WHAT MONEY CAN'T BUY: THE RELEVANCE OF INCOME REDISTRIBUTION FOR FUNCTIONING LEVELS

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Abstract

This paper relates Amartya Sen's capability approach to the literature on equivalence scales, in order to explore the former's implications for the use of the latter. Synthetic indicators of well-being are constructed by adjusting individual incomes for differences in functionings, so as to get some sort of "functioning-equivalent incomes". An exploratory comparative application to Italian and Belgian data illustrates the model and make possible to disclose the apparent relative contributions of monetary and non-monetary factors to changes in the functionings' level associated with several specific socio-economic characteristics. Reading across the various results leads to the conclusion that income as such cannot take us very far in evaluating achievements, mainly on account of the relative magnitude of the effect of some non-monetary factors as compared to household economic resources on the living standard enjoyed by different persons. Further, the analysis hints at the inappropriateness of the assumption that any dissimilarity among individuals may be efficiently dealt with by a suitable monetary compensation.

Key words: well-being, functioning, equivalence scale, equivalent income.

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> "Some capabilities are harder to measure than others, and attempts at putting them on a "metric" may sometimes hide more than they reveal. Quite often income levels – with possible corrections for price differences and variations of individual or group circumstances – can be a very useful way of getting started in practical appraisal".
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> - Amartya K. Sen, 1999, p. 81

1 Introduction

Hardly anyone would deny the enormous influence income has on what people can or cannot do. By the same token, it would probably be irrational not to acknowledge the advantages that additional monetary resources could bring about to everyone's life. Even so, a more fundamental issue seems to lie beneath common wisdom, namely which is the real relative power of such monetary factors in accomplishing people's ends and generating at least minimum acceptable levels of well-being?

Economics has traditionally distinguished itself from any other social science by keeping as close as possible to the well-known "measuring rod of money" (A. Marshall). Nevertheless, this no longer seems to be necessarily the case, as the variety of wider theoretical frameworks put forward during the last decades witnesses. While forcefully arguing in favour of a multidimensional notion of well-being as quality of life, more often than not the latter make a case for a more extensive characterisation than strict monetary measures, privileging the explicit consideration of a plurality of elements supposed to jointly contribute to the determination of an individual's standard of living. Specifically, a number of factors exhibiting a non-monetary nature are believed to come into play, the most obvious being the existence of various non-market commodities or the access to public goods. The role played by such factors either in generating well-being or in increasing the poverty risk of some population groups is, thus, by and large acknowledged at the theoretical level but, as a matter of fact, hardly ever translates into mainstream empirical analyses or official poverty and inequality measures[1].

It is not evident, in fact, how the non-income dimensions of one's living standard - and, consequently, the non-income differences among individuals - should be taken into account when making distributional assessments and, more specifically, when carrying out welfare comparisons. Within the traditional literature, a common way to derive monetary measures of well-being relates to the use of equivalence scales. The latter are meant to remove - at least to a large extent - the effects of specific needs and can subsequently be exploited to deflate the individual or household monetary resources, so as to make proper income comparisons possible.

This paper precisely draws upon one recent multidimensional framework modelling the notion of well-being (namely, Amartya Sen's capability approach) and relates it to the literature on equivalence scales, in order to explore the former's implications for the use of the latter. Sen's approach allows, in fact, to investigate a further solution (other than

[1] A recent notable exception is the pioneering report co-ordinated by Atkinson (2002) presenting a set of key-indicators to measure the progress of the struggle against poverty and social exclusion in Europe. Atkinson and his colleagues emphasise the multidimensionality of social disadvantage, agreeing with those who argue that it is inadequate to look only at income. According to them, poverty also depends on specific social circumstances such as poor housing, low education, and difficult access to health care.

expenditure information) to the fundamental question of welfare analysis, i.e. on which basis to compare the welfare levels of different individuals. Given that his so-called *functionings* relate to the outcomes achieved by a person on the various dimensions of his life through the consumption of goods and services and are supposed to fully describe one's status, they could plausibly be taken as a proxy for welfare levels. In the light of this and as Sen himself sets forth (Sen, 1999), a synthetic indicator of well-being could be constructed by adjusting individual incomes for differences in functionings, so as to get some sort of "functioning-equivalent incomes".

It is not our intention, however, to provide an answer to the question: which is the ideal equivalence scale from Sen's point of view? Clearly, the answer would be: if we do believe in the capability approach and we have perfect information on the individuals' standards of living, then we implicitly have the scale. Concentrating on functionings (or, even better, capabilities) allows circumventing the issues related to equivalisation, as hypotheses concerning scale economies or adult equivalence are made redundant by the direct monitoring of the individual's doings and beings. Rather, we wish to take a more pragmatic stance and elaborate an evaluative device that could help throwing some light on the effectiveness of income redistribution in compensating achievements' heterogeneity among individuals[2].

We will thus begin in Section 2 with an account of the notion and the use of equivalence scales as well as some cursory remarks on the main derivation methods. We will then proceed in Section 3 by setting out the reference framework for the subsequent analysis. While scrutinising an appealing but not yet fully appreciated option for the operationalisation of the capability approach, the proposed procedure will incidentally allow drawing some comparisons with the traditional methodology. An exploratory comparative application to Italian and Belgian data will illustrate the model and make possible to disclose the apparent relative contributions of monetary and non-monetary factors to changes in the functionings' level associated with several specific socio-economic characteristics, as will be argued in Sections 4 to 5. Furthermore, the computed scale factors will make possible to examine how the relative economic position of population sub-groups changes when we account for differences in alternative dimensions of their lives. We will explore this issue in Section 6. Finally, in Section 7 some conclusions will be drawn.

2 Well-being and equivalence scales: concept, usage and measurement methods

As briefly mentioned, the practice of resorting to equivalence scales when assessing inequalities, poverty and living standards typically aims at making comparisons between different households, i.e. between essentially heterogeneous entities, possible. Household size and composition, *in primis*, but also socio-demographic characteristics (such as occupational status, living location, age and health of members, etc.) are likely to affect both the capacity to generate income and the extent of needs, hence, more generally, the possibility of achieving a given level of well-being. The idea is, therefore, to reduce the

[2] Note that equivalence scales are, in this case, individual-specific. Households are no longer the relevant units of analysis; rather, each household is partitioned into its members and each of them is regarded as a separate agent. We are not suggesting, of course, that individuals should be considered in isolation. We recognise that the circumstances of the households in which people live are major determinants of the level of well being experienced by the individuals composing them, but we believe that the fundamental concern when measuring well-being should be with the position of each single person.

heterogeneous households to equivalent units that are comparable with respect to their standard of living[3].

Specifically, as Ringen (1996) points out, a couple of commonplace observations have to be carefully pondered whenever moving from the individual to the household dimension. First, an efficiency effect related to the fact that larger groups of individuals can exploit economies of scale in consumption, especially on those typical "family goods" like housing costs, durables or home production activities (transportation by car, preparation of meals, etc.). Next, a need effect stemming from the personal features of the household members makes that even families of identical size and with the same income may experience different levels of well-being depending on their characteristics. Age, gender, health status obviously tend to govern one's needs and, in turn, one's accomplishments in terms of living standard via the determination of the required amount of resources. A blind person will require the availability of some items specifically related to his condition, such as information in Braille or a well-trained dog to guide him around; a child will surely require less of most things than an adult; a woman might exhibit additional clothing needs if compared to a man.

Such factors, in combination with several others that are not subject to the family's choice, deeply affect the household's ability to extract well-being from income. Hence, an equivalence scale basically represents some sort of an exchange rate between money and well-being based on how much larger the income of a given type of household should be relative to the income of a reference one, so that both are equally well off. The specification of an equivalence scale entails a number of choices. The characteristics of individuals and households which are regarded as significant or the relevant price vector just represent a couple of them. But the fundamental question of the whole analysis is, essentially, the meaning to be attached to well-being or, otherwise stated, on which basis to compare the various welfare levels. One needs observable proxies for them. And here comes the major difficulty: no unanimity seems to exist concerning how such proxies should be characterised. The mainstream interpretation of the expression "equally well off" usually implies reaching the same level of material well-being. However, a number of ideas have, *de facto*, been proposed and assessed in the literature.

Despite the intrinsic arbitrariness of any such well-being indicator, two solutions – both relying on the idea that the household itself is the best judge of its own living standard - seem to have been more or less favourably received and have resulted in corresponding widespread types of scales. One rests on the observation of the actual market behaviour of households and takes their revealed preferences as a starting point for welfare comparisons (consumption scales); the other trusts the household's verbally expressed preferences to detect equivalence factors (subjective scales). A closer look at each of them will prove to be helpful for the forthcoming analysis.

2.1 Consumption scales

An extensive literature has accumulated regarding consumption equivalence scale models, but the most popular paradigms remain the oldest ones, namely those attributable to Engel (1895) and Rothbarth (1943). Both methods enjoy the very same beneficial feature:

[3] Following Slesnick (1998, p. 2130) it is self-evident that "measuring the welfare effects of demographic changes introduces a normative element to the analysis […] and this requires assumptions of interpersonal comparisons of well-being that are not empirically refutable". However, it has to be noted that various types of comparability can be postulated according to the assumptions concerning the specific type of transformations leaving social orderings unchanged. Cf., e.g., Blackorby and Donaldson (1991).

the scales are produced using econometric methods applied to household budget data. Specifically, by estimating a single equation on cross-section data, which makes them fairly undemanding from a computational point of view. Furthermore, both models start from the idea that the welfare level of a household can be assessed as a function of its actual consumption of some given commodities and, hence, that equivalent incomes are simply the incomes resulting in the same consumption amount of such commodities.

However, they do differ in the choice of the specific welfare proxy. The Engel method hinges on the observation (Engel's law) that - *ceteris paribus* - richer households spend proportionally less on food than poorer households do. This remark, when coupled with the empirical fact that the food share seems to increase with the number of children (when resources are held constant), led Engel to assert that the proportion of income spent on food could be taken as an indirect well-being measure[4]. An Engel scale, thus, measures the additional cost required by any household in order to achieve the same food share as the reference one[5]. Clearly, this method implicitly assumes the presence of children to have a similar impact on the consumption of all household commodities[6]. This looks rather implausible in reality, as Rothbarth forcefully argues: an additional child is unlikely to affect energy expenditures as much as it affects milk consumption. Consequently, the Rothbarth method proposes to ascribe the same welfare level to those households exhibiting an equal consumption of some spending category which is exclusively attributable to the adult members (i.e. tobacco, alcoholics, adult clothing, etc.). Otherwise stated, a Rothbarth scale measures the additional amount of money that would keep the expenditures on adult goods for a given household at the same level as the reference household. The most prominent complications in this case stem, on the one side, from the difficulties in finding persuasive examples of commodities exclusively consumed by adults as well as their plausibility as welfare measures and, on the other side, from the fact that Rothbarth scales appear to be extremely sensitive to the choice of the specific bundle of adult goods[7].

As a matter of fact, then, neither the Engel nor the Rothbarth scales seem to constitute ideal methods. Indeed, in spite of their straightforwardness, they neither allow recovering the complete structure of preferences, nor allow capturing the impact of demographic characteristics on preferences or modelling their possible interactions with prices[8]. For these reasons, as previously argued, the majority of the contemporary literature on equivalence scales advocates the use of a statistical–economic approach based on a utility

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[4] Clearly, a negative relationship links the food share and the well-being level: the higher the food share, the lower the household's well-being level.

[5] The literature also names the Engel model "iso-prop model", denoting by this a more general interpretation according to which the expenditure shares of any commodity group, rather than simply food, can be taken as a proxy for the welfare concept (e.g. clothing, housing costs, etc.).

[6] On top of this, the major difficulty with Engel's approach lies in the arbitrariness of the assertion that the food share indicates well-being. The latter does not directly follow from Engel's observations and might yield biased outcomes (take the case of food loving vs. car-loving families). Hence, why focussing on food for welfare comparisons? And why on the food share instead of the nutrient intake or, more generally, food consumption?

[7] A solution to this problem has been suggested by Deaton, Ruiz-Castillo and Thomas (1989), who introduced the concept of demographic separability, allowing to test the hypothesis that the demand for some bundle of goods is monotonically related to the adults' utility level. Nevertheless, the ethical issue of the oddness of equating one's well-being with the consumption of goods such as tobacco or alcohol still remains.

[8] Incidentally, note that a modification in household composition might also affect one's relative willingness to pay. The need for a larger car as a consequence of the birth of a child might, for instance, alter the price of the commodity "holiday trip" for a couple, making that the implicit price of a holiday would be higher than what actually paid.

maximisation model. Accordingly, well-being is then interpreted as utility. Postulating that two households having the same well-being will enjoy the same utility level, the cost of achieving a given level of utility is obtained from a specific indirect utility function after estimating the model's parameters under the assumption that households face equal prices.

Examples of utility-based methods can be found in Prais and Houthakker (1955), Barten (1964), Gorman (1976) and in the vast literature arisen from their works. However, these procedures basically take for granted the existence of a household utility function rationalising the household's observable choices, the feasibility of comparisons of utility levels across households and, finally, the appropriateness of utility as a welfare concept. Some not uncontroversial issues indeed, entailing, among others, major technical difficulties related to the identification of the scales[9]. One possible way out from the latter problem consists in making plausible identifying assumptions – based on prior beliefs - about the properties of equivalence scales (such as postulating the scale's independence of the reference utility level). Alternatively, one could combine demand data with additional information of essentially two types: either observations on revealed preferences for household composition, or direct questions on household cost functions. The latter option looks very much in the spirit of the methodology pursued by the so-called "Leyden school" and focussed on supplementing budget survey information with subjective valuations. Although it is fair to say that, by and large, the arguments of the Leyden school have not attracted much interest among mainstream economists, it is worthwhile to devote them some attention in the light of their relationship with the method we suggest.

