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Housing needs in an absolute poverty framework:
The case of Greece

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Abstract

The purpose of the present work is to present the basket of use values related to the satisfaction of the necessary domicile and the housing relating needs of households located in the Metropolitan Athens area. The main methodological vehicle is the full enumeration of needs related to housing and the calculation of the corresponding costs. These needs are described through field research conducted mainly through open interviews and are explicitly priced in detail using data collected via sampling, and are grouped in categories such as rent, taxes, and utilities. In this manner it is possible to derive actual costs and move towards a definition of a poverty line based on actual income and not relative to the overall income distribution. The research on accommodation expenses is part of a larger research effort to study absolute poverty from a radical perspective, thus overcoming the limits of the existing measuring methods. This larger research aims mainly at the construction of a basket of use-values, which satisfy contemporarily and socially defined needs. Within that perspective, expenses for housing constitute an important portion of needs and thus are a critical element for the estimation of the poverty line. Additionally, this line of research could be taken under consideration by the people who are involved in the design of housing policy.

1.   Introduction

In the research on poverty, there are two major issues to tackle. The first refers to the identification of the poor which, in turn, assumes a definition of poverty and the criteria that lead to the formation of a poverty line or threshold; while the second is related to the aggregation of the poor, so that the rate of poverty may accrue as a crude measure of the extent of the phenomenon (Sen, 1976; Hagenaars and de Vos, 1988). According to Hagenaars and de Vos (1988), all definitions that would solve the first problem can collapse in the following three:

"A. Poverty is having less than an objectively defined, absolute minimum.

B. Poverty is having less than others in society.

C. Poverty is feeling you do not have enough to get along" (p. 212).

Presumably, the aggregation problem should demand for a definition, yet a bypass was found through the approach of relative poverty that is represented mainly by B above, although C may lead to the same results. It has been argued that definitions which fall under group B are not relevant with poverty, but with inequality (Labrinidis et al., 2010).

This paper fits comfortably in the first group of definitions. In constructing and calculating the absolute poverty threshold, the concept of need is used as the core defining element of the situation of the "absolute minimum". More specifically, taking into account the relevant literature, we follow the approach of creating a detailed standard budget[5] for Greece. The latter represents the minimum disposable monetary income necessary to cover the "basic" needs[6] of a person or household in contemporary Greek society. A standard budget is constructed from a detailed list of specific goods and services and their prices. These goods and services, in certain quantities, satisfy adequately the needs of a person or household at a certain level – hence, at the poverty level as well.

Thus, the crucial issue in the proper construction of the basket which, when priced, will give the poverty threshold, relates to the selection or determination of the specific use values, and their quantities, so that the normal physical and social reproduction of the members of a household is achieved. Obviously, both the particular vector of use values selected, and their volume, are related to the social position of the subject(s) in question, that is, the way they are integrated in the overall social framework. In a capitalist economy the vast majority of the population and especially the social strata

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[5] See Fisher (2007) for a discussion of the concept and the recent renewal of interest for it, in the literature.
[6] Renwick and Bergmann (1993) call this approach the "basic needs budget", where basic is understood in a broader sense, encompassing not only the "traditional" need categories of shelter, food, clothing and footwear; but also those of health care, education, transportation, personal care and most importantly child care. In this study we follow a similar approach in defining the range and extent of "basic needs".

most susceptible to the risk of poverty, belong to the working class[7] broadly defined, namely those who have to sell their labour power successfully and systematically to ensure their continuous reproduction. Therefore, the reproduction of human beings is not discussed in the abstract; instead the focus is on the reproduction of persons with a specified position, having to perform specific activities within the framework of capitalist relations of production. It is no accident that the poverty level as defined here[8] – subsistence level plus a "social element" determined by concrete socioeconomic, geographical and cultural factors – corresponds to a fraction of the value of labour power as defined by Marx (1976). The latter corresponds to the subsistence level plus a "moral and historical element" which depends upon the history of the formation of the working class, the degree of unionization of workers, their access to means of production, etc. Moreover, it could be argued that the absolute poverty threshold not only is determined by similar, if not identical, factors as the value of labour power at a certain point in time, but also that the two measures are closely correlated as far as their movement over time is concerned.

