as well as a rising variability in income from self-employment were nevertheless accompanied by a decline in the overall inequality. The trend of a decreasing inequality (already observed in the period 1998-2000) brings about a decline in average incomes at the top and an increase in average incomes at the bottom of the income scale.

The macroeconomic framework shows in these years a weak growth in real GDP and a fall in the unemployment rate (passing from 11.3 percent in 1998 to 8.6 percent in 2002). The shift from unemployment together with the growing employment rate were likely to support the equalizing impact.

In this work the attention has been focused on the role of self-employment in accounting for both inequality in a given year and inequality changes in a time period.

The income from self-employment has the lowest incidence in the equivalent disposable income. This may be also due to the well-known problem of the under-reporting in sample surveys of some income components, notably revenues from the self-employment and income from financial assets. However, the relative contribution of the self-employment income factor to the overall inequality is much higher than its share in total income.

Between 2000 and 2002 the disequalizing impact of self-employment income was more than offset by the contributions of the other factors to the inequality change. The main driving force behind the fall in inequality since

1998 was the contribution from property income. Indeed both real average and inequality of income from financial assets fell dramatically, the former because of the decline in returns to securities and in share prices, the latter because of the rising share of households owning bonds and shares.

Within the households headed by a self-employed, in the years 2000-2002 the shift in the income distribution has benefited the lower-income section (other self-employed including artisans and shopkeepers) more than the higher-income section (entrepreneurs and professionals). The average income gap between the two groups has narrowed. The real growth in average income of the other self-employed has been second only to the growth in income for managers. Based on the measure of the Relative Economic Affluence (*REA*), the other self-employed have got closer to the entrepreneurs and professionals and they outstripped still further the less affluent groups, such as workers and clerks and not employed.

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