

Chapter Five
Household Economy

5. Household Economy

5.1 Summary of findings

The aim of this chapter is to document and investigate a household asset index estimated for the DOS Jordan 2003 Multi-Purpose Household Survey (MPHS)¹. Although the MPHS contains a module on current household income types and amounts, the broad range of topics included in the questionnaire only allowed for a limited range of questions about households' incomes. Moreover, there is no information about the households' expenditures. The main purpose of the asset index is thus to serve as a supplementary measure for the households' economic resources. First, it is common that household incomes show large fluctuations across years, in particular for households depending on seasonal labor, or on other types of employment in the informal sector. Second, while income is measuring the households' current *flow* of economic resources, an asset index measures the households' *stock* of economic resources. Hence, it serves better as an indicator for the households' accumulated *long-term* wealth. Finally, because the survey could not ask for details about all household members' incomes, it is possible that it under-estimates the total household income, due to memory lapse, and/ or deliberate concealment of incomes.

In the construction of an asset index several challenges arise. First, one must decide which items to include. Second, one must decide how to weight the various items up against each other and hence control for price and quality differences among the items included in the index. Finally, one must check the reliability and performance of the index, internally and externally.

The 2003 MPHS contains a large number of variables that are relevant candidates for inclusion in a household asset index. The questionnaire naturally suggests that three main groups of items are included in the index: After recoding the non-binary nominal candidate variables, we had 29 ordinal or scale variables about housing conditions, 29 variables about infrastructure items, and 23 variables about ownership of various consumer durables.

The simplest type of an asset index would be one that just sums up the household assets, giving all assets equal weights, regardless of their value and type. However, this is a completely arbitrary method, and instead we *estimate* the weights of the asset index, using the statistical procedure of *principal components*. The crucial condition for using this approach is that for a list of asset variables, long-run household wealth is what causes this

¹ The methodology and approach of this chapter is based on a similar paper produced for the CBS Syria 2003 Unemployment Survey

most common variation in the variable set. Hence, the assumption is that the *first* principal component estimated may be labelled “long-run household wealth”. The mean value of the index is zero by definition, but those who prefer an index that is non-negative by definition, such as the simple additive one, may simply add the difference between 0 and the lowest household index score to the estimated index value for all households. Because the asset index is defined at the *ordinal* rather than at the scale level, it will only *rank* households according to their long-term economic resources.

The last part of the chapter deals with tests of the performance and reliability of the index. Such checks are particularly important for a data set with limited income and expenditure information, as is the situation in our case. We first confirm that the index is internally coherent, i.e. that it produces clear separations across the poor, the middle and the rich households for each asset included in the index. The index also seems to be generally “robust” to the main groups assets included. The lowest 20% of households on the full index are in most cases also classified among the lowest 20% on the 3 sub-indices that contain mutually exclusive assets. Finally, the index also seems to produce reasonable comparisons with other indicators related to household welfare, e.g. with crude measures for total household *current* income, with male and female levels of education, and with subjective judgement of the welfare distribution across regions and urban and rural locality types.

We do, however, expect the index to have a positive urban bias. The main reason is that while land ownership is probably a positive economic indicator at the rural level, living in a *rural* area may not be associated with a high asset index score in the *national* Jordanian context. An index with negative weights to land ownership could have been an indicator of this kind of problems. In the MPHS, it is difficult to check upon this, because there were no questions about land ownership. Finally, we would like to warn against using the asset index as an *independent* indicator of welfare. If one’s primary research topic is the Jordanian households’ economic welfare and poverty, one should rather consult the more detailed and purpose-built DOS Jordan 2002-2003 Household Expenditure and Income Survey.

5.2 Introduction

The main aim of the Multi-Purpose Household Survey (MPHS) is to map living conditions for different groups in the Jordanian society. Access to economic resources is usually the single most important determinant of living conditions. The key attractiveness of economic resources is that they are highly “liquid”. They can be transformed into *other* living condition components, at least where markets exist. Unlike for example health and education, economic resources may also be moved across time, space and individuals,

through loans, savings and transfers. Finally, economic flows can be measured statistically with relative ease, as input, in terms of income, or as output, in terms of expenditures.

At the end of the road, measures of human welfare, whether referred to as utility, living standards, quality of life, or basic human needs, all apply to individuals. However, almost all individuals live in households together with other individuals, and almost all economic resources eventually available to individuals are mediated through some kind of household allocation mechanism. Although some household members may receive individually targeted transfers from outside, these are often “corrected for” by subsequent adaptations in the household allocation mechanism. The crucial analytical unit in this chapter will thus be the households.

The individual’s dependency on the household allocation mechanism must not lead us to think that we face a one-way casual relation, from the economic situation of the household to the material outcome for the individual. Although households are, by definition, taken as exogenous in a household survey as the MPHS, their composition and very existence are *endogenously* determined over time. We will not deal explicitly with household formation and dissolution in this chapter. However, one should keep in mind that in many cases, households are created, or cease to exist, as a direct consequence of changes in the economic situation of their individual members.

An analysis of the household as an *economic* unit can draw on experience from several fields. First, one may conceive of the household as a “small factory or firm”, (Becker 1981). According to Becker the household produces “household commodities”, which are non-market goods such as “children, prestige, envy, health, and pleasure of the senses”. Schematically one may portray this through *household production functions*, where the household allocates market goods and the labour of its members as inputs. The key characteristics of the household production process are resource pooling, division of labour, specialization and joint optimisation.

5.2.1 Analytical Objectives

The aim of this module is to map in coherent fashion household economies by systematic description of incomes, expenditures and savings, through a simplified version of a household accounting system

In a money economy, economic resources at the disposal of a household constitute one of the most vital aspects influencing its level of living. Consumption of goods and services are often equivalent to the amount of money at the disposal of the household. This goes for both the daily consumption as well as the ability to handle larger investments as marriages, household investments, expensive consumer durables etc (SSB 1993). In

economies where large parts of the exchange takes place in the form of barter relations, consumption of own produce etc, these mechanisms are less easy to establish and measure with a certain degree of precision.

Both at the input as well as at the output sides, income regulations may play a central role in the distribution of goods and burdens in the society. This may be seen e.g through the implementation of successive land reforms and business nationalisation, establishment of official wage structures and the pursuit of employment policies, operation of taxation systems, social security systems and indirect subsidies across wide sectors of the economy. The initiatives may have a direct levelling purpose.

On the other hand, economic regulations may have high economic costs in terms of expansionary public budgets and market inefficiencies. To a certain extent costs may be transferred to consumers in the form of higher prices for goods and services, but becomes difficult in situations of continuous economic recession. Governments, thus, are pressured from several angles in their attempts at job generation and improved income earning capabilities at the one hand, and in matching policies of income regulation to altering socio-economic realities on the other.

5.2.2 Problem Focus

The unit of analysis in this module is the household. The household economy is a complex pattern of different types of incomes earned by various household members. Consequently, there is a need for mapping of individual incomes aggregated to the household level, as well as for incomes from various household enterprises. Household expenses and savings are usually calculated at the household level.

Whatever is included as incomes or expenditures depends crucially upon what is defined as product, in what sense it is consumed, and whether it is included in the measurement of well-being (WB 1991). With the aim of describing household economics in coherent fashion, this module distinguishes between three vital elements: incomes, expenditures and savings. The three elements are derived from a set of household accounts, which systematically describes credits and debits during the last year, month or week.

The LCS represents a coherent mapping of the household economy, analogues to *national accounting* systems, and like them a measure of economic activities of income and expenditure production, consumption and the accumulation of assets and liabilities (UN, WB). The mapping is based on three different accounts. The *production account* is input to the *current account* which again is input to the *capital account*. On the other hand, it will not

be possible to construct a complete and comprehensive set of household accounts estimates as such a task would require utilisation of comprehensive household expenditure diaries and detailed income reporting for the entire year, including multiple visits at the household.

5.3 Household Income

The concept of “Household Income” measure depends on the definition of production

The flow of economic resources into a household during a given time period is labelled “household income”. A household’s income constitutes the basis for its outflow of economic resources, its household *expenditure*, and is the source for its accumulation of household wealth over time. The “income” concept is closely related to the concept of “production”. Usually, household income is generated from remuneration of the household members’ labour input in the production of goods and services. However, some income types, such as income from capital or transfers, are less directly knit to current income-generating activities. Moreover, some goods and services that are, (or at least *should* be), counted as “income” is produced directly for the household’s own consumption by household members.

Do the household members really pool their resources, and share the income on equal terms?

A core element of the definition of a “household” is that its members are assumed to pool their economic resources together. Hence, the relevant unit for analysis of income is the household. The definition of a “household” also implies that the household members share the *consumption* provided for by the household’s income in an “equal” manner. In principle, this assumption should at least hold for the consumption of household *public* goods, which, by definition, is shared by several household members. However, in reality, the access to household public goods such as cars, television sets etc, may be more restricted for certain types of household members than others.

With respect to the consumption of *private* goods, it is even less likely that the “equal consumption share” assumption holds. In most societies, there is a close, positive link between the shares of household income allocated for individual private consumption, and the person’s contribution to the overall household income. In a society where household income is mainly provided for by male breadwinners, it is also reasonable to assume that these household members take the lion’s share of the household consumption of private goods.

Which problems are involved in the use of “income” as an indicator for the household’s economic resources?

Due to the absence of data about consumption expenditures in the MPHS, we will use household incomes, together with household asset possession, as the main indicators for the economic resources among Jordanian households. The use of household income as an indicator of economic welfare raises several methodological challenges. We have already mentioned the problem of defining “production” (e.g. the exclusion of domestic household services), and the doubts that can be raised about the assumption of equal distribution of consumption above. Other methodological challenges are that “income”, as an economic *flow*, may fluctuate substantially between time periods, and that household members relatively easily may conceal, or forget to report about their incomes to a household survey².

How can we compare the incomes of households of different size and composition?

How to compare the incomes of households with large variations in size and composition is a hotly debated topic about. The existence of household public goods implies that there are economics of scale in household consumption. Moreover, some household members, e.g. children below 10 years, obviously have lower “objective” needs for necessity consumption of private goods such as food and clothing.

There are three main responses to these challenges: The first is to do nothing, i.e. not to moderate the household income according to differences in household size and composition. The second, technically simple approach is simply to divide the total household income by the household size, regardless of the household’s composition. Finally, one may divide the total household income by the household size expressed in terms of “standard” consumption units, so-called *adult equivalent units*. A wide range of theories and formulas for how to estimate adult equivalent units exist. To save space and complexity, we refer to the appendix for more details about this issue. In this report we will utilize the *total (annual) household income per capita* measure.

The structure of the income section

The income section is divided into six sub-sections. The first section deals with the geographical distribution of the total household per capita income. A related discussion of the distribution of total household income, and the relation of these distributions to the 1996

² Income varies in particular for households depending on seasonal labor, or on other types of employment in the informal sector.

Jordan Living Conditions Survey (JLCS 1996) and the 2002/ 2003 Jordan Household Expenditures and Income Survey (HEIS 2002/2003) is included in the income appendix.

Section 5.3.2 deals with the diversity and relative importance of household income sources, a factor that is of crucial importance for assessing household vulnerability against shocks interrupting some of their income flows. Section 5.3.3 investigates how total per capita household income varies with selected characteristics of the household, such as its size and composition, the education, health and labor activity of its members. Section 5.3.4 deals with changes in household incomes during the last year, while section 5.3.5 investigates the relation between the actual and the subjectively perceived economic status of Jordanian households. Finally, we undertake an investigation of geographical income inequalities in section 5.3.6.

Due to the multi-topic character of the survey, we have decided not to analyze *income poverty* in this report. The reason is partially that the MPHS data basis is sparse. Relatively few questions were posed about income types and amounts, and no questions were asked about expenditures. However, more important is that the recent 2002/ 2003 HEIS is a much better suited, purpose-built framework for estimating a poverty line, and drawing poverty profiles.

5.3.1 Geographical distribution of household income

How does our definition of income affect the geographical distribution of income?

The subject of this section is to present the geographical distribution of household income in Jordan. As mentioned above, we will strictly apply the concept of *total annual household income per capita* throughout the discussion. Relative to a household income concept *not* corrected for the household size, the per capita transformation will “reward” small households, and hence those geographical areas with less than the national average household size. The use of the per capita income concept hence implies that rural areas are scaled down, and similarly, that governorates with larger than average household sizes, such as Mafraq, Jarash, Ajlun and Ma’an have a relatively lower score than when non-corrected measures are used. At the other extremity is Amman, which has the lowest average household size of all governorates.

What is the best way of comparing household incomes across regions and governorates?

In almost all societies income distributions tend to have a typical *skewed* shape, with the majority of the households clustered together at the left hand side, and a long right “tail”, which reflects that some households are very rich³. This general shape is usually not affected by the choice of the income *measure*, but the degree of skewness depends on the *type* of income, an issue that we will leave for the next section.

Due to the skewness of the distribution, and the large spread of household incomes we prefer to show the full income distributions graphically, rather than to present them in terms of simple summary measures such as the mean or the median income. However, the very rich are so rich that it is virtually impossible to present their income levels along an axis with “true”, equal income intervals. As a compromise we made figures with equal income intervals along the axis, *except for the two last intervals*. Hence, the peak to the very right on the figures below is artificial, because of the much larger intervals used here. To the contrary, any other peaks at the left of the figures represent “true” clusters of household per capita incomes.

Rural areas seem poorer, but rural income is more difficult to measure because it often occurs as in-kind income

Four out of five Jordanian households live in “urban” areas⁴. In most developing countries, urban areas have higher household incomes than rural areas. Economic development is often associated with urbanization, and a corresponding transfer of labour from agriculture to other economic sectors. The primary driving force of urban-to-rural migration is the existence of a gap in urban-rural incomes. Because life is usually cheaper in rural areas, in terms of lower housing costs, and the availability of self-grown produce, the *recorded* urban-rural income gap must usually be fairly large to attract immigrants to the cities.

Figure 5.1 compares the urban and the rural income distribution in Jordan. As expected, we observe that the rural line is to the left of, and above the urban line at the left hand side of the figure, while the urban line crosses the rural line at a fairly high per capita

³ In these distributions, the mean income will typically be higher than the median income (which divides the population of households into two equal parts). Taking the natural logarithm of the income will usually generate a close-to-normal shaped distribution.

⁴ Two factors may affect the urban-rural differences shown by the figure. The first, which should pull rural income upwards, is that it is easier to remember and report on urban, wage dominated income, than about rural income, which is often received in-kind. The second factor is that the definition of an “urban” area used by the survey, as a locality with more than 5000 inhabitants, may not adequately represent the distinction between “urban” and “rural” economies.

income level. This implies that there are relatively more low-income households in the rural areas than in the urban areas. The peaks representing the very rich households at the right hand side of the figure are much higher for the urban areas than the rural areas. This implies that the very rich households are primarily found in the towns and cities.

Figure 5.1 Per Capita Household Income, by Urban-Rural

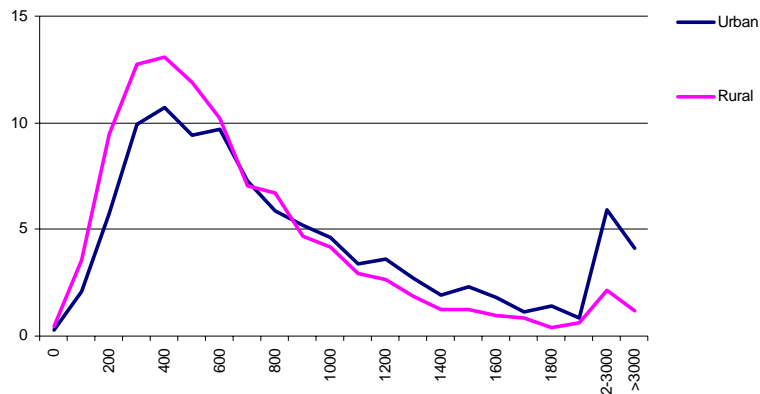
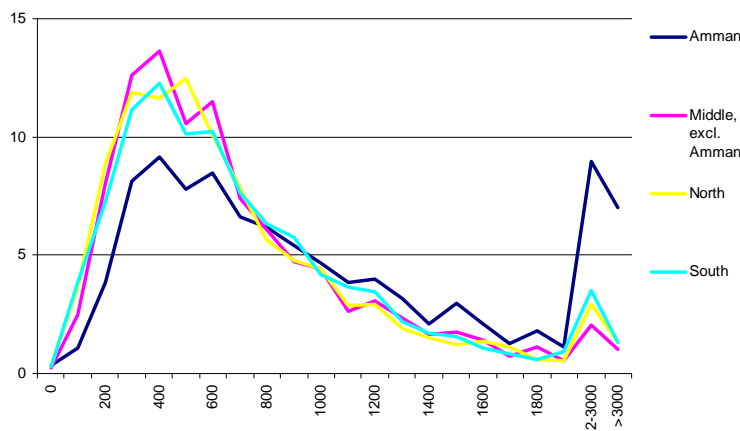


Figure 5.2 Per Capita Household Income, by Region



Amman has higher average household incomes than all other regions and governorates

The typical pattern of a richer than the national average capital is revealed by Figure 5.2, which shows the four regional per capita household income distributions. While the Northern, Middle and Southern regions have roughly the same income distributions, Amman has a distinctively lower left peak, and a much higher right peak than the other regions. The region seemingly worst off is the “Middle, excluding Amman” region. However, with 82 percent of the households living in urban localities, this region has a much higher degree of urbanization, than the Northern and the Southern regions at respectively 67 and 53 percent.

