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General Secretariat for Development Planning

Building an Effective Social Protection System

Low-Income Profiling and Income Distribution in Qatar

Department of Social Development
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The views, opinions and interpretations of data expressed in this publication are those of the Project Team and not necessarily those of the General Secretariat for Development Planning.

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Foreword

Historically, Qatar's economy was focused on primary sector activities such as pearl diving and fishing. Following the discovery of oil in the 1950s, Qatar's economy has gradually been transformed to its current state in which revenues from its buoyant hydrocarbon industry provides its citizens with many substantial benefits including social welfare.

In 2008, Qatar launched the Qatar National Vision 2030. The Vision foresees a continuation of Qatar's impressive economic growth and identifies a development path that is both sustainable and one that will provide a high standard of living for its people for generations to come. The Social Development Pillar of the Vision envisages that an effective social protection system will be put in place in the interests of all Qataris. An effective system is one that ensures civil rights, an adequate income, and a healthy and dignified life.

To sustain such a system, we must ensure that a sound social structure exists in Qatar. We therefore need to have effective public institutions and active civil society organizations that will:

- *preserve Qatar's national heritage and enhance Arab and Islamic values and identity;*
- *provide high quality services that respond to the needs and the desires of individuals and businesses;*
- *establish a secure and stable society operating on the principles of justice, equity and the rule of law;*
- *enhance women's capacities and empower them to participate fully in the political and economic spheres, especially in decision-making roles; and*
- *develop a spirit of tolerance, constructive dialogue and openness towards others at the national and international levels.*

This monograph describes and illustrates relevant approaches that can be used to measure income distribution and to formulate social protection policies and programmes. It measures the incidence and describes the main characteristics of low-income families in Qatar. The analysis takes into account the economic structure, culture and social aspects of the country and contributes to the development of an evidence-base for national policy-making. This is particularly important with the preparation of Qatar's first National Development Strategy (NDS), 2011-2016 well underway. The findings presented here have important policy implications and provide an indication of where we are, and how we might support future institutional and individual capacity building.

This research provides the first empirical work of this nature and is based on a household and individual-level dataset compiled by the Qatar Statistics Authority through the Household Income and Expenditure Survey, 2006-7 (HIES). I thank the Qatar Statistics Authority and HE Sheikh Hamad bin

Jabor bin Jassim Al-Thani, President of QSA, for providing the HIES data to GSDP. I would also like to thank all members of the project team (listed on page v) for their tremendous efforts, commitment and professionalism in putting this publication together. I am confident that this monograph will be of considerable value to those concerned with social protection issues and that it will be a useful tool for policymakers in Qatar and beyond.

Ibrahim Ibrahim
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March 2011

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Glossary of Terms

Absolute poverty - is a minimum standard of living below which an individual or household is deemed to be poor. It is often defined in terms of nutritional standards and basic needs. The absolute measure of poverty is not suitable for Qatar given its social context and standards of living.

Coefficient of variation (CV) - a measure of income dispersion defined as the ratio of the standard deviation to the mean. The standard deviation and the mean are measured in the same units so their ratio is 'metric free'.

Economies of scale – refers to the decreasing expenditure needs per household member as the number of persons in the household increases.

Equivalence scale – a measure that takes into account the demographic composition and size of households when assessing the household's needs. Two factors are important. The first is *economies of scale*; for example a two-person household can attain the same living standard with income less than twice that of a one-person household because they can share resources. For this reason the first household member in many equivalence scales counts fully as an adult but subsequent members count as less than the first member. The second factor is the *demographic composition* of the household. Children require less expenditure than adults: so one child may be counted as, say, one half an adult in the equivalence scale. A wide range of equivalence scales exist which weight additional adult and child members less than the first household member. Some of the most commonly used scales include the "OECD equivalence scale" and the "OECD-modified scale". When calculating the number of 'adult equivalents' in the household the latter assigns a value of 1 to the first adult member, 0.5 to each additional adult member and 0.3 to each child (less than 14 years old).

Equivalized Income – the income of the household divided by the number of adult equivalents in the household. For example a two person household earning QR100k has a mean income of QR50k but, according to the OECD scale, a mean equivalized income of QR100k divided by 1.5 (the number of adult equivalents) - QR67k.

Gini Coefficient – a widely-used income inequality summary statistic. It is defined as the area between the Lorenz curve and the equality line divided by the total area under the equality line. Its value lies between zero (perfect equality) and one (perfect inequality, where one household earns all income) and higher values indicating greater inequality.

Incidence of Poverty – the proportion of households whose income falls below the poverty line. It is sometimes called the *head-count* ratio.

Income per capita – when used in income inequality analysis, income per capita is the household's total income divided by the number of household members.

Income Gap – a measure of how far below the poverty line poor households lie. The income gap is defined as the sum of the income 'short-fall' over all poor households divided by the total number of households (rich and poor). The normalized income gap is the sum over poor households of their relative income short-falls divided by the total number of households, where relative income is defined as their income short-fall divided by the poverty line income. It is measured by the Foster-Greer-Thorbecke P_α index where $\alpha = 1$.

Intensity of Poverty – a measure of how poor low-income households are. For example if *all* households earned QR1 below the low-income threshold, the intensity of poverty would be small. It rises when low-income households receive income well below the threshold. It is measured by the P_α income gap index where $\alpha = 1$.

International Poverty Line – the World Bank definitions of poverty: individuals are poor if they earn less than the equivalent of US$1-a-day or US$2-a-day. Using this definition poverty rates comparisons across countries are possible. These are examples of *absolute poverty lines.*

Lorenz curve – a common graphic presentation of income inequality. It plots the cumulative proportion of income earned by the poorest *p* per cent of the households for different values of *p*.

Mean – a measure of the average: mean income is the sum of incomes across all households divided by the number of households.

Median – a measure of the average: median income is the income earned by the household located half way through a list of households ranked by their income. It is the income of the 50^{th} percentile.

Mode – a measure of the average: modal income is the income level that appears most commonly in a distribution (where the income distribution graph is at its peak).

$\boldsymbol{P_\alpha}$ - a measure of poverty proposed by James Foster, Joel Greer and Eric Thorbecke in 1984. When $\alpha = 0$ the measure corresponds to the incidence or head-count index; when $\alpha = 1$ the index measures the intensity of poverty and when $\alpha = 2$ the index measures its severity. Higher values for α are possible but the interpretation of the resulting measure is less intuitive and such measures are rarely used.

Relative poverty - a measure that interprets poverty in relation to the prevailing standards of the society at a given time.

Robin Hood Index - fraction of total income required for the rich to give to the poor to achieve perfect equality.

Severity of Poverty – a measure of poverty that squares the poverty gap. It weights incomes well below the poverty line more than incomes closer to it and is therefore more sensitive to very low incomes. It is measured by the P_α index where $\alpha = 2$.

Skewness – a measure of the skewness of the distribution. Income is usually distributed with a long upper tail when there are a number of very rich households. When graphing typical income distributions the presence of these very rich households will lead to an extended upper tail to the distribution and the distribution is said to be *positively skewed*. In such distributions, *mean* income is above the *median* and *mode*. If income were distributed with no skewness, mean, median and modes would be the same.

Standard Deviation – a measure of dispersion. If all households received the same income then the standard deviation of income across households would be zero. The more widely dispersed is income distributed across households, the higher its value. It is based on the sum of the squares of the difference between income received by each household and the mean.

Three I's of Poverty (TIP) – a graphical device for poverty analysis proposed by two economists, Jenkins and Lambert in 1997 The diagram captures the incidence, intensity and inequality of poverty, and the acronym TIP is used because the diagram illustrates these ‘three I's of poverty.

1

Introduction

Introduction

Qatar launched its long-term vision, the Qatar National Vision (QNV) 2030 in October 2008. The QNV 2030 aims to transform Qatar into a country that is capable of sustaining its own development and providing a high standard of living for current and future generations. It rests on four pillars: human, social, economic and environmental development that enunciate the principles that can guide the country onto a sustainable path of development. In support of the QNV 2030, there will be a sequence of medium-term National Development Plans that will provide a feasible path towards the sustainable achievement of national development goals. GSDP is currently coordinating the preparation of Qatar's first National Development Strategy, 2011 to 2016.

One of Qatar's social development outcome goals is to establish an effective social protection system. Traditionally social protection was understood as comprising measures to address the poorest, most vulnerable or excluded members of society. More recently it has embraced a wider range of measures that provide benefits, whether in cash or in kind, to secure the promotion and protection of fundamental individual human rights. In broad terms social protection covers a lack of :

- work-related income or insufficient income caused by sickness, disability, maternity, employment injury, unemployment, old age or death of a family member;
- access to shelter, education and healthcare;
- family support, particularly for children and adult dependents, and
- social exclusion.

A social protection system may also include mechanisms designed to protect people against the risks of poverty and vulnerability, mitigate the impacts of shocks, and support people who suffer from chronic disabilities to secure basic livelihoods.

Social protection helps to promote labour markets, protect workers and build assets, reducing both short-term and intergenerational transmission of poverty. Interventions that provide training and credit for income-generating activities also have a social protection component.

Measures to minimize risks and protect against hazards include: (i) social insurance (with contributions from employers and/or beneficiaries) to cover health, life, and asset insurance; (ii) social assistance which can be targeted at groups such as children, the unemployed and the elderly, and (iii) social services that can take the form of maternal, child health and nutrition programmes.

Qatar's Social Protection System

Qatar has a generous family and employment-based social protection system that is funded through its abundant hydrocarbon resource revenues – there is no personal income tax or value-added sales tax.

Qataris enjoy free health care, education, electricity and water. Interest-free loans are provided for first-time home building. Pensions are given to retired government servants. The Ministry of Social Affairs provides a range of welfare benefits for disadvantaged groups. In Qatar, an added component of social protection is the value added found in the close family structure where protection is provided between members of the family or members of a local community.

Civil service employment is seen as part of Qatar's social protection through the provision of social allowances over and above actual wages received. Hence government employment tends to be the first choice for Qataris. But not all Qataris obtain public sector employment so issues of equity arise, especially among the lesser-educated Qataris.

In a 2005 World Bank study, there was a call for the separation of civil service wages into two components – wages and a separately paid allowance, and for social protection employment-based payments given to private sector employees.

An effective social protection system needs to ensure that the payment of benefits is linked to a concept of 'mutual obligation'. For example, unemployment benefit beneficiaries should attend training to enable them to be marketable in the labour force. But few of Qatar's social benefits carry with them mutual obligations.

This report examines one dimension of social protection - patterns of income and expenditure inequality. Its main focus is the incidence and intensity of low incomes amongst Qatari households in 2006-7, utilising data from the Household Income and Expenditure Survey (HIES). We also analyse the impact of government transfers on the relative poverty status of Qataris. The relative poverty levels identified here would have been significantly higher if government transfers had not been taken into account. The findings are designed to help in the formulation of appropriate policies and programme to help strengthen Qatar's social protection system.

Identifying the Vulnerable in Qatar

Qatar's rapid economic growth and achievement of higher levels of human development are impressive. Its growth in wealth has enabled it to continue achieving higher standards of human development, including the promotion of social equity that aims to improve and enhance the quality of life for all of its people. In 2007, Qatar advanced to 33rd out of 182 countries in the Human Development Index (HDI), compared to its ranking of 57th a decade earlier (UNDP, 2009).