The specific objective of the present paper is to contribute to the estimation of the part of the poverty threshold which corresponds to the need category of housing, accompanied by the satisfaction of the need for utilities (i.e. electricity, heat, water and sewage), and fees and taxes for local government that relate directly to housing, and television[9]. In order to achieve this objective, the basket of use values that satisfy the need for shelter is defined and its constituent parts are priced, leading to the calculation of costs related to housing, as a function of household size, location within the Metropolitan Athens area and homeownership status.

Labour force surveys and patterns of actual household spending cannot be used in this context, since they involve an element of "circular reasoning": a poor family earns a relatively small amount of money and calibrates its needs to the income. But in doing so, it undermines its ability to reproduce its labour power, thus entering a downward spiral into pauperization. For example, by using inadequate heat in the winter, the primary wage earner could become chronically ill and unable to work. A more appropriate method is to define the basic needs of the reproduction of the labour power related to housing, with the help of expert opinion and existing cost structure. Qualitative open personal interviews with specialists, professionals or academics that have a special involvement with the matter at hand, as a whole or with parts of it, were used for delineating the minimum necessary use values.

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[7] Dafermos and Papatheodorou (2010) show that unemployment is negatively correlated with poverty, meaning that a fall in unemployment seems to raise the rate of poverty. To explain this finding, they argue that this (fall) rise in (un)employment was accompanied by a general fall in wages and the rise of part-time employment schemes.

[8] See Labrinidis et al. (2010) for a full exposition of the theoretical and methodological approach.

[9] That is a Greek peculiarity, where the public television system (ERT) is mainly supported by a universal tax levied and collected through the electricity bills.

After all, the "acknowledgment of a basic human need does not necessarily lead to measures that insure the fulfillment of that need" (Zetterbaum, 1977). Additionally, the research is informed by the related literature on housing need[10]. The cost data are derived through market surveys, once the necessary goods in quality and quantity are defined.

The structure of the paper is as follows. The next section and its subsections treat the issue of the housing need, initially defining the necessary domicile for the given social and historical framework. It then proceeds in measuring the cost for renting such a domicile, leaving aside the cost of ownership, in the first subsection. The second subsection treats Taxes and Fees related to residence and apply to tenants, as well as to owners. The third subsection deals with building maintenance & Condo fees, the fourth with water & swage charges, the fifth with electricity charges, the sixth with heating charges and the seventh with the cost of durables. Finally, the last section presents the concluding remarks and some comparisons with other methods used to define the poverty threshold. These comparisons are both illuminating the poverty issue and validating the proposed method herein.

2. Housing need in Greece

In the heart of the problem lies the notion of the necessary conditions of housing, for a given size of household. The necessary domicile comprises the building as such, that is, the size in m^2, the floor, the layout of rooms, the age and the quality of the construction, and the location of the building.

The latter refers to the environmental conditions and to the access to means of transport, schools, hospitals, parks and entertainment places, as well as shopping areas. Furthermore, the location represents particular socioeconomic characteristics. Given the family structure in Greece and the severe limitations of the social services, it is not axiomatic that "poor" households live only in low income areas. On the contrary, families will stay close to relatives and in neighbourhoods where they have friends and relatives, even when such a decision means higher housing related expenses. This could be a sound economic – over and above being correct from a social and psychological point of view – decision, since the support received from relatives and friends would have to be "purchased" from the private market otherwise. An example would be day care: living close to parents, a young couple could rely on them for day care. Living away they may have to pay for it. Then the savings on rent could be more than offset by the day care cost. It should be noted that the present work focuses on renters. It is the intention of the research team to expand the work to home owners as well.

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[10] For a good account of the literature see Bramley et al (2010).