(Amman Governorate is 93 percent urban). Hence, variations in urbanization do not seem to explain the regional income differences.

Governorates have roughly the same income level as their regional averages, but Aqaba governorate is higher than other Southern governorates

Figures 5.3-5 shows the income distribution at the governorate level for the multi-governorate regions. In the Northern region, Irbid has a higher household income level than the other governorates. Although Irbid is 77 percent urban, the urban-rural dimension does not seem to be a very important explanatory factor for household incomes in this region, because the governorate worst off, Ajlun, has a higher share of urban households (62 percent), than Mafraq and Jarash at respectively 37 and 44 percent.

Figure 5.3 Per Capita Household Income, by Governorate in the North Region

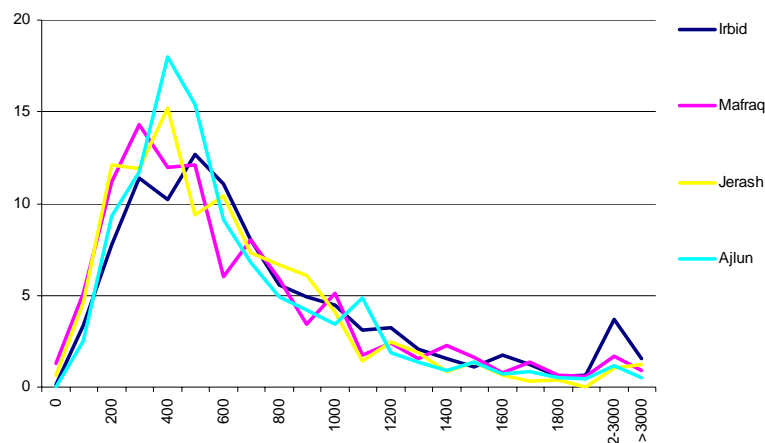
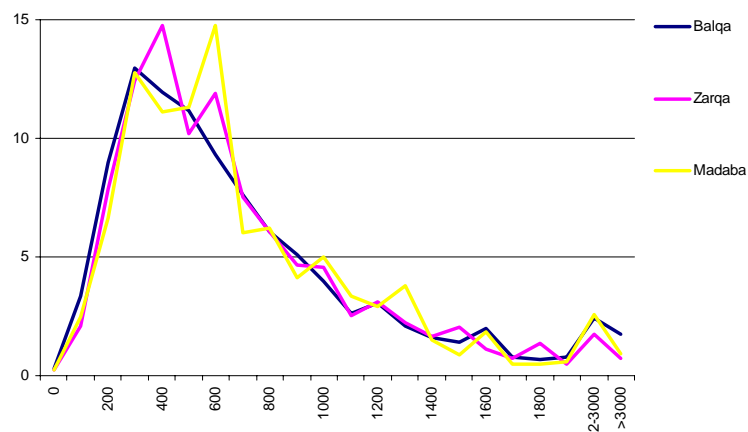
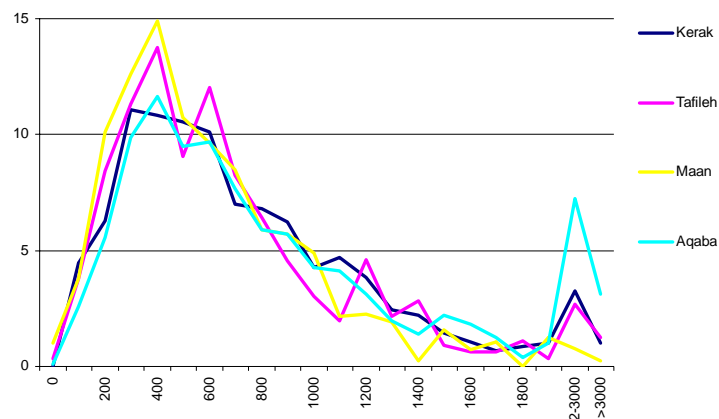


Figure 5.4 Per Capita Household Income, by Governorate in the Middle Region



Except for the Amman and Aqaba governorates, urbanization does not seem to be a major factor explaining income at the governorate level. Urbanization is neither a likely explanatory factor for the income score in the Middle region, where Zarqa governorate with 95 percent of the households in urban areas are slightly below Balqa and Madaba with respectively 62 and 53 percent urban households. However, in the Southern region, urbanization may play a big role because the 85 percent urban governorate of Aqaba has substantially higher household incomes than Karak, Tafila and Ma'an, especially at the highest income intervals. Aqaba is also the governorate which is closest to Amman governorate in terms of the level of household income.

Figure 5.5 Per Capita Household Income, by Governorate in the North Region



Summing up on the geographical distribution of household income

Using the *full* household income distributions as the basis for the analysis, it seems clear that Amman on the average is much better off than other governorates, and that the governorates within the three other regions are roughly heterogeneous. The only real exception is the governorate of Aqaba, which is second only to Amman with respect to above average household income. Variations in the urbanization levels do *not* seem to be important in explaining income differences between governorates. Regardless of governorate, the income differences *within* each governorate are much larger than between the governorates.

5.3.2 Diversity and Importance of Income Sources

Income diversification reduces household vulnerability by lowering the risk of a complete loss of household income

The topic of this section is the *income diversity* and the *importance of various income sources* for Jordanian households. To diversify income is an important household ex ante strategy to cope with risk. Household incomes may vary substantially over time, and more than expenditures. At the aggregate level, variations are caused by business cycles in the economy, or by seasonal variations. At the micro level, a range of factors pertaining to the individual households cause random or systematic variations.

The higher the number of alternative substantial income sources that are available to the household, the lower the risk that it will suffer a substantial consumption decline if an income source is fully, or partially lost. Hence, not only households at low income levels are vulnerable to economic shocks, but also households relying on only one substantial income source. This is particular the case when income from this single source is also received by only one person.

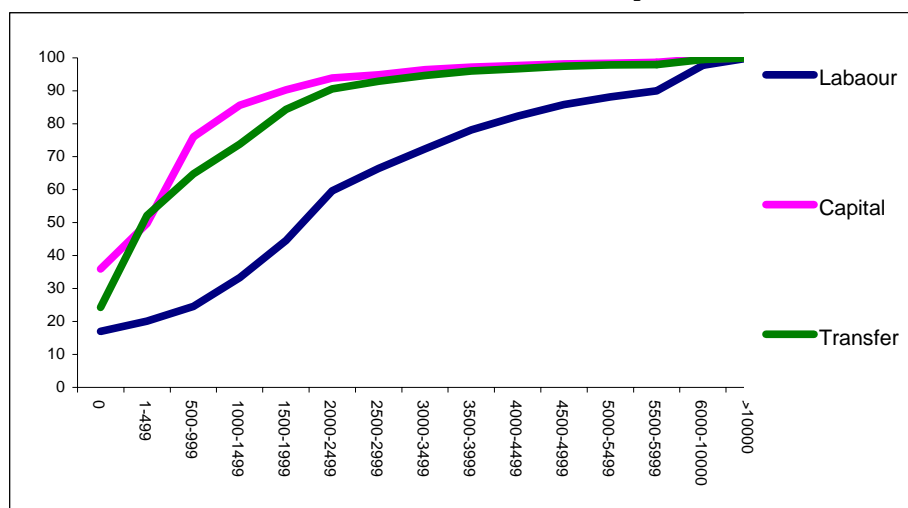
Income diversification is only genuine when the supplementary income sources are of a *substantial* relative importance to the household

In order to measure diversification of income it is not sufficient to merely record the *existence* of an income type. The income type should also constitute an *important* contribution to the household economy. One could, for example, require that the income should be above a given amount in Jordanian Dinars to be taken into consideration. However, due to the large income differences between households, we have chosen to apply a *relative* importance criterion for income sources. Our justification for this approach is that households usually have adapted their consumption levels to their income levels, and that it, except for the very poorest households, is the *relative*, rather than the absolute loss of income, that causes shocks to the household economy. Hence, we will count the *number* of, and describe the *types* of incomes received by Jordanian households, experimenting with different criteria of the relative share an income source must represent of the total household income, in order for it to be included.

The MPHS questionnaire asked for households to report their total annual incomes for six substantial sources of income, in addition to one, almost empty, “other” category.

These sources were wage income, income from self-employment, income in the form of interests and property income, and income from domestic and international transfers. No distinction was made between transfers received from public and from private sources, and no (direct) information about which individual household member that received the various income types⁵.

Figure 5.6 Cumulative Distribution of Income per Capita, by Income Types, and Total Household Income Per Capita



Due to the need to introduce an “importance criterion”, and in order to avoid overloaded figures and graphs, we have decided to collapse the six original substantial income sources into three “main” groups of income, which corresponds to the usual grouping of income sources. Hence, we have grouped wage and self-employment income into “labour” income. Interests and property income have been added together as “capital” income, and finally, domestic and international transfers have been joined into “transfer” income.

Labour income is the most important, and most evenly distributed type of income

Figure 5.6 gives a first impression of the income distribution for the three main sources of household income. (The figure is *cumulative*, i.e. all three main income sources eventually reach the 100 percent ceiling). The line for the labour income roughly follows the diagonal of the figure, implying that it grows at approximately the same rate as the total household income. 17 percent of the households do not receive any labour income. The more the line of an income source bend towards the upper left corner, the more it is primarily

⁵ In households with only one person employed, we could obtain this from the employment data, but as of today we have not pursued this issue.

received by the upper income groups. This is particularly the case for capital income. 36 percent of the households receives no such income, and as many as 74 percent receives 200 JD or less per capita annually. For labour income, only 27 percent of the households receives 200 JD or less per capita annually.

Figure 5.7 Per capita Income, by Income Type and Total Household Per Capita Income

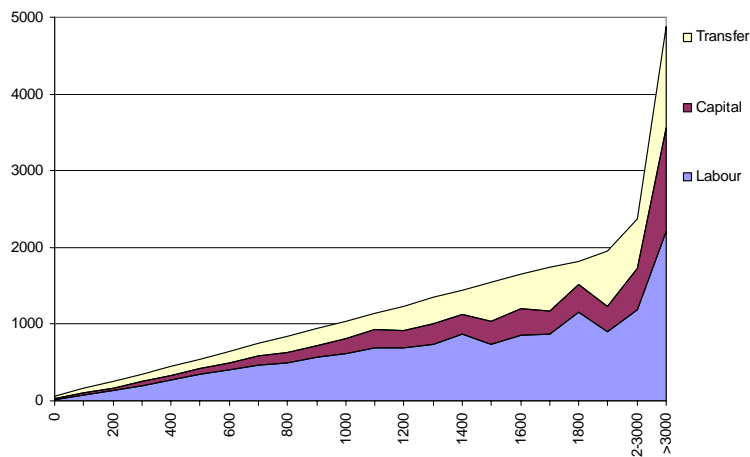
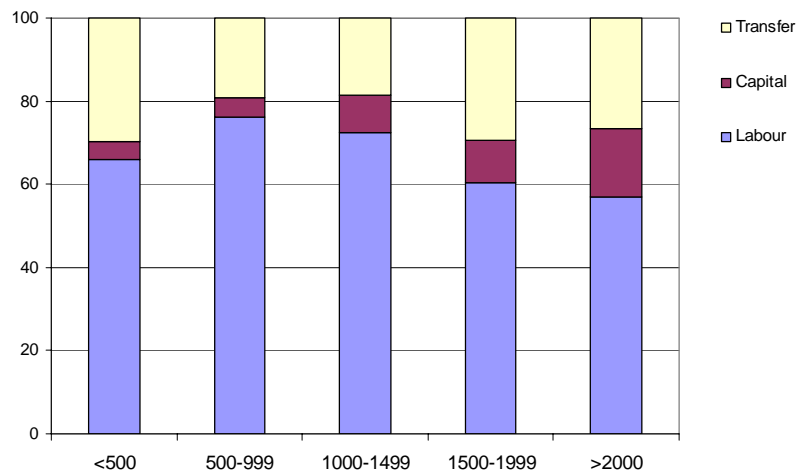


Figure 5.8 Largest Source of Income by Total Household Per Capita Income



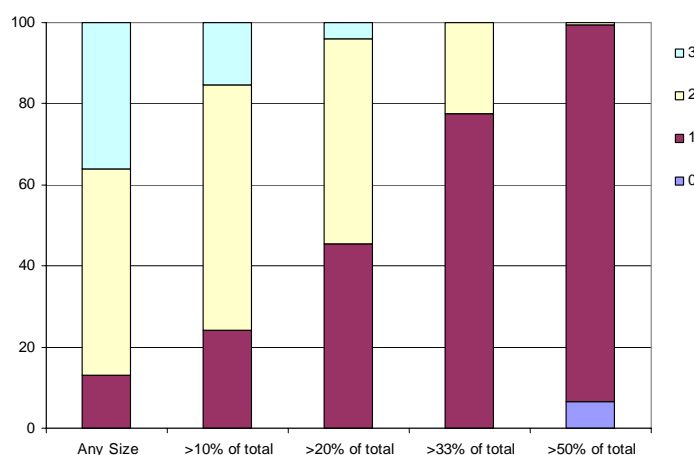
That labour income is more “democratically” distributed than other income types is found in nearly all societies. What is somewhat surprising for Jordan is that labour income seems to represent a nearly constant share of the total household income, regardless of the

total household income level (Figure 5.7)⁶. Figure 5.8 confirms this pattern. Labour income is the dominant income type for all groups of total per capita household income, except in the very lowest groups⁷. Transfers tend to be most important at the extremities of the income distribution. At the lower end transfers are given as “emergency” relief to needy friends and family members, at the upper end, transfers are given as remittances from abroad to those family members who have remained in Jordan.

Only one in five households have more than one income source representing at least one third on their total income

Above, we said that in order to measure income diversification and vulnerability, we would count the *number* of, and describe the *types* of incomes received by Jordanian households, while testing out different criteria of the relative share an income source should represent of the total household income, in order for it to be included. Figure 5.9 shows how the distribution of the number of income sources received by the households vary when we introduce more and more strict criteria for an income type to be included. When no criterion about relative size of an income type is imposed, only 13 percent have only one income type. As we require that the income should represent respectively at least 10, 20, 33 and 50 percent of the total household income, the number of income sources (as could be expected) drops sharply. For example have only 22 percent of the households two income sources that each represents at least one third of the total household income. The conclusion is thus that most households have several income types, but that the other income sources than the main source is of a rather supplementary nature.

Figure 5.9 Number of Income Sources Conditional on Their Share of Total Household Income

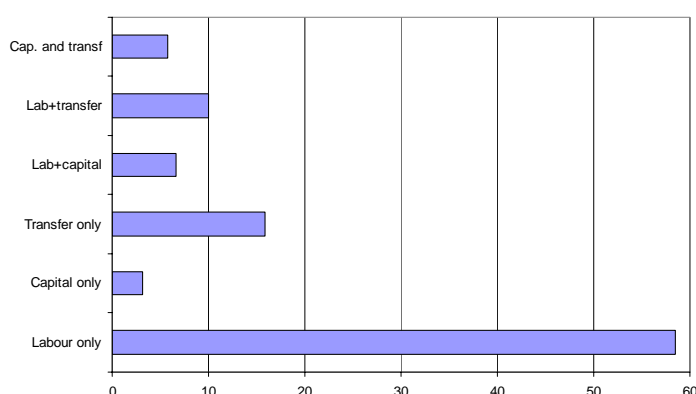


⁶ This is probably because wages of (self-employed) professionals such as doctors and engineers are very high, compared to

Labour income is generally the most important income types for all groups

It should not come as a surprise that the main income source is labour income, as wages or as self-employment. Let us require that an income source should represent at least one third of the total household income to be included. Then, Figure 5.10 shows that almost 6 out of 10 households have labour income as their only income at this substantive level. Another 17 percent relies on labour and one of capital and transfer incomes. Only 25 percent rely on either capital or transfer income alone, or on a combination of the two.

Figure 5.10 Combination of Income Sources, Each Representing at Least One Third of Total Household Income



Capital income and transfers usually of a less important, supplementary nature, except among the very poor

Figures 5.11-5.13 show how the prevalence of the three main income types vary with the total household income, and with the minimum requirement of its relative importance. For labour income, there is not much variation in the share of households who receives it, regardless of the percentage criteria imposed (Figure 5.11).

“normal” wages.

⁷ Transfer was the dominant income type for annual per capita income below JD 200.