As part of the promotion of social development in Qatar, it is necessary to consider the welfare status of its people. One immediate and intuitive way of

thinking of welfare is in monetary terms through a measure of income. However, this approach is limited given that welfare is multidimensional and includes non-monetary elements. The Millennium Development Goals (MDGs) adopted by world leaders at the United Nations Millennium Summit held in New York in 2000 illustrate this multidimensionality of welfare.

In an attempt to capture the non-monetary aspects of welfare, the Development Co-operation Directorate of the OECD set out five key 'capabilities' that individuals require. These include:

- economic capabilities: ability to earn income, consume goods, and possess assets;
- human capabilities: health, education, nutrition, clean water, and shelter;
- political capabilities: human rights;
- socio-cultural capabilities: the ability to participate as a valued member of a community; and
- protective capabilities: the ability to withstand economic and external shocks.

Although money income is only one influence on a country's welfare, it is an important one. National income per capita is often used for welfare comparisons across countries but of equal importance is its distribution over households and individuals within the country. And the single most important dimension of income distribution is the incidence of poverty or low incomes.

Poverty is usually assessed using two types of measure: (i) an international standard measure of poverty of US$1 a day or US$2 a day, that provides inter-country comparability; and (ii) a national poverty line income which can take the form of an absolute or a relative measure[1]. An absolute poverty line is a minimum standard of living below which an individual or household is deemed to be poor, regardless of incomes enjoyed by society at large. The

[1] For a detailed discussion of different poverty measures, see EPU and UNDP, 2008.

United States monitors poverty using an absolute poverty line income but this is unusual amongst developed countries. A relative poverty line, which is used in most European countries, interprets poverty in relation to the prevailing standards of the society at a given time.

The most common approach is to define the national poverty line income (PLI) as *x* per cent of the country's median or mean level of income. A relative PLI rises as the country enjoys economic growth.

Qatar has achieved a standard of living that is sufficiently high to cover the basic needs of a society. Given Qatar's social context and standards of living, it is therefore much more appropriate and meaningful to utilise a relative measure of poverty – one that reflects the living standards of the community as a whole and one that automatically changes when overall standards of living improve.

This monograph provides the first comprehensive study on relative poverty and income distribution in Qatar using a national dataset collected by the Qatar Statistics Authority (QSA).

Organisation of the Report

For ease of reference, the monograph is divided into 4 chapters. The first chapter provides an introduction and reviews the main approaches that are used to define poverty internationally (both in developed and developing countries). Chapter 2 reviews the survey data utilised, including a description of the key assumptions that are required when using income and expenditure data to compare welfare levels across households which vary in size and composition. It also discusses the analyses of the incidence of low incomes or relative poverty in Qatar, while Chapter 3 discusses the results of an income distribution analysis. The final chapter presents implications for policy, including suggestions for further work and possible future developments in survey design for relative poverty analysis. The appendix contains the

findings of an analysis examining the impact of the recent financial crisis on income distribution using Qatar's Labour Force Surveys (LFS).

2

Measuring Relative Poverty

Measuring Relative Poverty

An absolute measure of poverty is defined as the income or expenditure required to attain a minimum standard of living. It is usually measured in two parts, a food and non-food component. The food component is largely linked to nutrition and the resources required to achieve an adequate diet. The non-food component measures the expenditures required on non-food *basic needs.* These include clothing, shelter, transport and health and education services. The achievement of these basic needs is essential for individuals to live healthy and fulfilling lives..

When measuring relative poverty, the overall standard of living of the population is taken into account: the relative poverty line income is typically higher in richer societies. The most common approach is to define it as a percentage of the country's median or mean income level. In measuring Qatar's relative poverty rate or low-income incidence[2], we utilise QSA's Household Income and Expenditure Survey (HIES) collected in 2006-7.

Qatar's Household Income and Expenditure Survey

QSA, the country's key data authority, conducted a Multi-Purpose Survey (MPS) in 2005 in response to data needs of its stakeholders. The MPS project included 4 key surveys, one of which was the HIES, 2006-7. It was conducted from April 2006 to April 2007 and was aimed at identifying consumption and expenditure patterns and living standards of Qatar's households and individuals. The previous HIES was conducted in 2000-1. The HIES 2006-7 contained 1,203 Qatari household records.

Equivalized Incomes

Our aim in this monograph is to analyze income and expenditure distributions of *households* (rather than individuals). Since each household's needs vary with its size and demographic composition, its *total* income and spending is

likely to give a misleading picture of the welfare of its members. A *one*-person household needs income and spending sufficient to meet only *one* person's needs. A larger household naturally requires more income and expenditure to reach the same welfare for its members as the single-member household.

A better approach would be to compare households' incomes and expenditures expressed in *per capita* terms – simply dividing household income by the number of household members. However even the per-capita approach may give a misleading comparison of differential levels of household welfare. Child members typically require less income and expenditure than adults. And large households can potentially exploit *economies of scale*. A household of four adults, for example, will typically require less than four times the income of a one-person household in order to match the latter's welfare. For example four persons in the same household can share some fixed costs (like housing, utilities etc); in a single-member household these costs fall to one person to meet.

To allow for household size and demographic composition, income (and expenditure) of the household is often divided by the number of *adult equivalents* in that household. The age composition of the household is taken into account by counting a child as less than a full adult. And economies of scale are taken into account by a reduced weighting of additional adult members, only the household head counting as a full adult in the calculation of the household's adult equivalents. Since there is currently no Qatar-specific analysis of equivalence scales, the OECD scales (based as they are on developed countries) would seem to be the most appropriate.[3] This scale assigns a value of 1 to the household head, 0.5 to each additional adult member (members aged 14 years and above) and 0.3 to each child (below

[2] These two terms are used interchangeably throughout the monograph.
[3] In the late 1990s the Statistical Office of the European Union adopted the 'OECD-modified equivalence scale'. This scale was first proposed by Haagenars *et al*. (1994). The original 1982 OECD scale assigned the weight of 1 to the first adult, 0.7 to the second and 0.5 to each child below the age of 17 years. The OECD-modified approach has been adopted by Eurostat for income analysis in the EU (Euorstat, *European social statistics - Income, poverty and social exclusion: 2nd report* 2003).

the age of 14 years). Experiments with other equivalizing schemes indicated that the results were not particularly sensitive to the scale used.[4]

Dividing each household's total income (expenditure) by the number of its adult equivalents gives *equivalized* income (expenditure). It is this that we use in this monograph to analyze income inequality across Qatari households.

Our benchmark definition of 'relative poverty' (or 'low-income threshold') is this: a household is considered to have low income (expenditure) if its equivalized income (expenditure) *is less than half the median equivalized income over all households*. We also consider low-income thresholds of 40% and 60% of the median, the latter being the definition of relative poverty adopted in the European Union. Our benchmark case is easier to interpret intuitively: a household is defined as being in relative poverty if its equivalized income or expenditure is less than half that of the average household.

Table 2.1 sets out some descriptive statistics of the data series we will be using to analyze relative poverty and inequality. A number of features can be noted. First, as one might expect, equivalized household incomes and expenditures have a *positively skewed* distribution with longer tails on the right-hand end of the frequency distribution.[5] This is a typical characteristic of income and expenditure distributions. Because of this, median incomes and expenditures are below their means. For example mean equivalized income amongst Qatari households is 14% higher than the median, reflecting a large number of very wealthy households that raise the mean but have no effect on the median.

[4] The UK equivalizes income by the following weightings: 0.67 for the first adult, 0.33 for each subsequent adult and for each child aged 14 years or over, and 0.2 for each child below the age of 14.The proportion of Qatari households with equivalized income below 50 per cent of the median was 9.1 per cent by this scheme and 9.2 per cent by the OECD Modified scheme. The difference is marginal.

[5] These distributions are shown graphically in the different sections below. Skewness is measured using the cube of the deviation of household income around its mean (the third moment of the distribution). If the lower tail of the distribution is longer than the upper tail,

The dispersion of equivalized income across Qatari households is measured by the standard deviation and the related statistic, the coefficient of variation (CV) defined as the ratio of the standard deviation to the mean. The CVs for Qatari households are 0.65 and 0.87 for equivalized income and expenditure respectively. These are very similar to the dispersion measures found in developed countries.[6]

Table 2.1 **Equivalized Income and Expenditure: Summary Statistics, Qatari Households 2006-7**

Equivalized Household Income (QR)			
Mean	Median	St. Deviation (CV)	Skewness
146,295	128,571	94,533 (0.646)	3.65
Equivalised Household Expenditure (QR)			
Mean	Median	St. Deviation (CV)	Skewness
138,613	107,932	120,806 (0.872)	4.98
Household Demographics			
Household Size		Adult Equivalents	
Mean	Median	Mean	Median
7.36	7	3.66	3.4

Source of data: Computed from QSA's HIES, 2006-7

Low-Income Incidence

This chapter will focus on the measures that capture the incidence (and later the intensity) of low-income and low-spending Qatari households: such as, the proportions of *relatively poor* households.[7] We consider three threshold levels of equivalized incomes and expenditures: households are considered to be 'low-income' or 'low-spending' if their equivalized incomes/expenditures are below 40 per cent, 50 per cent and 60 per cent of the median equivalized incomes and expenditures across all households.

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skewness will be negative. The classic normal distribution, with symmetric tails, has a skewness measure of zero.

[6] Jenkins (2006) for example reports the CV for equivalized income in the UK in 1991 to be around 0.7 though he reports figures around 0.5 for the 1980s.

[7] The incidence and intensity measures of low-income which we use in this report are examples of the Foster-Greer-Thorbecke P_α class of measures. See James Foster, Joel Greer and Eric Thorbecke, 'A Class of Decomposable Poverty Measures,' *Econometrica,* 1984. The incidence measure is referred to as P_0 and the intensity measure which we cover below is referred to as P_1.

The choice of the median as the appropriate benchmark is a natural one. If the incomes of every low-income household were raised to the low-income threshold this would inevitably raise the mean, but it would leave the median unaffected. Moreover means are typically well above medians in positively-skewed distributions (like income and expenditure) so the median gives a far better indication of the 'average standard of living' amongst Qatari households.

We adopt a 'benchmark' threshold of 50 per cent of the median though in this chapter we also report the lower and the higher thresholds to gain some idea of the sensitivity of the threshold choice. The 50 per cent threshold is intuitively appealing and more easily interpreted to refer to what it means to receive only half the income of the average household.

In the 2006-7 HIES, the (weighted) average number of adult equivalents in Qatari households was 3.66.[8] The thresholds for annual equivalized income are QR51,429, QR64,286 and QR77,142 for the 40 per cent, 50 per cent and 60 per cent thresholds respectively.[9] By the most demanding of these thresholds (that of 60 per cent of the median), the *average* Qatari household is considered to be 'low-income' if its total income in 2006-7 fell below QR282,402 (the weighted mean of total household income in 2006-7 was QR497,611).

[8] The (weighted) mean number of adults in Qatari households in 2006-7 was 4.77 and the mean number of children, 2.59. Thus the mean equivalent household size is 1 + 3.77 x 0.5 + 2.59 x 0.3 or 3.66.

[9] The international 1993-based $2-a-day absolute poverty threshold converts to QR4.2 per person per day using Ahmad's (2003) consumption-based Purchasing Power Parity exchange rate. Updating this to 2006-7 prices using Qatar consumer price indices gives QR8.5 per person per day, or around QR3,100 per person per year. The least demanding of our equivalized thresholds (40 per cent of median equivalized income, or QR51,429) is over sixteen times larger than the more generous of the two World Bank international definitions of absolute poverty. The more demanding 60 per cent threshold is nearly twenty-five times the $2-a-day standard. According to Deaton (2004) the US poverty threshold is 'more than ten times as much as the international extreme poverty line of $1 a person a day' – or five times the $2-a-day standard. The lowest of the low income thresholds we are considering for Qatar is three times the US absolute poverty standard. These numbers serve to emphasise that the definition of the 'poverty line' we are using for Qatari households is very much a *relative* one.