A series of assumptions are considered necessary. First, it is assumed that households follow an average age structure and their members are strongly related (family or other strong bonds) so that they can use all common rooms without any sense of lack of private space. Furthermore, the domiciles that are offered for rent reflect the level of productive forces in housing and, therefore, the "available resources" (Bramley et al, 2010, p.29)[11]. Provided that the sample is big enough, it is argued that it will comprise all kinds of shelters: new, old, with better or worse layout, closer or further away from one of the few parks of Athens, etc. Finally, it is assumed that all differences in floor, quality of construction and location, with all their pros and cons will be expressed in the market and will be reflected in the market prices[12]. Consequently, it is assumed that rents reflect generally the qualitative differences between domiciles in the same location, or between similar domiciles in different locations. Additionally, it is assumed that supply is inelastic enough to take the supply price as the final price in which the house will be rented.

Size is thus risen to prominence as a key variable. Nevertheless, we were not able to find any study that would inform our quest with the minimum square meters for the reproduction of a given household. The best approximation could be based on the bible of the architects, the work of Neufert (2000), but it doesn't tackle social dimensions of housing. The method of interviews was chosen to tackle this essential issue.

The interviews were conducted with the use of discussion or topic guides which were formed by a framework of mostly open questions[13]. These are actually focused interviews (Merton and Kendall, 1946) and their process is generally more rigid than the process of an interview with free questions, since the choice of the interviewed persons and the object of the research is determinate (Merton, 1946). The configuration of the discussion guide, from the framework up to wording, was informed by Payne (1951), Labaw (1980), Bailey (1994), Gentall (1998) and Kyriazi (1999). The interviews were conducted in Athens, in the period from May to September 2009. The interviewees were experts, architects, civil engineers, urban designers, constructors and builders, academics and people involved in the real estate market, individuals and public servants in the Organisation of Labour Housing[14].

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[11] "Needs [...] will in practice have to be weighed against available resources" (Bramley et al, 2010, p.29). Also Foster argues that "[p]overty measurement is based on a comparison of resources to needs" (1998, p.335).

[12] In a neo-classical framework this assumption is not worth quoting. More research is needed on how house prices are actually formed, taking into consideration financialisation and ground rent.

[13] For a discussion about research conducted through interviews see Tatsis (1997) and Filias (2003).

[14] Interviews are available upon request.

From the interviews it was established that there is no theoretical response referring to any of the above dimensions of housing, and especially in reference to size. Nevertheless, these interviews led to a very useful conclusion: it might be very difficult to argue with solid and consistent academic references for the features of the necessary domicile, for a given size of household, but all the respondents converged to a set of features which therefore were considered as objective. Consecutively the following correspondence was used: a single-member household needs at least $25m^2$. Each additional member requires an additional $20m^2$.

These data can be compared with quality standards for living conditions, particularly the overcrowding concept, as defined by EUROSTAT[15]: A person is considered to live in an "overcrowded" household if the household does not have a minimum number of rooms equal to:

- one room for the household
- one room per couple at home
- one room for each person aged 18 years and over
- one room for two persons of the same sex between 12 and 17 years old.
- one room for every single person between 12 and 17 years of age are not included in previous category
- one room every two children under 12 years of age.

The above restrictions do not specify the size (area) of the room. Though there exists a sizable bibliography on housing, the particulars of apartment size have not been investigated and indeed they vary from country to country. Recent work by the Royal Institute of British Architects (2011) gives some numbers which are close (and in some instances over) the numbers used in the present study. Relevant figures in a more general context, can also be found in a study of the Ministry of Infrastructure of the Italian Republic (Federcasa, 2006). There, apartment "useful area" is defined as the interior area of all rooms (not counted as walls, storage rooms, lofts and common areas of apartment buildings). According to the above study, the average area per person ranges from $22.9m^2$ in Poland to $52.4m^2$ in Denmark. In Greece, the corresponding measure is $30.6m^2$ per person. The study makes no reference to standard deviation, but the addition of $20m^2$ for each additional person, as suggested by experts, is a fairly conservative approach, more so since the stated area of an apartment in Greece includes the walls. It is therefore possible to assign the following (in parentheses the mean values used in this study): single member household: 30 (25) m^2, two-member household: 50 (45) m^2, three-member household: 70 (65) m^2, four-member household: 1 +1 +1 +1 rooms: 90 (85) m^2. If it is a

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[15] http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Overcrowding_rate

household with 2 children under 12 years old, or children of the same sex under 18, the limit is 3 rooms, i.e. 70 m^2. Finally for five-member household: 1 +1 +1 +1 +1 rooms: 110 (105) m^2. If it is a household with 3 children under 18 years, the limit is 4 rooms, i.e. 90 m^2.