Figure 5.11 Prevalence of Labour Income, by Share of Total and Per Capita Household Income

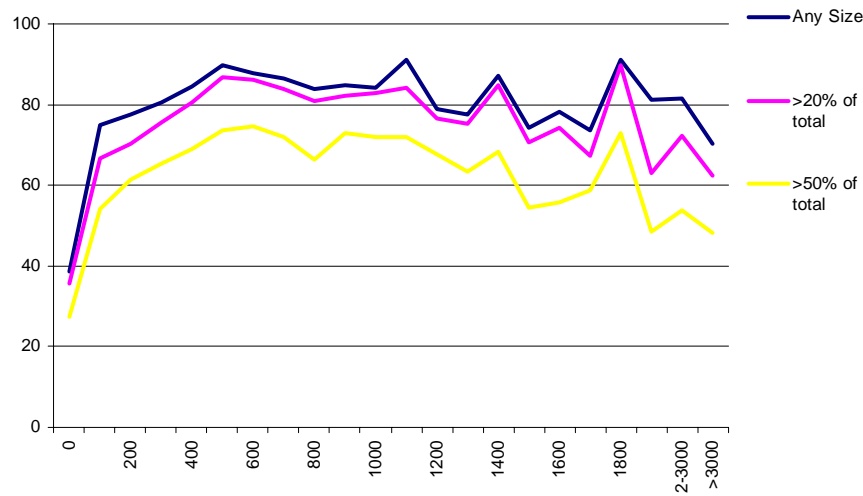
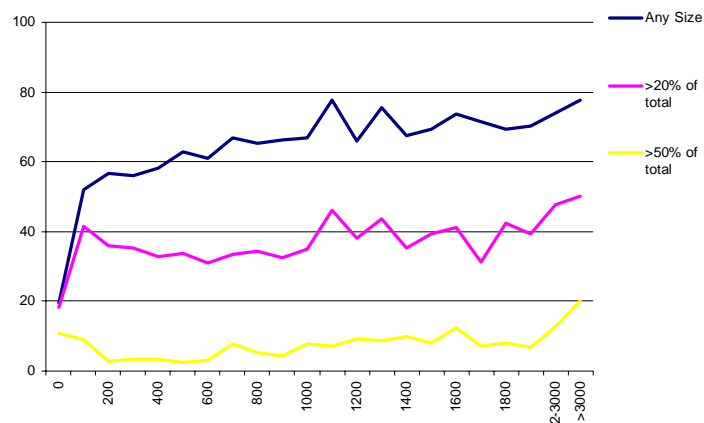
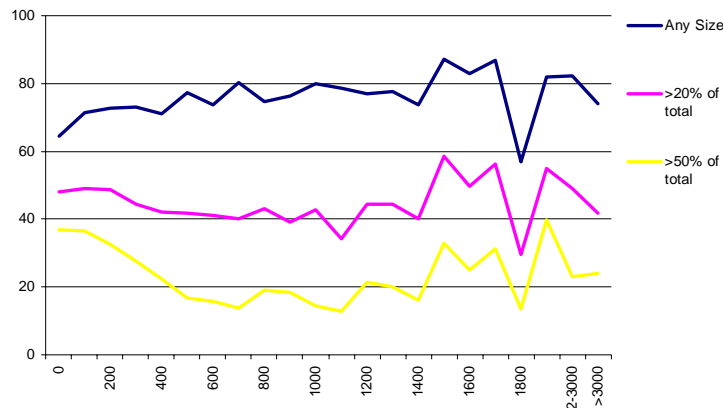


Figure 5.12 Prevalence of capital income, by share of total and per capita household income



However, for the two other main income types, capital and transfer income, the number of receivers drops sharply when an importance criterion is imposed. In particular, capital income is received by a large number of households, but is of *essential* importance to almost none. For transfer incomes, the pattern is, as observed above, that the importance is highest for the lowest and the highest total household income groups.

Figure 5.13 Prevalence of Transfer Income, by Share of Total and Per Capita Household Income



Summing up on income sources and diversification of household income

Labour income is by far the most important source of household income, except among the very poor, who mainly depends on domestic transfers. *Most households have no other income source of substantial (relative) importance than labour income.* Households who have only one gainfully employed household member are vulnerable to events that may cause unemployment for this person. Hence, *job safety for single breadwinners* is essential to reduce household vulnerability. In times of crises, it seems that the private re-distribution of incomes through domestic transfers serves as an important strategy for coping with economic shocks after they occur.

5.3.3 Determinants of Household Income

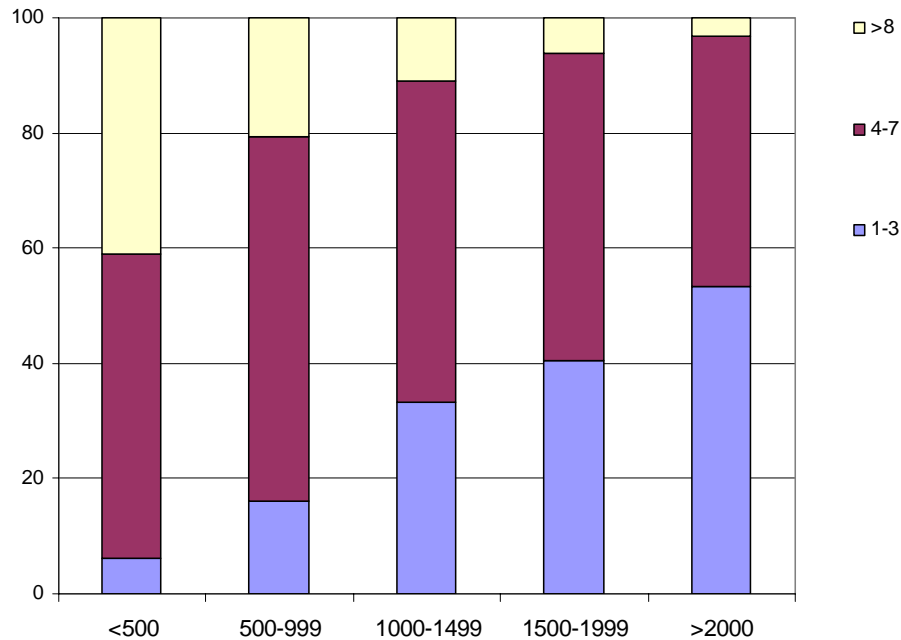
In this section we will investigate how total per capita household income varies with selected characteristics of the household, such as its size and composition, and the health, labor activity and education of its members.

While the household size and composition is given at the time of the interviewing, these factors are themselves subject to change according to the development of the household members’ individual economic resources

From Figure 5.14 it seems that there is clear negative relation between household size and per capita income. One obvious reason is, as mentioned above, that the choice of the “per capita” income measure gives a premium to small households, in particular when their members are employed adults. The figure shows that there is obviously a “life cycle”

element in household per capita income. Households with children below 15 are clearly worse off than those without small children (more about this below).

Figure 5.14 Per Capita Household Income by Household Size



However, the casual relationship between household size and household economic resources may also go the opposite way. Although the household size and type must be taken as given parameters in a household survey, there is usually a direct relationship between a household 's economic situation, and its size and composition over time. A large household may for example be the outcome of a situation, where adult sons cannot afford to move out when they marry. Hence, the daughter-in-law moves in, and the couple's children later add to the household size. Moreover, some households are large because the nuclear household members decide to incorporate family members who are not able to care for themselves, such as old, sick and disabled persons. Finally, even if preferences for large households were evenly distributed in the Jordanian population, very large households are associated with poorer rural areas, not least because the physical housing conditions in modern urban living quarters do not allow for a large number of household members.

Figure 5.15 Per Capita Household Income by Household Type

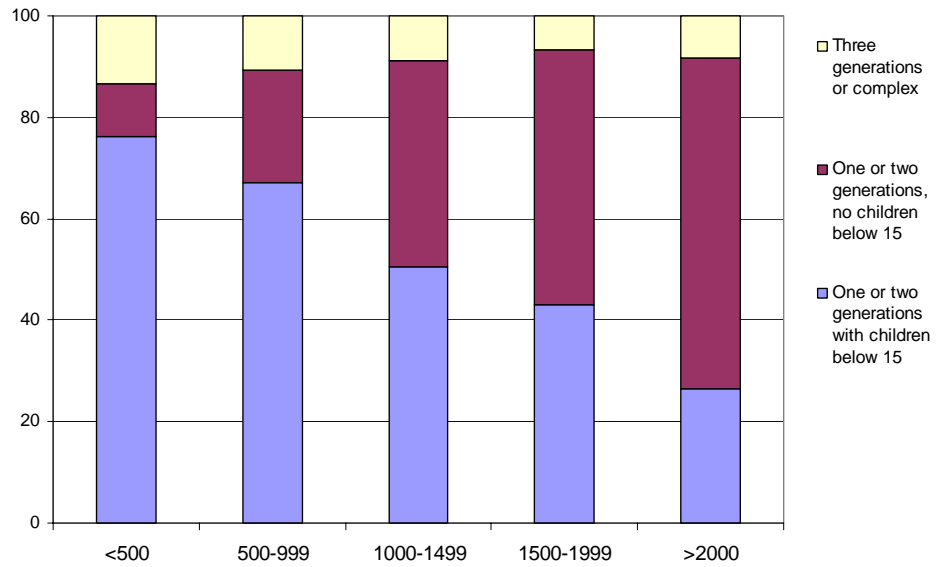
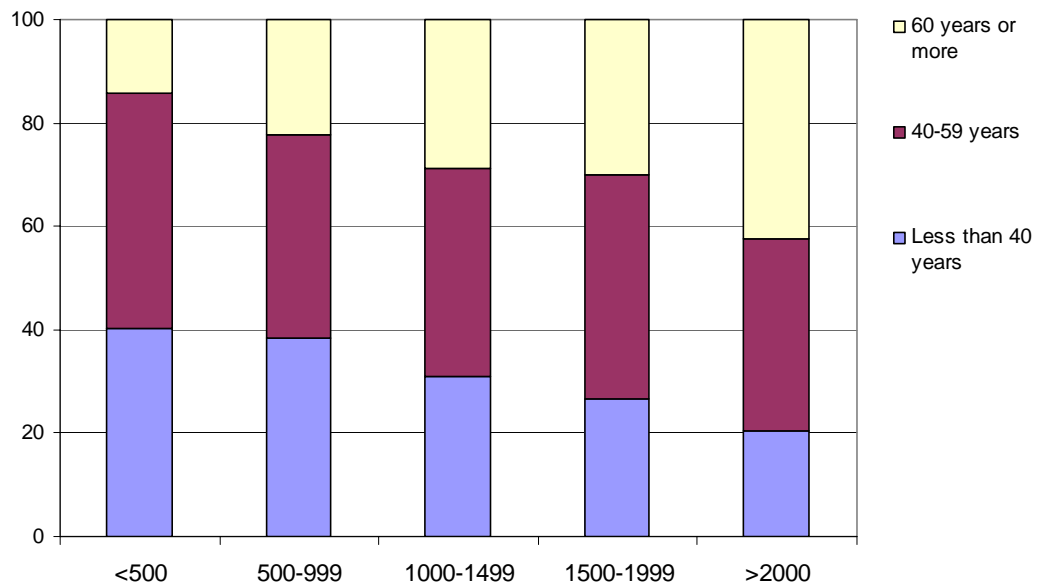


Figure 5.16 Per Capita Household Income by Age of Head



The effect of the “life cycle” of the household may be illustrated by comparing per capita income with the age of the (usually male) household Head. There is a tendency that household per capita income increases with the age of the household Head. However, headship may also be dependent on a person’s income-generating capacity. In larger households a young male may become Head in respect of high incomes. Moreover, high incomes also facilitate the formation of own households for young, newly married males, who then become Heads of their own nuclear households.

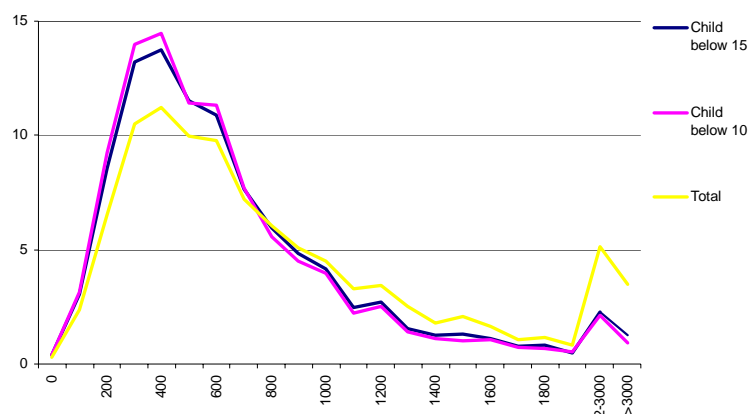
Policy challenge: Households with children lag behind the national average household income

Regardless of household size and type, it seems that households with children is a dis-privileged group, and that the income deficit relative to other households is larger for households with children below 10 years, than for households with children in ages 10-14 years. Young children not only generate additional costs for the households (accounted for by using the “per capita” income measure), but also frequently cause the loss of the previously working spouse’s income. Hence, a current income deficit is more serious for families with children, than that they are lagging behind on the asset index, (which to a larger extent captures the household’s aggregation of assets during its life cycle). Because small children are particularly vulnerable to sub-standard living conditions, special attention should be given to low-income households in this group in subsequent surveys.

In a country like Jordan with relatively few institutions for public provision of old-age benefits, older persons are usually dependent on economic transfers from their offspring, living within, or outside their households. Hence, having children is also an important investment in old-age economic security. Households with children may thus be regarded as making an inter-temporal economic adaptation, where they scarify household income early in the household’s life cycle, in return for higher incomes at a subsequent stage.

However, there may be irreversible losses to the human capital of children in very poor households, even though these households’ economic position improves significantly when their children enter the labour market. Typical examples are loss of education and ordinary childhood activities due to child labour, or malnutrition or other health damages caused by low material standards. Hence, the low incomes for some households with children cannot be reduced to a question about inter-temporal consumption choices, but pose a challenge for the whole Jordanian society.

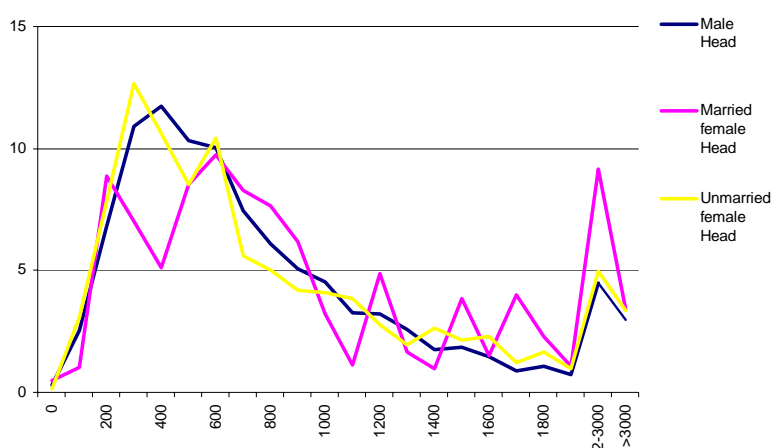
Figure 5.17 Per Capita Household Income by Prevalence of Children in the Household



Are Female Headed households worse off?

Over the last years, much attention has been given to “female headed households”, which have been identified as a particularly vulnerable group. The argument that these households are worse off than those who are headed by males, with one important exception (Figure 5.18). It is namely only the female headed households with an *unmarried* Head that deserves attention (i.e. roughly 3 out of 4 female headed households in Jordan). To the contrary, households headed by *married* females are better off than male headed households. The reason is, of course, that the male is long-term, but temporary absent, in most cases working in the Gulf or in Europe. In the usual Head’s absence, his spouse is defined as Head by the MPHS criteria, and due to remittances from the working male Head, the household per capita incomes of these households are above the Jordanian average.

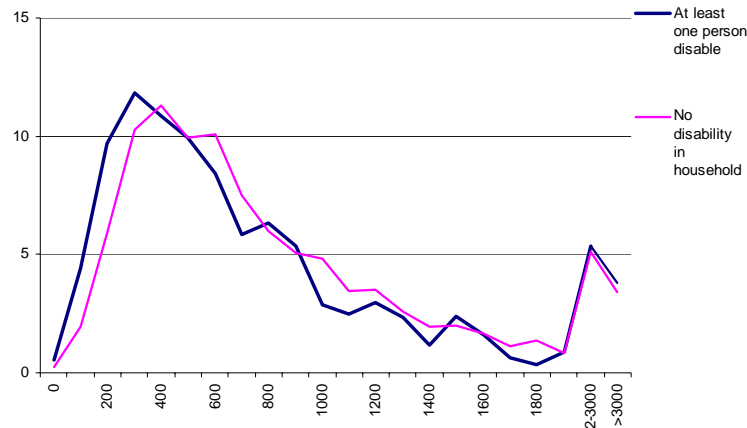
Figure 5.18 Per Capita Household Income by Sex of the Household Head



Why are households with disabled members not worse off than the average?

Contrary to what one could expect, households with disabled members are not particularly worse off than other households (Figure 5.19). In most cases, there is only one disabled household member. Although they are slightly over represented among the households with low income per capita, they are well represented also among the high-income households. One possible reason is that high income also provides the economic basis for taking care of disabled household members outside the core.

Figure 5.19 Per Capita Household Income by Disability in Household

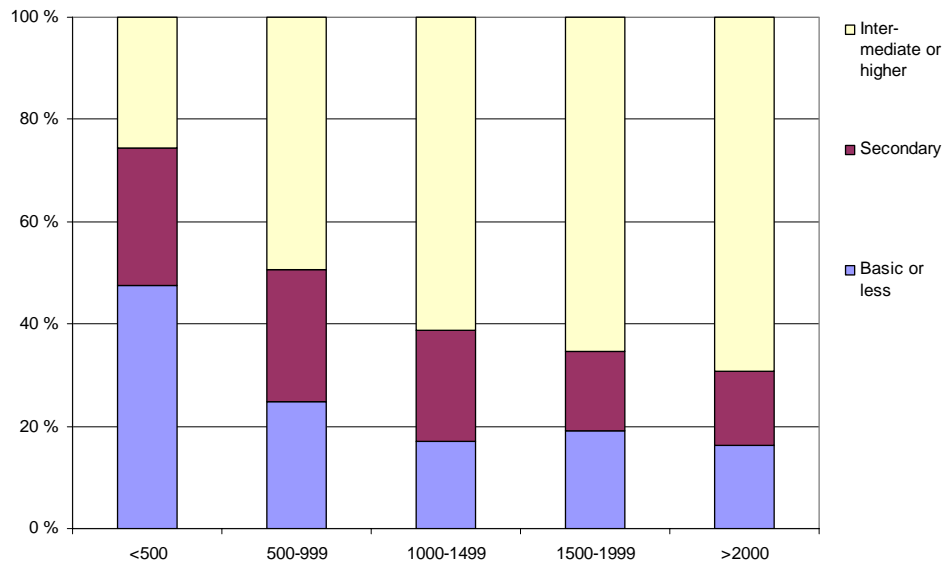


A clear and systematic relationship is found between the education of the most educated household member and the household income

Although education is an *individual* feature, we would generally expect a strong positive relation between education measures and *household* economy. The reason is that there usually a strong positive correlation between the education levels of the adult household members. We could thus obtain an indicator for education at the household level in several ways: As the mean education across adult household members, as the education of the Household Head, and/ or as the education of the spouse.