The key results are set out in Table 2.2. Less than 5 per cent of Qatari households have equivalized incomes or expenditures below 40 per cent of the median, the lowest of our three thresholds. This proportion rises to over 16 per cent (income) and 20 per cent (expenditure) if the low-income threshold follows the European Union's and United Kingdom's 60 per cent relative standard. In our benchmark case, just over 9 per cent of Qatari households received income less than half the median (and 11.5 per cent for expenditure).

Table 2.2 **Low-Income and Low-Spending Incidence (P_0), Qatari Households 2006-7**

Measurement	40% of Median	50% of Median	60% of Median
Equivalized Income Threshold	QR51,429	QR64,286	QR77,142
Low-Income Incidence (%)	4.47 (3.25 – 5.69)	9.20 (7.47 – 10.92)	16.85 (14.62 – 19.08)
Low Income net of transfers Incidence (%)	8.21 (6.60 – 9.82)	14.03 (11.99 – 16.08)	21.48 19.02 – 23.94)
Equivalized Expenditure Threshold	QR43,173	QR53,966	QR64,759
Low-Spending Incidence (%)	4.68 (3.42 – 5.94)	11.48 (9.54 – 13.43)	20.85 (18.41 – 23.30)

Note
Numbers in parenthesis are the 95% confidence intervals
Source of data: Computed from QSA's HIES, 2006-7

Transfers are an important source of income for Qatari households and within the transfers received, government transfers[10] form the larger proportion, on average 92 per cent of total transfers in 2006-7 (Table 2.3)Government transfers as a source of income have also been increasing, rising from 0.5 per cent in 2000-1 to 6 per cent in 2006-7.

[10] Government transfers in the HIES includes pension, social welfare, accident compensation, healthcare, education and marriage assistance.

Table 2.3 Qatari Household Income Sources (%), 2001 and 2007

Income source	2001	2007
Wages and Salaries	72.9	56.7
Businesses and Free enterprises	18.0	33.0
Investment Income and Interest	0.8	3.7
Current Transfers from Government	0.5	6.0
Current Transfers from Others	0	0.5
Total	100	100

Source of data: QSA HIES Analytical Summary, 2008

To examine the impact of government transfers on the incidence of low-income households, we subtract government transfers from each household's income and the change in the incidence of low-income households gives an indication of how progressive government transfers are. The results show that had households not received the transfers, the incidence of low income would have nearly doubled to over 8 per cent by the 40 per cent threshold, and to 14 per cent in the benchmark case (Table 2.3).[11] By reaching the very poorest households, it is not surprising that the effect on low-income incidence was most pronounced for the lowest income threshold.

Low-Income Intensity

The incidence figures measure the proportions of low-income and low-spending households but it says nothing about how far below the thresholds these households lie. For example the incidence figures would be unaffected if every household's equivalized income (and spending) were raised to a point just QR1 below the threshold. An alternative measure is the relative income gap statistic.

[11] These figures are based on the income thresholds reported in Table 2.1. Had the threshold income itself been based on median incomes after deducting government transfers, the incidence of relative poverty would be 11.1 per cent in the benchmark (50 per cent) case, higher than the 9.2 per cent when government transfers are included.

The first step in calculating the relative income gap statistic is to take the difference between the income threshold and the equivalized income received by each low-income household. Divide this 'gap' by the threshold itself - forming, for each low-income household, its *relative* distance from the threshold. Thus if the threshold were QR50,000 and the household being considered has an equivalized income of QR25,000, the relative distance is 0.5 or 50 per cent. The relative gaps for households with incomes higher than the threshold are all set to zero – we're only measuring the intensity of low incomes and expenditures. Next, average the relative income gap over *all households* in the sample.

Formally the normalized income gap is written:

$$P_1 = \frac{1}{n}\sum_{i}^{m}\left(\frac{z - y_i}{z}\right)$$

where n is the total number of households, m is the number of households with equivalized income below the threshold, z is the income threshold and y_i is the equivalized income of the ith low-income household.

This measure is sometimes referred to as the *per capita aggregate poverty gap*: the amount, expressed as a fraction of the income threshold, that each adult-equivalent in the population would have to contribute (under perfect targeting) to bring all households up to the threshold. So, for example, if our measure took the value 0.1 (or 10 per cent), then low-incomes (as defined) could be eradicated if every household 'chipped in' 10 per cent of the income threshold for every adult equivalent member to a fund to be transferred to those households with low income.

In Table 2.4 we report measures of low-income and low-spending intensity using the same thresholds as those used in Table 2.2. Consider first households with equivalized incomes below 40 per cent of the median. If every Qatari household contributed QR505 (0.98 per cent of QR51,429) each

year (for each of its adult equivalent members) to a welfare fund, then, with perfect targeting, every low-income household could be brought up to the threshold equivalized income level. To raise every household to the benchmark threshold (50 per cent) would require a larger contribution - this would be QR1,328 times the number of adult equivalents in the household per year (2.07 per cent of QR64,286, from Table 2.4) for each household.

It is informative to calculate the *total* transfer required to lift all households to the threshold. For each low-income household we calculate its (non-equivalized) income gap by multiplying its equivalized gap by the number of adult equivalents in the household. In the benchmark case this gives an average income gap of QR66,707 for the low-income households.

Using the survey weights, we estimate the total number of Qatari households to be 29,258 and the number of low-income households is this total multiplied by low-income incidence: there are 0.09196 x 29,258 = 2,691 low-income households. Perfectly targeted transfers out of a total fund of QR66,707 x 2,691 = QR179.5m would raise all low-income households up to half the median income. The required fund for the lower 40 per cent threshold is QR68.7m and QR395m for the higher 60 per cent threshold.

Table 2.4 **Low-Income and Low-Spending Intensity (P_1), Qatari Households 2006-7**

Measurement	40% of Median	50% of Median	60% of Median
Equivalized Income Threshold	QR51,429	QR64,286	QR77,142
Low-Income Intensity (%)	0.98 (0.67 – 1.30)	2.07 (1.58 – 2.55)	3.84 (3.18 – 4.50)
Low Income net of transfers Intensity (%)	2.15 (1.60 – 2.71)	3.89 (3.16 – 4.62)	6.15 (5.26 – 7.05)
Equivalized Expenditure Threshold	QR43,173	QR53,966	QR64,759
Low-Spending Intensity (%)	0.98 (0.61 – 1.35)	2.39 (1.85 – 2.94)	4.68 (3.95 – 5.41)

Note
Numbers in parenthesis are the 95 per cent confidence intervals
Source of data: Computed from QSA's HIES, 2006-7

Low-Income Profiles

The HIES has enabled us to calculate the incidence and intensity of low incomes amongst Qatari households. From the survey we are also able to say something about the main characteristics of low-income households and these may reveal some of the factors that pre-dispose households to poverty. In this section we present a number of low-income profiles which will help identify the main characteristics of relatively poor households.

Location by Municipality

Our measures of low-income incidence and intensity are sub-component additive. This means, for example, that the *national* incidence and intensity measures are weighted averages of the *municipality* figures, where the weights are the proportions of households in each municipality.

The figures in the column headed 'Frequency' in Table 2.5 are the (weighted) percentages of households in the survey in each municipality. So, for example, Doha and Al-Rayyan together account for 78 per cent of households. In panel (A) of Table 2.5 we analyse households with equivalized *income* below the benchmark threshold and in panel (B) the welfare measure is equivalized expenditure. The incidence of low incomes is highest in Al-Rayyan and Umm Salal, where the percentage of low-income households (again in our benchmark case) is over 12 per cent. In column four of panel (A) we present the distribution of low-income households by municipality: nearly 60 per cent of low income households live in Al-Rayyan, with a further 22 per cent in Doha.

The low-income intensity figures in the last two columns are similar to incidence. Doha and Al-Rayyan together account for 85 per cent of the national relative income gap. Unsurprisingly, in any targeted welfare programme designed to bring households up to the threshold income level, households in these municipalities would receive the lion's share .

Using the alternate expenditure measure of welfare (panel (B)), the incidence figures are significantly higher in Doha, Al-Khor and Al Wakra: 77 per cent of low-spending households are in Doha and Al-Rayyan and they account for over 82 per cent of the national relative expenditure gap.

Table 2.5 **Relative Poverty by Municipality 2006-7, Qatari Households**

A. Low-Income Incidence and Intensity (%)					
Municipality	Frequency	Incidence	Incidence Share	Intensity	Intensity Share
Doha	35.10	5.81	22.19	1.77	30.14
Al-Rayyan	43.07	12.43	58.23	2.65	55.24
Umm Salal	6.22	12.36	8.36	2.05	6.18
Al-Khor	9.01	6.52	6.39	1.07	4.65
Al-Wakra	3.36	3.96	1.45	0.61	1.00
Others	3.23	9.63	3.38	1.79	2.80
All Households	100	9.20	100	2.07	100
B. Low-Spending Incidence and Intensity (%)					
Municipality	Frequency	Incidence	Incidence Share	Intensity	Intensity Share
Doha	35.10	9.39	28.70	2.22	32.62
Al-Rayyan	43.07	13.07	49.02	2.79	50.22
Umm Salal	6.22	11.97	6.48	1.40	3.65
Al-Khor	9.01	12.48	9.79	2.27	8.56
Al-Wakra	3.36	11.89	3.48	2.13	2.99
Others	3.23	8.99	2.53	1.45	1.96
All Households	100	11.48	100	2.39	100

Notes
'Others' are Mesaieed, Al Jumaliyah, Jariyan al Batnah, Al Ghuwariyah and Ash Shamal. The limited sample sizes for these municipalities does not allow reliable estimates of their separate measures. The column headed 'Frequency' contains the proportions of all households located in each municipality.
Source of data: Computed from QSA's HIES, 2006-7

Household Size and Demographics

In Table 2.6 we present poverty profiles by the size and composition of households. Over 80 per cent of Qatari households had five or more members: over 28 per cent of households had nine or more members (see the column headed 'Frequency' in Table 2.6).

From panel (A) in Table 2.6, around 3 per cent of all households with six or fewer members received equivalized incomes below the threshold level. For larger households the incidence of low income is substantially higher: 18 per

cent of households with nine or more members have low equivalized incomes. In the fourth column we present the proportions of poor households by their size. Over 56 per cent of poor households have 9 or more members; over 83 per cent of low-income households have 7 or more members. So whilst 55% of all Qatari households have 7 or more members, 84% of poor households have 7 or more members. There is a clear message in these figures: low income is a particular problem for larger households, in which there are likely to be (relatively) fewer income-earners and more dependents (both children and the elderly).

The results using expenditure as the welfare indicator are also set out in Table 2.6, panel (B), and they broadly confirm the income-based results: 86 per cent of Qatari households whose equivalized expenditure is less than half the median have 7 members or more.