2.2 Subjective scales

The line of research using subjective information made its first appearance in the early seventies thanks to the work of Van Praag (1971), immediately followed by Kapteyn and many others. On the assumption that households can evaluate themselves their needs at best, the methodology recommends establishing utility values straightforwardly by questioning a given sample of people about the levels of income that they judge would produce alternative levels of welfare. The latter are specified on a verbal scale going from "very bad" to "very good". Verbal scales are subsequently converted into numerical scores and equivalisation factors are finally computed on the basis of the observed effect of a change in family composition on the income evaluations and, consequently, on household welfare.

It follows then that well-being is here understood as a function of the extent to which income meets one's needs. From a theoretical point of view, in its original formulation the whole model was basically used to rest on a pre-specified form of utility function as well as on the assumption that individual welfare / utility is cardinally measurable on a 0-1 scale, where identical distances mean identical welfare differences[10]. Specifically, a bounded log-normal welfare function is postulated whose parameters, for a given respondent, are the log-mean m and variance s^2 of his answers. Of course, these parameters can only be measured after having transformed the verbal labels into

[9] Demographic characteristics may not only affect equivalence scales through their impact on household consumption; rather they may well exert a direct influence on the household utility function as well, and such direct influence cannot be estimated using demand data. This remark corresponds to the well-known distinction between conditional and unconditional preferences made by Pollak and Wales (1979) and their assertion that scales computed from demand data cannot be used for welfare comparisons.

[10] This no longer holds for recent applications, where assumptions about the form of the utility functions, the distributions of the error terms, etc., are avoided as much as possible and only ordinal measurability of utility is usually postulated. See, e.g., Van Praag and Plug (1994-1995).

numerical indices, say e_j. To enable such conversion, verbal labels need to be supposed to convey the same meaning to each and every respondent and the so-called "equal interval assumption" is required[11]. If it holds, respondents will associate the *j*-th verbal label out of *J* with the welfare level $e_j = (2j-1)/2J$. Denoting the standard normal distribution function by *N* and the respondent's answers by a_j, then by the log-normality assumption the latter will approximately satisfy

$$N(\ln(a_j); m, s) = N\left(\frac{\ln(a_j) - m}{s}; 0,1\right) = e_j \qquad j = 1,\ldots J \qquad (1)$$

implying that

$$\frac{\ln(a_j) - m}{s} = N^{-1}(e_j; 0,1) \qquad j = 1,\ldots J \qquad (2)$$

from which, by adding an error term, the parameters m and s can be estimated

$$\ln a_j = m + sN^{-1}(e_j; 0,1) + e_j \qquad (3)$$

The parameters m and s fully describe the shape of the so-called "welfare function of income". The parameter m is found to vary over individuals and it has been shown to be well-explained by household characteristics

$$m_h = b_0 + b_1 \log(fs_h) + b_2 \log(Y_h) + e_h \qquad (4)$$

where m_h is the value of m for the *h*-th respondent, Y_h denotes the respondent's household income and fs_h the respondent's family size. On the contrary, attempts to explain s have met with only limited success. Hence, in most analyses s is taken to be randomly varying over individuals. Specifying utility levels in view of the calculation of equivalence scales turns out to be rather problematic in this setting, given that people partially adapt to their income and use it as their reference position to evaluate other incomes. This makes that one's evaluation of income in terms of welfare strictly depends on one's current economic prosperity[12]. Hence, equivalence scales have to be calculated taking such factor into account. The problem is solved by the Leyden school by deriving equivalence scales under the assumption that households enjoy equal welfare if their actual incomes coincide with the equivalent income. In other words, assume that the welfare derived from income is a function of the ratio of the respondent's household income and *exp(m)*

$$N(Y_r) = N(\log(Y_r) - m_r) \qquad (5)$$

This implies that welfare depends both on income and on household size (through μ). The new income level Y_h that will restore the welfare level to its value prior to the change of the family size to fs_h will be defined as

$$\log(Y_r) - [b_0 + b_1 \log(fs_r) + b_2 \log(Y_r)] = \log(Y_h) - [b_0 + b_1 \log(fs_h) + b_2 \log(Y_h)]$$

which solves to

$$m_h = Y_h / Y_r = (fs_h / fs_r)^{b_1/(1-b_2)} \qquad (6)$$

Despite the stability exhibited by the results originating from the empirical estimations performed on the subjective approach (the tests on log-normality and equal intervals are generally favourable to the theory), one cannot deny that it still suffers from some deep-rooted difficulties. Its various technical problems of estimation probably

[11] The assumption is motivated by an information maximisation argument. Cf. Van Praag (1991).
[12] Van Praag names this phenomenon "preference drift", corresponding to $b_2 \neq 0$.

account for the extremely moderate appreciation granted to this procedure[13]. On top of this, some conceptual difficulties related to what the welfare function of income actually measures persist. The evidence shows that depending on the phrasing of the question, different underlying concepts are apparently measured (see, e.g., Van Praag and Plug, 1994-1995), which, of course, brings about some uneasiness and raises a number of doubts. Is the question itself well-understood by the respondents? And, even more, do the verbal labels indeed have the same meaning for all individuals in the sample? Further investigations are thus needed, at least to find out which welfare concept people actually use when answering the survey question.

The above summary, as will be clear by this time, has been pointing at emphasising that, in spite of their remarkable reputation and scientific pedigree, no unique and objective way of generating equivalence scales for performing welfare comparisons exists. A variety of welfare concepts can be adopted, each of which inevitably entails some value judgements (implicit, in most cases). Consequently, given the wide variety of possible views, no consensus can be found, no single method can be regarded as superior to the others. These are no staggering news, one could well say. Nevertheless, such observation is of crucial importance for our analysis. Indeed, the welfare concept implicitly underlying nearly all equivalence scale models is, in our opinion, one which is not most ethically appealing and such unattractiveness translates into estimated equivalence scales reflecting a much too narrow definition of human well-being, if we are any judges. Hence, why couldn't one possibly combine the growing belief that alternative spaces for evaluating people's living standards should be explored with the search for unconventional proxies for welfare levels, perhaps more clearly revealing their normative component?

3 Developing equivalisation factors for functionings

3.1 The model

A particularly unconventional proxy for welfare levels could be found, for instance, in Amartya Sen's notion of "functionings". On top of the fact that welfare effects that are not revealed in the consumption behaviour of households get fully ignored by the conventional consumption approach (though not by the subjective one)[14], a relevant aspect that the functionings' methodology may possibly address relates to the mentioned ethically narrow characterisation of welfare lying beneath both consumption and subjective scales. Though not denying the informational content of income or expenditure *per se*, it has been extensively demonstrated that, by and large, dimensions of well-being exist that cannot be easily captured by these standard indicators: immaterial aspects such as self-esteem, self-confidence, social status, social integration, psychological distress or health conditions all play a considerable role in determining whether an individual can be

[13] The assumption of cardinal utility – forcefully criticised by many – is not essential for the estimation of equivalence scales. Van Praag and Van der Sar (1988) offer a derivation of subjective scales in an ordinal framework, providing very similar results to the ones presented above except that these ones do depend upon the reference welfare level, i.e. upon *j*. Further criticisms relate to the flatness of subjective scales, i.e. when increasing family size the incomes needed by the compared households do not seem to increase much. Cf., e.g., Van Praag (1991), Van den Bosch *et al.* (1993).

[14] It is fair to stress, however, that both consumption and subjective scales could easily be extended to a multidimensional context, allowing for regional disparities or other socio-economic discrepancies as well. Indeed, as for subjective scales, a number of studies have extended the original model by incorporating further explanatory variables. Cf., e.g., De Vos and Garner (1991). Moreover, traditional equivalence scales could well be estimated to account for factors other than family size, as the recent works by Jones and O' Donnell (1995) or Zaidi and Burchardt (2002) on the costs of disability prove.

said to be leading a satisfactory life[15]. What's more, a number of relevant aspects of what common wisdom regards as the living standard apparently look only weakly correlated with one's economic resources[16]. At odds with these remarks, consumption scales are deeply rooted in the general strategy of defining well-being only in terms of "what money can buy" or, better, in terms of an essentially materialistic condition, neglecting moral motivations and sentiments, relying on the simplifying assumption of the existence of a direct link between the quantity of goods possessed and the well-being (in the form of utility) achieved. On the other hand, Leyden scales conform to an idea of welfare as a subjective phenomenon, as a mental status, and as such they look subject to the distorsions typically brought about, for instance, by the psychological adjustment to persistent deprivation. Even more and aside from the major theoretical objections that have been raised during the years against this kind of welfare conceptions, it looks quite hard to defend an income transfer exclusively granted on the basis of personal dissatisfaction and disregarding any other aspect. One could well wonder, of course, why subjective scales are being so firmly discarded, since they could perhaps be seen as closer to what Sen advocates. Interpreting the collected answers as estimates by the respondents of the income needed in order to achieve some given basic functioning, the variation in the answers could be regarded as a consequence - as well as a proof - of need heterogeneity among people. As a matter of fact, however, the information on which Leyden scales rely looks far more subjective than Sen's proposal: one may want to arrive at a slightly more objective measurement of well-being, especially in the light of the mentioned influence exerted by experiences and ambitions on one's opinions. When this is granted, satisfaction levels at best enter as indicators in the welfare index rather than being the sole welfare criterion, at least at a theoretical level (data availability constraints, actually, often make that one cannot escape resorting to the exclusive use of subjective information).

These considerations, in our opinion, open the way for exploring the possibility of embracing an alternative perspective on the notion of welfare, which avoids both the dearth of comparisons in the goods space and the subjectivity inherent in the level of felt satisfaction. A perspective that also seems to somewhat reflect the welfare conception lying behind public policies, whose ambition is to make sure that – through social support - people are able to do certain things, participate in given activities, etc. A perspective that allows accounting for "what money cannot buy" as well.

Concretely, on account of Sen's assertion that "income adequacy to escape poverty varies parametrically with personal characteristics and circumstances" (Sen, 1992, p. 111), we therefore propose to define individual well-being as an evaluation of the functionings a person achieves on a number of dimensions of his life, so that well-being levels are

[15] Sweeney (1998), for instance, offers an in-depth analysis of the relevance of mental distress as well as of its relationship with the individual's occupational status. Further interesting contributions on multidimensionality can be found in Dasgupta (1990), Dasgupta and Weale (1990) or in the Scandinavian approach by Erikson (1987, 1996) and Allardt (1996), among others.

[16] Schokkaert and Van Ootegem (1990), for instance, clearly prove that compensating the unemployed for their income loss still leaves them worse off on a variety of other facets exhibiting no relationship at all with economic resources and linked to social, physical and psychological well-being. An extensive literature also exists about the relationship between income and life expectancy, but Anand and Ravallion (1993) provide empirical evidence for 22 developing countries pointing to the fact that this positive association fades away when the effect of affluence on public spending (particularly on health care) and the decrease in income poverty typically accompanying higher incomes are taken into account. Balestrino (1996) compares income poverty and functioning poverty in the Italian town of Pistoia, suggesting that the educational and social functionings seem to be only indirectly influenced by access to market goods and services. Hence, one should expect them to be hardly associated with income.

compared on the basis of some specific functionings' achievements f_h^m on the various m dimensions ($m = 1,..., M$). Hence,

$$W_h = W_h(f_h^1,..., f_h^M) \qquad (7)$$

Assuming that each f_h^m depends upon some given individual endowment (which we generally interpret as income Y_h) as well as upon some demographic factors p_h results in

$$f_h^m = f_h^m(Y_h, p_h) = f_h^m(Y_h, fs_h, z_h) \qquad (8)$$

where, out of convenience in view of the application of this framework to the equivalence scales' estimation, the set of demographic variables $p_h = \{fs_h, z_h\}$ is partitioned into a subset fs_h providing information concerning the size and composition of the household individual h lives in, and a subset z_h comprising any other socio-economic attribute. We posit, evidently, that functionings are straightforwardly measurable, which is by no means a weak assumption, as the subsequent empirical application will make clear. Moreover, given the lack of any consensus in the literature about the criteria on the basis of which the whole set of functionings could/should be aggregated in order to obtain an overall picture of the individual standard of living, we opt for a distinct analysis of each single component of well-being, thus abstaining from merging them into a common index. We feel, in fact, that the functionings' vectors as such already offer quite illuminating information and subsuming them into aggregates could imply "hiding" some important aspects. Accepting for the time being such hypotheses, equivalence scales can then be computed as the compensating amounts of income that, given a reference individual r, are necessary in order to make individual h equally well off, namely guaranteeing him an identical fulfilment as r on a given dimension of well-being. Formally, therefore, for each functionings' vector one determines the income level Y_h^* such that $\left\{Y_h^* \middle| f_r^m(Y_r, p_r) = f_h^m(Y_h^*, p_h)\right\}$ and computes an equivalence coefficient as $m_h = Y_h^* / Y_r$.