Since the above mentioned limits refer to degraded living conditions (and thus correspond to the lowest acceptable area), they are fully compatible with the assumptions of this study. Differences observed in four-and five-member households are a function of household composition by age and sex. The age restrictions though should be considered in the light of a pragmatic approach: mobility regarding housing in Greece is limited. Even households that rent do not move frequently. So they choose a home based on the future prospects of the household as well. Thus, even though two children can share room, it is possible to choose a residence based on the logic that in the near future it will not be possible (or should not) for the children to share rooms. Furthermore it should be noted that no reference is made in the EUROSTAT definition about ancillary areas such as kitchen and bathroom(s). Table 1 below contains the size standards used, as discussed above.

Household Size	1	2	3	4	5
Target house area	25	45	65	85	105
Range	15 - 35	36 - 55	56 – 75	76 - 95	96 - 115

Table 1 Apartment mean area and range (in m^2), by household size.

The municipalities which comprise the 73 areas of the study were divided into three regions, based on socioeconomic criteria. Region 1 is populated by working class and low income families. These municipalities are Western Athens Area, Piraeus and its suburbs and some municipalities in the periphery of Athens. Region 2 is populated by middle and higher income households. It includes Southern and Eastern Athens area, the Northern suburbs and the rest of Attiki. Finally, the city of Athens is Region 3 because of its special characteristics, i.e. older housing stock, almost exclusively apartment buildings, typology of people who prefer to live in the center of the city, and high variability of household income.

2.1. Rent

The apartments used to calculate the average rent, were selected via stratified random sampling from the ads in the classified advertisement newspaper "Chrysi Efkairia"[16]. The ads sampled were limited to apartments. The strata were household size (one through five members) and the regions defined in the previous paragraph. Within each stratum a simple random sample was selected with size

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[16] http://www.xe.gr/

proportional to the stratum size. An attempt was made to distribute the sample proportionally to the municipalities which comprised each stratum. In the resulting sample, its proportionality within each stratum was marginally violated, thus the sample did not need weighting[17].

It should be noted that households with more than 5 members account for about 2.2% of the total, and have not been included in the sampling process and the subsequent analysis. The cumulative percent of households with up to four members is over 92%, with the city of Athens reaching 95%. Households with 2 and 3 members are uniformly distributed across the three regions. On the other hand households with 1, 4 or 5 members do have significant differences in distribution across regions: the city of Athens has a far larger percentage of single member households, and a far smaller percentage of households with 4 or 5 members.

Comparing the mean apartment area in the sample with the target value, there exists no real deviation in all household sizes but the single member household. A possible explanation is that the stock of offered apartments is skewed towards larger apartments in this category. Thus, market conditions force single people to rent apartments with a larger area than what they actually need.

It should also be noted that an implicit assumption of the calculations that follow, is that the distribution of renters (with respect to household size) is the same as the stock of apartments offered.

The mean rent increases with household size, from 275€(single member household), to 607€(5 member household). It should be noted that the price per m2 drops sharply from 9.93€corresponding to a mean size of 25 m^2, to 5.83€corresponding to a mean size of 135 m^2. Finally the mean apartment size for the full sample is 59 m^2, the mean rent is 399€and the mean price per m^2 is 7.39 €

Table 2 summarizes the information presented in the previous paragraphs, broken down by region for comparison purposes.

Household Size	1	2	3	4	5	Total
Region1: Low						
Count	478	628	541	539	135	2321
Mean area (in m^2)	30	48	67	85	103	61
Mean rent (in €)	243	310	386	456	498	359
€/ m^2	8.21	6.48	5.82	5.37	4.82	6.33
Region2: middle to high						
Count	279	402	355	343	81	1460
Mean area (in m^2)	30	48	67	86	105	61
Mean rent (in €)	299	411	510	609	765	480
€/ m2	10.23	8.63	7.63	7.10	7.27	8.26

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[17] The tabulations and statistical analyses gave the same results both in the weighted and unweighted samples.