The strongest relation we found, however, was between the education level of the highest educated household member and household per capita income. The reason is that being highly educated is a necessary condition for many well-paid jobs, and that there are certain educational thresholds that must be passed. Figure 5.20 clearly shows how the share of households with at least one member with intermediate education or higher increases from 20 to 70 percent from the lowest to the highest per capita income groups. For university education, the corresponding figures are 5, and almost 60 percent (not shown in the figure).

Figure 5.20 Per Capita Household Income by Highest Educational Attainment in Household



Poor households tend to have no employed member, but not all households with no employed member are poor

Being employed is also an individual feature. The common solution for the problem of relating household economy to employment have been to use the employment of the Household Head as an indicator for employment at the *household* level. Rather than using this approach, we have instead summarized employment across the household members, distinguishing between households without employed members, households having only one person employed, and those having two or more employed (Figure 5.21).

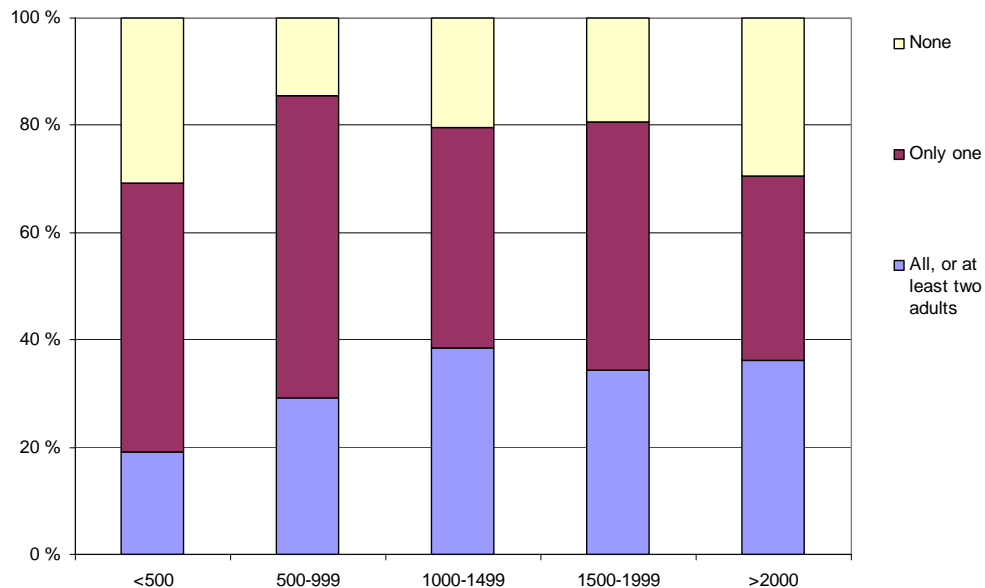
Households with very low per capita income clearly suffer from having nobody employed. However, there are also a surprisingly high number of well-of households without any employed household member. Some of these households live from transfers from former household members who temporarily work and live away from the households, for example the group of households headed by married women, referred to above.

Most households seem to manage well with only one employed member

Above an annual household per capita income of JD 1000, there is no difference between households having one, and households having two or more employed members. An obvious explanation is that many of the employed persons in the “only one employed” household groups have so well-paid job that they could afford to establish their own

households. However, relying on only one source of employment income, this group is, of course, more vulnerable to economic shocks than the group of households with two or more employed members.

Figure 5.21 Per Capita Household Income by Employment Status of Adult Household Members



Summing up on determinants of household income

Summing up section 3.3, the main message is that the relations between most “background variables” and household per capita income are as expected, and similar to most MENA countries. The main exception is the somewhat surprisingly high average income of households with disabled members. Having members with higher education seems to play a pivotal role in the household economy. Particularly vulnerable groups are households with small children, and households headed by *unmarried* females.

The relation between the household’s size and composition at the one hand, and household incomes at the other, requires careful interpretation. Although these features are given in the short term, not least due to the sampling design of the survey, they are themselves subject to change, depending on the development of the *individual* economic resources of the household members. *General economic improvement may generate an increased rate of household fragmentation, because some members who would like to live separately from e.g. their parents could then afford to do it.* Hence, some of the *material*

gain, (although not the *utility*) gain may get lost in the smaller economies of scale associated with smaller households⁸.

5.3.4 Perception of changes in own income from 2002 to 2003

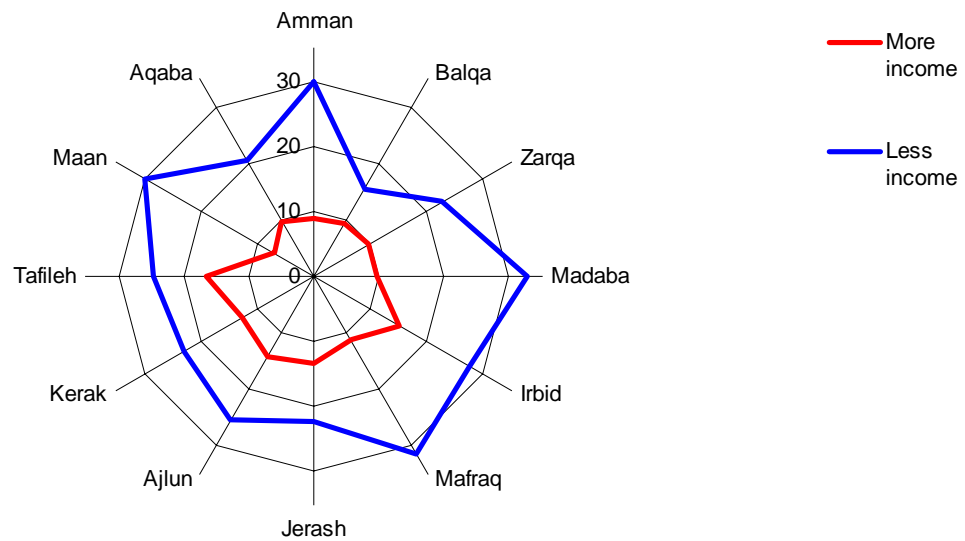
Why do more households report a reduction than an increase in income, although there at the same time was a national per capita GDP growth?

In the introduction to section 3.2 we mentioned that household incomes tend to vary substantially over time, and more so than expenditures. The topic of this section is to present the respondents' *own* perceptions of changes in their households' income from 2002 to 2003. As mentioned above, changes in household income may both be due to phenomena occurring at the aggregate level, such as business cycles in the economy, or seasonal variations, or due to factors pertaining to individual households. The results in this section must be interpreted with care: First, the question asks for the respondent's *subjective* assessment, second, we have no information about the households' (objective) economic situation in the previous, "base" year, 2002.

Altogether, more households in Jordan reported an income decline, than an income increase (27 against 11 percent). There was surprisingly little variation in the pattern of income change between urban and rural households, and also between the four main regions, with the exception of Amman, (which is anyway covered by the figure of governorates), so we have chosen not to present these figures here. The next step is to show the pattern of income changes across governorates (Figure 5.22). In order to simplify, we have focused only on the size of the groups of households reporting either a positive, or a negative change.

⁸ Everything else being equal, smaller households use a relatively larger share of their resources on items such as dwelling, consumer durable and other household amenities.

Figure 5.22 Change in Per Capita Household Income by Governorate



Among the governorates suffering from a higher share of households having an income decrease than the national average is Amman, which is best off, as well as Madaba, Ma'an and Mafraq. It is, however, difficult to see a clear pattern in the changes. Some governorates, as Irbid and Ajlun, have *both* a higher share of households with an income decrease and an income increase, than the national average.

The reader should also keep in mind that in particular for Amman, immigration of poor families from elsewhere in Jordan could in itself cause a certain number of households reporting an income decrease. The argument is that households move in order to improve their long-term economic prospects but that it takes time for newly established households to benefit from the earnings potential in the city, and fully compensate for the loss of their previous livelihood.

We cannot conclude whether the poor as a group have become poorer, because we do not know the households' incomes in 2002

In Figure 5.23, the share of households with changed income is plotted against the per capita household income in 2003. An immediate interpretation of the figure would be that the poor households in Jordan are worse off than the year before. However, this is *not* a valid conclusion from the data available to us, as long as we do not know the poor households' objective situation in 2002. By definition, a large share of the households that

reported a drop in income from 2002 to 2003 were not low income households in 2002, but ended up as poor in 2003. We have no way of distinguishing those households who were poor in *both* years, from those who became poor during the last year. Of course, the inverse argument holds for the well-to-do households.

Figure 5.23 Change in Per Capita Household Income by Per Capita Household Income

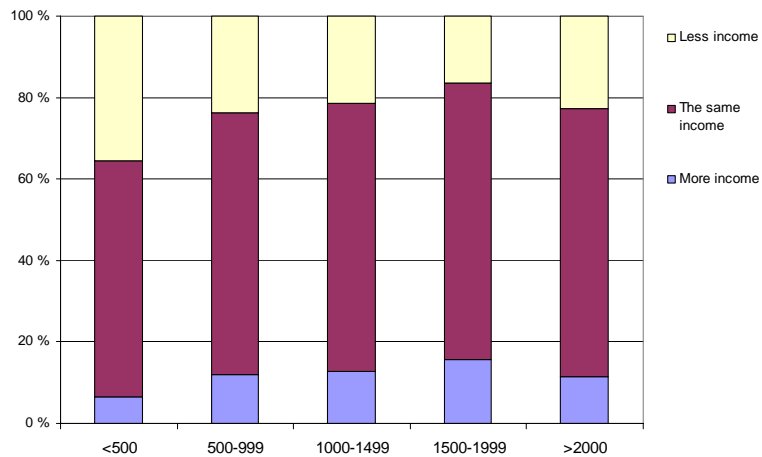
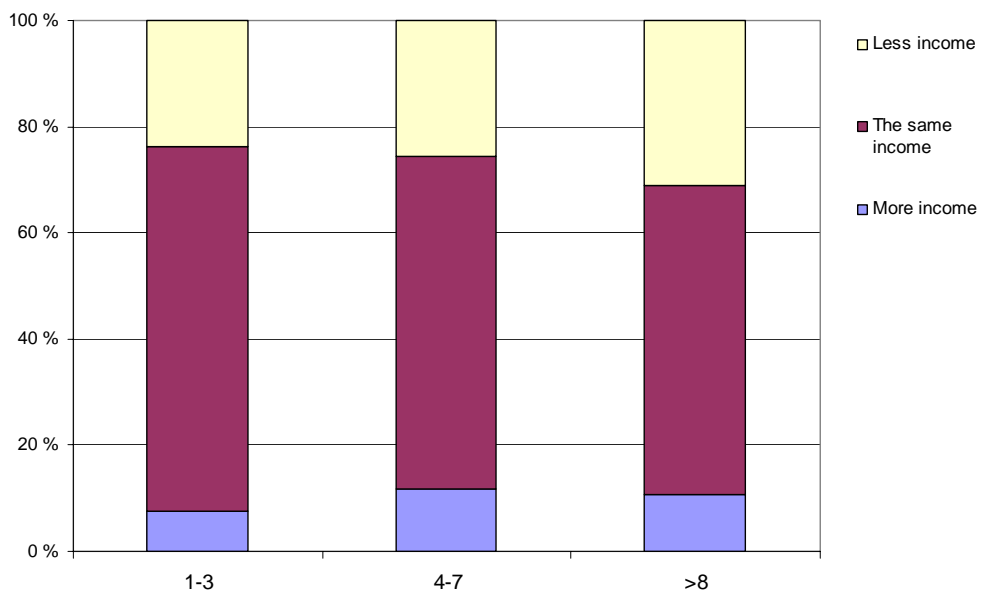


Figure 5.24 Change in Per Capita Household Income by Household Size



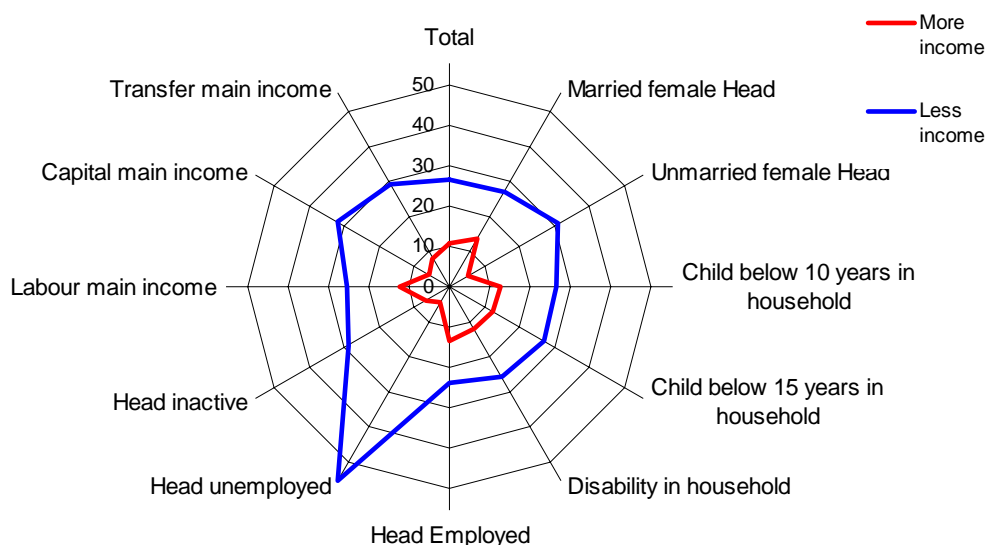
One should also keep in mind that not all households who suffer an income decline are victims to negative shocks such as losing their employment etc. Some households simply become “poor” due to natural “life cycle” features, such as persons moving in, or out

of the households. (This effect is also made stronger by the fact that the question referred to total household income, and not to the per capita income measure, used elsewhere in this report). Along the same track of reasoning, we may *partially* explain the observation in that more large than small households report an income decline by the fact that merging households, or at least postponing formation of new households is an important strategy to cope with income deficits.

The vulnerable groups, households with young children and households headed by unmarried females, suffered *less* income decrease than the national average

In order to highlight some particularly interesting (non-exhaustive) social groups, Figure 5.25 presents the group shares of households reporting either a positive, or a negative income change. (Note that we as reference have made the 12 o'clock “group” the *national* total). It should come as no surprise that the largest loss is suffered from the group of households where the Head are unemployed. The encouraging message is that some groups that we have previously identified as vulnerable, such as households with children below 10 and 15 years, and households headed by unmarried females, seem to have a smaller share of households with an income decline, and a larger share with income increase than the national average. However, there are more households reporting an income decline, than an income increase also in these groups.

Figure 5.25 Change in Per Capita Household Income by Selected (Non-exhaustive) Household Features



Summing up on determinants of household income

When analysing income changes during 2002, one should be extremely careful. Partially, because of the respondents have made *subjective* assessment of their income changes, and partially because we only know the households' incomes in 2003, but not in 2002. That being said, although more households report an income decline than an income increase, it seems that the largest decrease have occurred in socio-economic groups that, *on the average*, were among the better off, such as those living in Amman, and those having capital as their main income. Vulnerable socio-economic groups, such as households with young children and households headed by unmarried females, suffered *less* income decrease than the national average.

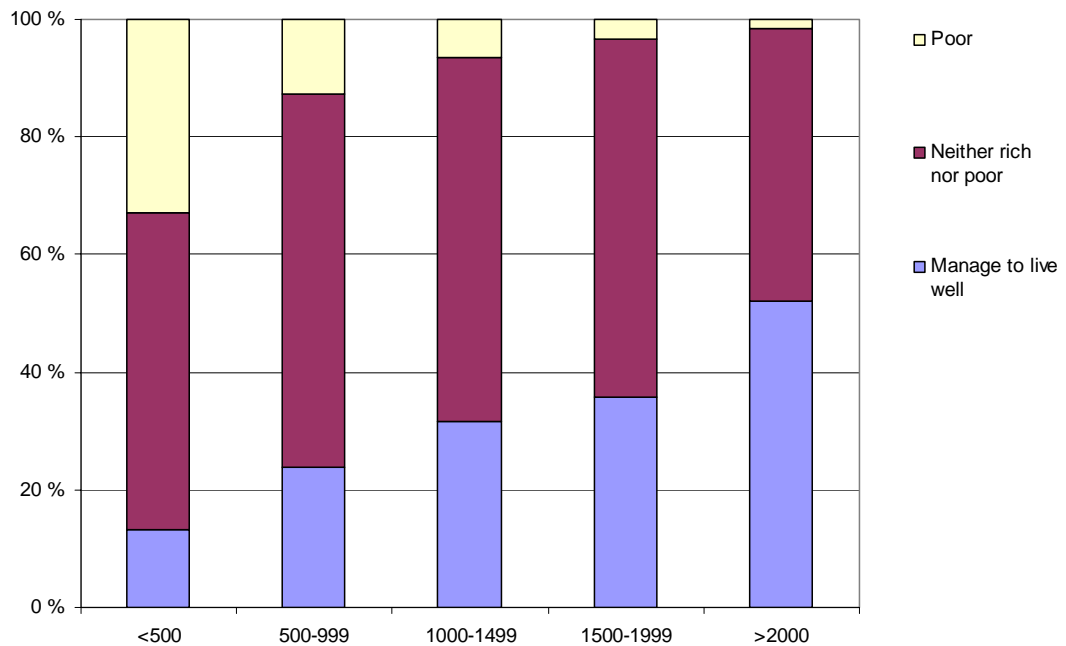
5.3.5 Household Economic Self-Assessment

Is the households' *subjective* perception of their economic situation in accordance with their *measured* incomes?