The underlying intuition is that one's functioning level is positively affected by income availability, but the presence of greater needs - in the form of disadvantaged location or low educational level, for instance – may alter one's efficiency in converting income into well-being and thus result in a lower standard of living. It has to be stressed, however, that such attempt at making the income levels of people with various characteristics comparable in terms of achieved functionings implies in no way supporting the idea that an appropriate amount of money can always efficiently compensate for any dissimilarity (in the specific case, for any disparity in achieved functionings). Using Sen's terminology, we then clearly "distinguish between income as a *unit* in which to measure inequality and income as the *vehicle* of inequality reduction" (Sen, 1999, p. 84, emphasis in the original). Hence, suggesting that an income transfer will make up for being seriously disabled lies completely outside the purpose of this analysis; rather, we believe that equivalence scales may represent an effective instrument for the purpose of summarising inequality information and, consequently, we confine ourselves to measuring disparities in functionings in terms of equivalent incomes.

3.2 The actual derivation of the scales

From a formal point of view, the concrete application of the suggested methodology is carried out by postulating that the following functional form can satisfactorily depict the relationship linking individual functionings, resources and personal characteristics

$$f_h^m = a + b\ln(Y_h) + h\ln(fs_h) + \sum_d g\, fs_{hd} + dz_h + e_h \qquad (9)$$

where fs_{hd} represents the number of members of the household individual h lives in belonging to age class d and the γ coefficients associated to the latter variable allow to investigate the effects of changing composition while holding household size constant. The equation can also be extended to provide a more flexible and realistic representation by including a quadratic term in the logarithm of income

$$f_h^m = a + b\ln(Y_h) + l\left[\ln(Y_h)\right]^2 + h\ln(fs_h) + \sum_d g\, fs_{hd} + dz_h + e_h \qquad (10)$$

In both cases, demographics are entered in the equation in a pragmatic but convenient way, following the specification suggested by Deaton and Paxson (1998) and thus separating the effects of household composition from household size. On the basis of the estimates, scales providing the compensating level of income needed by agents living in households of different composition and/or exhibiting different personal socio-economic characteristics in order to reach the same position with respect to a specific functioning can easily be derived. Concretely, equivalence scales can be computed from equation *(9)* after selecting a reference individual, equating the latter's functioning level on the given dimension with the one for the h-th considered person and solving for Y_h/Y_r. The arbitrarily selected reference individual, in what follows, will be the single childless adult[17]. Let fs_r and $\sum_d fs_{rd}$ refer to the household size and family composition of the reference agent. Then, being interested in calculating the equivalence scale relative to the h-th agent with household size fs_h and composition $\sum_d fs_{hd}$ and assuming all other things to be equal, we will have for each given individual

$$f_h^m = a + b\ln(Y_h) + h\ln(fs_h) + \sum_d g\,(fs_{hd}) + dz_h + e_h \qquad (11)$$

$$f_r^m = a + b\ln(Y_r) + h\ln(fs_r) + \sum_d g\,(fs_{rd}) + dz_r + e_r \qquad (12)$$

Assuming $f_h^m = f_r^m$

$$0 = 0 + b\ln\left(\frac{Y_h}{Y_r}\right) + h\ln\left(\frac{fs_h}{fs_r}\right) + g\left(\sum_d fs_{hd} - \sum_d fs_{rd}\right) + d\left(z_h - z_r\right) + e_h - e_r \qquad (13)$$

from which

$$\ln\left(\frac{Y_h}{Y_r}\right) = -\frac{h}{b}\ln\left(\frac{fs_h}{fs_r}\right) - \frac{g\left(\sum_d fs_{hd} - \sum_d fs_{rd}\right)}{b} \qquad (14)$$

and

$$m_h = \frac{Y_h}{Y_r} = \exp\left[-\frac{h}{b}\ln\left(\frac{fs_h}{fs_r}\right) - \frac{g\left(\sum_d fs_{hd} - \sum_d fs_{rd}\right)}{b}\right] \qquad (15)$$

The derived equivalence scales exhibit the beneficial property of being independent of the base level of income (the so-called "Equivalence Scale Exactness" in Blackorby and Donaldson's (1991) terminology), meaning that they remain constant no matter the income

[17] Consequently, the equivalence scale can also be interpreted as the number of adult equivalents comprising the household.

level at which they are estimated. Consequently, the cost of any additional household member does not vary with income. The same no longer holds, however, when scales are instead computed on the basis of equation *(10)*. Owing to the presence of a quadratic term, in fact, one will typically get a set of scales that depend on a chosen level of reference income. Moreover, it will generally not be possible to obtain an explicit solution for the scales unless one resorts to an iterative procedure. Nevertheless, Maltagliati (2000) claims that an analytical solution is possible as well (basically corresponding to the solution of a quadratic equation). Whenever applied to our setting, the procedure he suggests will provide the following equivalence scale[18]

$$m_h = \frac{Y_h}{Y_r} = \exp\left(\frac{-(2\lambda \ln(Y_r) + \beta) - \sqrt{(2\lambda \ln(Y_r) + \beta)^2 - 4\lambda\left(\eta \ln\left(\frac{fs_h}{fs_r}\right) - \gamma(fs_{hd} - fs_{rd})\right)}}{2\lambda} \right) \quad (16)$$

Yet, an interesting spin-off of the suggested methodology is represented by the possibility of appraising the indications stemming from the equivalisation of incomes for differences in attributes other than family size. Along the same lines as before, in fact, indices can be derived that adjust income levels upward or downward according to determinants of well-being such as occupational status, educational level, age or gender. We can interpret these estimates as measuring the cost differences related to different conditions. Hence, for instance, neglecting disturbances and considering two single individuals only differing in their occupational status z_1 (thus assuming household size, household composition and any z-variable other than one's occupational status to coincide), at equal functioning's levels $f_h^m = f_r^m$ we obtain the identity (linear case)

$$\beta \ln(Y_h) + \eta \ln(fs_h) + \sum_d \gamma_d fs_{hd} + \delta z_{1h} = \beta \ln(Y_r) + \eta \ln(fs_r) + \sum_d \gamma_d fs_{rd} + \delta z_{1r}$$

from which an equivalence scale can simply be derived as

$$m_h = \frac{Y_h}{Y_r} = \exp\left(\frac{\delta (z_{1r} - z_{1h})}{\beta} \right) \quad (17)$$

Clearly, promoting a new approach to equivalence scales lies completely outside the purpose of this work. Less ambitiously, we would just like to explore how far a familiar concept like income can take us in the actual evaluation of Sen's functionings, how efficient it is in compensating achievements' heterogeneity among individuals[19]. Besides, the willingness to work further on Brandolini and D'Alessio (1998, B&DA in what follows), who explored the distribution of functionings' achievements and deprivation among the

[18] The complete derivation of the equivalence scale is given in Appendix A.

[19] A somewhat similar approach has been explored by Smeeding *et al.* (1993) and Brandolini and D'Alessio (1998b), who try to widen the income definition so as to include some non-monetary factors (health care subsidies, education benefits, public support to housing, housework). A money-value is attributed to these factors and subsequently they are imputed to households and added to their disposable income to arrive at a measure of "full income". Though being an extremely interesting exercise, it results in some ethically bizarre implications for well-being comparisons: unless one corrects income not only for subsidies but also for needs, the possibility exists that some households may result less poor than others simply because they have a worse health and more often avail themselves of the health care services. Furthermore, in-kind transfers cannot be considered fully equivalent to income or any other available resources, owing to their own specificity: one cannot use imputed education transfers to buy food, for instance. So, we feel it would perhaps be better to keep the various informations separate.

Italian population, further motivates the present study and accounts for the choice of the specific dataset, to whose description we now turn.

4 The data

The data on which the subsequent exploratory analysis is based have been drawn from the Bank of Italy's "Survey of Household Income and Wealth" (SHIW) for the year 1995. Such long-established questionnaire mainly aims at collecting information concerning the economic behaviour of a sample of 8135 Italian households (corresponding to some 24000 individuals). Carrying on an established tradition, the survey is composed of two main sections. In a first one – repeated every year – information concerning demographics, income sources, working conditions, financial portfolios and real assets are collected. In a second part, a monographic section varying from one year to the other and pointing towards the investigation of some non-monetary dimensions which may possibly influence households' living conditions is presented.

It is fair to emphasise that the main focus of the SHIW is on people's real and financial activities, thus its suitability for a comprehensive well-being evaluation in Sen's spirit is fairly limited. The wealth of qualitative information characterising an alternative dataset collected by the Italian National Institute of Statistics (namely, the "Indagine Multiscopo sulle Famiglie") would have surely proved to be of greater help for our analyses. Nonetheless, on top of our interest in carrying on B&DA investigations, the above mentioned alternative dataset includes no information at all concerning household income or wealth, which makes it incompatible with the purpose of this study. Hence, in what follows we will try to make the best possible use of the available SHIW information to derive a number of elementary indicators which could reasonably be aggregated to measure a few valuable states of life, and then compute "functioning-equivalent incomes". At the same time, the consumption information provided by the SHIW will allow estimating a set of standard Engel scales from whose comparison with the previous ones interesting indications can be drawn about the agents' living standard.

4.1 In search of suitable well-being indicators

A limited number of indicators have been selected from the overall database so as to make the identification of a few functionings possible, although rather tentative. As previously stressed, our hypothesis concerning the undemanding identification of functionings proves to be a very optimistic one. We only follow B&DA to a certain extent in defining functionings' vectors, mainly as a consequence of both the debatability of some of their functionings and the statistical requirements of the analysis[20]. Specifically, the questionnaire enables us to measure three distinct valuable dimensions in a relatively accurate and reliable way: health, shelter and job satisfaction[21]. Not too wide a choice

[20] On the one hand, "social relationships", for instance, were appraised on the basis of information such as the existence of close relatives or the availability of a telephone at home, and the derived functioning hence looked conceptually quite weak, as the authors themselves acknowledge. On the other hand, B&DA characterisation of the functioning "labour market status" did not satisfy the statistical requirements imposed by the particular aggregation technique chosen for our application (namely, an extremely high proportion of missing values as well as deeply heterogenous sample sizes characterised the information by which employment conditions were assessed). Finally, in the absence of additional variables, educational achievements were appraised on the basis of one single indicator (i.e. educational qualification), resulting in a fairly restrictive interpretation of such functioning.

[21] Appendix B reports a systematic description of the indicators.

indeed, rather minimalist even, but still reasonable to get an approximate picture of those basic and elementary constitutive elements of one's well-being.

As a general rule, we try to reconcile data availability with consistency with Sen's approach, hence we attempt at choosing a combination of available indicators that once aggregated can truly depict a functioning. As for health, respondents of the SHIW were asked to record their overall self-assessed health status on a scale from "very bad" to "very good", as well as the presence of disabilities and/or chronic diseases. We then take such variables to acceptably describe one's physical conditions.

A slightly wider set of indicators is, instead, available for appraising shelter circumstances. We basically make use of the information provided by four questions. Two of them are rating scales pertaining to the respondent's perceptions about his own dwelling (in a range going from "very low-income" to "luxury") and its location (on a scale from "run-down" to "upscale"), hence essentially constitute subjective measures. Nevertheless, they represent extremely valuable pieces of information, in that they can be said to account for some of those socio-environmental factors over which a person may have very limited control, that acutely affect the relationship between income and functionings. The remaining two indicators are undeniably more objective. They consist of the house's floor area and heating's availability[22].

Finally, labour conditions exclusively deal with perceived levels of well-being. They are, in fact, evaluated in terms of the satisfaction derived from one's job. The answers provided by a restricted sample of employed individuals to a number of questions investigating the extent of their contentment with respect to a variety of aspects characterising their current activity (from physical and social conditions to social status or job security, etc.) are exploited. The major drawback of such a measure is, of course, represented by its deeply subjective nature. Yet, in the light of the fact that the largest part of one's life is spent at work, we feel that job satisfaction is an important aspect of the lives of most of us, a relevant factor in improving our well-being, hence deserving consideration despite its wholly self-assessed character.

4.2 Aggregation procedures

An explicit aggregation procedure has to be selected to combine the elementary indicators and obtain an overall measure for each and every functioning. Since our objective simply consists in summarising the largest possible part of the information at our disposal in a relatively small number of artificial variables (three, actually) that subsequently have to be entered in a regression model, we believe an efficient choice could be principal component analysis. Specifically, we propose to extract the first principal component of each separate set of elementary indicators, i.e. the linear function of the set of variables which fits these same variables in the best possible way in a least squares sense. At a general level, given v variables, the goal of first principal components analysis is to find a new variable S accounting for as much of the variance in the original v variables as possible[23]. Since the component is a linear combination of the original variables, it is

[22] As accurately remarked by B&DA, within a Mediterranean country like Italy, heating availability could be said to take a real necessity character in the northern regions only. The use of a binary indicator brings about the possibility of underestimating shelter conditions in the southern area as a consequence of the irrelevance of heating availability in this part of the country. Unfortunately, the available data allow no such distinctions to be made.

[23] By this we mean that geometrically the first component is the line that is as close as possible to the v observations. It thus minimises the sum of the squared distances of the v observations from the line, giving us a way to summarise the set of variables by a single linear combination of them.

usually possible to easily ascribe a meaning to what it represents. Algebraically, scores for the first component S_1 are created just by adding up the answers by each respondent h on the v items a_v under consideration, weighted in such a way that the resulting component accounts for the largest share of the variance in the dataset, i.e [24].

$$S_{1h} = b_{11}(a_{1h}) + b_{12}(a_{2h}) + ... + b_{1V}(a_{Vh}) = \sum_{v=1}^{V} b_{1v} a_{vh} \qquad (18)$$

such that the variance of S_1 is maximised given the constraint that the sum of the squared weights equals one[25]. If the variance of S_1 is maximised, then so is the sum of the squared correlations c of S_1 with the items. First principal component analysis, then, recovers the optimal weights vector and the associated variance of S_1.