Region3: Athens						
Count	394	355	237	187	46	1219
Mean area (in m^2)	25	48	64	83	104	51
Mean rent	297	335	400	546	648	380
€/ m2	11.81	7.17	6.26	6.56	6.25	8.36
All Regions						
Count	1151	1385	1133	1069	262	5000
% in the sample	23.02%	27.70%	22.66%	21.38%	5.24%	100,00%
Mean area (in m^2)	28	48	66	85	104	59
Mean rent (in €)	275	346	428	521	607	399
€/ m2	9.93	7.28	6.48	6.13	5.83	7.39

Table 2 Count of apartments in the sample, mean area, rent and price per m^2, by household size and region.

Figure 1 below, presents the mean rent by region and household size. Region 2 has clearly higher mean rent from the other two, especially in the larger households.
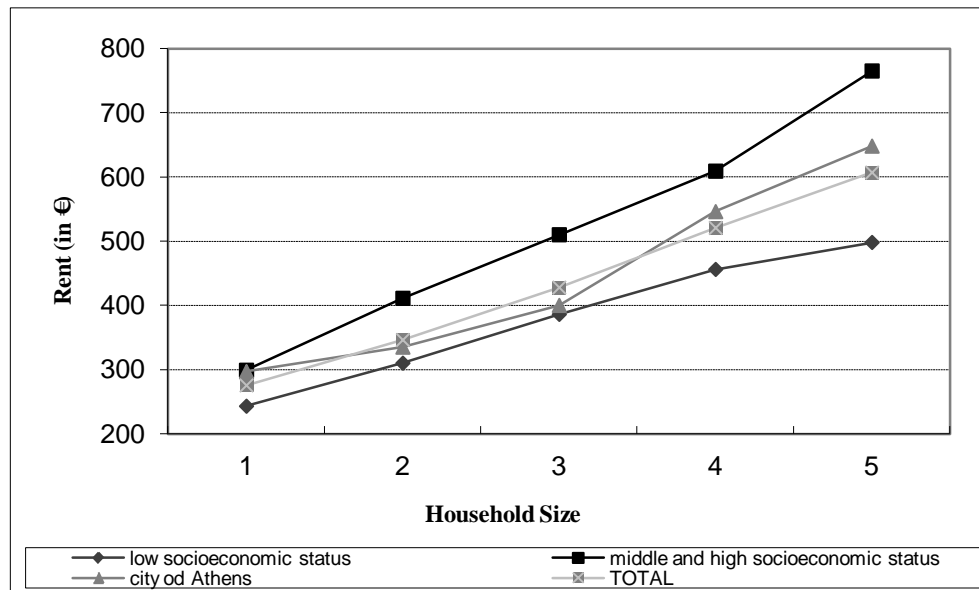

Figure 1 Mean rent, by household and region.

The differences in mean (median) rent were compared across the three regions for each household size separately, using the non parametric Kruskal – Wallis ANOVA. The choice of the non parametric method was dictated by the distribution type of the data which did not match the normal distribution (a fundamental prerequisite for the use of standard ANOVA techniques). No statistically significant differences were observed in two cases: single-member households between mid-high socioeconomic region and the city of Athens and 3-member households between low socioeconomic region and the city of Athens. In all other comparisons the differences were statistically significant at the 0.01 level.

Prices are particularly higher in the region of middle-to-high socioeconomic status. In general, there exists a price increase from the lower socioeconomic status, through the city of Athens, to the middle-to-high socioeconomic status. This observation is also reflected in the price per meter squared, since there are no differences if apartment size between the three classes.

2.2. Taxes and fees related to residence

There are two types of expenses related to residence. One is a monthly charge for the Hellenic Radio & Television (HeRT). The others are three forms of real estate tax levied by the municipal authorities. All charges are added to the electricity bills.

2.2.1. HeRT charge

The Public Electricity Company pays HeRT 50.88€ per year, for each electricity meter installed, which in turn collects from the power consumer. The charge is flat and does not depend on the size of the residence, the household or the electricity consumption. The monthly cost for each household is 4.24€

2.2.2. Real Estate taxes

These are consisted of the Municipal Fee (MF), the Municipal Tax (MT) and the Real Estate Fee (REF). The first two are set by each municipality per m^2, using different rates for residences and commercial properties. The last one is set by the government. There is no database containing the MFs and MTs, so we had to collect them through fieldwork.