Table 2.6 **Qatari Households by Household Size, 2006-7**

A. Low-Income Incidence and Intensity (%)

Household Size	Frequency	Incidence	Incidence Share	Intensity	Intensity Share
1-2	4.53	3.25	1.60	0.11	0.25
3-4	12.34	3.88	5.20	0.58	3.48
5-6	28.20	3.05	9.36	0.65	8.91
7-8	26.72	9.40	27.31	2.42	31.35
9 or more	28.20	18.43	56.52	4.10	56.01
All Households	100	9.20	100	2.07	100

B. Low-Spending Incidence and Intensity (%)

Household Size	Frequency	Incidence	Incidence Share	Incidence Share	Intensity Share
1-2	4.53	4.38	1.73	0.27	0.51
3-4	12.34	5.18	5.57	1.13	5.83
5-6	28.20	4.69	11.52	0.62	7.30
7-8	26.72	10.78	25.09	2.13	23.80
9 or more	28.20	22.84	56.10	5.30	62.56
All Households	100	11.48	100	2.39	100

Note:
The column headed 'Frequency' contains the proportions of all households by their size.
Source of data: Computed from QSA's HIES, 2006-7

The fact that large households tend to receive low equivalized incomes suggests that low-income incidence will be higher across all *individuals* than across all *households*. By the benchmark threshold, we can identify all Qatari low-income households and count the total number of individuals in such households, expressing this number as a percentage of the population of all individuals. This will give us an *individual* low-income incidence.

The high incidence of low incomes amongst large households is reflected in the difference between the household and individual low-income and low-spending incidence figure. Whereas only 9 per cent of *households* have equivalized incomes below half the median, over 12 per cent of individuals belong in these households. And over 13 per cent of children and the elderly belong in low-income households. A similar pattern emerges when expenditure is the welfare measure, with incidence rates being uniformly higher than those based on income (Table 2.7).

Table 2.7 **Low-Income and Low-Expenditure Incidence, Qatari Households, Individuals, Children and the Elderly, 2006-7**

	Incidence (%)	
Category	Income-based	Expenditure-based
Household	9.20	11.48
Individual	12.02	14.75
Child (under 14)	13.70	15.35
Elderly (60 and over)	13.35	16.93
Other Individuals	10.96	14.26

Source of data: Computed from QSA's HIES, 2006-7

Low-income household heads are evenly distributed by age, at least in the range 30-59 years and low-income incidence is only slightly higher in the older age categories (Table 2.8).

Most household heads are married with only 2 per cent divorced, though the incidence of low income amongst the latter is substantially higher (28 per cent). Of low-income households, only 6.6 per cent have a divorced head; in more than 80 per cent of these households the head is married, a proportion

only slightly smaller than that of the population at large (Table 2.8). The distribution of low-income and low-spending households by the marital status of the head of house is very close to the distribution of all households.

Table 2.8 **Low-Income Incidence and Intensity by Age and Marital Status Qatari Households, 2006-7**

	Frequency %	Incidence %	Incidence Share %	Intensity %	Intensity Share %
Age of Household Head					
<30	7.44	7.67	6.20	1.21	4.36
30-39	23.53	7.34	18.77	1.87	21.29
40-49	32.80	10.06	35.86	2.18	34.54
50-59	20.54	10.07	22.48	2.40	23.86
60 or more	15.69	9.78	16.69	2.10	15.94
Marital Status of Head					
Not Married	7.37	11.23	9.00	1.39	4.96
Married	85.46	8.66	80.46	2.01	83.24
Divorced	2.15	28.25	6.61	7.11	7.40
Widowed	5.02	7.22	3.94	1.81	4.39
All Households	100	9.20	100	2.07	100

Note:
The column headed 'Frequency' contains the proportions of all households by the age and marital status of the household head.
Source of data: Computed from QSA's HIES, 2006-7

Low-Income Labour Market Profiles

Thirty-seven per cent of households in the HIES survey had two income earners and a quarter of households sampled had only one earner (Table 2.9). Low income incidence in two-earner households was 8 per cent and predictably, the incidence in one-earner households was substantially higher at 14 per cent. Curiously, incidence rises for households with three income earners (to over 10 per cent) and this is probably due to the fact that three earners are more commonly found in the very large households, which, we have seen, have high incidence.

Low-income incidence is highest amongst households where the head has the least level of education. For example the incidence of low income in households where the head is illiterate is over 20 per cent and the rate falls with progressively higher levels of education.

Whereas over a quarter of all Qatari households sampled are headed by someone with university education, the incidence of low-incomes amongst these households is only 1.6 per cent. Fifty-six per cent of low-income households were headed by someone with a level of schooling up to primary level and 81 per cent had heads with secondary level schooling or less. Educational attainment is an important determinant of low-income incidence for Qatari households.

Seventy-two per cent of sampled households had a working head of household and 64 per cent of low-income households had a working head. A quarter of low-income households had a head that was no longer in the labour force. The incidence of low incomes amongst newly-unemployed household heads was over 30 per cent, but because these accounted for less than half of one percent of the sample they comprised only 1.5 per cent of the low-income households. There is also a high incidence of low income amongst households with disabled heads (over 18 per cent) but again, because they account for only 1.6 per cent of households sampled, only 3 per cent of low-income households had disabled heads.

Table 2.9 **Low-Income Incidence and Intensity: Labour Market Profiles Qatari Households, 2006-7**

	Frequency %	Incidence %	Incidence Share %	Intensity %	Intensity Share %
Number of Income Earners					
1	25.12	13.96	38.12	3.72	45.26
2	37.38	8.00	32.52	1.52	27.50
3	13.92	10.31	15.61	2.40	16.19
4	12.50	7.44	10.11	1.33	8.05
5	5.77	2.55	1.60	0.66	1.84
6 or more	5.32	3.53	2.04	0.45	1.15
Education of Head of Household					
Illiterate	9.49	20.55	21.21	4.13	18.98
Read and Write	9.14	15.41	15.32	4.20	18.56
Primary	13.61	12.88	19.06	3.21	21.15
Intermediate	16.81	14.15	25.87	2.99	24.30
Secondary	18.24	6.86	13.60	1.28	11.29
Diploma	4.29	1.59	0.74	0.08	0.16
University	24.62	1.57	4.20	0.47	5.55
Higher Diploma/Masters	3.79	-	-	-	-
Labour Force Status of Head of Household					
Working	71.99	8.17	63.96	1.68	58.60
Unemployed and worked before	1.52	12.81	2.12	2.04	1.50
New unemployed	0.46	30.88	1.54	8.33	1.86
Student	0.46	-	-	-	-
Housewife	3.18	12.70	4.39	3.20	4.93
Out of Labour Force	20.75	10.94	24.68	2.98	29.96
Disabled	1.64	18.50	3.30	3.98	3.16
All Households	100	9.20	100	2.07	100

Note:
The column headed 'Frequency' contains the proportions of all households by the characteristics given in the first column..
Source of data: Computed from QSA's HIES, 2006-7

Since the number of income earners and the size of household will clearly interact, a cross tabulation by the two dimensions shows that the incidence of low income for households with 7 or 8 members is nearly 19 per cent when there is only one income earner. This falls to 7.4 per cent when there are three income-earners, and zero if there are more. A similar pattern emerges for the proportions of children in low-income households (Table 2.10).

For the very large households (with 9 or more members), one-third of households have equivalized income less than half the median when there is only one earner; and 36 per cent of children living in these households are in low income households. As the number of income earners rises, low-income

incidence falls progressively until with 6 income earners, the proportion of low-income households is only 4 per cent. These numbers tend to confirm that household size only leads to relative poverty if there are few income earners in the household (Table 2.10).

Table 2.10 **Low-Income Incidence: Large Households and Number of Income Earners, Qatari Households, 2006-7**

Size of Household	*Income Earners*	Frequency %	Household Incidence %	Child Incidence %
7-8 members	1	7.36	18.86	19.43
	2	10.46	7.84	7.80
	3	4.12	7.38	6.26
	4	2.59	-	-
	5	1.69	-	-
	6 or more	0.51	-	-
9 or more members	1	4.18	33.22	36.08
	2	4.98	30.95	32.93
	3	4.42	24.38	26.16
	4	6.79	12.63	14.49
	5	3.29	4.47	13.86
	6 or more	4.55	4.13	7.57
All Large Households		54.93	14.04	17.59

Source of data: Computed from QSA's HIES, 2006-7

Graphical Analysis

A helpful graphical device for poverty analysis has been proposed by Jenkins and Lambert (1997).[12] The diagram captures the incidence, intensity and inequality of poverty, and they use the acronym *TIP* because the diagram illustrates these 'three I's of poverty'. We have already defined the terms incidence and intensity. By inequality of poverty Jenkins and Lambert mean the distribution of equivalized incomes *amongst* poor households.

The *TIP* diagram is formed by first ranking households from the poorest to the richest (by their normalized poverty gaps), cumulating the normalized gaps, and plotting the cumulative per capita values against the cumulative share in

the population. The resulting graph displays the incidence of poverty (P_0) on the *x*-axis (where the *TIP* curve becomes horizontal) and the intensity of poverty (P_1) on the *y*-axis (again where the *TIP* curve becomes horizontal). The normalized poverty gap for each household *i* is defined as:

$$\Gamma(y_i, z) = \max\left(\frac{z - y_i}{z}, 0\right)$$

where z is the poverty line and y_i is household *i*'s equivalized income.

For the non-poorthe gap is zero and for those households with low-income the gap is the household's relative income distance from the equivalized income threshold. The *TIP* curve for all Qatari households is presented in Figure 2.1.Starting with the poorest Qatari households, along the horizontal (*x*) axis we measure the cumulative share of these households at successively higher levels of equivalized incomes. When we have covered the poorest 9.2 per cent of the population, we have covered all households with equivalized incomes below the threshold.

On the vertical (*y*) axis we measure the cumulative normalized poverty gap (averaged over all households), so when we reach the last (richest) low-income household, the TIP curve becomes horizontal and the point on the *y*-axis where this occurs gives the intensity measure, P_1.

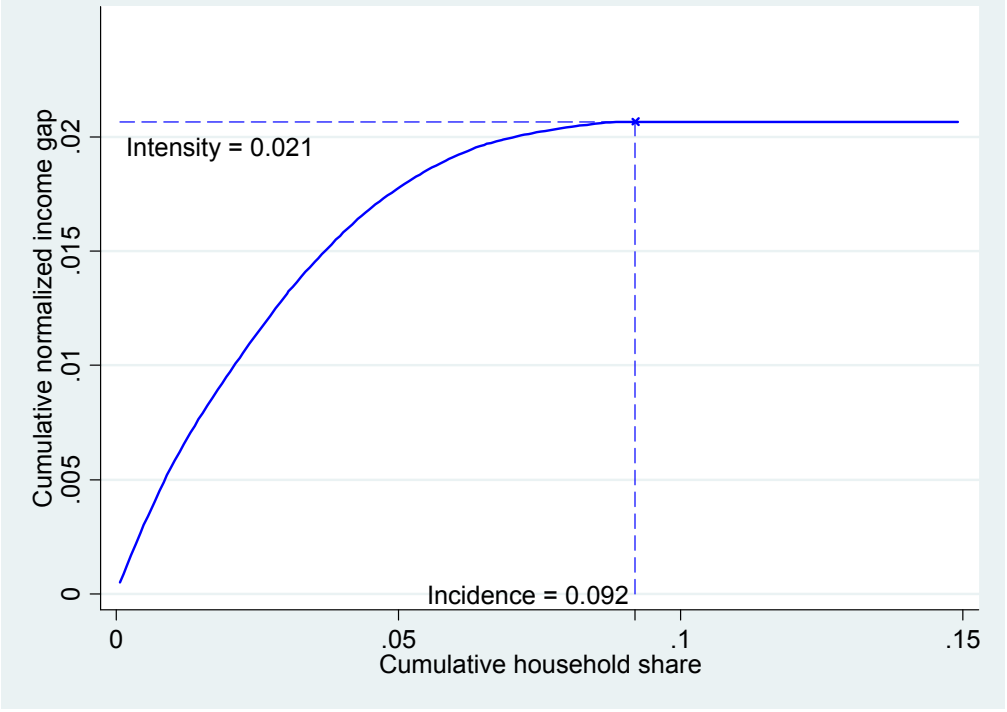
Of course the incidence and intensity points match the statistics given in Tables 2.2 and 2.4 above. This covers two of the 'I's'. How is the inequality of incomes amongst households with low income illustrated? Imagine that every low-income household had the same equivalized income so that the household ranking would be irrelevant. The per capita cumulative poverty gap

[12] Jenkins, S. and P. Lambert (1997), 'Three 'I's of Poverty Curves, with an Analysis of UK Poverty Trends,' *Oxford Economic Papers,* 49, 317-27.

would rise by the same distance for each additional percentile added to the horizontal axis – so the *TIP* curve would be linear.