Table 1a – First principal component analysis (Italy)

Original variables	*First eigenvector*	*Proportion of variance accounted for by 1st component*
Health		61 %
Health status	0.61071	
Chronic illness	0.59480	
Disability	0.52273	
Shelter		46 %
Dwelling's rating	0.59063	
Location's rating	0.47425	
Heating	0.46840	
Floor area	0.45480	
Job satisfaction		33 %
Working environment	0.46642	
Dangerousness	-0.19685	
Demandingness	-0.39809	
Interestingness	0.54722	
Social status	0.50840	
Job insecurity	-0.16526	

The main benefits of this procedure, as emphasised by Klasen (2000), lie in its detecting – on an empirical basis - the associations going on among variables and deriving a weighing system for the various elementary indicators from the intensity of the relationship linking each of them and the well-being measure we are interested in. Of course, principal component analysis is a statistical procedure and, as such, it is often not intuitively straightforward from an economic point of view. Still, we believe it is fairly informative and exhibits obvious merits for our purposes (it lets the data determine the optimal weights)[26]. Accordingly, we perform it on our dataset after carrying out the necessary recodings for ensuring that the resulting indices are positively measured.

[24] From a technical point of view, principal components are weighted sums of the original variables, where the latter's variances act as weights. In detail, the weights are the elements of the eigenvectors of the original variables' covariance matrix, and such eigenvectors are disposed in decreasing order with respect to the size of their associated eigenvalues.

[25] The size of the elements in the weights vector has to be constrained or otherwise one could arbitrarily make the variance of the principal component large simply by selecting large weights.

[26] A distinction has to be drawn between principal component analysis and its companion technique, factor analysis. They are both typically used to analyse groups of correlated variables representing one or more common domains. However, because factor analysis is a model similar to regression, we expect that, for each observed variable, some of the variability will be explained by the model and some will not. In contrast, in principal components analysis, all variability in the original variables will be

Results are displayed in Table 1a and reveal a fairly satisfactory outcome as far as the health dimension is concerned, with the first component capturing 61 per cent of the total variance of the constituent variables. The same enthusiasm cannot be expressed for the remaining two dimensions. Even though a careful inspection of the loadings clearly reveals that the derived composite indicators do depict the hypothesised well-being aspects, none of them looks much of an ideal substitute for the original variables. However, the examination of alternative aggregative procedures (such as simple adding up or frequency-based weighing) ultimately confirms these results. As the empirical analysis carried out in Lelli (2001) has emphasised, it is well possible that various *modi operandi* for translating Sen's philosophical framework of thought into practice basically look equally performant. Consider, for instance, the health and shelter cases. It can easily be remarked that each elementary indicator is about equally represented in the first principal component, which thus makes each linear composite substantially correspond to an equal weighing scheme. Hence, failing better accounts, we take the obtained three principal components as an acceptable representation of the functionings "being in good physical shape", "being well sheltered" and "being satisfied with one's job".

Table 1b – First principal component analysis (Belgium)

Original variables	*First eigenvector*	*Proportion of variance accounted for by 1st component*
Health		37 %
Health status	-0.46090	
Chronic illness	0.42474	
Recent illness	0.36927	
Hospital	0.34965	
Generalist	0.43824	
Specialist	0.38425	
Alternative medicine	0.09408	
Shelter		36 %
Dwelling's problems	0.58015	
Area's problems	0.52005	
Housing satisfaction	-0.52745	
Heating	-0.30135	
Crowding index	-0.15477	
Working conditions		35 %
Work certitude	0.33554	
Work type	0.62335	
N. of hours	0.41191	
Work schedule	0.43920	
Working environment	0.44670	
Work distance	0.28136	
Job search	-0.18722	
Overqualified	-0.10621	

explained by the components. In our case, factor analysis could have been used as well. As a matter of fact, it was performed on the same set of data, yielding substantially comparable results. Both for health and shelter only one factor could be extracted, hence its correlation with the first principal component turned out to be extremely high (0.997 and 0.995, respectively). As for job satisfaction two factors could be identified. The first rotated factor score, however, exhibited a degree of association of 0.997 with the corresponding principal component.

Given the availability of exactly corresponding observable indicators for Belgium subsequently aggregated into functionings from a previous work (i.e. Lelli, 2001), we feel that resorting to the latter so as to compare and contrast evidence related to different (affluent) countries on the role of the same set of dimensions could, possibly, provide instructive comparative findings. As a general rule, our Belgian data provide a larger breadth of socio-economic information than the Italian ones, hence should lead - at least in principle – to a more precise conceptualisation of the individual achievements, which further motivates their inclusion. Replicating the application of the principal component model on the Panel Study of Belgian Households for the variables listed under the headings "health", "shelter" and "working conditions" in Table B.2 of Appendix B leads to the identification of the optimal weights reported in Table 1b. Unfortunately, also in this case the first principal components only capture a modest proportion of the variance of the considered elementary indicators. Still, a closer glimpse at the weights allows appraising the presumed reliability of the derived indices, looking fairly close to what intuition would suggest and, especially for the health index, undoubtedly more articulated than the Italian counterparts[27].

5 Moving towards the operationalisation of functioning-equivalent incomes

5.1 Estimating functionings' curves

The accomplishment of our objective requires the preliminary estimation of equations *(9)* and *(10)* linking each composite indicator taken to represent a functioning with household income and a bundle of socio-demographic variables. With regards to the latter, we specifically control for the effect of household size and composition, age, gender, area of residence, type of occupation, occupational sector, educational level, marital status, dwelling's location and tenure[28]. We report in Tables 2a and 2b the parameter estimates for health, shelter and job satisfaction for the Italian and Belgian datasets, respectively. In all cases, the fit of the models to the data does not improve substantially by including the quadratic term in income. Still, shelter conditions (for both countries) and job satisfaction (for Italy) statistically significantly vary - in a non-linear way - with one's financial possibilities. For practical reasons, however, only information concerning the linear case is conveyed here, and we refer the reader to Appendix D for a full account of the non-linear results.

The explanatory power of the regressions ranges in between 0.36 and 0.04: not an unusual interval of values for this stream of literature. Moreover, the sample on which the Italian regressions are performed exhibits a nearly double size (except for job satisfaction) if confronted with the available one for Belgium, and it is then reasonable to conclude that this accounts for some of the greater estimation accuracy in the Italian functionings' equations. The following statements are made with respect to the baseline individual, which is taken to be male, aged between 51 and 70, from the North East in the case of Italy and from Wallonia in the case of Belgium, single, employee in the agricultural sector,

[27] Given its characterisation and despite the label that was chosen, the working conditions functioning basically relates to the individual's "job satisfaction" rather than his "job situation". Note, moreover, that high scores on the shelter or health functionings imply "bad shelter" and "bad health", owing to the coding of the involved variables. Such dimensions, however, will be positively measured in the remainder of the paper.

[28] It is helpful background to the interpretation of the coming tables to inspect the sample means for income and demographic variables that have been used in the exercise. They can be found in Appendix C.

illiterate, resident in a rural area where he enjoys the usufruct of the house he inhabits[29]. A good number of coefficients are found to be highly significant at the 5 percent level and their signs for the most part accord well with intuition.

A comparison between the snapshots of living conditions in the considered countries can prove to be informative. Basic similarities are that, in both countries, high scores on the three selected functionings show a robust positive correlation with reasonably high levels of educational attainment and the self-employed labour condition. Basic dissimilarities, instead, relate to the income variable, which happens to be more relevant in the Italian regressions. Specifically, monetary resources do not seem to matter neither in determining the Belgians' health scores nor in shaping their work contentment (even under the non-linear specification), whereas - at least for job satisfaction - they play a rather prominent role in the Italian sample.

Table 2a – Parameter estimates of the functionings' equations (Italy)[30]

Variables	*Health*		*Shelter*		*Job Satisfaction*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Intercept	-1.200***	(0.111)	-3.092 ***	(0.101)	-1.861 ***	(0.254)
Ln (Y)	0.130 ***	(0.024)	0.747 ***	(0.027)	0.265 ***	(0.047)
Ln (fs)	0.017	(0.073)	-0.207 ***	(0.068)	-0.138	(0.158)
Age 10-14	0.840 ***	(0.133)	-0.719 **	(0.341)	-	-
Age 15-20	0.639 ***	(0.064)	0.083	(0.082)	-0.007	(0.169)
Age 21-50	0.411 ***	(0.034)	-0.033	(0.032)	-0.097	(0.063)
Age over 70	-0.604 ***	(0.064)	-0.094 *	(0.049)	0.314	(0.348)
N. children aged 0-4	0.126 ***	(0.030)	0.068 **	(0.033)	0.015	(0.072)
N. children aged 5-9	0.062 **	(0.031)	0.088 ***	(0.032)	0.089	(0.067)
N. children aged 10-14	-0.012	(0.029)	0.112 ***	(0.030)	0.039	(0.066)
N. children aged 15-20	-0.001	(0.027)	0.041	(0.027)	0.062	(0.057)
N. adults under 70	0.036	(0.024)	-0.001	(0.023)	0.020	(0.054)
Female	-0.005	(0.021)	0.026	(0.019)	-0.117 **	(0.047)
Married	-0.134 ***	(0.028)	0.307 ***	(0.030)	0.071	(0.064)
Divorced	-0.230 ***	(0.069)	0.249 ***	(0.070)	0.004	(0.124)
Widowed	-0.179 ***	(0.068)	0.275 ***	(0.053)	0.233 **	(0.111)
North West	0.216 ***	(0.031)	-0.126 ***	(0.026)	-0.073	(0.065)
North East	0.085 ***	(0.032)	0.174 ***	(0.028)	0.209 ***	(0.065)
South	0.007	(0.034)	-0.207 ***	(0.031)	-0.112	(0.069)
Islands	0.057	(0.044)	-0.414 ***	(0.042)	0.280 ***	(0.087)
Compulsory educ.	0.455 ***	(0.064)	0.437 ***	(0.047)	0.326 *	(0.177)
Secondary school	0.601 ***	(0.067)	0.800 ***	(0.052)	0.571 ***	(0.181)
University	0.584 ***	(0.074)	0.988 ***	(0.062)	0.866 ***	(0.191)
Self-employed	0.055 **	(0.024)	0.331 ***	(0.029)	0.386 ***	(0.052)
Student	0.151	(0.244)	0.804	(0.604)	-	-
Unemployed	-0.089 *	(0.048)	0.082	(0.050)	-	-
Retired	-0.463 ***	(0.042)	0.088 **	(0.034)	-	-
Home duties	-0.158 *	(0.087)	-0.065	(0.081)	-	-
Manufacturing	0.119 **	(0.051)	0.158 ***	(0.040)	0.110	(0.110)
Services	0.111 **	(0.050)	0.207 ***	(0.040)	0.416 ***	(0.107)
Ownership	-0.005	(0.040)	0.194 ***	(0.036)	0.195 **	(0.078)
Rental	-0.018	(0.043)	-0.369 ***	(0.040)	0.211 **	(0.086)
Urban	0.001	(0.035)	0.030	(0.034)	0.042	(0.072)
Adj. R-squared	0.264		0.356		0.082	
Sample size[31]	12838		12797		3895	

[29] Unfortunately, information concerning the level of urbanization of the area of residence or the sector of activity is not available for the PSBH cross-section, thus we could not control for the effect of such characteristics when performing the Belgian part of the exercise. Similarly, the minimum age of the PSBH respondents is 16 years old and this accounts for the modification in the age categorization.

[30] Standard errors corrected for heteroskedasticity. *, ** and *** denote significance at 10, 5 and 1 per cent.

Monetary resources would seem to make a difference also for the health status of the Italian respondents. Nevertheless, the impossibility of establishing a robust finding prevents us from emphasising this trend, leading to a particularly important inference for both countries, viz. that extra household income does not have any clear potential to alleviate one's unsatisfactory physical conditions. In the light of this and leaving aside the influence on the results of the specific set of elementary indicators based on which one's functioning achievements have been computed for the two countries, perhaps part of the reason for the greater relevance and robustness of the income variable in the Italian regressions is that income inequality is larger in the latter geographical area than in Belgium. Table 3 summarises this aspect for our two samples, reporting equivalent household income (corrected via standard OECD scales) at the 10th and 90th percentile expressed as a percentage of the median and of each other, as well as the proportion of individuals falling below 40, 50 and 60 percent of the median in each country. From the upper part of the table one can easily remark, for instance, that the income of the household at the 90th percentile in the Italian sample is nearly 5 times that of the household at the 10th percentile. Similarly, from the lower section, one may learn that 14 percent of the Italians live in households whose income is below 40 percent of the median, falling by 2 percentage points in the Belgian case.