To calculate the municipal charges, the sum of taxes and fees was multiplied by the area of each apartment. The resulting cost was divided by twelve in order to get the monthly figure.

REF is calculated using the following formula:

REF= (apartment area in m^2) X (zone price[18]) X (coefficient of "age"[19]) X (REF coefficient)

It is impossible to calculate REF for the sampled apartments, since the age of each apartment is unknown. Thus an approximate measure was used, based on prior studies, which assigned an average REF of 20€ for an apartment of 45 m^2 per year[20]. This value was adjusted for the known sizes of the

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[18] The zone price is a function of the location of the building and it is higher in areas were the market value of a building is higher. As a result the actual REF would be higher in the middle to high region than in the low region or Athens.
[19] This coefficient is based on how old the building is, the older the lower the rate.
[20] It is difficult, but doable, to refine further this estimation by adjusting for the socioeconomic region.

apartments. It should be noted that, though there are differences between regions in the tax rates, these differences are not big, so it is possible to work with overall averages over regions.

Table 3 presents the total of monthly charges related to real estate in the electricity bill by household size and in total:

Household Size	1	2	3	4	5	Total
Municipal fees and taxes	9.78	12.92	16.42	19.75	23.25	16.42

Table 3 Total monthly municipal fees and taxes, and real estate tax (in €).

As it can be seen from Table 3, there is a clear rise in the cost, as the household size increases, since the area of the apartment increases.

Putting together the monthly cost of housing including rent and charges, we get the following table:

Socioeconomic Region	Household Size					
	1	2	3	4	5	Total
Low	252.78	322.92	402.42	475.75	521.25	375.42
Middle to high	308.78	423.92	526.42	628.75	788.25	496.42
Athens	306.78	347.92	416.42	565.75	671.25	396.42
Total	284.78	358.92	444.42	540.75	630.25	415.42

Table 4 Monthly cost of housing including rent and charges (in €).

The total monthly cost of housing makes up a significant part of the monthly expenses of any given household. The amount of 540.75€ for mean monthly housing expenses (excluding electricity, water, sewage, and maintenance costs) for a family of four, is already very close the minimum wage (if not below, because of the tax and social security withholdings), given the recent changes in the law, which sets the minimum wage at 586€ for workers over 25 years of age and 511€ for workers 25 and below.

2.3. Building maintenance and condo fees

The size of condo fees depends on two factors: (a) the cost of standard maintenance activities and (b) the allocation of cost between the residents of the building.

Standard condo fees include the following: weekly cleaning, monthly sewage, communal electricity & water, and lift maintenance bills, and annual fire extinguisher refilling and boiler maintenance costs. It is assumed that there are no garden and swimming pool maintenance costs. condo fees are allocated to the tenants, weighted by the thousandths of building area corresponding to each apartment. The thousandths are calculated by an engineer overseeing the construction of the building as

a function of the area, volume and percentage of communal space each property uses. Differences in the volume of apartments within a building, generally arise from differences in surface area, while the portion of communal spaces depends on the floor of the apartment following the rule the higher floor an apartment is, the greater its use of communal spaces.

Making use of the last census of buildings conducted by El.STAT (2007) in the year 2000 we can identify that the average apartment building has four floors and a total of four apartments per floor in the municipality of Athens, with the volume of apartment buildings increasing when in "poor" suburbs and decreasing when in "rich" ones. Assuming that a typical apartment is approximately 60 m^2 and that communal spaces per floor amount to an additional apartment, the total area of such a building is between 1,200 and 1,500 m^2 depending on how many apartments the ground floor houses.

We assume for simplicity that a typical apartment building has a total area of 1,400 square meters. For such a building the total condo fees charged by the maintenance company were found, after a field research, to be approximately 195€ Table 5 below presents the allocation of condo fees for different apartment sizes of such an apartment building. Allowing for differences of floor level to have an impact would have resulted in minimal changes.