The more unequal the distribution of income *amongst* the poor, the steeper will the *TIP* curve be at its start, when the very poorest persons (with large poverty gaps) are being included and the flatter it will be as the horizontal chapter is approached. So the third 'I' – inequality – is indicated by the curvature (concavity) of the *TIP* curve.

Figure 2.1 **TIP Curve for Qatari Households, 2006-7**

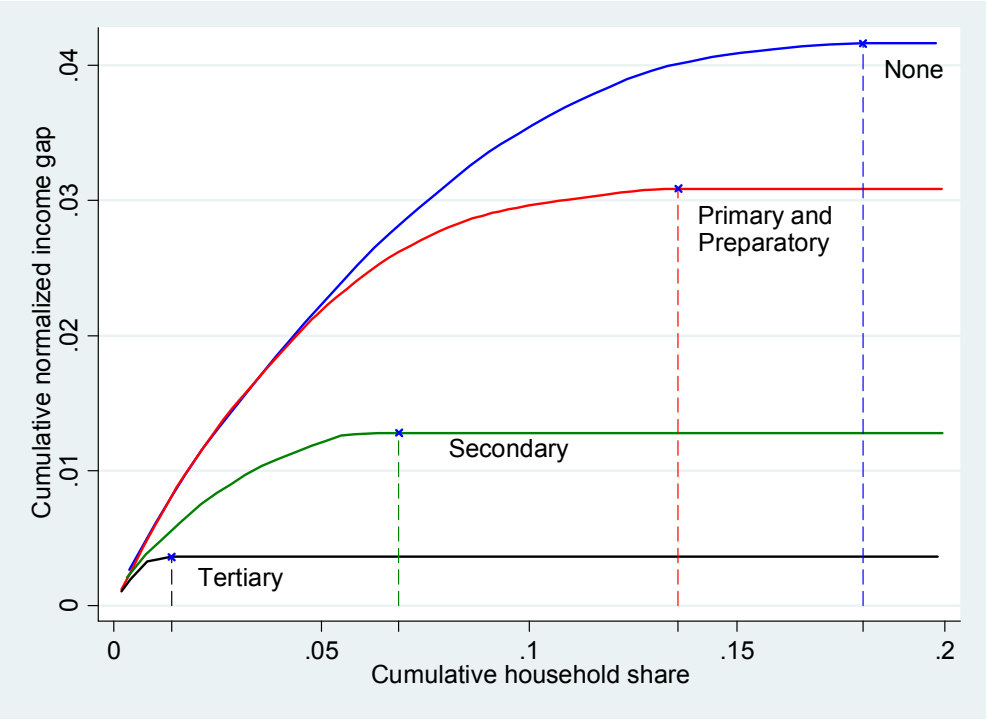


Source of data: Computed from QSA's HIES, 2006-7

If every low-income household had the same equivalized income the TIP curve would be a straight line from the origin to the incidence-intensity point. The curve for Qataris has some curvature but it could be considered quite mild, suggesting the incomes within the poorest households are not that widely dispersed.

It is possible to construct TIP curves for household sub-groups. This possibility is strikingly illustrated by considering Qatari households by the educational level of the household head. Four subgroups are identified: (i) households whose heads are illiterate or have only reading and writing skills (these are labeled 'None' in the figure); (ii) households whose head has primary or preparatory schooling; (iii) those with secondary schooling; iv) and lastly those with tertiary schooling. The TIP curves for these three groups are presented in Figure 2.2.

Figure 2.2 **TIP Curves for Qatari Households By Educational Attainment, 2006-7**



Source of data: Computed from QSA's HIES, 2006-7

The incidence and intensity measures fall progressively as we move to higher levels of schooling, reflecting the indices reported in Table 2.8 above (though finer sub-categories were presented there). Notice that the TIP curves do not intersect. In the terminology of Jenkins and Lambert, the distribution of incomes amongst household whose heads have no schooling '*TIP dominates*' the distribution of households whose heads have achieved

primary or preparatory schooling. Intuitively this means that the incidence, intensity and inequality of poverty are all worse in the first case, and this pattern is repeated at successively higher levels of schooling.

Multivariate Analysis

Thus far, our profiles of low-income incidence have generally been two-dimensional. However the determinants of being low-income may be due to other, more relevant, characteristics of low-income households which happen to be correlated with income. The dimensionality of the tables could be extended. However, as the dimensions increase, the tables get more difficult to interpret. One way to investigate the many influences on low-income incidence is through *multivariate regression techniques*, such as logit and probit regressions.

Firstly, a dichotomous variable (*pov*) which takes the value 1 for a low-income household and 0 otherwise is defined. Applying a logit regression, utilising the dichotomous variable as its dependent variable and using the parameter estimates, predictions can be made about the probability of low income for any household with given characteristics. We apply (weighted) logit regression to all Qatari households and the following explanatory variables are included:

- Municipality
- Schooling (none, primary and preparatory, secondary, tertiary)
- Head of household divorced
- Employment status dummies (working, newly-unemployed, unemployed, disabled, non-participant)
- Household size
- Age of head of household
- Number of income recipients

Given the definition of the explanatory variables used, if all dummy variables in the model were set to zero, we would be analysing a Doha household where the head has secondary schooling, is able-bodied, and is not divorced.

The results of the logit regression for Qatari households are set out in Table 2.11. If the *p*-value of the explanatory variable exceeds 0.05 we cannot reject the null hypothesis (at the 5 per cent level) that the true coefficient is zero. All municipality dummy variable coefficients are insignificant so the probability of being a low-income household does not depend on location.

The municipality variations in incidence we reported in Table 2.5 thus capture other, more relevant, household characteristics. The significant explanatory variables are: (1) head of household variables: schooling level, age, being unemployed for the first time, whether divorced or disabled; (2) household variables: household size and the number of income earners.

Table 2.11 **Logit Regression Coefficients, Qatari Households, 2006-7**

Dependent Variable: Low income/relative poor indicator	Coefficient	Robust Standard Error	*p*-value
Explanatory Variables			
Al-Rayyan	-0.128	0.336	0.703
Umm Salal	0.890	0.505	0.078
Al-Khor	-0.488	0.577	0.398
Al-Wakra	-0.608	0.894	0.497
Other Municipalities	0.124	0.800	0.877
Age	-0.029	0.013	0.027
Divorced	2.035	0.629	0.001
New Unemployed	2.158	0.834	0.010
Unemployed	0.041	1.000	0.967
Non-participant	0.208	0.336	0.537
Disabled	1.774	0.849	0.037
Illiterate or only read and write	1.695	0.430	0.000
Primary and Intermediate	0.887	0.327	0.007
Higher Education	-1.636	0.555	0.003
Household Size	0.388	0.048	0.000
Number of Income Earners	-0.930	0.129	0.000
Constant	-2.639	0.611	0.000

Source of data: Computed from QSA's HIES, 2006-7

The predicted probabilities that a household will have low income given its characteristics, some of which relate to the head of household, are given in Table 2.12.

The first row of Tale 2.12 describes the characteristics of a ‘reference’ household. In subsequent rows of the table we calculate, using the logit model, the predicted change in the probability of low income caused by changing some of the reference household’s characteristics. Our reference household has around a 7 per cent probability of being in the low-income group. But note that, because the parameters of the model are estimated with sampling error, we can only be 95 per cent sure that the true value lies in the interval 3.9 per cent-14.6 per cent – a substantial degree of uncertainty.

When we examine changes in the point estimates in the table, we need also to take into account how accurately these numbers are estimated by considering their associated confidence intervals. The accuracy of the predictions will naturally improve with a larger sample of households. In households with a disabled head the probability of having low income is substantially increased, but there are only 19 households in the sample with a disabled head. Inferences from such a small number of households will necessarily be prone to substantial sampling variation.

Being disabled and having no schooling clearly raise the probability of having a low income. And having a second income earner in the household more than halves the probability of having low income (from 7.7 per cent to 3.17 per cent). Households with older heads are less likely to have low income as are households with fewer members.

Table 2.12 **Probabilities of Low Income, Qatari Households, 2006-7**

Household Description	Predicted Probability	95% Confidence Interval	
	%	%	%
Reference: Head of house is 30 years old working and able-bodied, living in Doha with secondary schooling, sole income earner in five-member household.	7.67	3.88	14.59
Head of house is 30 years old working and able-bodied, living in Doha with **no schooling**, sole income earner in five-member household.	31.14	14.13	55.41
Head of house is **50 years old** working and able-bodied, living in Doha with secondary schooling, sole income earner in five-member household.	4.48	2.18	8.97
Head of house is 30 years old working and able-bodied, living in Doha with secondary schooling in a five-member household. **Two income earners** in the household.	3.17	1.53	6.47
Head of house is 30 years old and **disabled**, living in Doha with secondary schooling, sole income earner in five-member household.	32.87	7.79	73.94
Head of house is 30 years old working and able-bodied, living in Doha with secondary schooling, sole income earner in **two-member** household.	2.53	1.17	5.38

Note
The **bold** features indicate departure from reference household
Source of data: Computed from QSA's HIES, 2006-7

Summary

In this chapter the focus has been on the incidence and intensity of low-incomes (and expenditures) amongst Qatari households. Income in each household is 'equivalized' by dividing total income by the number of adult equivalents, defined according to the OECD-modified equivalence scale. The purpose of this scale is to allow for the reduced requirements of children in the household and to recognize that by sharing relatively fixed overhead expenditure (like housing costs), large households can enjoy economies of scale.

The baseline low-income threshold level of equivalized income is defined as half the Qatari median equivalized income. Using this threshold, the incidence of low incomes is around 9 per cent. Using the more demanding EU-UK threshold of 60 per cent of the median, incidence rises to nearly 17 per cent.

Cross tabulations and multivariate analysis suggest that the following household characteristics are associated with low income among the Qatari households: age and educational attainment of the head of household, the number of household members, and the number of income earners present.