Table 2b – Parameter estimates of the functionings' equations (Belgium)

Variables	*Health*		*Shelter*		*Working conditions*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Intercept	-0.045 **	(0.156)	-0.076 **	(0.152)	-0.104 **	(0.271)
Ln (Y)	-0.004	(0.027)	0.598 ***	(0.019)	-0.021	(0.038)
Ln (fs)	0.142	(0.087)	-0.355 ***	(0.078)	0.281 **	(0.142)
Age 16-20	0.273 **	(0.128)	-0.203 *	(0.112)	-0.465	(0.316)
Age 21-50	0.153 **	(0.064)	-0.295 ***	(0.053)	-0.535 ***	(0.096)
Age over 70	-0.529 ***	(0.113)	0.233 ***	(0.072)	1.377 **	(0.656)
N. children aged 0-4	-0.015	(0.047)	0.018 **	(0.044)	-0.088	(0.070)
N. children aged 5-9	0.111 ***	(0.036)	0.017 **	(0.037)	-0.118 **	(0.060)
N. children aged 10-14	-0.019	(0.042)	0.037 *	(0.040)	-0.029	(0.065)
N. children aged 15-20	-0.024	(0.022)	-0.028	(0.021)	-0.027	(0.035)
N. adults under 70	0.058	(0.036)	-0.009 ***	(0.032)	-0.108 *	(0.060)
Female	-0.143 ***	(0.038)	0.052	(0.032)	0.149 ***	(0.057)
Married	-0.194 ***	(0.057)	0.239 ***	(0.053)	-0.021	(0.083)
Divorced	-0.175 **	(0.082)	-0.121	(0.082)	0.049	(0.119)
Widowed	-0.271 **	(0.114)	0.234 ***	(0.084)	0.338	(0.318)
Brussels	0.078	(0.062)	-0.221 ***	(0.068)	0.065	(0.105)
Flanders	0.118 ***	(0.040)	0.054	(0.033)	0.448 ***	(0.066)
Compulsory educ.	-0.295 ***	(0.104)	-0.108	(0.093)	0.288	(0.213)
Secondary school	0.036	(0.086)	0.054	(0.084)	0.204	(0.156)
University	0.233 ***	(0.087)	0.148 *	(0.085)	0.225	(0.155)
Self-employed	0.263 ***	(0.050)	0.109 *	(0.059)	0.289 ***	(0.083)
Student	0.041	(0.091)	0.160 **	(0.080)	-	-
Unemployed	-0.316 ***	(0.078)	-0.196 **	(0.080)	-	-
Retired	-0.444 ***	(0.083)	-0.094	(0.062)	-	-
Home duties	-0.213 ***	(0.078)	-0.129 *	(0.069)	-	-
Ownership	0.047	(0.107)	0.522 ***	(0.108)	-0.027	(0.191)
Rental	-0.106	(0.112)	-0.553 ***	(0.114)	-0.086	(0.194)
Adj. R-squared	0.180		0.179		0.040	
Sample size	6555		6509		3386	

[31] The difference in sample size is a direct consequence of data availability. All functionings are measured at the individual level, but information concerning job satisfaction was only available for a restricted sample of employed people. The same observation applies to the Belgian data.

It is clear, therefore, that evidence of a higher incidence of income-poverty as well as of greater income inequality exists for our Mediterranean reference country, which makes reasonable to presume that some of the greater relevance of the income variable in the Italian regressions is to be attributed to such phenomenon. Clearly, this represents no exhaustive argument. Possibly, the Belgian results look suggesting that in a country where the individual's work discontentment is not associated with poor salary (or, more generally, with limited financial resources), the non-monetary aspects of this same condition represent apparently salient factors whose discernible impact should not be neglected (e.g. available leisure time, pleasant workplace, interesting tasks, etc.).

Table 3 – Income inequality and income-poverty in Italy and Belgium

Ratios of percentiles	*Italy*	*Belgium*
P10 / P50	0.42	0.44
P90 / P50	2.10	1.79
P90 / P10	4.97	4.04
Percentage of individuals below stated percentage of median		
below 40 percent	9.1	8.8
below 50 percent	14.0	11.9
below 60 percent	20.9	17.4

Furthermore, the working dimension regressions emphasise a striking discrepancy touching on Belgian women's satisfaction opposed to Italian women's dissatisfaction. Not being keen on resorting to conventional stereotypes, we feel that at least a couple of possible explanations exist. To start with, one could claim that the answer is perhaps to be searched in the Italian female workers' lower propensity to adjust their preferences and expectations so as to come to terms with the inferior quality of their jobs if compared to men. Alternatively, a justification could relate to the institutional and social framework still characterising paid work in Italy, which is – in our view - far less favourable to women if compared with Belgium, and where a substantial gender inequality persists in all those activities needed to raise the children and to take care of any other member of the household.

Concentrating on health, one can further remark that the negative effect of both unemployment and unpaid work at home gets even magnified (both in size and significance) in the Belgian case, as a consequence of the latter social groups' more frequent recourse - on average - to medical consultation, which is not accounted for in the characterisation of the Italian health functioning. Yet, care is required in the interpretation of such high correlations with labour market states as reverse causation phenomena may, of course, take place, i.e. the person is unemployed or devoted to home duties because he or she experiences health problems, not *vice versa*. Reverse causation could, then, weaken the interpretation of whether the factors studied are truly intermediaries between socioeconomic status and health.

A harmful impact of divorce on one's physical conditions is also evident. Such disruptive influence of separation in both countries, however, is soon invalidated by an F-test for the equality of the marital status coefficients[32]. We are on somewhat firmer ground,

[32] The significance of the differences between the coefficients on the various socio-economic traits here considered has been tested for all the regressions. As for Italy, in addition to marital status (for both shelter and health), no apparent statistically significant differences happen to exist concerning the occupational sector (for health), housing tenure and geographical location (for job satisfaction). When considering the Belgian results, on top of marital status, statistical equality of coefficients characterises the age classes 16-20 and 21-50 (for both health and shelter) as well as the occupational states "unemployed" and "home duties" (for shelter).

however, when turning to housing. People voluntarily or involuntarily lacking an occupation, a condition that 6 percent of the Belgian sample experiences as against 8 percent of the Italian, look robustly associated with unsatisfactory achievements in terms of shelter in the former but not in the latter. Quite the opposite, there is no evidence that for the Belgian sample being retired implies better housing conditions than being employee, whereas such evidence exists for Italy. It is also noteworthy that the elderly's lodging situation substantially conflicts in our two samples, with the Latins suffering from worse housing than the baseline individual while their Belgians counterparts are enjoying the most comfortable situation if compared to any other age class.

In general, one can say that education and occupation seem relevant for all the considered functionings. Regional factors as well, emphasising the pre-eminence of the North East (in Italy) and Flanders (in Belgium). Sizeable gaps between North and South in what concerns health and shelter attainments further characterise the Mediterranean sample in as much the same way as the rest of Belgium seems to be doing better than Brussels' area in terms of housing well-being. A clear enhancement of one's contentment level brought about by a career in the services sector further emerges, together with the complete irrelevance of urban or rural dwelling's location. From a qualitative point of view and as far as Italy is concerned, the findings coincide with B&DA analysis, except for the gender bias in work contentment, probably due to the different definition of our measure of functioning's achievement[33].

5.2 Computing functioning-equivalent incomes

On the basis of the previous parameter estimates – that we believe provide a meaningful picture of people's living standards in the considered dimensions - and after selecting a reference household, we can then proceed to the actual derivation of our well-being indicators in the form of a set of equivalence scales for the three considered functionings. Our baseline family is composed of a single childless adult, male, aged between 21 and 50, residing in a urban area of either the North East or Flanders, self-employed in the service sector, with college education, and being the owner of the house in which he lives.

Tables 4, 5 and 6 present the scales computed for both countries along the lines of equations *(11)* to *(15)* for statistically significant variables. This results in a substantial implication: since household size seems to represent no influential explanatory factor neither for health (in both countries) nor for job satisfaction (in Italy), no attention is paid to such variable in the derivation of scales for these dimensions. Otherwise stated, scales are derived for the single adult household only. Similarly, no scales have been computed for those variables where standard econometric test procedures established the absence of any significant difference between the coefficients. Finally and in line with what we have already adverted to, given the lack of significance of the coefficients on the level of disposable household income in the Belgian regressions for health and working conditions, it would be meaningless to derive monetary measures of well-being and carry out income comparisons for such dimensions. We thus refrain from calculating scales from the corresponding equations.

The scale factors for our physical conditions functioning, hence, only focus on the Italian sample and basically re-express the considerations already made in the previous subsection. Yet, the use of monetary units in terms of ratio of purchasing power needed

[33] This corroborates, however, the insightful remark by B&DA (1998a, p.38) stressing how "measures of functioning achievements have to be interpreted with the care required by their dependence on the choice of the elementary indicators and the underlying measurement hypotheses".

allows conveying the very same message in an undoubtedly more powerful and direct way. We can now remark, for instance, that *ceteris paribus* an Italian teenager only needs one-thirtieth of the income of an adult under 50 in order to achieve a similar well-being in terms of health.

Table 4 – Estimated scales for Health

	Italy		
	Fs=1		*Fs=1*
Age		*Occupation*	
10-14	0.04	Employee	1.53
15-20	0.17	Self-employed	1.00
21-50	1.00	Unemployed	3.03
51-70	23.61	Retired	53.76
70+	2459.45	Home duties	5.15
Geogr. Location		*Education*	
North West	0.36	Illiterate	89.33
North East	1.00	Compulsory	2.70
Centre	1.92	Secondary	0.88
		College	1.00

Similarly, other things being equal, a resident of the central regions of the country should be granted about twice the revenue of his northern compatriots to enjoy an equivalent level of healthiness. Likewise, the indicators displayed in Table 5 and relating to job satisfaction suggest that bridging the previously mentioned gender gap would require women to be entitled 55 per cent additional monetary resources if compared with their male fellow workers. Interesting enough, large discrepancies in terms of the specific type of occupation held are emphasised by the equivalence factors characterising – *ceteris paribus* – the social group of employees under both welfare measures. They call, in fact, for an increase of one's endowment ranging from 53 (in the case of health) to more than 300 percent (in terms of work contentment) if compared with our self-employed baseline agent. The latter indication, however, clearly does not sound much realistic and, most probably, reflects a weakness of our estimates.

Table 5 – Estimated scales for Job Satisfaction

	Italy		
	Fs=1		*Fs=1*
Occupation		*Sector*	
Employee	4.29	Services	1.00
Self-employed	1.00	Agriculture	4.80
Gender		*Marital Status*	
Male	1.00	Single	1.00
Female	1.55	Widowed	0.41
Education			
Illiterate	26.20		
Compulsory	7.67		
Secondary	3.04		
College	1.00		

Nevertheless, an immediate remark is likely to arise straight away when examining Tables 4 and 5. Actually, one cannot fail to notice the extremely large values exhibited by a considerable number of scale factors, with notable peaks for some attributes such as illiteracy, retirement or eldership. This phenomenon magnifies, in our view, the implications of assessing well-being in the space of achievements (specifically, one where the latter are identified with a functioning vector) rather than in the space of means to well-

being. In particular, we would be keen on taking it as a preliminary but clear indication of the already mentioned inappropriateness – within the current framework of analysis - of the assumption that any dissimilarity among individuals may be efficiently dealt with by a suitable monetary compensation. This is not surprising and we will return on this issue more carefully below.

For the time being, a further feature of the computed scales looks worthy of note. It becomes apparent from Table 6a, where equivalence scales for the shelter dimension are presented. Given the statistically significant influence played by household size in both the Belgian and the Italian regression, shelter equivalisation scales have been derived also with reference to the latter attribute. In particular, they show the estimated cost of a one person family plus one or more additional members of various ages, calculated relatively to the costs of a single adult household. Shelter scales for any other socio-demographic trait are displayed in Table 6b and illustrate, instead, the estimated cost of the stated characteristics for an adult agent (i.e. aged between 21 and 50). The most important observation is that these scales look rather flat, i.e. the income needs of families do not increase much with rising household size. A glimpse at other equivalence scales for any of the considered countries, whether derived from customary data on consumption behaviour or proposed by experts (e.g. Perali, 1999 or the official scale by Carbonaro, 1985 in the case of Italy, for instance), clearly reveals a greater steepness. The same consideration arises when inspecting Table 7, where Engel scales estimated on the SHIW dataset are displayed[34].

Of course, understanding the reasons why our equivalence factors are so much flatter than traditional ones is essential in order to make sure that they correctly indicate the income levels where families of various sizes enjoy the same living standard. Despite no other methodology can be said to constitute a fully fail-safe benchmark against which one can assess such validity (*cf. infra*), a few observations are possible.

Table 6a – Estimated scales for Shelter by household size

	Italy			
	Fs=1	*Fs=2*	*Fs=3*	*Fs=4*
Household size				
0-4 years	-	1.11	1.14	1.13
5-9 years	-	1.08	1.08	1.04
10-14 years	-	1.04	1.01	0.94
Adult	1.00	1.21	1.37	1.49
	Belgium			
	Fs=1	*Fs=2*	*Fs=3*	*Fs=4*
Household size				
0-4 years	-	1.46	1.80	2.07
5-9 years	-	1.46	1.80	2.07
10-14 years	-	1.42	1.70	1.90
Adult	1.00	1.53	1.97	2.37

Why are additional household members substantially cheap in terms of functionings?[35] Well, we believe one first of all needs to put the question into perspective

[34] Appendix E reports the complete parameter estimates of the Engel curve for the Italian sample. Unfortunately, no information on food consumption habits is gathered by the Panel Survey of Belgian Households. This prevented us from performing a similar analysis on Belgian data.