Household Size	1	2	3	4	5
Residence size (in m^2)	25	45	65	85	105
Monthly Cost per apartment (in €)	3.48	6.27	9.05	11.84	14.62

Table 5 Proportion of the area corresponding to each apartment and the relevant monthly charges per household size

2.4. Water and sewage

The calculation of the need for water has been made under the assumption that daily domestic uses of water include those activities related to drinking and cooking along with activities of personal and domestic hygiene. Given that a tap partially open provides one liter of water in ten seconds, thus allowing the calculation of water consumption in activities such as washing hands, etc, and given that other activities require a fixed amount of water, such as flushing the toilet, it was possible to estimate that daily necessary consumption of water is 20 lt. for cooking, 85 lt. for household cleaning and 128 lt. for personal hygiene. Naturally increasing household size does not increase water consumption proportionately but only for the amount necessary for personal hygiene.

To calculate the final cost, VAT, two Monthly Fees and the Sewage Cost, were included[21]. Base costs and VAT increase significantly the cost of water use as they account for over 50% of the final bill. The final cost of using water is the following:

Household Size	1	2	3	4	5
Water and sewerage charges	7.62	13.13	18.26	23.39	29.47

Table 6 Monthly cost of water and sewerage by household size and in total ((in €).

2.5. Electricity

The calculation of the need for electricity has been made under the assumption that daily electricity needs result from the use of light bulbs, a kitchen, a refrigerator, washing machine and water boiler. Assuming that those are normally utilized Class A appliances, daily consumption was calculated at 5.17Kwh per person. In the same way as with water consumption just described, augmenting household size does not result into significant changes in the usage of electricity since most of the appliances serve the entire household and not solely one of its members. In particular we assumed that major differences in consumption come as a result of the use of the boiler although the use of other appliances also increases marginally. To calculate the final cost, VAT and a number of special taxes were also included. The final cost of electricity is the following[22]:

Household Size	1	2	3	4	5
Electricity	15.35	24.45	28.64	33.81	41.84

Table 7 Monthly cost of electricity by household size and in total (in €).

2.6. Heating fees

Using the same assumptions as for the condo fee calculations, field investigations show that 14 tons of oil is needed for heating a building. With an average heating oil price of 1.243€[23] per liter, the total cost is 17,402€ per year.

In a typical apartment building, provided that no apartment is empty, and that no independent heating exists, the cost per household is given directly by heating thousandths. The following table presents the monthly heating cost. It should be pointed out that the relevant cost is spread out over the full year.

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[21] Water Prices were obtained from the web site of the Athens Water Supply and Sewerage Company (EYDAP) www.eydap.gr at 30 of March 2013

[22] Electricity Prices were obtained from the web site of the Public Electricity Company (DEI) www.dei.gr at 30 of March 2013

[23] Fuel prices were obtained from the web site of the Observatory of Liquid Fuel Prices of the Ministry of Development (http://www.fuelprices.gr/) at 30 of March 2013 for Athens.

Household Size	1	2	3	4	5
Residence size (in m2)	25	45	65	85	105
Monthly cost (in €)	25.89	46.61	67.32	88.04	108.76

Table 8 Monthly heating fees by household size and in total.

2.7. Durables: furniture and appliances

The Household Budget Survey (ELSTAT, 2008) identifies as consumer durables related to housing expenditures three major categories: (a) furniture, (b) electric appliances and (c) dishes, glassware, cutlery and other household utensils. Data on electric appliances household penetration rate are available from a study by Fawcett et al. (2000). On the other hand detailed official statistics for furniture and household appliances penetration rates are not reported by EL.STAT, thus a relevant detailed list that satisfy basic needs was constructed. The construction of this list was facilitated by the decomposition of the house into its various spaces (kitchen, living room, bathroom, and bedroom) and the identification of the needs each compartment satisfies.