3

Income Distribution

Income Distribution

Inequality Graphics and Indices

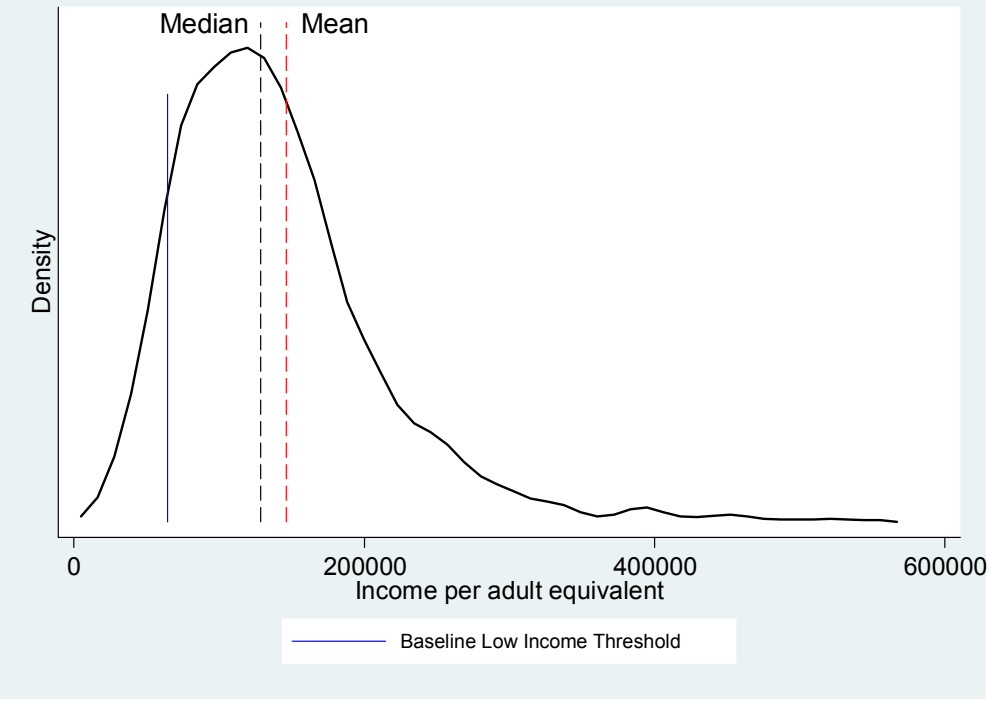
In this chapter we analyse Qatari household income distribution through the use of graphical methods and selected inequality indices. In order to make meaningful comparisons of welfare across households of different size and composition, we continue to use the OECD-modified equivalizing income as discussed in Chapter 2.

Figure 3.1 shows the general distribution of equivalized household income amongst Qatari households.[13] The plot gives the frequency (or density) on the vertical axis of the equivalized incomes on the horizontal axis. The distribution has the usual long upper tail (typical of such distributions worldwide), though the data have been trimmed to remove the top one-percentile to allow a little more detail at lower income levels.

The skewness of the distribution is reflected in the fact that the mean is higher than the median.[14] The median is QR128,571 and the mean is QR 146,294: a ratio of mean to median of 1.138. To gain some visual impression of the baseline income threshold, half the median is indicated on the graph.

[13] For the technically minded, Figure 3.1 is based on weighted density estimates using the Epanechnikov kernel with the bandwidth optimally determined.
[14] If the distribution were symmetric the mean, the median and the mode would be equal to each other.

Figure 3.1 **Distribution of Household Equivalized Income, Qatari Households, 2006-7**



Source of data: Computed from QSA's HIES, 2006-7

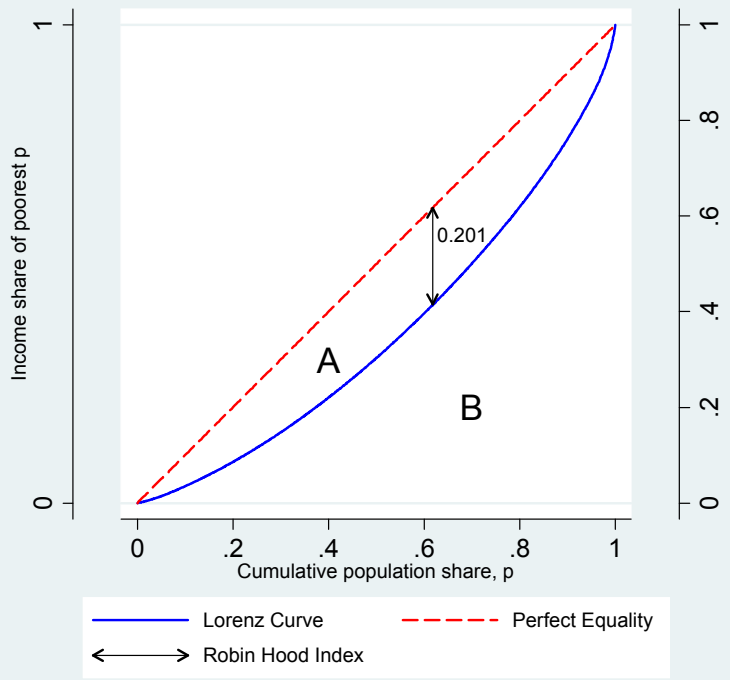
The Lorenz curve provides a more widely-used graphic presentation of income inequality. This curve plots the *cumulative proportion of income* earned by the poorest p per cent of the households for different values of p. Notationally we refer to this curve by the function $L(p)$. If equivalized incomes were perfectly equally distributed amongst Qatari households then 'poorest' p per cent of households would also earn p per cent of income: $L(p) = p$.

The Lorenz curve for Qatari equivalized income is presented in Figure 3.2. The line of perfect equality is the red-dash line. The closer the (blue) Lorenz curve to the line of perfect equality, the more equally incomes are distributed across households in the survey. The more the Lorenz curve becomes bowed towards the bottom right-hand corner of the graph, the more unequally incomes are distributed.

The Gini coefficient is a widely used income inequality summary statistic. The area between the Lorenz curve and the equality line divided by the total area

under the equality line gives the Gini coefficient. Its value lies between zero (perfect equality) and one (perfect inequality, where one household earns all income) – higher values indicating greater inequality. Graphically it is the area A in Figure 3.2 expressed as a proportion of the area A+B.

Figure 3.2 **Lorenz Curve for Equivalized Income, Qatari Households, 2006-7**



Source of data: Computed from QSA's HIES, 2006-7

The Gini coefficient, together with other income distribution statistics, is given in Table 3.1. The coefficient of variation (*CV*) is a useful measure of income dispersion as it expresses the standard deviation as a ratio of the mean. So whereas mean and standard deviation are measured in units of riyals, *CV* is 'metric free' – it is simply a ratio of two numbers. The *CV* for Qatari households is less than one, indicating the equivalized incomes are not very widely dispersed.

The Gini coefficient of 0.29 also suggests that income inequality amongst Qatari households is low. Interestingly, the Gini coefficient for the distribution of income *per capita* is significantly higher at 0.39. By attaching equal weight

to child and adult household members and by ignoring household economies of scale, per capita incomes become more widely dispersed than our measure of equivalized income.[15] Since welfare comparisons are better made with equivalized incomes, a Gini of 0.293 gives a better reflection of inequalities in household incomes across Qatari households.

Table 3.1 Income Distribution Statistics, Qatari Households, 2006-7

Mean (μ)	QR146,295	Gini	0.293
Median	QR128,571	$p90/p10$	3.534
Standard Deviation (σ)	QR 94,533	$p75/p25$	1.914
CV (= σ / μ)	0.646	Robin Hood Index	0.201

Source of data: Computed from QSA's HIES, 2006-7

Table 3.1 reports three further indices of inequality. The first two are percentile ratios: the ratio of incomes at two selected percentiles of the distribution, often chosen are the 90th and 10th percentiles ($p90/p10$). The numerator of this ratio is the highest income earned by the poorest 90 per cent of households (equivalently the lowest income of the richest 10 per cent of the population) and the denominator is the highest income earned by the poorest 10 per cent of households.

If incomes were equally distributed this number would be 1. A higher value for the ratio indicates higher levels of income inequality. Of course this statistic compares incomes at only two points in the distribution so it is a rather selective statistic. As the choice of percentiles is arbitrary, we also consider the less extreme 75-25 percentile ratio ($p75/p25$).

The lowest equivalized income of the richest 10 per cent is 3.5 times the highest income of the poorest 10 per cent. For comparative purposes note that in the UK the $p90/p10$ was reported by Jenkins (2006)[16] to be 3.19 in

[15] The Gini coefficient using raw household income with no attempt to correct for household size and demographics is 0.295, very similar to that using equivalized income.
[16] Stephen Jenkins, 'Estimation and interpretation of measures of inequality, poverty and social welfare using Stata', University of Essex 2006.

1981 and 4.33 in 1991, rather similar to the ratio for Qatari households. The $p75/p25$ case expectedly narrows the percentile ratio to 1.9.

An informative but less well known index of inequality is given by the proportion of total income that would need to be reallocated across the households to achieve perfect equality in income. This is called the 'Robin Hood Index'. It tells us the fraction of total equivalized household income required for the 'rich to give to the poor' to achieve perfect equality. Graphically it is the maximum distance between the line of equality and the Lorenz curve. The maximum value of $p - L(p)$ is attained where the slope of $L(p)$ is 1 and this is true when $p = p_m$ where p_m is the proportion of households earning less than the mean.

The proportion of Qatari households earning less than the mean equivalized income in 2006-7 was 61.75 per cent ($p = 0.6175$) and $L(0.6175)$ is 41.6 per cent – roughly speaking, the poorest 62 per cent of households received 42 per cent of total income. The Robin Hood index for 2006/7 is therefore 62 per cent - 42 per cent = 20 per cent. To achieve perfect equality of incomes, 20 per cent of total income would have to be transferred from richer households to poorer ones, as displayed graphically in Figure 3.2.

Inequality Profiles

In this section we examine the main characteristics of low and high-income households. The former are households with equivalized income less than the 10th percentile and the latter are households with income above the 90th percentile. The characteristics of these low-income households will be similar to those low-income households analyzed in Chapter 2, since the incidence of low incomes (9 per cent) is close to the lowest decile. The tabulations are set out in Table 3.2.

The first set of profiles examines the educational attainment of the head of the household. The heads of the lowest decile are typically poorly educated: only

around 4 per cent have schooling beyond secondary level and a fifth are illiterate and well over half have schooling at only primary level or below. By contrast the top decile heads are highly educated: 62 per cent have degree or postgraduate qualifications.

Far fewer heads of low-income households are working (64 per cent compared with 85 per cent for the top decile), and this is not primarily due to unemployment (just over 3 per cent are unemployed). A quarter of low-income household heads are simply no longer participating in the labour market, compared with only 10 per cent of the heads of the richer households.

Household size is also an important difference between these households. The poorer households tend to be large: 31 per cent have 10 members or more and over 80 per cent of the bottom decile have 7 or more household members. The profile of the top decile is very different: over 78 per cent of these households have 6 or fewer members (Table 3.2).

In around 12 per cent of low-income households the share of self-employment income exceeds half the total income received, and in the top decile this is significantly higher – nearly one third of households receive most of their income from self-employment.

Table 3.2 **Characteristics of Top and Bottom Deciles, Qatari Households, 2006-7**

Characteristic	Bottom 10%	Top 10%
Education of Head		
Illiterate	22.66	0.76
Read and Write	15.28	6.01
Primary	18.41	3.47
Intermediate	25.76	10.71
Secondary	13.32	14.07
Diploma	0.69	2.57
University	3.88	51.25
Postgraduate	-	11.16
Total	100	100
Labour Market Status		
Working	63.98	85.00
Unemployed and worked before	1.96	0.76
New unemployed	1.44	-
Housewife	4.74	2.47
Out of Labour Force	24.83	10.81
Disabled	3.06	0.96
Total	100	100
Household Size		
1-2	1.48	12.84
3-4	5.70	31.00
5-6	10.20	34.98
7-8	26.72	16.10
9-10	24.76	3.64
More than 10	31.15	1.44
Total	100	100
Income Source:		
Self Employment < 50%	88.05	67.22
Self Employment > 50%	11.95	32.78
Total	100	100

Source of data: Computed from QSA's HIES, 2006-7

Summary

Equivalized incomes are distributed reasonably equitably across Qatari households. The Gini coefficient of 0.293 is low by many international standards.[17] The US Gini coefficient rose to 0.47 in 2006 and the UK Gini was 0.36 in 1999. Countries with a Gini coefficient closer to that of Qatar are Germany (0.28), Finland (0.27), Sweden (0.25) and Denmark (0.23). However the Qatari Gini is sensitive to the way household incomes are equivalized. In particular income per capita is more widely dispersed with a Gini coefficient substantially higher at 0.39.