[35] Flatness typically characterises subjective equivalence scales as well. At least three possible explanations for this have been put forward in the literature: substitution effects, dampening of parents' aspirations about their material well-being and reference group effects. For a comprehensive analysis of the subject we refer, among others, to Van den Bosch (1996).

by considering that we are basically contrasting a quality with a quantity issue. To be exact, by its empirical definition the welfare yardstick that is being used in the construction of functionings' equivalence scales has an essentially qualitative nature, in full contrast with the quantitative orientation characterising a measure such as the food share. Obviously, when speaking in terms of quality, income needs become less stringent. Specifically, when welfare is an index reflecting how well one is sheltered in terms of location or dwelling's features, the relatively low cost of any extra resident can be regarded as an expected outcome. Notwithstanding, an obvious and more economically plausible hypothesis for the cheapness of additional household members relates to possible returns to scale, which are likely to affect shelter to a far larger extent than food consumption and may, thus, motivate the almost negligible marginal cost of any extra family member. By the way, an obvious suggestion of the existence of returns to scale comes from the observation that while for Engel scales the marginal cost of extra family members (in terms of relative food requirements) increases at a diminishing rate, this only partially holds for the corresponding Italian housing scales. As far as children are concerned, in fact, their marginal cost (in terms of shelter quality) seems to decrease once an "optimal" household size has been attained.

Our shelter equivalence factors also persistently point to a relative "cheapness" of older children vis-à-vis babies, for both countries. Possibly, they convey the idea of some society's standards pressuring families to make sure, for instance, that the child be provided a room of his or her own, or that a relocation towards a better neighbourhood takes place. Accommodating the new-born baby into the family could, then, entail some sort of fixed initial investment in shelter conditions, no longer required for older children. Although somewhat justifiable, this phenomenon is once again most likely to reflect a weakness of our functioning equations' estimates, hence should not be credited too much reliability.

Turning to Table 6b, the very similar definition of the shelter functioning adopted for the two considered countries enables some informative direct comparisons concerning the cost of given characteristics for a single adult belonging to either of the samples. For instance, our respective parameters' estimates allow pinpointing the relatively better housing conditions – *ceteris paribus* - of Belgian employees if compared with their Italian counterparts. The former's endowment only needs to be raised by 20 percent (as against 56 percent for the latter) in order to make their shelter well-being comparable with respect to a self-employed. On the contrary, despite in both countries the tenancy status turns out to be robustly associated with lower shelter achievements in comparison with the ownership condition, the computed equivalence factors point out that the Belgian respondents are significantly more penalized than the Italian ones when experiencing rental tenure, perhaps as a consequence of the relatively larger spreading of ownership within this sample.

A tenant residing in Central Europe would, therefore, need five times the income of his landlord compatriot to enjoy similar housing conditions, whereas a Southern European collegue would just require 22 percent of such compensation. Again, the fairly large absolute value of the Belgian scale may be interpreted as suggesting that a tenant's shelter quality cannot efficiently be improved upon simply via extra household income. Several other factors, exhibiting a non-monetary nature, might reasonably play a role, consequently weakening the relative importance of one's endowment.

In the spirit of the illustrative empirical exercise performed by Winkelmann and Winkelmann (1995) in the context of their analysis of the psychological costs of unemployment, we can draw on the parameter estimates from equation *(9)* to explicitly inquire into the apparent relative contributions of such non-monetary factors to one's

welfare level, so to uncover the actual role played by income on our selected well-being measures.

Table 6b – Estimated scales for Shelter by other demographic characteristics

Italy		*Belgium*	
	Fs=1		*Fs=1*
Geogr. Location		*Geogr. Location*	
North West	1.49	Brussels	1.58
North East	1.00	Wallonia	1.09
Centre	1.26	Flanders	1.00
South	1.66		
Islands	2.19		
Occupation		*Occupation*	
Employee	1.56	Employee	1.20
Self-employed	1.00	Self-employed	1.00
Retired	1.38	Unemployed	1.66
		Student	0.92
		Home duties	1.49
Housing Tenure		*Housing Tenure*	
Ownership	1.00	Ownership	1.00
Rental	2.12	Rental	6.03
Usufruct	1.30	Usufruct	2.39
Education			
Illiterate	3.74		
Compulsory	2.09		
Secondary	1.28		
College	1.00		
Sector			
Manufact.	1.07		
Services	1.00		
Agriculture	1.32		

It goes without saying, of course, that - in addition to gaining some insights concerning the effectiveness of income redistribution for functionings' levels - if the non-monetary component turns out to play a considerable role, then one can reasonably question the traditional assumption according to which the entirety of the well-being concept would be robustly enough captured by its monetary counterparts.

Table 7 – Estimated Engel scales

	Italy			
	Fs=1	*Fs=2*	*Fs=3*	*Fs=4*
Household size				
0-4 years	-	1.30	1.65	1.99
5-9 years	-	1.55	2.09	2.61
Adult	1.00	1.77	2.49	3.16

Specifically, we ask what percentage of the total increase (or decrease) in functionings' achievements associated with given individual characteristics appears to be due to the growth (or decline) of income and what to non-monetary factors. To answer this question we assume that the average yearly household incomes of the individuals belonging to the chosen category in the sample express the most likely before and after positions of people who experience that particular situation. Because of the semilog functional form adopted in the estimation, the change in the dependent variable f associated to a modification in

one's monetary resources *Y* may be computed as $\Delta f = b(\Delta Y / Y)$, i.e. by multiplying the estimated coefficient on the logarithm of income by the relative change in income[36].

In our Belgian sample - considering, for instance, the previously mentioned housing tenure variables - the average yearly disposable household income of an usufructuary amounts to 22318 Euro, while it raises to 30254 Euro for the average landlord, suggesting a difference of 7936 Euro in favour of the latter. Assuming household income rises by this full amount, the shift from experiencing usufruct towards experiencing ownership will be associated with a rise in the dependent variable of our shelter regression in Table 4.2b of 0.02 (i.e. {0.598*[Ln(30254/22318)/Ln(22318)]}, which represents only 3.7 percent {0.02/(0.522+0.02)} of the total increase associated with moving from one contingency to the other[37]. This suggests that *ceteris paribus* some 96 percent of the improvement in housing conditions consequent on ownership is non-monetary. Similarly, moving from usufruct to tenancy (average income 22066 Euro) when any other socio-demographic trait remains unchanged brings about a decreased shelter quality of 0.0007, only corresponding to some 0.13 percent of the total. A comparison with the Italian sample reveals an essentially analogous pattern, although the orders of magnitude appear to be larger. Namely, just 9.3 and 2.6 percent of the change in shelter achievements associated with ownership and tenancy respectively turns out to be due to monetary factors. However, in the light of the relatively large imprecision characterising the Belgian tenure coefficients, this close alignment of results should probably not be taken too seriously. The same exercise can, of course, be repeated for other variables such as occupational status or residence area, which exhibit smaller standard errors. We find that, other things being equal, 98 percent of the deteriorated housing circumstances experienced by an individual residing in Wallonia with respect to one inhabiting Brussels appear to be related to non-monetary determinants, in exactly the same way as the fall from the income level enjoyed by the average Roman resident to the one enjoyed by the average Neapolitan implies a related decline in housing conditions, some 91 percent of which is non-monetary.

An even lower contribution of pecuniary factors emerges if one turns to occupational status. Given average incomes of 29060 and 30660 Euro for employees and self-employed respectively, the Italian estimates suggest that when workers move to an autonomous job some 98 to 99 percent of the higher well-being they experience (*ceteris paribus* and no matter the specific dimension) does not stem from the income growth. The estimate lowers to 97 percent when looking at the Belgian sample[38]. An equally sizeable proportion of non-monetary elements is to be found when the departure from the job market is considered: focusing on Italy, only 2.5 percent of the overall decline in housewives' health, 0.8 percent of the decline in the retired's physical state and 6.8 percent of the unemployed's bodily decay (9.2 percent of the sharpening of this same social group's housing conditions in the Belgian sample) could be ascribed to financial factors, emphasising the immaterial side-effects of voluntarily or involuntarily occupying the not-employed state. Likewise, slightly more than 1 percent of Italian women's dissatisfaction with their occupation exhibits a pecuniary nature, the remaining 98.7 percent being probably imputable to social or cultural determinants.

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[36] In the light of the adopted specification, *Y* stands, of course, for *Ln(Y)*.

[37] For sake of accuracy, we specify that 0.522 corresponds to the estimated coefficient for ownership in the Belgian shelter regression, while 0.598 represents the income coefficient.

[38] Specifically, in the Italian sample monetary factors account for 1.2 percent of both health and shelter improvements, and 0.2 percent of the additional felt satisfaction. For Belgium, only shelter can be considered owing to the statistical irrelevance of the income variable for the remaining functionings. In the examined case, *ceteris paribus* pecuniary elements describe 2.7 percent of the total enhancement of housing circumstances.

When confronted with the orders of magnitude of the previously derived equivalence scales, this exercise can clearly be said to convey essentially the same information. Still, its own specific value-added lies in allowing us to posit that a significant contribution of a given individual condition, when income and other variables are controlled for, to either a high or low level of functioning achievement can be attributed to a large extent to the non-monetary aspects of the condition itself. In other words, the impressive predominance exhibited by the non-monetary counterparts of well-being places an emphasis on income's inadequacy as a comprehensive proxy for it. These are by no means astonishing news: a variety of empirical applications of Sen's approach exist that provide evidence on such issue[39]. However, confining us to the samples under consideration, also note that at the end of the above exercise it seems reasonable to recall the previous suspicion (cf. *supra*), conjecturing that transferring income need not necessarily be the best way to offset the observed disparities among individuals. No doubt that income's effectiveness in redressing functioning disparities needs to be further investigated, and so the role played by incentives and the like. Precisely for these reasons, for the time being we acknowledge income – if appropriately adjusted on the basis of information on functionings' constituents - the contingent merit of representing a useful and immediate inequality indicator. Yet, we have reasons to proceed with great care when interpreting it as a fitted instrument for redressing those same disparities.

6 Comparing the poor: a closer look at the relative economic position of population sub-groups

In an attempt to foster the understanding of the results presented in Tables 4 to 7, two types of equivalence scales estimated in this study (namely, Engel scales and scales for shelter by household size) have been applied to the incomes of a set of individuals singled out from the whole sample. The selection process of the sub-sample is not completely random, however. Owing to the fact that only equivalisation scales (by household type) for children up to nine years old and adults could be derived from both Engel and shelter estimates (cf. Tables 6a and 7), any individual living in households including kids older than nine has been excluded *a priori* from the sub-sample. This selection process resulted, therefore, in 14000 sampled individuals out of 23900 for Italy and 4839 out of 7021 for Belgium[40]. This procedure allows an interesting comparison, i.e. the identification of differences in the distribution of welfare. To accomplish such goal we have been adjusting incomes using the scales computed at each individual's specific household composition. The resulting series of deflated monetary resources have been used to compute the non-parametric density function of welfare for the sample (Figure 1). For the time being, we only refer to the Italian sample owing to the unavailability of analogous food scales enabling the comparison for the Belgian dataset.

As it immediately appears, the density functions yield similar distributions of welfare. Yet, the Engel one displays a tiny higher concentration of low levels of welfare while the distribution of functioning-equivalent incomes derived from the shelter scale factors looks slightly more concentrated (it exhibits a smaller variance). Moreover, the latter also undergoes a slight translation to the right, entailing a modification in the overall poverty rate. To further scrutinize this shift and assess whether or not some specific demographic

[39] See, among others, Ruggeri Laderchi (1997), Phipps (1999), Balestrino (1996).

[40] For the purpose of drawing such direct comparisons, the availability of a nutritional functioning would have unquestionably represented a more effective device. Unfortunately, the lack of any information concerning body size or metabolic rates in the dataset made such idea absolutely unworkable.

groups are hurt more by the alternative shelter scales, we count the number of individuals whose deflated (i.e. equivalised) income falls below the poverty line, arbitrarily set at 60 percent of the median equivalent income and report the results in Table 8.

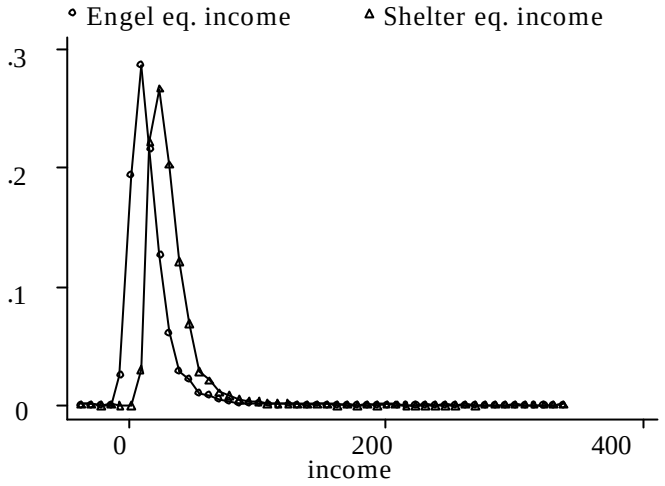

Figure 1 - Non-parametric density of equivalent incomes for Italy

The choice of the scale indeed seems to affect the overall poverty estimates, although not to an extremely large extent. Resorting to equivalisation factors computed on the basis of individual achievements in functionings results in a higher percentage of individuals regarded as living in poverty (about 2 percent, according to our definitions). Sensible discrepancies, however, are to be remarked when focussing on given population sub-groups.