To assess the economic status of a household has both an objective as well as a subjective edge. Although one may argue that the objective measures of the households' economic resources should take precedence as basis for monitoring social policy, subjective perceptions may be even more important than the objective situation for explaining and predicting households' social behaviour.

The MPHS posed a question about economic self-assessment that originally also contained the answer category "I feel we are among the well-off in Jordan". Interestingly, for the country as a whole, this category ended up having only 0.3 percent of the answers. Hence, we merged this category with the closest answer alternative, which was phrased "We are not rich, but we manage to live well". It is, however, illuminating that even in a society with a large spread in household income, such as Jordan, very few people are willing to identify themselves as "rich".

Figure 5.26 Subjective Economic Status by Total Per Capita Household Income



Because the methodological challenges involved in reporting about economic self-assessment are so large, and because the relation between the subjective and “objective” economic status of households are interesting in itself, we start this section by comparing the two. First, it is not obvious whether the self-assessment refers to the households’ *current* economic position, as portrayed by the flow of income into the household. Figure 5.26 shows that there is clearly a large understanding among “objectively” poor households that they are poor. Interestingly, even in the lowest income groups 5-10 percent classify themselves in the highest category, probably rather illustrating lower material ambitions and expectations among these families than anything else. At the other end of the income ladder, roughly the same share of “objectively” rich households classify themselves as “poor”.

Households’ *subjective* perceptions depend on their aspirations and who they choose to compare themselves with

We have already mentioned differences material ambitions and expectations as an important explanatory factor behind these “absurdities”. A more general explanation is that households tend to report their subjective economic status relative to some “reference group”. The reference may be other households closely related in space and social environment (family, friends or neighbours), or their own situation over time, e.g. a very rich households suffering a relative deprivation, although still having much higher than the

average national income. There is a positive correlation between having more income, and assessing the one's own situation positively, and correspondingly, between having suffered an income decline, and classifying oneself as "poor".

Table 5.1 Bivariate Correlations Between Per Capita Household Income, the Asset Index, Change in Income Last Year, and Subjective Economic Situation (temporary lay-out).

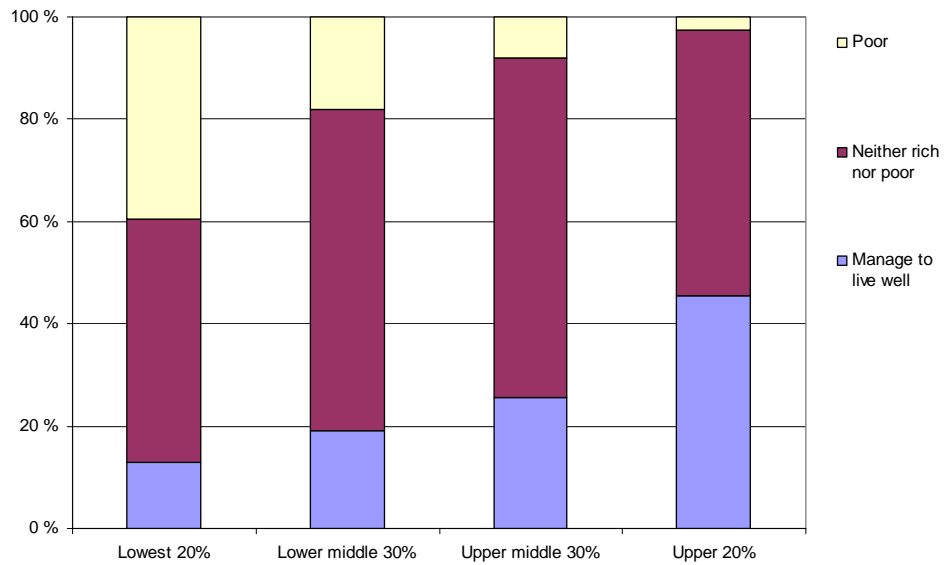
		IN 100 JDC	Asset Index	HH Income	Economic Conditions
IN 100 JDC	Pearson C	1	0.611	-0.115	-0.341
	Sig. (2-tailed)		0	0	0
	N	9676	9663	9547	9676
Asset Index	Pearson C	0.611	1	-0.065	-0.366
	Sig. (2-tailed)	0		0	0
	N	9663	9663	9533	9663
HH income	Pearson C	-0.115	-0.065	1	0.174
	Sig. (2-tailed)	0	0		0
	N	9547	9533	9547	9547
Economic Conditions	Pearson C	-0.341	-0.366	0.174	1
	Sig. (2-tailed)	0	0	0	
	N	9676	9663	9547	9676

Correlation is significant at the 0.01 level (2-tailed)

Households' subjective perceptions also seem to depend more on their *usual*, rather than their *current* situations

Above, we hypothesized that households tend to refer to their "usual" situation as much as to their "current" situation. Figure 5.27 seems to support this idea. If we assume that the index adequately represents the households' wealth, the asset index displays a "nicer" and more systematic relationship with the economic self-assessment than the household per capita income. Still, there is a substantial number of households at the very low end of the asset index that seem to have low material ambitions and expectations.

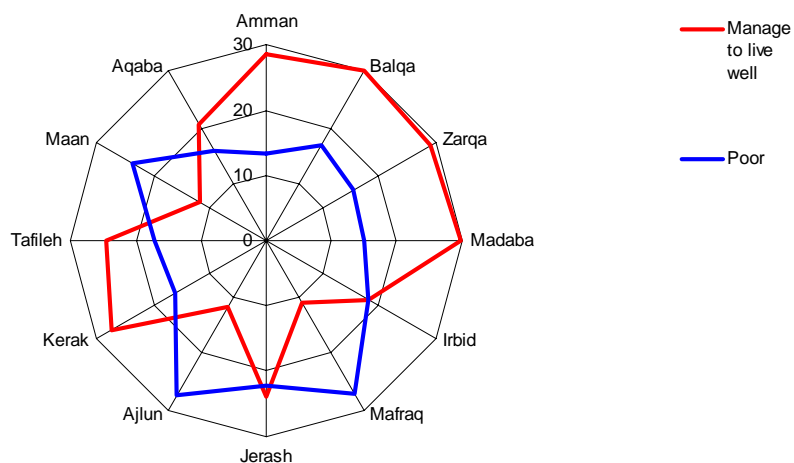
Figure 5.27 Subjective Economic Status by Household Asset Index Groups



Why are households in Ma’an discontent compared to Zarqa, when the distribution of measured income is almost identical in the two governorates?

Keeping these initial considerations in mind, we proceed with a comparison of the economic self-assessment across Jordanian governorates (Figure 5.28). In order to facilitate comparison we included only the two “extreme” groups, “Manage to live well” and “Poor”. The three governorates with a highest share of households considering themselves as “poor” are Ma’an, Mafraq and Ajlun. At the other end of the scale, the governorates of Amman, Balqa, Zarqa and Madaba has a higher than national share of households reporting that they “Manage to live well”. We were somewhat surprised about the figures for Amman, because large cities often provide for a large spectre of possible reference groups.

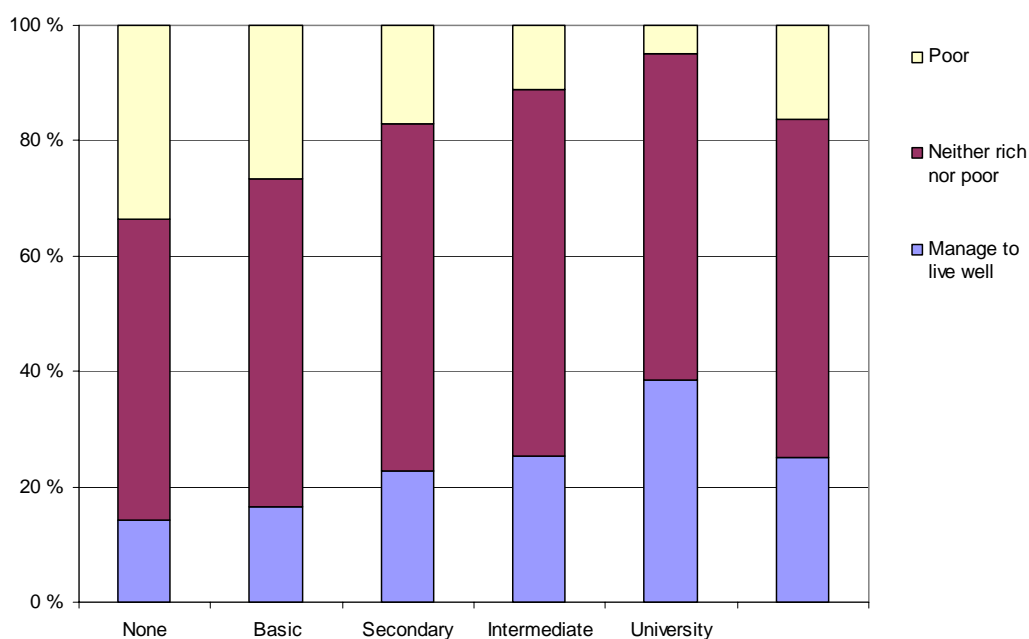
Figure 5.28 Subjective Economic Status by Governorate



Although measured income increases strongly with education, a corresponding change in material aspirations and change of reference groups cause their subjective position to increase less sharply with income

We also investigated the relationship between the households' subjective economic assessment and the households' education, represented by the educational level of the most educated household member (Figure 5.29). Our prior expectations would be that although households' income levels increase with increasing education of their members, so do also their material expectations and aspirations. We observe from the figure that the share of subjectively "poor" households decrease with increasing education of the most educated member, but that the increase turn into a decrease for the group with university degree. Our interpretation of this "surprise" is one of a change towards high-income reference groups, and failed material aspirations among some of the highly educated.

Figure 5.29 Subjective Economic Status by Highest Educational Attainment in the Household

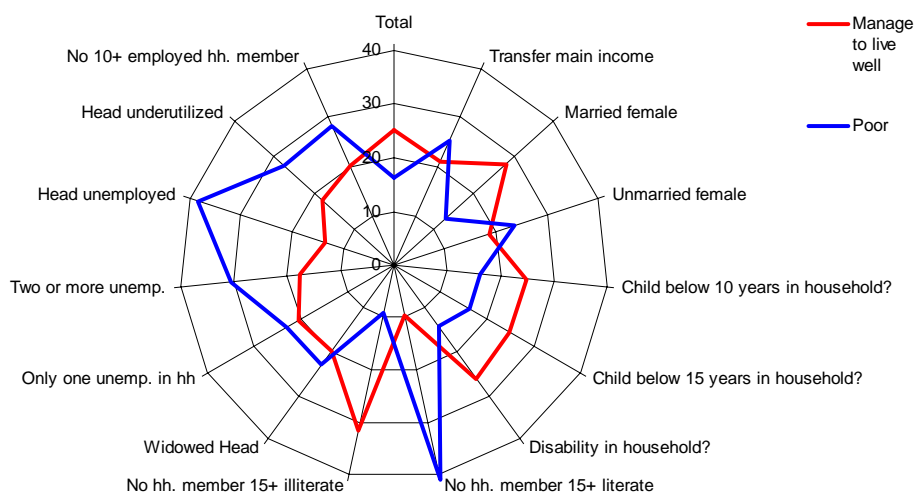


For which other socio-economic groups are the households' subjective perception of their economic situation in accordance with their measured incomes?

Finally, we want to highlight the subjective economic situation of some particularly interesting (non-exhaustive) social groups. Figure (5.30) presents the group shares of

households reporting either that they are in the group of “poor” households, or in the group that “manages well”. (Note that also here, we have included the *national* total as the 12 o’clock “group” as a quick reference).

Figure 5.30 Subjective Economic Status by Selected (non-exhaustive) Household Characteristics



A particular high prevalence of subjectively “poor” households is found among those with no literate adult household member, and among those where the Head is unemployed, households which probably suffered both an objectively low current income, and a negative *change* in household income.

Households with children below 10, and below 15 years, seem to be relatively content, compared to other groups previously identified as having reported low “objective” per capita income levels. One factor may be that they as already mentioned consider small children as an investment for older age, and that it is easier to accept that they have less material goods in their current life cycle. For female household heads, we once again observe the difference between *married* female heads, whose husband usually works abroad, and *unmarried* female heads. For both groups, there is a good correspondence with their subjective and their objective economic situation.

Summing up on determinants of household income

Subjective poverty is an important indicator for social frustration, which may lead to corresponding negative behaviour. It is important to relate the subjective assessment to “objective” measures for economic wealth, both measures for current flows of household income, and the stock of household assets. On the average households’ subjective economic

assessments largely seem to be rooted in their measured incomes. However, differences in aspirations and reference groups, in addition to quick changes in households' own economic situation, contributes to thwart the direct relation between the two.

Education raises *measured* incomes, but less subjective economic status. This is most likely due to increasing aspirations and changing reference groups at higher education levels. Households with small children are more content than they should be according to their measured position. Those who are illiterate, and those who are unemployed are not.

5.4 Household Wealth

Why is household wealth an important indicator for households' economic resources?

While income measures the flow of economic resources into a household during a given time period, *household wealth* refers to the *stock* of economic resources, usually accumulated over a longer time period. A household's stock of assets represents the footprint of the *past* incomes and consumption choices of its members. Hence, there may often be a relatively long and twisting casual chain between a household's *current* economic situation in terms of income, and its possession of assets.

Together with household income, household asset possession, will serve as one of our main indicators for the economic resources among Jordanian households. To supplement income measures with asset possession has several advantages: As an economic stock, asset possession tends to vary less randomly than income across time periods. It is also important to remember that the households' accumulated *long-term* wealth represents a different *dimension* of economic resources than their current incomes.

Although the MPHS contains a module on current household income types and amounts, the broad range of topics included in the questionnaire only allowed for a limited range of questions about household incomes. While household members may relatively easily conceal, or forget to report about their incomes to a household survey, the interviewers could, to the contrary, *observe* most assets at display in the household themselves⁹. Finally, although asset possession reflects *past* incomes and consumption levels, their use renders *current* services to the household members.

⁹ However, no questions were posed about savings whether financial savings such as bank accounts and shares, and in the traditional form of gold.

Most household assets are *public* goods, i.e. they are, at least in principle, shared by several household members. However, in reality, the access to household public goods such as cars, television sets etc, may be more restricted for certain types of household members than others. We would also expect household members to diverge on the *type* of assets they would like to prioritise. It is, for example, likely that women, which in the Jordanian society are the main responsible for running the daily household affairs, would give priority to the acquisition of household appliances, such as washing machines and vacuum cleaners, in order to lighten their burden of household maintenance. On the other hand, we would expect that men would prioritise assets pertaining to the “external” use and display of status, such as cars and mobile phones.

How can we compare the household wealth with households of different size and composition?

Also for the choice of household assets we assume that there exist a close, positive link between the influence on acquisition choices, and the person’s individual contribution to the overall household income. In Jordan, household income mainly provided for by male breadwinners. Hence, it is also reasonable to assume that this practice is mirrored in the household’s acquisition of assets. We will come back to this issue in relation to the possible influence of the gender of the household Head on the households’ consumption choices in section 4.1.

Being essentially *public* goods, it is difficult to argue in favour of correcting the possession of assets by the households’ size and composition. Hence, in contrast to household incomes, we will not measure household asset possession on a per capita basis. The implication of this choice is that, in contrast to incomes, large households, and in particular households with several small children will not be “punished” by our aggregate measures for household asset possession, such as is to some extent the case for household incomes.

The structure of the household wealth section

The household wealth section is divided into five sub-sections. The first sub-section deals with the possession of selected individual consumer durables. In section 4.2 we present the *household asset index*, which is our preferred measure for summing up household asset possession. While the individual assets to be discussed in section 4.1 are selected from the 23 consumer durables asked for by the survey, the asset index has a much broader scope. In

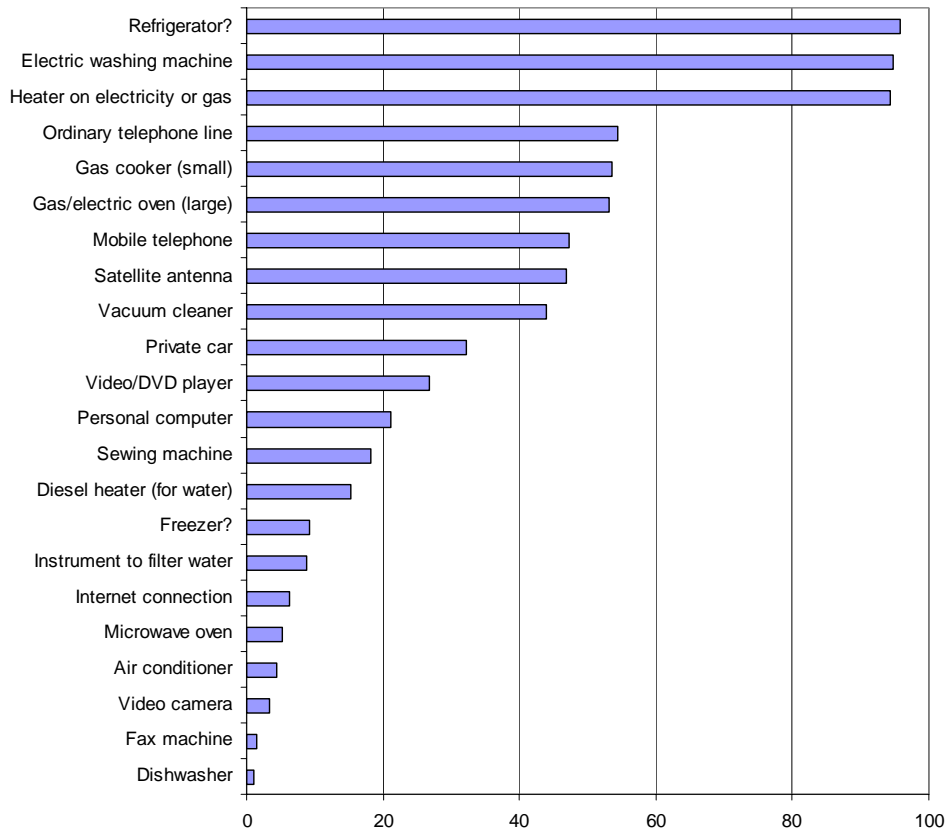
addition to all consumer durables, it also based on the physical and infrastructure characteristics of the household's dwelling, in total using 81 different features as its basis¹⁰.