Typically low-income households were large, the household heads had low levels of schooling, and fewer than two-thirds of them were working. Households in the top decile were far smaller, their heads were well educated, and over 85 per cent of them were working.

[17] The Gini coefficients reported in the text are from The World Bank, *2007 World Development Indicators:* http://siteresources.worldbank.org/DATASTATISTICS/Resources/table2_7.pdf

4

Implications for Policy

Implications for Policy

Some key policy options follow from the findings of the analysis on income distribution discussed in chapters 2 and 3.

Perfectly Targeted Transfers

In the short-run government could make transfers directly to low-income households. Indeed the analysis of low income incidence and intensity based on the HIES allows us to estimate the size of fund required to completely eradicate relative poverty through a perfectly targeted transfer programme. From the HIES we estimated that 2,691 households in Qatar received equivalized incomes below the benchmark low-income threshold. The average income shortfall across these households was QR66,707. So a fund of QR66,707 x 2,691 = QR179.5m would be sufficient to raise every low-income household to the benchmark level.

Similar calculations can be made to raise incomes to the other income thresholds. For example a fund of QR 68.7m would be sufficient for every household to reach the lower threshold (40% of the median), and QR 395m is required to achieve the higher income target (60% of the median). Because of sampling variation in the survey, these estimates provide only a rough guide, but they do give some indication of the order of magnitude costs of direct relief for relative poverty through a perfectly targeted transfer programme.

Identifying the Vulnerable

The evidence-based approach we have used in this monograph allows us to identify the type of household at greatest risk of failing to reach an acceptable standard of living.

To achieve this we have adopted a definition of income that allows us to compare welfare *at the household level*. The use of *equivalized* income as our

welfare measure took account of the differential needs of children and adults in the household and also recognized the possibility of household scale economies. When designing social protection programmes such measures of household well-being are essential. Large households may receive large incomes but individuals in such households may well be poorer than those in smaller households. Household income must be interpreted in the light of household size and composition.

Using equivalized income as our indicator of household welfare we identified larger households as those most vulnerable to income poverty. And because of this, whilst 9% of households have income below the bench-mark threshold, the individual members within these households comprise 12% of the population. One in eleven households are relatively poor; one in eight individuals are relatively poor.

Child Poverty

Larger households are often those with most children: 14% of children in Qatar are in low-income households. So whilst roughly one in ten adult individuals are in poor households, one in seven children are. Childhood deprivation may well affect lifetime opportunities: children from poorer homes typically have poor nutrition and end up with low levels of education. The poor start in life means that they will continue to live in relative poverty in later life. Today's poor children are tomorrow's poor adults and there is clearly a need for policy intervention to break the intergenerational transmission of deprivation.[18]

Welfare programmes should therefore be specifically directed to households with children. And learning support for children in low-income families may be necessary to raise their educational attainment levels and improve their chances for entering higher paid employment in later life.

[18] This is precisely why the UK government has set explicit targets for child poverty rates rather than household or individual rates..

Support for learning outcomes for children in relatively disadvantaged households goes beyond the formal schooling system. It aims to improve the home environment, consistent with a holistic child wellbeing approach which starts at birth.

Measures that could improve learning outcomes of such children include, encouragement for parents to spend time with their children, including reading, writing and participating in recreational activities. Others might include pre-schooling awareness and measures that minimizes absenteeism from school, and the creation of a culture of learning at home.

International evidence shows positive effects on children's academic performance with increased parental involvement. Children show higher academic achievement, greater cognitive competence, greater problem-solving skills, greater school enjoyment, improved school attendance and fewer behavioural problems at school (Melhuish, *et al*, (2001); Fan & Chen, (2001))

Creating Employment Opportunities

Targeted welfare programmes can offer immediate help for poorer households in the short term but in the long run it is important for households to generate sufficient income without the need for government support. We have found that households are more prone to relative poverty when there are few income earners present.

Most low-income households have at least one working member present. Our empirical analysis suggested that having a second income earner present halved the probability of being a low-income household. Encouraging other members of the household to work may require policy intervention. Many mothers in these low-income households have limited or no schooling and hence cannot readily find employment that is culturally acceptable

Further, many mothers of young children may find it particularly difficult to pursue their careers. Mothers in low income households may find this particularly difficult without the kind of domestic help that women in richer households can afford. Thus flexible employment opportunities are needed with possibilities for part-time or work-sharing arrangements. State support for child-care may also be necessary to encourage female labour force participation. Through such measures the current trend of rising Qatari labour force participation rates would gain momentum.

Policy Targeting

We have in this monograph given a formal definition of relative poverty: the proportion of households whose equivalized income is less than half the median. The use of this quantitative approach enables policy-makers to monitor the success or otherwise of policies aimed at improving the well-being of low-income households. When the next comprehensive income survey is undertaken in Qatar it will be clear whether there are fewer or more households with equivalized incomes below the threshold.

In the Appendix we describe how the incidence and intensity of relative poverty can be monitored over time. Because the HIES is currently only available as a 'snap-shot' for 2006-7,[19] in the appendix we use the Labour Force Surveys (LFS) for 2006 and 2008 to illustrate how policy measures can be evaluated and monitored over time. The LFS only collects information on employment income: there is no information about income from self-employment, asset income or public and private transfers to household. Because of the partial information about household income, the analysis is obviously incomplete, but it does illustrate how low-income thresholds can be used to say something about the behaviour over time of relative poverty.

We calculated the incidence and intensity of low *employment* income in the two years 2006 and 2008, using each year's own low-income threshold. The

[19] The previous income survey was in 2001.

relative poverty line income in 2006 was half the median equivalized income for that year, and the line for 2008 was half the 2008 median equivalized income. The poverty line moves with the median as it should when measuring relative poverty. So when we report that the relative poverty rate fell between 2006 and 2008, it fell despite the fact that the threshold used in 2008 was higher than that of 2006.

The appendix also shows how the surveys can be used to monitor *absolute* poverty as well. We could calculate the incidence and intensity of low incomes in 2008 *using the income threshold for 2006* (obviously adjusted for any consumer price inflation over the 2006-8 period). In this approach we are using the 2006 standard when analyzing the 2008 data, so our measures for the two years reflect changes in *absolute* poverty, where the absolute standard is set to the relative standard set in the year 2006.[20]

The evidence-based approach adopted here is also useful when policy-makers set targets for their social protection programmes. For example, in 1999 the UK government set itself the target of halving child poverty by the year 2010. And whilst it seems likely this target will not be attained, it provided a useful benchmark against which outcomes can be compared.

Of course relative income poverty is only one, albeit important, dimension of relative deprivation. The quantitative approach used in this monograph offers policy-makers the opportunity to set targets for poverty alleviation and monitor over time the effectiveness of the programmes they have implemented.

Data Requirements

Social protection policy for Qatar needs to be based on a regular flow of high quality and relevant data. The analysis of the HIES undertaken here suggest

[20] This is the approach adopted by the UK government when monitoring poverty over time.It measures trends in both relative and absolute poverty, the latter defined by the relative poverty line income of an earlier year.

that there is a need to supplement cross-sectional data on household income and expenditure with longitudinal data.

A single survey in the form of a cross-sectional dataset analysed in this report can provide a rich source of information about relative poverty, income distribution and the characteristics of households that are associated with both. But surveys of this sort reveal little of the permanence or otherwise of a household's standard of living. For example, a household may have been sampled over a period when working members were between jobs, temporarily depressing earnings.

In the survey this household might well fall into the relatively poor group but it is unlikely to remain there for long. Compare this household to one where household members are poorly skilled and have found difficulty finding and keeping employment for some time. The second household presents more of a policy challenge than the first. It is the *persistence* of low incomes that leads to low welfare and self-esteem, but it is impossible to identify these households using the 'snap-shot' survey data analysed in this report.

If there is what Jenkins (2006) has called 'bottom-end churning', in which people move in and out of poverty, it is very important to understand something of *poverty dynamics*. A number of solutions are possible. The first is very expensive but potentially highly informative – a longitudinal survey that regularly records information on the same household over a long period. Such a survey would identify households in persistent poverty and inform policy more helpfully.

A second less ambitious approach is achievable at far lower cost. When a household is surveyed, information which tends to be correlated with persistent poverty could be gathered. A household with temporarily low income will typically have the consumer durables normally in the possession of a richer household but a persistently poor household will not. It is increasingly common for the analysis of poverty to consider a wider set of

indicators than just income and expenditure. Households may be considered poor if they have low incomes or expenditures *and* there is evidence of persistent poverty.

In Ireland, household disposable income per equivalent adult is combined with a 'relative deprivation' index to define poverty, and this general approach is sometimes referred to as the 'Irish' method.[21] This index currently consists of the following eight basic deprivation indicators:

- Not having:
    - new, but second-hand clothes
    - a meal with meat, fish or chicken every second day
    - a warm waterproof overcoat
    - two pairs of strong shoes
    - a roast or its equivalent once a week

- or conversely, having:
    - debt problems arising from ordinary living expenses
    - a day in the last two weeks without a substantial meal
    - to go without heating during the last year through lack of money

If a household in Ireland receives income per adult equivalent to below 60 per cent of average or median income and also lacks at least one of the items in the basic deprivation list, it is said to experience 'consistent poverty'. The UK government currently uses a three-pronged definition of poverty: a relative income measure, an absolute income measure and an index of material deprivation, much like the Irish one. An approach similar to this could be easily implemented in the Qatari setting.

[21] The deprivation indicators were first identified in 1987 by Ireland's Economic and Social Research Institute.

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APPENDIX

Impact of the Financial Crisis on Qatar's Vulnerable - Analysis of the 2006 and 2008 Labour Force Surveys

In this section, we analyse employment income inequality in Qatar in 2006 and 2008 using information from the Labour Force Surveys (LFSs) for these years. Employment income is a narrower measure of income as compared with the HIES income where in addition to paid income, it includes in-kind-payments and other sources of income over and above that received from employment.

The analysis is of particular interest because it may shed some light on the effects of the global financial crisis on income inequality in Qatar. From the published national accounts, the effect of the crisis on economic activity in Qatar was less than one might have expected. Table A1.1 sets out Qatar's GDP estimates for the period 2006-8.

Table A1.1 **Gross Domestic Product, Qatar 2006 – 2008**

	QR million in current prices			Annual per cent Growth		
Year	GDP	Oil-Gas	Non-Oil-Gas	GDP	Oil-Gas	Non-Oil-Gas
2006	206,644	118,168	88,476			
2007	258,591	142,310	116,280	25.1	20.4	31.4
2008	365,483	212,777	152,706	41.3	49.5	31.3

Source of data: QSA website, www.qsa.gov.qa

The financial crisis did not appear to have had a major impact on economic activities in Qatar over the period spanned by the two LFS surveys (2006 and 2008) analysed in this report. We anticipate that the 2009 GDP estimates may reveal a different story based on QSA's national accounts estimates for the last quarter in 2008 and the first quarters in 2009.