Table 8 – Identifying the poor: Engel-poor vs. functioning-poor

		Below the Poverty Line		
	Italian sample	*Engel*	*Functioning*	*% Variation*
Sample size	14143	-	-	-
N. households	5765	965	1448	+8.4 %
N. children (0-9)	1401	388	255	-9.5 %
N. adults	12742	2195	2599	+3.2 %
North West	3254	305	412	+3.3 %
North East	3113	194	312	+3.8 %
Centre	3011	357	373	+5.3 %
South / Islands	4765	1727	1757	+0.6 %
Self-employed	1294	226	209	-1.3 %
Employee	3526	278	238	-1.1 %
Unemployed	851	391	357	-4.0 %
Retired	4789	709	1250	+11.3 %
Student	1014	235	161	-7.3 %
Home duties	1762	513	479	-1.9 %
Married	7751	1341	1385	+0.6 %
Divorced	302	57	87	+9.9 %
Widowed	1471	226	545	+21.7 %
Single	4619	959	837	-2.6 %
Women	7339	1349	1642	+4.0 %
Man	6804	1234	1212	-0.3 %
Illiterate	2752	812	899	+3.2 %
Compulsory educ.	6793	1319	1572	+3.7 %
Secondary educ.	3649	403	339	-1.7 %
College educ.	949	49	44	-0.5 %
Percentage of people in poverty	-	18.3	20.2	1.9 %

Considerable differences occur, for instance, at the geographical level. In particular, a relative increase in the incidence of deprivation among Northern and Central Italy inhabitants seems to be suggested by the distribution of functioning-equivalent incomes, revealing the complexity underlying regional gaps. Exposure to a significantly increased poverty risk also seems to characterise the feminine gender as well as divorced and/or widowed individuals, witnessing the existence of possible welfare effects for these categories that are not captured by one's consumption behaviour. Similarly, discrepancies are to be noticed for the not employed. While measures of destitution based on the quality of one's life in the form of shelter achievements hint at a reduced presence of both students, unemployed and housewives, poverty among the retired looks remarkably understated when assessed on the basis of the standard Engel scales.

In addition to comparing evidence for Italy on the role of different equivalence scales for the distribution of welfare, our data allow focusing on functioning-poverty only and contrasting its extent in the two European countries that we have been examining until now. Table 9 facilitates such exercise. Also in this case several comments can be inferred, starting from the observation of the relatively higher rate of occurrence of destitution among certain Mediterranean population sub-groups (i.e. unemployed, students, divorced or widowed individuals), which places an emphasis on the persistence of significant failures in terms of life quality within a country traditionally considered among the world's most developed ones. Furthermore, the table uncovers substantial shiftings in the configuration of the deprival's partition based on educational levels. While a significant increase occurs in the extent of functioning-deprivation among Italian people having no educational qualifications if compared to Belgium (probably as a result of the more limited spreading of illiteracy within the latter sample), a sizeable mitigation characterises the proportion of Southern educated individuals estimated to be in poverty. Also note the relatively less favourable conditions endured by the Central European housewives.

Table 9 – Functioning-poverty: Belgium vs. Italy

	Below the Poverty Line		
Proportion of functioning-poor in stated categories	*Belgium*	*Italy*	*Difference*
N. households	20.7 %	25.1 %	+4.4 %
Children (0-9)	16.1 %	18.2 %	+2.1 %
Adults	24.3 %	20.4 %	-3.9 %
Self-employed	11.3 %	16.1 %	+4.8 %
Employee	9.0 %	6.7 %	-2.3 %
Unemployed	28.4 %	41.9 %	+13.5 %
Retired	24.1 %	26.1 %	+2.0 %
Students	0.2 %	15.9 %	+15.7 %
Home duties	33.1 %	27.2 %	-5.9 %
Married	19.2 %	17.9 %	-1.3 %
Divorced	20.9 %	28.8 %	+7.9 %
Widowed	23.6 %	37.0 %	+13.4 %
Single	15.8 %	18.1 %	+2.3 %
Women	20.9 %	22.4 %	+1.5 %
Man	17.3 %	17.8 %	+0.5 %
Illiterate	20.2 %	32.7 %	+12.5 %
Compulsory educ.	32.9 %	23.1 %	-9.8 %
Secondary educ.	19.2 %	9.3 %	-9.9 %
College educ.	10.8 %	4.6 %	-6.2 %
Percentage of people in poverty	19.3 %	20.2 %	+0.9 %

Despite some dissimilarities in the extent to which some national sub-groups are hurted by functioning-deprivation, when taken altogether the overall patterns do not look

too disparate: given our discretionary poverty line, in fact, the share of the whole population expected to experience deprivation only raises by less than 1 percent (from 19.3 to 20.2) when moving from the Belgian to the Italian sample. Altogether, such results come as no surprise in the light of both our choice of two Euro-area (hence, inevitably similar) economies and our initial claims. No doubt that, if the latter are to be held true, having chosen a notion of well-being as achievement and given that the welfare definition on which the mainstream approach (i.e. our contender measure) relies takes no account whatsoever of qualitative life aspects, its corresponding set of poor does not precisely identify the set of functioning-poor agents. Clearly, this observation implies no tacit judgement: the objective of this section is neither to measure poverty nor to claim the supremacy of shelter quality as a yardstick for assessing it. This would take us far away from the scope of the present work.

Rather, the real question is establishing whether the functioning perspective yields a more accurate picture of well-being (or, at least, additional information on it), so to counterbalance its extra costs in terms of data requirements. As already stressed, one cannot fail to notice from Table 8 that some social categories perform in a notably different way when a functioning-based rather than a consumption-based approach is adopted. The incidence of deprivation among retired, widowed, students or divorced individuals, just to mention a few, significantly vary. Hence, we are led to a very similar conclusion to the one reached by Balestrino and Sciclone (2000) in the context of their investigation of the correlation linking income and functionings. Specifically, that despite the *prima facie* resemblance of the welfare distributions resulting from the application of the two considered scales to our sample's incomes, focusing on different notions does have a bearing on the identification of particular deprived categories, and this is likely to seriously affect any subsequent assessment in well-being analysis.

7 Conclusions

The growing awareness of the complex variety of factors likely to contribute to determining well-being in the more advanced societies threatens to severely lessen both the ethical appeal and the explanatory power of the traditional approaches. Albeit it probably would only be deceiving ourselves to think that one day every single element likely to directly or indirectly affect an individual's attainment of a state of well-being will be elucidated, to consider just the insufficiency of income or expenditures at the individual or household level means indeed subscribing to an extremely circumscribed account.

In this paper we have been trying to assess whether a well-being profile rooted in Sen's capability approach provides us with different insights than one based on economic welfare, using Belgian and Italian household survey data. In accomplishing such aim, we have been performing welfare comparisons across individuals with different demographic profiles using the instruments typically suggested by standard economic theory, i.e. equivalence scales, on account of their efficacy in summarizing the welfare information excerpted from the econometric regressions. In the absence of any consensus in the literature about the specific proxy on the basis of which welfare levels are to be compared and as - in principle - equivalisation can be applied to any kind of need that can be quantified in terms of an income gap, we have been exploring what Sen himself defined as the third line of approach "in giving practical shape to the foundational concern [...] as to how individual advantages are best judged and interpersonal comparisons most sensibly made" (Sen, 1999, p. 81). Precisely, feeling that there is a strong ethical case for not resorting to the utility concept when measuring well-being, we have been adjusting

individual income levels for differences in valuable states of life, so to make them equivalent in terms of functioning achievement.

The empirical implementation of the proposed procedure - relying on the comparison between the living standards of people exhibiting disparate needs at a given income level – allowed us to ascertain the feasibility of deriving such "functioning-equivalent incomes" while appraising the quantitative importance of the parametric variations affecting individuals' ability to convert available resources into actual doings and beings. At the same time, we could highlight the fact that both the demographic structure of people in poverty and the overall extent of deprivation look quite dissimilar depending on whether equivalence factors accounting for differences in functioning achievements across individuals or traditional consumption scales are used. This suggests, in turn, that if one is interested in capturing deprivation in basic functionings an expenditure indicator will not be sufficient or appropriate. It is important, we believe, to be aware of this. Reading across the various results presented in this paper leads to the conclusion that income as such cannot take us very far in evaluating achievements, mainly on account of the relative magnitude of the effects of some non-monetary factors as compared to household economic resources on the advantages enjoyed by different persons. Further, doubts were raised about income's effectiveness in redressing disparities across individuals within the current framework of analysis: the size of the computed scale factors as well as the mentioned relevance of elements exhibiting a non-pecuniary nature seem to clearly hint at the inappropriateness of the assumption that any dissimilarity among individuals may be efficiently dealt with by a suitable monetary compensation. This is meant to be, of course, no final judgment on the issue. Nevertheless, it happens to be fully in line with some existing works in the area, emphasising that cash transfers are unlikely to represent a useful vehicle of inequality reduction in a capability context (Balestrino, 1996 for instance).

For the time being, a final remark looks meaningful. Our attempt to explore an underexploited strategy for the practical use of the capability approach has suggested that resorting to the metric of income - appropriately adjusted - may provide essentially comparable information as the more commonly used "direct strategy" (namely, directly examining and comparing vectors of functionings). On top if it, the just pursued alternative may reveal rather effective in condensing information and conveying it in an immediately understandable way to the general public. Unfortunately and in addition to the mentioned danger of interpreting income as a functioning-inequality reduction instrument, this eases its implementation by no means: analogous needs for practical compromises arise and so do the various judgments required in order to get suitable measures of functionings (from the data issues or the underlying measurement hypotheses to the assumptions concerning the weighing structure, in case one aims at a joint analysis of the various dimensions of well-being).

Of course, the adopted approach is far from comprehensive and further refinements are certainly to be hoped. Still, we could hopefully prove that the experience acquired with equivalence scales in other areas of economics can be fruitfully and sensibly utilized within a quality of life-oriented context, while resulting in a reassessment of results on policy matters such as the incidence of poverty or the distribution of welfare.

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Appendix A - The analytical solution for equivalence scales computed from a quadratic uni-equational model

We follow Maltagliati (2000), with some slight adaptation to the current setting. Start from equation *(10)*

$$f_h^m = a + b\,\ln(Y_h) + l\,[\ln(Y_h)]^2 + h\,\ln(fs_h) + \sum_d g\,fs_{hd} + dz_h + e_h$$

Let the *h*-th household be composed by a couple and the reference household be the single adult one. The equations will thus respectively amount to

$$f_h^m = a + b\,\ln(Y_h) + l\,[\ln(Y_h)]^2 + h\,\ln(fs_h) + \sum_d g\,(fs_{hd}) + dz_h + e_h \qquad (A\text{-}1)$$

$$f_r^m = a + b\,\ln(Y_r) + l\,[\ln(Y_r)]^2 + h\,\ln(fs_r) + \sum_d g\,(fs_{rd}) + dz_r + e_r \qquad (A\text{-}2)$$

Assume the *z*-vectors coincide and neglect the disturbances. In order to impose equality of functionings' levels, subtract the second equation from the first one

$$0 = 0 + b\,[\ln(Y_h) - \ln(Y_r)] + l\,\{[\ln(Y_h)]^2 - [\ln(Y_r)]^2\} + h\,\ln\left(\frac{fs_h}{fs_r}\right) + g\,(\sum_d fs_{hd} - \sum_d fs_{rd}) \qquad (A\text{-}3)$$

Setting $a_h = [\ln(Y_h) - \ln(Y_r)]$, we get $\ln(Y_h) = a_h + \ln(Y_r)$ from which one can rewrite *(A-3)* as

$$0 = b a_h + l\,\{[a_h + \ln(Y_r)]^2 - [\ln(Y_r)]^2\} + h\,\ln\left(\frac{fs_h}{fs_r}\right) + g\,(\sum_d fs_{hd} - \sum_d fs_{rd})$$

Solving the quadratic expression one obtains

$$l\,(a_h)^2 + [2\,l\,\ln(Y_r) + b]\,a_h + h\,\ln\left(\frac{fs_h}{fs_r}\right) + g\,(\sum_d fs_{hd} - \sum_d fs_{rd})$$

from which two values for *a* can be computed

$$a_h = \frac{-(2\,l\,\ln(Y_r) + b) \pm \sqrt{(2\,l\,\ln(Y_r) + b)^2 - 4\,l\left(h\,\ln\left(\frac{fs_h}{fs_r}\right) + g\left(\sum_d fs_{hd} - \sum_d fs_{rd}\right)\right)}}{2\,l} \qquad (A\text{-}4)$$

Finally, the equivalence scale is

$$m_h = \exp(a_h)$$

The main advantage of this procedure seems to lie in the fact that the study of the parameters of expression *(A-4)* can immediately show whether the scale is increasing (? positive) or decreasing (? negative) with the growth of ln*(Y)*. However, only the solution obtained from the use of the minus sign is claimed to be actually available. For a thorough justification we refer to Maltagliati (2000).

Appendix B – The indicators of basic functionings

Table B.1 - Italy

Functioning's components	Type of indicator	Description of the indicator
Health		
Health status	Categorical (5 modalities)	Self-assessed health status
Chronic illness	Dichotomous	Presence of chronic illness
Disability	Dichotomous	Presence of disabilities
Shelter		
Dwelling's rating	Categorical (6 modalities)	Quality of the dwelling itself
Location's rating	Categorical (4 modalities)	Quality of the neighbourhood

Table B.1 – Italy (continued)		
Heating	Dichotomous	Heating's availability
Floor area	Continuous	Total floor area in square meters
Job satisfaction		
Working environment	Categorical (5 modalities)	Assessment about physical and social envir.
Dangerousness	Categorical (5 modalities)	Assessment about dangerousness for life and health
Demandingness	Categorical (5 modalities)	Assessment about effort required
Interestingness	Categorical (5 modalities)	Assessment about job's interestingness
Social status	Categorical (5 modalities)	Assessment about consideration by others
Job insecurity	Categorical (5 modalities)	Assessment about the probability of losing one's job

Drawing a comparison with B&DA characterisation of functionings, one can easily remark that in the absence of additional (and less subjective) information we stick to their portrayal of the health functioning and emulate their study also in appraising shelter conditions. At variance with B&DA, who also inquire into the reasons underlying the choice not to work and the feelings associated to one's possible unemployment experience, labour conditions are instead exclusively portrayed in terms of job satisfaction.