Depreciation period was set at 20 years in order to obtain the yearly cost. This cost can be interpreted as the cost of creating a new household. The monthly cost (the yearly depreciated cost divided by 12) and can be interpreted as the cost that households should be paying if adequate financial mechanisms exist in order to buy the entire stock of durable assets on credit (with no interest!). Increases in household size affect directly only the cost created by bedrooms, since all other expenses are independent of household size. For the bedroom cost the basic rate used was 841.9€ for a person living alone. For a couple the basic rate was multiplied by 1.5, the basic rate was added for the first child, half the basic rate wad added for the second child, and, finally the full basic rate was added for the third child. Table 9 below contains the relevant figures and the calculated monthly cost after depreciation.

	Household Size				
Reference Room	1	2	3	4	5
Kitchen	774.53	774.53	774.53	774.53	774.53
Living Room	1109.78	1109.78	1109.78	1109.78	1109.78
Bedroom	841.90	1262.85	2104.75	2525.70	3367.60
Bathroom	370.84	370.84	370.84	370.84	370.84
Total	3098.05	3520.00	4362.90	4784.85	5627.75
Monthly Total	12.91	14.67	18.18	19.94	23.45

Table 9 Durables. Total cost per household size and living space and calculated monthly expense (in €).

3. Conclusion

In the sections above the various components of the housing need were analyzed. Because break-down by socioeconomic region was not possible for all quantities measured, it was assumed that all quantities but rent and taxes, do not differ much between the three regions, while they do differ significantly based on household size. Table 10 below contains the summary of all costs by household size. Next, table 11 contains the total monthly costs (in €) related to housing, by socioeconomic region and household size.

	Household Size				
Cost Component	1	2	3	4	5
Rent	275.00	346.00	428.00	521.00	607.00
Municipal fees and taxes	9.78	12.92	16.42	19.75	23.25
Maintenance and condo fees	3.48	6.27	9.05	11.84	14.62
Water and sewerage charges	7.62	13.13	18.26	23.39	29.47
Electricity	15.35	24.45	28.64	33.81	41.84
Heating cost	25.89	46.61	67.32	88.04	108.76
Durables	12.91	14.67	18.18	19.94	23.45
Total	350.03	464.05	585.87	717.77	848.39

Table 10 Summary of all costs (in €) by household size and in total.

	Household Size				
Socioeconomic Region	1	2	3	4	5
Low	318.03	428.05	543.87	652.77	739.39
Middle to high	374.03	529.05	667.87	805.77	1006.39
Athens	372.03	453.05	557.87	742.77	889.39
Total	350.03	464.05	585.87	717.77	848.39

Table 11 Total monthly costs (in €) related to housing, by socioeconomic region and household size.

As one can see from table 11, the order, from less to more expensive for a four member household, is, as expected: low socioeconomic region (653€), to Athens (743€), to middle-high socioeconomic region (806€).

In the concluding remarks, a comparison will be made with two alternative measures of the poverty threshold: The "Orshansky line", used by the US Census Bureau and a method proposed by the US National Academy of Sciences.

The first index was proposed by Orshansky (1965). It is calculated by dividing the food cost by its share in the total household expenses. Using a share of 13.06%, based on data from the Household Budget Survey (EL.STAT, 2008), and the food cost figures from Labrinidis et al. (2010), the corresponding poverty threshold ("Orshansky line") was calculated according to the methodology of the US Census Bureau.

An alternative poverty index is provided by the National Academy of Sciences (NAS), USA. The NAS index defines the poverty threshold according to the following formula based on the true consumption in three basic need categories: poverty threshold = (80% of the true median consumption of all households for food, clothing and shelter) X 1.20.

Poverty threshold method	Household Size				
	1	2	3	4	5
Total housing expenses	350.03	464.05	585.87	717.77	848.39
"Orshansky line"	1106.42	2024.34	3100.16	3644.72	3858.64
NAS (100%)	747.66	1135.92	1434.05	1540.49	1545.65

Table 12 Comparison of poverty thresholds and total housing expenses (in €)

It can easily be seen from the preceding table that the proposed method of calculation is rather conservative, especially when compared with the Orshansky line figures. It should be noted that the proposed method does not include, in this presentation, expenses on food, health care, transportation, clothing, education, entertainment and miscellaneous expenses. Nevertheless it can be assumed that housing costs lay between one third and one fourth of the total expenses of a typical household, following the logic behind the NAS index calculation.

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