Section 4.2 also deals at the basic level with some key methodological problems related to the construction of asset indices, such as the question about which items to include, and how to weight the various items up against each other, in order to control for price and quality differences between the items included in the index. A more thorough methodological discussion is conducted in a separate appendix.

Section 4.3 investigates the reliability and performance of the asset index, in particular the relation between our various measures for household income, and the asset index. In section 4.4, we present the results of a multivariate analysis of factors that seem to influence households' asset possession. Finally, we investigate the relationship between household asset possession and crime levels in section 4.5.

¹⁰ The inclusion of many household infrastructure items in the index, sewage and water networks also raises the question about to what extent some features depend on *public* infrastructure provisions, such as electric grids, rather than on *household* wealth. This argument also pertains to some of the individual consumer durables, which require electricity and/or water connection to operate.

Figure 5.31 Ownership of Consumer Durables



5.4.1 Possession of Selected Assets and Consumer Durables

Why we have chosen the selected items?

In the reminder of this sub-section we will present the distribution of only a few consumer durables selected from the 23 listed in the MPHS questionnaire. Although all of them are interesting in their own right, it would require too much space to show the distribution of all 23 across both geographical units and other socio-economic groups.

The 9 durables that have been selected have been selected from the following criteria: First, we want a good mix of durables, i.e. some durables that is owned by nearly every Jordanian household (fridge and washing machine), some that are owned by nearly half of the households (ordinary telephone), and some that are owned only by a small minority (personal computer and Internet connection).

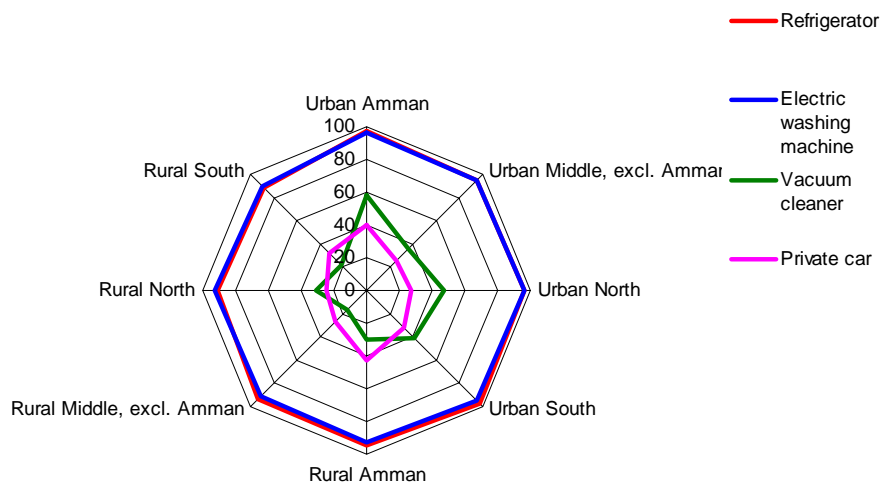
Second, we have chosen to include two items owned by roughly the same percentage of households nationally, but where we expect males to have preferences for the first item

(cars), and women to have preference for the second (vacuum cleaner). Third, we have selected some items that indicate to what extent the household receives impulses and use modern tools of communication with the outside world (ordinary and mobile telephone, satellite antenna, personal computer and Internet connection).

Rural areas prefer cars, while urban areas prefer the vacuum cleaner

Nearly every Jordanian household own a refrigerator and a washing machine (Figure 5.32). There is not much regional difference, except for a slightly higher rate in the urban than in the rural areas. The ownership rate for cars and vacuum cleaners are much lower, with an interesting urban-rural difference: In the rural areas, cars are more popular than vacuum cleaners, while in the urban areas, and in particular in urban Amman, the pattern is the opposite. Although there is a good reason to prefer a car in rural areas with sparse public communications, it is also likely that this difference to some extent is knit to the stronger influence of women with higher education in the cities.

Figure 5.32 Selected Consumer Durable by Region and Urban-Rural residence

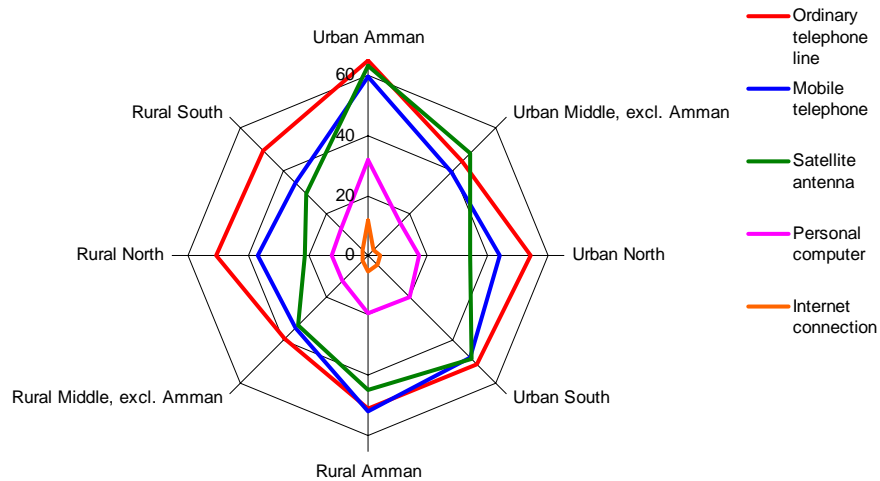


Rural areas lag somewhat behind in ownership of modern communication tools

Ordinary telephones have traditionally been the most important device of electronic communication in Jordan. Over the last years, a range of new items has arrived on the market. The most important are mobile telephones, personal computers, Internet connection and satellite dishes. While there is not much difference in ownership of ordinary telephones

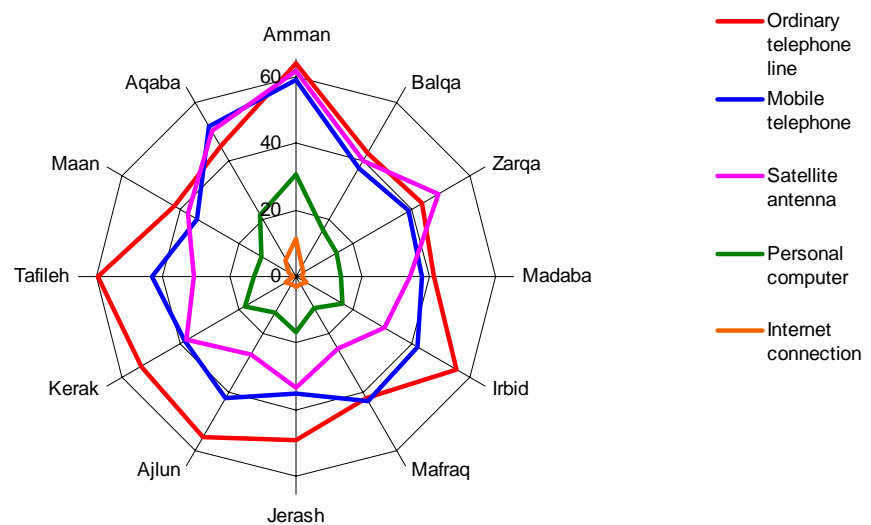
between rural and urban areas, there seem to be a clear urban-rural bias in the ownership of the modern communication tools (Figure 5.33).

Figure 5.33 Selected Communication Consumer Durable by Region and Urban-Rural



The rural-urban dimension is important for explaining differences between governorates. Ownership of refrigerators and washing machines is close to 100 percent in all governorates. Else, it seems that the Southern governorates, probably due to large distances, have preferences for cars rather than vacuum cleaners. The ownership of modern communication tools is particularly high in Amman, and to some extent in Aqaba governorates (Figure 5.34).

Figure 5.34 Selected Communication Consumer Durable by Governorate



Not owning a refrigerator or a washing machine is a clear sign of poverty

The only households where the ownership-rate of refrigerators or washing machines is not close to 100 percent are the very low-income households. Else, all the selected items increase systematically with increasing household per capita income. For Internet connection, there seem to be an income threshold at JD 2000 per capita per year (Figures 5.35 and 36).

Figure 5.35 Selected Consumer Durable by Total Annual Per Capita Household Income

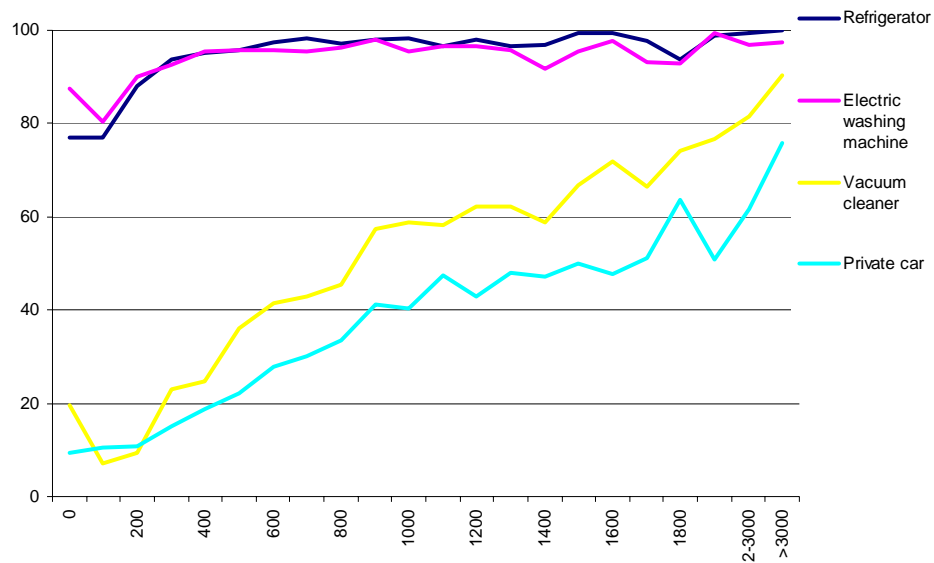
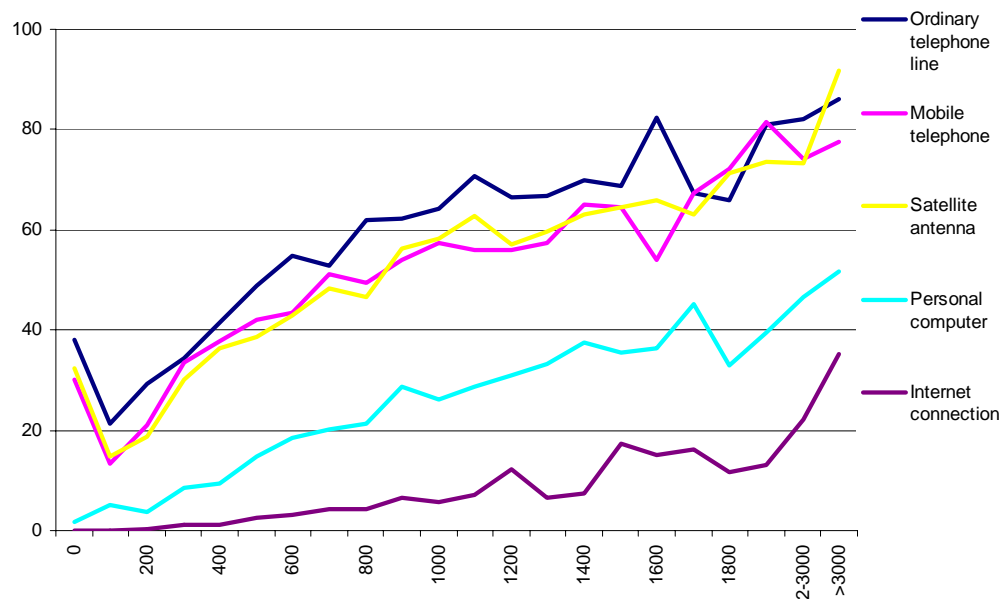


Figure 5.36 Selected Consumer Communication Durable by Total Annual Per Capita Household Income



Households with 5-6 members own most items

Ownership of consumer durables peaks at households with 5-6 members, (Figures 5.37 and 5.38). The main explanation is probably that average household per capita incomes are lower for larger households, and that the costs of public goods relative to private goods are higher for the smallest households. An interesting finding is the relatively sharp inverse-u shape of the curve for vacuum cleaners. This may indicate the abundance of female labour available to the large households.

Figure 5.37 Selected Consumer Durable by Household Size

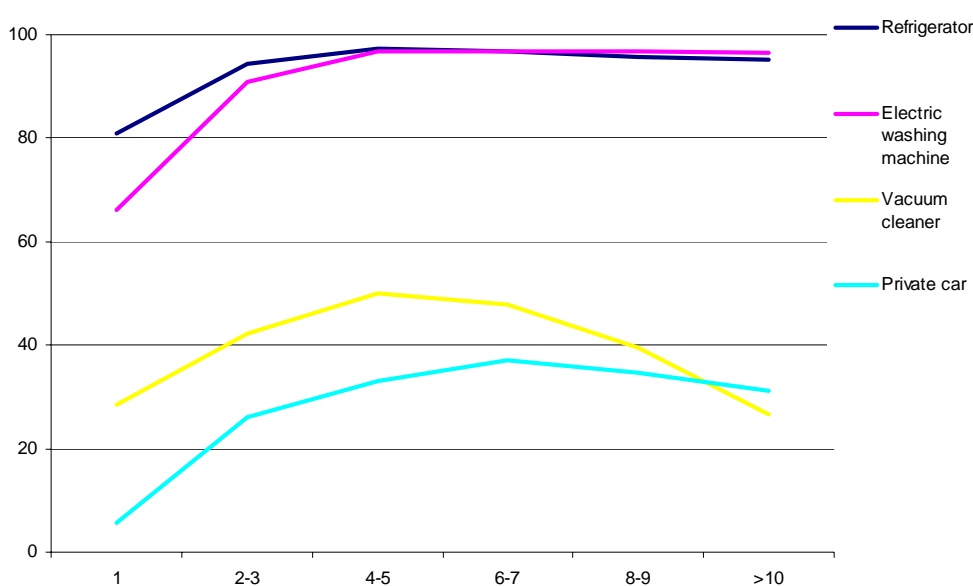
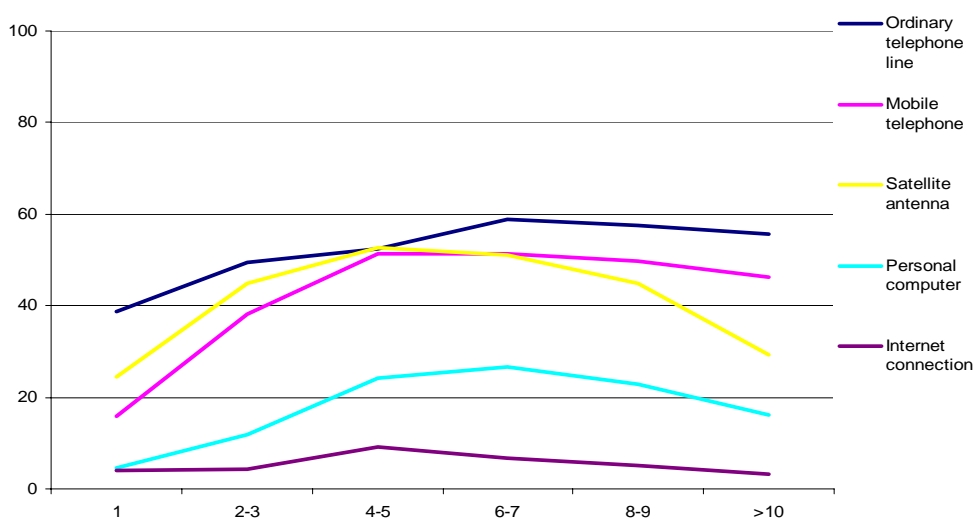


Figure 5.38 Selected Communication Consumer Durable by Household Size



Illiterate households lag behind

Households where all members are illiterate are most systematically deprived with respect to ownership of our selected items. Ownership of all items increases the fewer household members that are illiterate (Figure 5.39). Unmarried female household Heads once more clearly lag behind other households, in contrast to households with disabled members, who are at the average national level. An interesting observation is that households with *married* female Heads clearly prefer ownership of vacuum cleaners relative to cars, while in the male headed households, the order of priority is the opposite (Figure 40).