Table B.2 - Belgium		
Functioning's components	Type of indicator	Description of the indicator
Health		
Health status	Categorical (5 mod.)	Self-assessed health status
Chronic illness	Dichotomous	Presence of chronic illness or disability
Recent illness	Dichotomous	Interruption of activities due to recent illness or accident
Hospital	Dichotomous	Hospitalised during last year
Generalist	Continuous	N. of visits to a generalist in last year
Specialist	Continuous	N. of visits to a specialist in last year
Alternative medicine	Continuous	N. of visits to an homeopath, an osteologist, etc. in last year
Shelter		
Crowding index	Continuous	N. of rooms
Heating	Dichotomous	Heating availability
Housing satisfaction	Categorical (6 mod.)	Degree of satisfaction about one's housing
Dwelling's problems	Summated scale	Presence of structural problems in the house[41]
Area's problems	Summated scale	Presence of problems due to the location[42]
Working conditions		
Work certitude	Categorical (6 mod.)	Degree of satisfaction about the certitude of one's work
Work type	Categorical (6 mod.)	Degree of satisfaction about one's type of activity
Number of hours	Categorical (6 mod.)	Degree of satisfaction about the number of hours spent at work
Work schedule	Categorical (6 mod.)	Degree of satisfaction about one's schedule
Working environment	Categorical (6 mod.)	Degree of satisfaction about one's working conditions and environment
Work distance	Categorical (6 mod.)	Degree of satisfaction about the distance of one's workplace from home
Job search	Dichotomous	Currently looking for an alternative job
Overqualified	Dichotomous	Feeling overqualified for the current job

[41] The indicators whose summated rating has been considered are: insufficient space; lack of brightness; heating problems; mould or humidity; damaged roof; cracks in the walls; damaged coatings.

[42] The indicators whose summated rating has been considered are: noise from neighbours; noise from outside (street, factories, etc.); environmental pollution; criminality in the area; bad acoustic insulation; slum district; lack of privacy with respect to neighbours.

Appendix C – Variable means

Table C.1 – Variable means for the Italian sample

Variables	*Sample means (n=23900)*	*Variables*	*Sample means (n=23900)*
Male	0.49	Illiterate	0.16
Female	0.51	Compulsory education	0.53
Age 0-10	0.10	Secondary school	0.25
Age 11-20	0.13	University and over	0.06
Age 21-30	0.16		
Age 31-40	0.14	Employee	0.28
Age 41-50	0.14	Self-employed	0.09
Age 51-60	0.13	Unemployed	0.08
Age 61-70	0.11	Retirement	0.23
Age 71-80	0.06	Studies	0.19
Age 80+	0.03	Home duties	0.13
Married	0.51	Agriculture	0.09
Divorced	0.02	Manufacturing	0.35
Widowed	0.07	Services	0.56
Single	0.40		
North West	0.21	Ownership	0.65
North East	0.20	Usufruct	0.09
Centre	0.20	Rental	0.26
South	0.28	Household size	3
Islands	0.11		
		Mean household income	24710 Euro
Urban location	0.89	1st decile (% mean)	0.12
Rural location	0.11	9th decile (% mean)	1.75

Table C.2 – Variable means for the Belgian sample

Variables	*Sample means (n=7021)*	*Variables*	*Sample means (n=7021)*
Male	0.47	Illiterate	0.01
Female	0.53	Compulsory education	0.39
		Secondary school	0.51
Age 16-25	0.14	University and over	0.09
Age 26-35	0.18		
Age 36-45	0.23	Employee	0.45
Age 46-55	0.16	Self-employed	0.07
Age 56-65	0.11	Unemployed	0.06
Age 66-70	0.06	Retirement	0.21
Age 71-75	0.05	Studies	0.09
Age 75+	0.07	Home duties	0.12
Married	0.60	Ownership	0.74
Divorced	0.08	Usufruct	0.03
Widowed	0.08	Rental	0.23
Single	0.24		
		Household size	3
Flanders	0.56	Mean household income	28148 Euro
Brussels	0.09	1st decile (% mean)	0.32
Wallonia	0.35	9th decile (% mean)	1.75

Household income: unadjusted household disposable income in Euro.

Appendix D – Parameter estimates from the quadratic model

Table D.1 - Belgium

Variables	*Health*		*Shelter*		*Job Satisfaction*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Intercept	-0.049 **	(0.156)	-0.018 **	(0.151)	-0.091 **	(0.269)
Ln (Y)	-0.013	(0.042)	0.218 ***	(0.038)	0.091	(0.074)
[Ln(Y)]²	-0.002	(0.011)	0.041 ***	(0.009)	0.028 *	(0.015)
Ln (fs)	0.140	(0.088)	-0.316 ***	(0.078)	0.323 **	(0.144)
Age 16-20	0.273 **	(0.129)	-0.214 *	(0.112)	-0.465	(0.316)
Age 21-50	0.153 **	(0.064)	-0.290 ***	(0.053)	-0.526 ***	(0.095)
Age over 70	-0.529 ***	(0.113)	0.228 ***	(0.072)	1.409 **	(0.065)
N. children aged 0-4	-0.015	(0.047)	-0.014	(0.044)	-0.086	(0.070)
N. children aged 5-9	0.111 ***	(0.036)	0.018	(0.037)	-0.119 **	(0.060)
N. children aged 10-14	-0.018	(0.042)	0.039	(0.040)	-0.031	(0.065)
N. children aged 15-20	-0.024	(0.022)	-0.029	(0.021)	-0.029	(0.035)
N. adul ts	0.059	(0.037)	0.077 **	(0.032)	-0.118 *	(0.060)
Female	-0.143 ***	(0.038)	0.051	(0.032)	0.148 ***	(0.057)
Married	-0.193 ***	(0.057)	0.227 ***	(0.053)	-0.033	(0.083)
Divorced	-0.175 **	(0.082)	-0.128	(0.082)	0.046	(0.119)
Widowed	-0.270 **	(0.114)	0.229 ***	(0.084)	0.337	(0.318)
Brussels	0.079	(0.062)	-0.241 ***	(0.068)	0.048	(0.105)
Flanders	0.118 ***	(0.040)	0.058 *	(0.033)	0.452 ***	(0.066)
Compulsory educ.	-0.296 ***	(0.104)	-0.090	(0.093)	0.309	(0.213)
Secondary school	0.036	(0.086)	0.049	(0.084)	0.205	(0.156)
University	0.234 ***	(0.087)	0.124	(0.085)	0.214	(0.155)
Self-employed	0.265 ***	(0.051)	0.075	(0.059)	0.269 ***	(0.084)
Student	0.040	(0.091)	0.166 **	(0.080)	-	-
Unemployed	-0.318 ***	(0.079)	-0.170 **	(0.080)	-	-
Retired	-0.446 ***	(0.083)	-0.064	(0.062)	-	-
Home duties	-0.214 ***	(0.077)	-0.110	(0.069)	-	-
Ownership	0.047	(0.107)	0.528 ***	(0.107)	-0.011	(0.190)
Rental	-0.107	(0.112)	-0.536 ***	(0.114)	-0.063	(0.193)
Adj. R-squared	0.180		0.181		0.041	
Sample size	6555		6509		3386	

Table D.1 - Italy

Variables	*Health*		*Shelter*		*Job Satisfaction*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Intercept	-1.325 ***	(0.183)	-2.427 ***	(0.168)	-0.711 *	(0.407)
Ln (Y)	0.218	(0.103)	0.278 ***	(0.096)	-0.503 **	(0.218)
[Ln(Y)]²	-0.015	(0.016)	0.081 ***	(0.015)	0.123 ***	(0.034)
Ln (fs)	0.012	(0.073)	-0.184 ***	(0.068)	-0.107	(0.158)
Age 10-14	0.861 ***	(0.135)	-0.835 **	(0.329)	-	-
Age 15-20	0.637 ***	(0.064)	0.092	(0.082)	-0.004	(0.168)
Age 21-50	0.410 ***	(0.034)	-0.026	(0.031)	-0.085	(0.063)
Age over 70	-0.600 ***	(0.064)	-0.112 **	(0.049)	0.307	(0.347)
N. children aged 0-4	0.126 ***	(0.030)	0.066 **	(0.033)	0.008	(0.072)
N. children aged 5-9	0.064 **	(0.031)	0.079 **	(0.032)	0.078	(0.067)
N. children aged 10-14	-0.010	(0.029)	0.100 ***	(0.030)	0.025	(0.066)
N. children aged 15-20	0.001	(0.027)	0.034	(0.027)	0.052	(0.057)
N. adults	0.039	(0.024)	-0.017	(0.023)	0.006	(0.054)
Female	-0.004	(0.021)	0.024	(0.019)	-0.121 ***	(0.047)
Married	-0.134 ***	(0.028)	0.306 ***	(0.030)	0.072	(0.063)
Divorced	-0.228 ***	(0.069)	0.240 ***	(0.069)	0.006	(0.124)
Widowed	-0.177 ***	(0.068)	0.266 ***	(0.053)	0.242 **	(0.111)
North West	0.217 ***	(0.031)	-0.132 ***	(0.026)	-0.080	(0.065)
North East	0.087 ***	(0.032)	0.165 ***	(0.028)	0.198 ***	(0.065)
South	0.007	(0.034)	-0.208 ***	(0.031)	-0.127 *	(0.069)

Table D.1 – Italy (continued)

Variables	*Health*		*Shelter*		*Job Satisfaction*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Islands	0.058	(0.043)	-0.418 ***	(0.041)	0.268 ***	(0.087)
Compulsory educ.	0.454 ***	(0.064)	0.441 ***	(0.047)	0.336 *	(0.177)
Secondary school	0.603 ***	(0.067)	0.791 ***	(0.052)	0.570 ***	(0.181)
University	0.592 ***	(0.073)	0.944 ***	(0.061)	0.834 ***	(0.191)
Self-employed	0.058 **	(0.025)	0.310 ***	(0.029)	0.355 ***	(0.052)
Student	0.150	(0.245)	0.813	(0.611)	-	-
Unemployed	-0.082 *	(0.049)	0.045	(0.050)	-	-
Retired	-0.463 ***	(0.042)	0.088 **	(0.034)	-	-
Home duties	-0.155 *	(0.088)	-0.079	(0.081)	-	-
Manufacturing	0.118 **	(0.051)	0.165 ***	(0.040)	0.130	(0.110)
Services	0.110 **	(0.050)	0.212 ***	(0.040)	0.439 ***	(0.107)
Ownership	-0.004	(0.040)	0.191 ***	(0.036)	0.196 **	(0.078)
Rental	-0.018	(0.043)	-0.372 ***	(0.040)	0.204 **	(0.086)
Urban	0.001	(0.035)	0.029	(0.034)	0.039	(0.072)
Adj. R-squared	0.264		0.359		0.084	
Sample size	12838		12797		3895	

Tests of equality of coefficients revealed a lack of statistical significance for marital differences among the Belgians (for both health and shelter), age classes 16-20 and 21-50 (for both health and shelter) as well as the labour market states "unemployed" and "home duties" (for shelter). As for the Italian sample, in addition to marital status (for both shelter and health), no apparent statistically significant differences happen to exist concerning the occupational sector (for health), housing tenure and geographical location (for job satisfaction).

Appendix E – Parameter estimates of the Engel curve

Variables	*Coeff.*	*Std. Err.*
Intercept	0.643 ***	0.013
Ln (per capita expenditure)	-0.132 ***	0.004
Ln (fs)	-0.023 ***	0.005
Ratio children aged 0-4	-0.093 ***	0.017
Ratio children aged 5-9	-0.046 ***	0.018
Ratio children aged 10-14	-0.017	0.016
Ratio children aged 15-20	0.015	0.014
Ratio adults under 70	-0.012 **	0.006
Female	-0.005	0.004
Married	-0.001	0.004
Divorced	-0.019 **	0.008
Widowed	0.013	0.006
North West	0.003	0.005
North East	-0.001	0.005
South	0.004	0.005
Islands	0.004	0.006
Compulsory educ.	-0.001	0.005
Secondary school	0.002	0.006
University	0.015	0.008
Self-employed	0.002	0.005
Unemployed	-0.003	0.009
Retired	0.026 ***	0.004
Student	0.003	0.032
Home duties	0.030 ***	0.007
Manufacturing	0.009	0.006
Services	0.007	0.006
Ownership	0.001	0.005
Rental	0.001	0.006
Urban	0.025 ***	0.005
Adj. R-squared	0.178	
Sample size	8098	

The estimation has been performed at the household level, thus demographics refer to the family head. An extension of the Working-Leser equation that incorporates a vector of characteristics was adopted. Standard tests of equality of coefficients were employed, rejecting the statistical equality of coefficients. Tha variables “Ratio children” and “Ratio adults” denote the ratio of the number of children or adults belonging to the indicated age class to total household size.