Figure 5.39 Selected Consumer Durable by Household Literacy Status

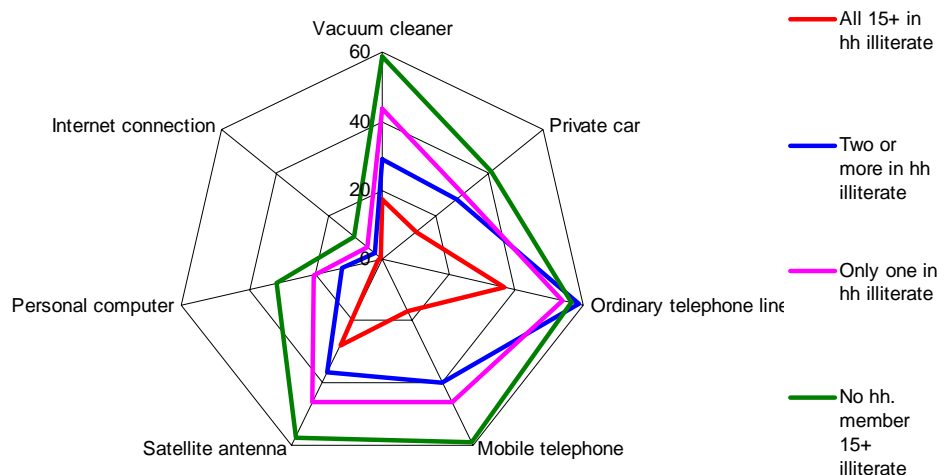
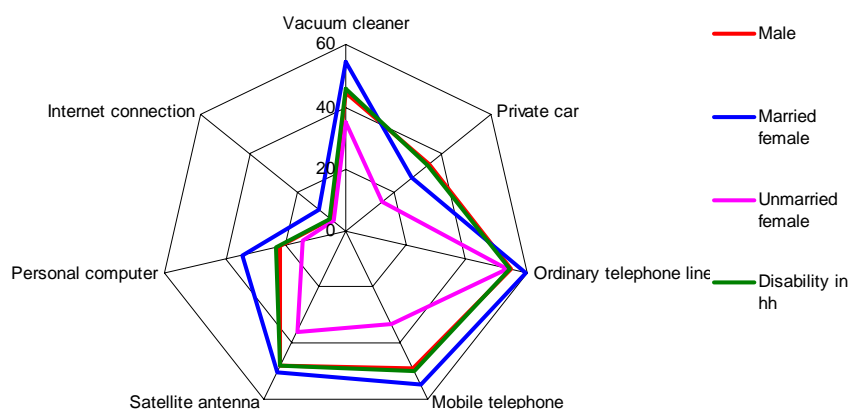


Figure 5.40 Selected Consumer Durable by Sex of Head and Disability in Household



Summing up on Household Asset possession

The asset possession of Jordanian households clearly reflects a mid-income developing country, where almost every family owns items such as washing machines and refrigerators. Many new items, in particular items for modern electronic communication, are being introduced. Rich and urban households spearhead this development. Although most differences in ownership rates may be explained by the household per capita income, there also seem to be an urban-rural difference with respect to preferences for modern electronic communication items. Moreover, there are indications that households where women may be assumed to have above the average influence in the households give priority to the acquisition of modern household appliances that reduces the need for manual female labour, such as vacuum cleaners.

5.4.2 The Household Asset Index

Why should we construct a household asset index?

Although the MPHS contains a module on current household income types and amounts, the broad range of topics included in the questionnaire only allowed for a limited range of questions about households' incomes. Moreover, there was no information about the households' expenditures. The main purpose of the asset index is thus to serve as a *supplementary* aggregate measure for the households' economic resources, a measure that to some extent covers a different dimension than current incomes, namely *long-term* accumulated household wealth. Finally, the household asset index is also a convenient tool for *summing-up* the possession of assets among Jordanian households.

What are the main challenges in the construction of the asset index?

In the construction of an asset index several challenges arise. First, one must decide which items to include. Second, one must decide how to weight the various items up against each other and hence control for price and quality differences among the items included in the index. Finally, one must check the reliability and performance of the index, internally and externally. Our solutions to these challenges are briefly presented below.

Which items should be included in the asset index?

The 2003 MPHS contains a large amount of variables that are relevant candidates for inclusion in a household asset index. The questionnaire naturally suggests that three main

groups of items are included in the index: After recoding the non-binary nominal candidate variables, we had 29 ordinal or scale variables about housing conditions, 29 variables about infrastructure items, and 23 variables about ownership of various consumer durables.

How should one weight the various items up against each other?

The simplest type of an asset index would be one that just sums up the household assets, giving the score of 1 if a household has the asset, and the score 0 otherwise. This simple “additive” asset index implies giving all assets equal weights, regardless of their value and type. The classical problem of how to add “apples and oranges” is thus solved by labeling everything “fruits”. However, giving equal weights to all assets is a simple, but completely arbitrary method, because assets have varying prices, quality and importance. We thus prefer to look for an alternative weighting approach.

Instead of giving equal weights to each item in the index, Filmer and Pritchett (1998) suggest to *estimate* the weights of the asset index, using the statistical procedure of *principal components*. The crucial condition for using this approach is that for a list of asset variables, long-run household wealth is what causes this most common variation in the variable set. Hence, the assumption is that the *first* principal component estimated may be labelled “long-run household wealth”. The mean value of the index is zero by definition, but those who prefer an index that is non-negative by definition, such as the simple additive one, may simply add the difference between 0 and the lowest household index score to the estimated index value for all households. Because the asset index is defined at the *ordinal* rather than at the scale level, it will only *rank* households according to their long-term economic resources. In other words, a household that has twice as high score on the asset index as another household does *not* possess twice as many assets.

How can we test the performance and reliability of the index?

Performance and reliability checks of an asset index are particularly important for a data set with limited income and expenditure information, as is the situation in our case. We first confirm that the index is internally coherent, i.e. that it produces clear separations across the poor, the middle and the rich households for each asset included in the index.

The index also seems to be generally “robust” to the main groups assets included. The lowest 20% of households on the full index are in most cases also classified among the lowest 20% on the 3 sub-indices that contain mutually exclusive assets. Finally, the index also seems to produce reasonable comparisons with other indicators related to household

welfare, e.g. with crude measures for total household *current* income, with male and female levels of education, and with subjective judgement of the welfare distribution across regions and urban and rural locality types.

We would, however, expect the index to have a positive urban bias. The main reason is that while land ownership is probably a positive economic indicator at the village level, living in a *rural* area may not be associated with a high asset index score in the *national* Jordanian context. An index with negative weights to land ownership could have been an indicator of this kind of problems. In the MPHS, it is difficult to check upon this, because there were no questions about land ownership.

Finally, we would like to warn against using the asset index as an *independent* indicator of welfare. If one's primary research topic is the Jordanian households' economic welfare and poverty, one should rather consult the more detailed and purpose-built DOS Jordan 2002-2003 Household Expenditures and Income Survey.

Is the index internally coherent?

That the index is "internally coherent" implies that it produces clear separations across the poor, the middle and the rich households for each asset included in the index. Table 5.2 contains four columns, one for each of four groups that are constituted by their score on the overall asset index. The first column from the left shows the mean value for each asset among the 20% (of households) who have the *lowest* score on the asset index. The second column contains the mean asset value for the next 30% of households, and so on. We would then expect the mean value for the asset to increase when we move from the very left, towards the very right column. The bottom line of the table shows the mean values for the full asset index.

From Table 5.2 we can see the gap in the mean value of the index between the two highest groups is quite large, at almost 14 units. The right column in the table shows us that in order to move from the second highest to the highest, a household would have to acquire a fax machine, a dishwasher, a microwave oven, a computer, an air-conditioner, and a mobile telephone and another car, which would raise its score on the asset index by roughly 13 points.

Table 5.2 Group Means for the Asset Index with Weights derived by Principal Components Analysis

Group means total Jordan				
Asset variable	Lowest 20%	Lower middle 30%	Upper middle 30%	Upper 20%
Live in apartment	0.318	0.537	0.704	0.788
Live in dar	0.680	0.463	0.296	0.178
Live in other dwelling type	0.002	0.000	0.000	0.035
Road to dwelling is paved	0.414	0.636	0.795	0.947
Road to dwelling is partially paved	0.282	0.186	0.109	0.031
Road to dwelling is unpaved	0.219	0.126	0.058	0.010
Road to dwelling is stairs	0.061	0.044	0.036	0.011
Road to dwelling is other type	0.024	0.008	0.002	0.001
Main building material is stone	0.005	0.018	0.096	0.589
Main building material is concrete	0.055	0.062	0.067	0.055
Main building material is cement bricks	0.907	0.917	0.836	0.357
Main building material is other type	0.032	0.003	0.001	0.000
Main building material in roof is concrete	0.905	0.994	1.000	1.000
Main roof material is iron / zinc	0.063	0.004	0.000	0.000
Main roof material is other type	0.032	0.002	0.000	0.000
Size of housing unit (SQM)	72.321	100.993	120.741	169.796
Garden plot / kitchen garden	0.320	0.423	0.453	0.547
Compound / courtyard	0.386	0.385	0.387	0.452
Balcony / veranda (larger than 4 m2)	0.275	0.341	0.391	0.586
Roof area	0.612	0.742	0.730	0.707
Shop area / workshop	0.010	0.012	0.016	0.011
Own dwelling	0.555	0.616	0.605	0.727
Rent dwelling	0.256	0.225	0.275	0.198
No payment for living in dwelling	0.178	0.153	0.110	0.066
Other tenure type	0.011	0.006	0.010	0.009
Monthly rental value	38.776	54.379	76.193	151.266
Separate kitchen	0.903	0.995	0.999	0.998
The total number of rooms in the housing unit	2.647	3.540	4.091	5.073
Number of rooms for sleeping	1.405	1.815	2.100	2.702
Connected to the public water network	0.927	0.976	0.996	1.000
Drinking water from public water system	0.879	0.879	0.838	0.588
Drinking water from tanker truck	0.048	0.024	0.007	0.001
Drinking water from rain water collection	0.049	0.071	0.050	0.021
Drinking water from bottles	0.009	0.017	0.095	0.385
Drinking water from other source	0.015	0.009	0.009	0.005
Light from electricity grid	0.996	1.000	0.999	1.000
Light from other source	0.004	0.000	0.001	0.000
Main heating is central heating	0.001	0.001	0.015	0.410
Main heating is gas	0.082	0.258	0.448	0.411
Main heating is kerosine	0.793	0.684	0.508	0.164
Main heating is electricity	0.001	0.001	0.004	0.007
Main heating is diesel	0.019	0.018	0.014	0.007
Main heating is coal /wood	0.051	0.017	0.006	0.000

Group means total Jordan (ctd)				
Asset variable	Lowest 20%	Lower middle 30%	Upper middle 30%	Upper 20%
Main heating is other type	0.007	0.006	0.001	0.000
No heating	0.047	0.015	0.010	0.007
Main fuel for cooking is gas	0.981	0.999	0.997	1.000
Main fuel for cooking is other	0.019	0.001	0.003	0.000
Does the housing unit have a separate bathroom	0.793	0.977	0.995	0.998
Flush toilet	0.016	0.075	0.437	0.913
Traditional toilet	0.947	0.919	0.558	0.080
Other toilet type	0.037	0.006	0.005	0.007
Connectet to sewage grid	0.404	0.525	0.662	0.802
Cesspoint	0.586	0.474	0.338	0.198
Other sewage system	0.010	0.001	0.000	0.000
Garbage is put in open container	0.379	0.463	0.541	0.576
Garbage is put in closed container	0.015	0.018	0.016	0.048
Garbage is collected	0.549	0.484	0.416	0.349
Garbage is disposed of otherwise	0.058	0.036	0.027	0.027
No. of refrigerators	0.831	0.979	1.006	1.045
No. of freezers	0.001	0.012	0.066	0.341
No. of gas/electric ovens (large)	0.080	0.310	0.766	0.978
Gas cooker (small)	0.953	0.765	0.327	0.094
Electric washing machine	0.806	0.975	0.984	0.998
No. of television sets	0.920	1.027	1.147	1.389
Satellite antenna	0.093	0.288	0.611	0.901
Video/DVD player	0.069	0.181	0.305	0.542
No. of ordinary telephone lines	0.153	0.446	0.690	0.898
No. of electricity or gas heaters	1.047	1.455	1.849	1.892
Diesel heater (for water)	0.008	0.066	0.201	0.349
No. of personal computers	0.008	0.056	0.258	0.634
Internet connection	0.000	0.002	0.035	0.259
Sewing machine	0.060	0.122	0.239	0.311
Fax machine	0.000	0.000	0.004	0.065
Dishwasher	0.000	0.000	0.001	0.056
Microwave oven	0.000	0.001	0.011	0.243
No.of air conditioners	0.010	0.019	0.043	0.161
Vacuum cleaner	0.026	0.206	0.623	0.925
Video camera	0.001	0.001	0.011	0.144
No. of mobile telephones	0.150	0.387	0.722	1.423
Instrument to filter water	0.002	0.011	0.084	0.297
No. of private cars	0.051	0.167	0.407	0.818
Asset Index	-11.093	-5.304	2.052	15.966

First set of variables are the variables concerning housing and infrastructure. Some of the latter variables, such as water and sewerage network connection to some extent are partially provided on a community basis. This helps to explain the somewhat odd phenomenon, that the mean value of “living in a dar” decreases as the total index score increases. The “dars” are to a large extent old houses situated in rural areas, where community infrastructure such as piped water, sewage and electricity grids are sparse, while

“apartments” are typically newer dwellings situated in more developed areas. In contrast, the mean size of the dwelling, the total number of rooms, and the mean number of rooms used for sleeping in the households’ dwelling all increase nicely with the grouped asset index scores.

Next comes ownership of 23 consumer durables, which mostly require electricity connection. These items vary across the groups formed by the households’ index scores, as one would expect. Many of the assets, like dishwasher or video camera are not common in Jordanian households, even among households whose score fall in the upper 20% group on the asset index. However, the mean value for all assets increases systematically as we move from the left to the right column¹¹. This is particularly the case for items that we know are commonly owned by the rich, but not by the poor, such as ordinary telephone, washing machine and car.

A less visible problem with the asset index is that it probably has an urban bias, because it gives a strong “reward” for owning items associated with modern society (e.g. computers and mobile phones) rather than traditional items, such as land. The main point is that while land ownership is probably a positive economic indicator at the village level, living in a *rural* area may not be associated with a high asset index score in the *national* Jordanian context¹².

For the purpose of comparison we also constructed a “simple” additive asset index. The bivariate correlation coefficient between the asset index with weights derived from principal component analysis, and the simple additive asset index was as high as 0.905. One may argue that this confirms the performance of the first index type. However, one may also argue that one could as well replace the former with the latter, which is simpler to construct, because the results do not differ much between the indices. Still, we maintain that one should prefer the asset index with weights derived from principal component analysis to the simple additive asset index because the weighing of items in the latter index lack any theoretical or empirical qualified justification.

¹¹ If the assumption holds that most households own only one computer, one fridge etc, one may multiply the column figures by 100 in order to obtain the (rough) percentage of households in each group that owns the asset. (This is obviously not a valid assumption for individually possessed consumer such as mobile telephones, where the group mean for the highest group is as high as 1.42).

¹² Below we will investigate this phenomenon closer by estimating one principal component asset index for an *urban* sample only, and one similar index for the *rural* sample.

Is the index robust?

In order to check the *robustness* of the index, we constructed five sub-indices. First, we made one index for the full range of items in the national index, but estimated from *urban* households only, and a similar index estimated from *rural* households only. Then we made three sub-indices for sub-groups of the assets included in the full index, i.e. one sub-index for housing, one for infrastructure, and one sub-index for consumer durables.

Table 5.3 shows the bivariate correlation matrix between respectively the full index with weights estimated by principal component analysis, the four sub-indices, and the simple additive index. The correlations between the full principal component index and its five sub-indices are relatively high, although – somewhat surprisingly – not systematically higher than for the simple *additive* index and the five sub-indices. To some extent the correlation between the full principal component index and its five sub-indices follows by definition, especially since the housing, infrastructure and consumer durable sub-indices contributed roughly equally to the total index. We would, however, have expected a somewhat smaller correlation between the full index for the *national* sample, and the full index for the *rural* sample. The fact that the urban and the rural sub-indices had roughly the same correlation with the national index, indicates that the problem of an urban bias is less than feared. The low correlation coefficients that were found between the total annual current income and the asset indices were somewhat surprising. Using a grouping of the total annual income, it seems that it behaves just as nicely as the full asset index with respect to its behaviour across the individual items included in the asset index. We then tried to take the log of the total annual income, which raised the correlation coefficient with the full principal components asset index from 0.49 to 0.64. This indicates that a very long right tail in the total annual income distribution is one reason for the relatively low correlation.

Table 5.3 The Bivariate Correlation Matrix

Full PC index	1.000	0.998	0.993	0.766	0.746	0.920	0.905	0.493
Full PC index urban sample	0.998	1.000	.	0.829	0.716	0.917	0.930	0.521
Full PC index rural sample	0.993	.	1.000	0.807	0.686	0.907	0.921	0.457
PC Sub -index for 29 housing features	0.766	0.829	0.807	1.000	0.349	0.594	0.798	0.424
PC Sub -index for 29 infrastructure features	0.746	0.716	0.686	0.349	1.000	0.570	0.485	0.288
PC Sub -index for 23 consumer durables	0.920	0.917	0.907	0.594	0.570	1.000	0.909	0.482
Simple additive index , full sample	0.905	0.930	0.921	0.798	0.485	0.909	1.000	0.491
Total annual household Income	0.493	0.521	0.457	0.424	0.288	0.482	0.491	1.000

* Households that are in the urban sample are not in the rural sample and vice versa

The basis for the asset index is very good. The index contains 81 different items, of which some are owned by nearly all households, some are owned by roughly half the households, and some are owned by only a few of the households. There is thus little reason to believe that the index is invalid, e.g. that it is too much influenced by a few particular items. This indicates that there probably is some substantial difference between households' score on *long-term* wealth and their *current* incomes.

For each of the principal component indices, as well as for the simple additive index and total annual household income we have also investigated how those households *who belonged to the lowest 20%* on the full-item, full-sample asset index were (re-) classified by each of the other measures.

Table 5.4 Classification of Bottom 20% Group for Full Index

	Full PC index	Full PC index urban sample	Full PC index rural sample	PC Subindex for 29 housing features	PC Subindex for 29 infrastructure features	PC Sub index for 23 consumer durables	Simple additive index full sample	Total annual household income
	100	98	59	53	57	73	72	50
Lowest20%								
Lower middle30%	0	2	41	37	31	27	28	35
Upper middle30%	0	0	0	10	12	1	0	13
	0	0	0	0	0	0	0	2
Upper20%								
Total	1000	1000	1000	1000	1000	1000	1000	1000

Table 5.4 shows those households *who belonged to the lowest 20%* on the full-item, full-sample asset index were re-classified by each of the five grouped *sub*-indices, the grouped simple additive index and the grouped total annual household income. As a first point, we note the encouraging fact that at the most, 10% of the households in the lowest group were re-classified into the upper two groups on any of the five sub-indices. For the simple additive index approximately no households who belonged to the lowest 20% on the full-item, full-sample principal component asset index were re-classified into the highest 50% on the simple additive index, while this was the case for 15% of the households in the lowest group when grouped by total annual household income. As expected, the sub-index for the urban sample behaves “perfectly” as no households at all were re-classified. However, this also shows the urban bias of the full index. For the rural sub-index, the results are rather different as almost half the households were reclassified from the lowest to the second lowest group. However, even for this index, hardly any households were reclassified into the two highest groups.

The three sub-indices for respectively housing, infrastructure, and consumer durables all performed at roughly the same level, and somewhat better than the rural sample sub-index, but not as “good” as the urban sample sub-index. It seems that the main problem with the full index is mainly related to its classification of *rural* households, rather than the internal consistency with respect to the items included in the full index. The problem probably occurs because there is no measure for possession of traditional asset items, such as agricultural land, or even modern agricultural equipment such as tractor.

Summing up on the household asset index

Our conclusion is that the index performs relatively well, and that it may well be used as a supplementary measure for households’ economic welfare, in particular as reference to phenomena depending on for households’ *long-term* economic wealth. Testing the internal coherence of the index, we made the two problematic findings. First, the correlation coefficient between the asset index and the total annual household income was fairly low. Second, there is reason to believe that the index may have an urban bias. Else, the index is generally “robust” to the assets included, and the lowest 20% of households on the full index are in 90% of the cases also classified among the lowest 20% on other economic welfare measures in the data set.

However, we want to stress that the main intention of the index is to serve as an internal reference for MPHS data set. We advice against using the asset index as an *independent* indicator of welfare, and suggest that analysts rather use the more detailed and purpose-built DOS Jordan 2002-2003 Household Expenditures and Income Survey to analyse and produce reliable estimates of household welfare and poverty across regions and socio-economic groups.

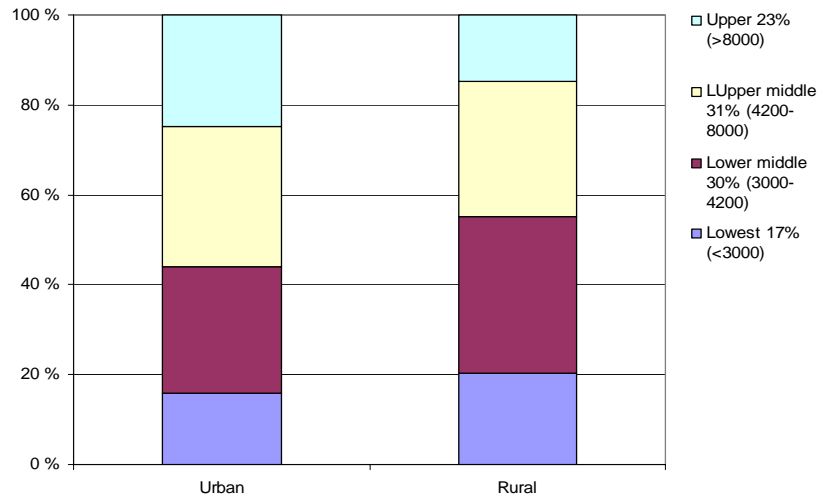
5.4.3 The Household Asset Index, Household Income and education

How does the geographical results for the asset index correspond to the 2002-2003 HEIS?

The third type of the reliability check is to see whether the asset index produces *reasonable comparisons with related indicators*, e.g. with poverty or GDP per capita. Here, we have chosen to use the Jordanian 2002-2003 Household Expenditures and Income Survey as our main external reference¹³.

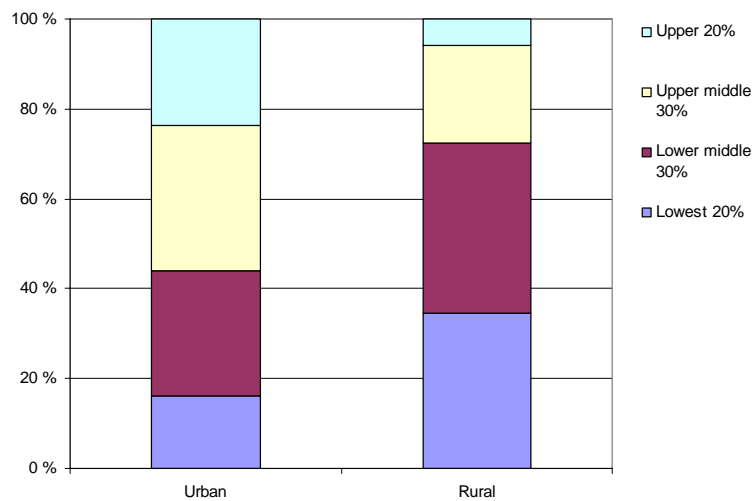
¹³ Table 4.13 “Percentage Distribution of Households by Place of Residence and Household Expenditure Group (%)”.

**Figure 5.41 Grouped Annual Household Income for 2002 in JD
by Urban-Rural**



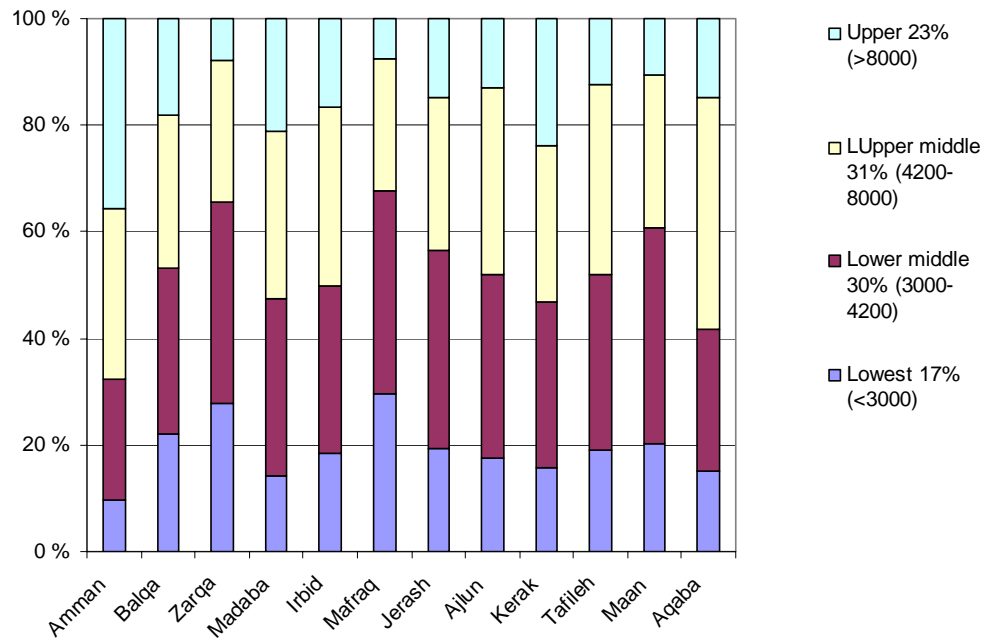
From Figure 5.41, we note that the 2003 MPHS asset index has a slight positive urban bias relative to the annual total household income recorded by the 2002-2003 HEIS. The asset index classifies more rural households into the two lower groups than the total household income measure¹⁴. It is not likely that the difference is caused by changes in the relative urban-rural living standards from 2002 to 2003. Rather, the reason for the difference is most probably that the asset index “rewards” owning items associated with a modern urban life, more than items traditionally found in rural areas.

**Figure 5.42 Grouped Annual Household Asset Index Score,
by Urban-Rural**



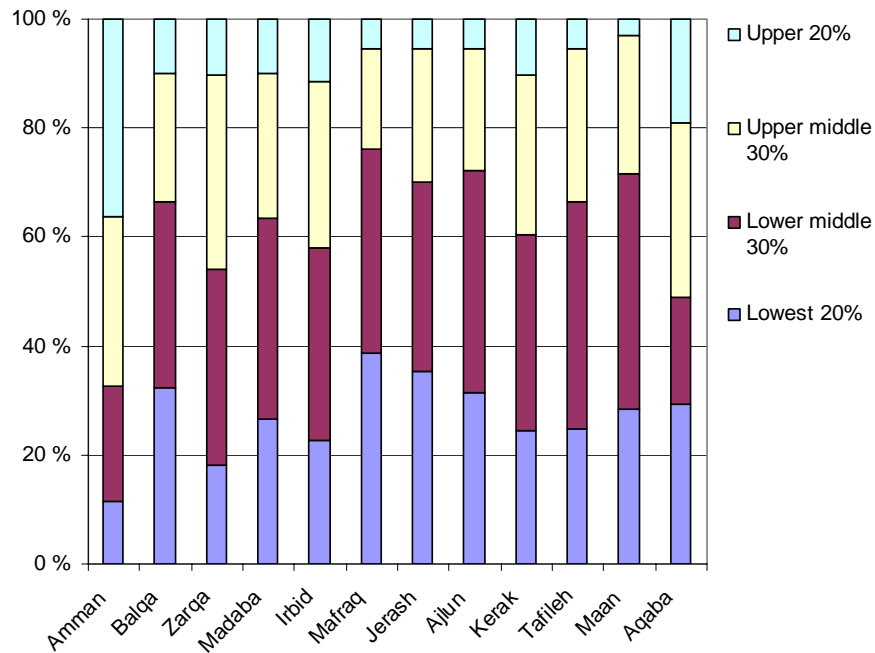
¹⁴ Since both the MPHS and the HEIS are conducted by DOS Jordan, the definition of “urban” and “rural” localities are identical in the two surveys.

Figure 5.43 Grouped Annual Household Income for 2002 in JD, by Governorate of Residence



Also when we investigate differences in the distribution of total household income and asset index scores across governorates, we find some differences in the classification produced by the two measures. We notice that in both figures Amman is over represented in the highest group, and under-represented in the lowest group. At the other end of the economic level, Mafraq governorate is classified as having few in the highest group, and many in the lowest group by both measures. For Zarqa governorate, the results are less consistent, at least for the share of the lowest group (*nationally* defined). However, the general impression is that the distribution of households across groups is consistent for the two measures, both by urban-rural residence and by Governorate.

Figure 5.44 Grouped Asset Index Score, by Governorate of Residence



The asset index and male and female education

Figure 5.45 shows how male education levels increase systematically as we move from the lowest household asset index group (left) towards the highest group (right). While only 16% of the males in the lowest group has secondary education or higher, this figure increases to 52% in the highest asset index group. The corresponding results for women are shown in Figure 5.46, and are similar to that of men.

The pattern of an increasing asset index score with increasing education is similar to what was observed for household income. However, the increase is less sharp. This is probably because the asset index “rewards” well-established households, which have had long time to accumulate assets. However, many of the well-educated households, as well as a substantial part of the high-income households consist of relatively young members, who are in an early phase of their “household life cycle”.

Figure 5.45 Male Education Levels by Four Asset Index Groups

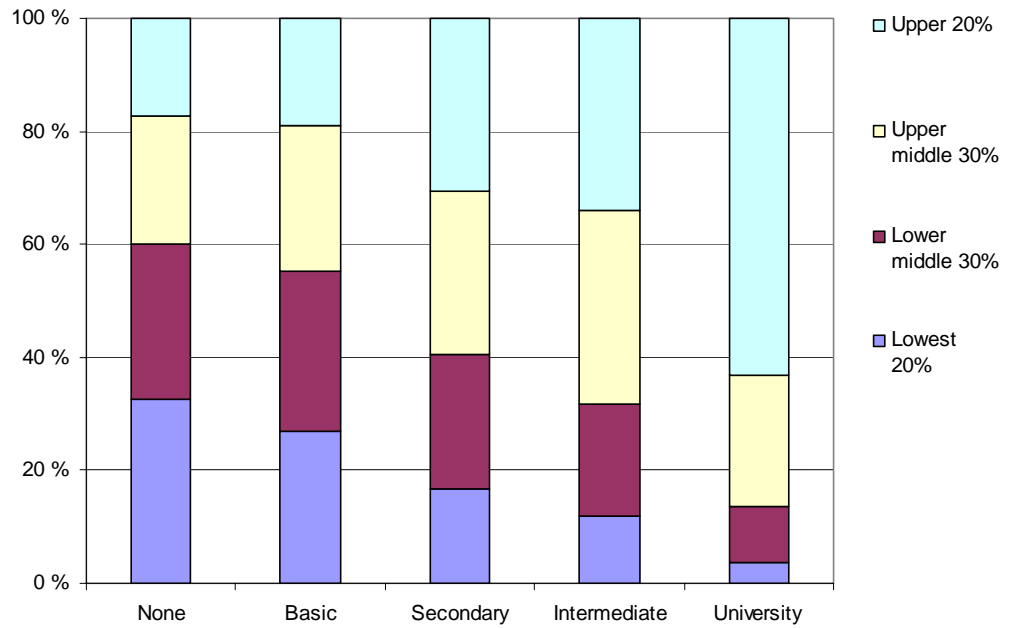
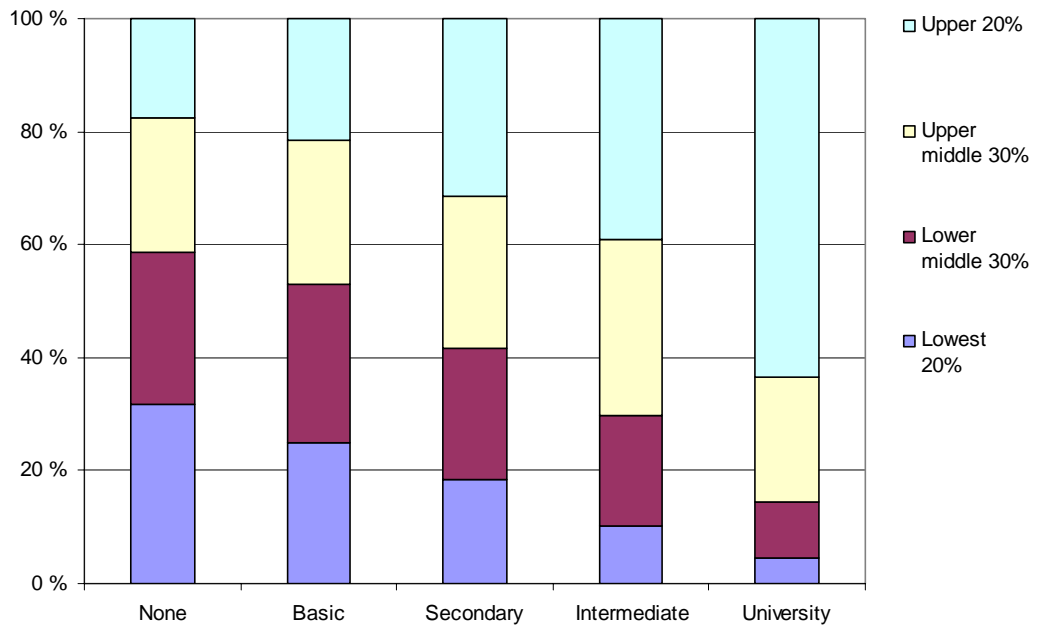


Figure 5.46 Female Education Levels by Four Asset Index Group



Summing up on the Household Asset Index and Household Income and education

Relative to the annual total household income recorded by the 2002-2003 HEIS, the 2003 MPHS asset index has a slight positive urban bias. The reason for the difference is most probably that the asset index “rewards” ownership of items associated with a modern urban life more than items traditionally found in rural areas.

The index produces reasonable results with male and female levels of education, another feature that is related to “modern” society. The asset index “rewards” well-established households. However, many of the well-educated, high-income households consist of relatively young members. Hence the positive relationship between assets and education is less strong than for income. Finally, the distribution of the scores of the asset index across governorates seem to be roughly on accord with the distribution of total annual household income as recorded by the 2002-2003 Household Expenditures and Income Survey.