GDP contribution from the gas sector fell in each of the three quarters in 2008 Q4, 2009 Q1 and 2009 Q2; and GDP contribution from the oil sector fell substantially in 2008 Q4, less dramatically in 2009 Q1 and recovered a little in

2009 Q2. Combining the two, GDP contribution of oil and gas in 2009 Q2 was around half their levels in 2008 Q3 and the effects of these changes on income and its distribution could well be evident in the 2009 LFS.

Income Data and Definitions in the Labour Force Surveys

Our analysis is based on QSA's 2006 and 2008 LFSs. These data provide considerable detail about the labour market characteristics of Qatari individuals. Using the individual records in the LFS we are able to assemble *household* income datasets for 2006 and 2008, and then use them to analyse the distribution of income *over households* for these years. Because households share resources, it is the more appropriate unit for income distribution.

The HIES 2006/7, which covered 1,203 Qatari households, contains more detail about a wide range of income sources: income from employment, self-employment income, property income, transfers from government, etc. The LFS surveys only record monthly *employment income* for each individual.[22] From the HIES we know that the mean shares of employment and self-employment income in total household income were 60 per cent and 30 per cent respectively.

In analysing the income records of the LFS, we are covering the most important income source, and one that may be particularly sensitive to macroeconomic shocks. But we are not able to analyse changes in the level and distribution of self-employment income, which is also likely to be highly sensitive to business-cycle fluctuations. Another caveat in using the LFS for this analysis is that we will not be able to capture the impact of government transfers used to compensate for the loss of earnings from other sources given the scope of the income data in the LFS.

[22] For a handful of individuals in the *LFS*, wage and salary incomes were recorded daily or weekly. These were adjusted to a monthly basis.

By aggregating the incomes of each household member, we derive total employment income for the household. We analysed only those households in the *LFS* with positive employment income. In the 2006 LFS there were 1,724 such households and 1,877 in 2008.

Table A1.2 presents some summary statistics of the LFS 2006 and 2008 equivalized monthly employment income[23]. Mean household income in 2008 was 55 per cent higher than in 2006. To obtain real employment income, we divided equivalized incomes in 2008 by the ratio of the Consumer Price Index (CPI) in 2008 to the CPI in 2006[24] and the result is reported in Table 2.1 in the row labelled '2008 Real'.

In 2008 real equivalized incomes were 19 per cent higher than in 2006, an annual growth of around 9 per cent. The international economic turbulence appears to have had very little impact on average Qatari incomes, at least by 2008. In what follows, income in 2008 is always expressed in real terms, in 2006 consumer prices using the CPI deflator.

Table A1.2 **Equivalized Monthly Employment Income, Qatari Households, LFS 2006 and 2008**

Equivalized Household Income (QR)				
Year	**Mean**	**Median**	**St. Deviation**	**Skewness**
2006	6,694	5,938	4,092	2.17
2008	10,363	9,167	6,058	1.41
2008 Real	7,918	7,004	4,629	1.42

Household Demographics				
	Household Size		**Adult Equivalents**	
Year	**Mean**	**Median**	**Mean**	**Median**
2006	7.06	7	3.49	3.3
2008	7.38	7	3.65	3.3

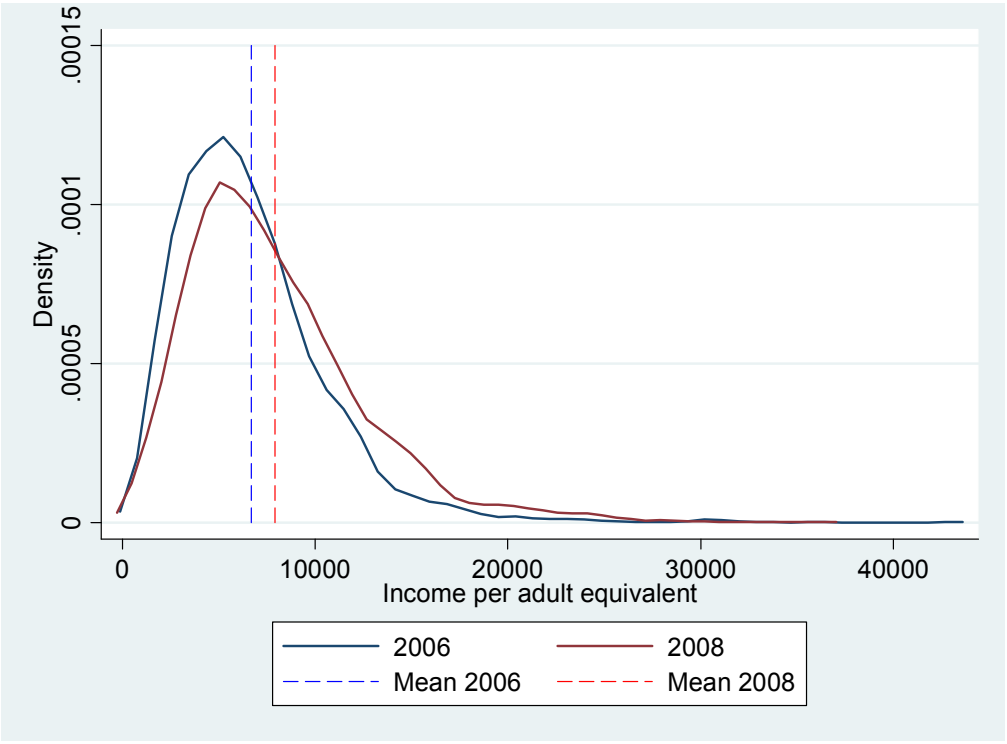
Source of data: Computed from QSA's LFSs, 2006 and 2008

[23] As the *LFS* has information on employment income alone, in what follows we shall simply refer to it as income. All statistics in this report are weighted by the survey sampling weights.

Inequality Measures

Figure A1.1 shows the income distribution for both survey years using kernel density methods. The figure suggests that incomes were distributed more evenly in 2008. The frequency of low-income households fell and the frequencies of 'middle-income' households rose in 2008. The figure would suggest that the real incomes of poorer households grew faster than the average so that the frequencies of such households fell in 2008.

Figure A1.1 **Equivalized Employment Income Density Functions, LFS 2006 and 2008**

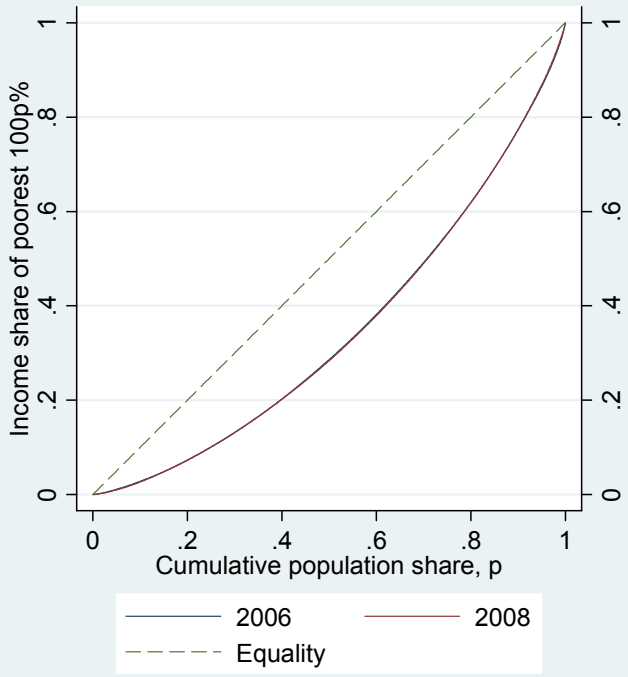


Source of data: Computed from QSA's LFSs, 2006 and 2008

The Lorenz curves for equivalized incomes for the two years are presented as Figure A1.2. The differences in the density functions plotted in Figure A1.1 have no detectable effect on the Lorenz curves of Figure A1.2; the two curves would appear coincident.

[24] The CPI index in 2008 was 174.37 (base year 2001) and in 2006 the index was 133.23. Source: http://www.qsa.gov.qa/eng/CPI.htm

Figure A1.2 **Equivalized Income Lorenz Curves, LFS 2006 and 2008**



Source of data: Computed from QSA's LFSs, 2006 and 2008

Inequality indices for 2006 and 2008 are presented in Table A1.3. The Gini coefficient did not change over the 2-year period. Inequality indices cannot be expected to change a great deal over two years but what change is detectable in the other indices suggests a marginally more equitable distribution of income, confirming the changes in income distribution in Figure A1.1.

The ratio of the standard deviation to the mean – the coefficient of variation (*CV*) – is lower in 2008. The percentile ratios also suggest a marginally more equitable distribution – in 2006 the equivalized income of the poorest household in the top 10 per cent of earners was 4.6 times that of the richest household in the bottom 10 per cent, a figure that fell to 4.5 in 2008. The financial crisis of 2007-8 seems to have no detectable negative impact on average Qatari incomes and no impact on the household distribution of employment income.

Table A1.3 Equivalized Income Inequality Indices, Qatari Households LFS 2006 and 2008

2006 Labour Force Survey			
Mean (μ)	QR 6,694	Gini	0.31
Median	QR 5,938	$p90/p10$	4.62
Standard Deviation (σ)	QR 4,092	$p90/p50$	1.94
CV (= σ / μ)	0.61	$p75/p25$	2.16
2008 Labour Force Survey			
Mean (μ)	QR 7,918	Gini	0.31
Median	QR 7,004	$p90/p10$	4.49
Standard Deviation (σ)	QR 4,629	$p90/p50$	1.98
CV (= σ / μ)	0.59	$p75/p25$	2.22

Source of data: Computed from QSA's LFSs, 2006 and 2008

Low-Income Incidence

Taking the equivalized low-income threshold to be 50 per cent of the median income and applying it to the *LFS* 2006 and 2008 Qatari household datasets, the incidence and intensity of low incomes are based on different thresholds in the two years. For example, in 2006 the median equivalized income was QR 5,938 and therefore the threshold level for that year is 0.5 x QR 5,938 = QR 2,969.

The threshold for 2008 (expressed in 2006 prices) is QR 3,502. We also measure the incidence and intensity of low incomes in 2008 using the 2006 threshold. Indices based on this threshold can be interpreted as 'absolute' low income measures as the threshold is the same in both years. Table A1.4 provides the details.

Low-income incidence is the simple 'head-count' ratio, which refers to the percentage of households with income less than the threshold. In 2006, 15 per cent of households had equivalized incomes below half the median income for that year; in 2008 13 per cent of households had incomes below that year's income threshold. So by the 'relative income' threshold, low

income incidence had fallen – the incomes of the poorest Qatari households have grown faster than the average, thus lowering the proportion of households with income levels of half the median. As is clear from the 95 per cent confidence intervals (given in parentheses), the difference in measured incidence could well be due to sampling variation, and we cannot reject the null hypothesis that incidence is the same in the two years.

Because the 'absolute income' threshold is lower, the incidence of low income by this measure is significantly lower (final column in Table 3.3) – only 9 per cent of Qatari households had incomes less than half the median income of 2006.

Table A1.4 **Low-Income Incidence (P_0) and Intensity (P_1), Qatari Households LFS 2006 and 2008**

	2006	2008	
Measurement		**2008 Threshold**	**2006 Threshold**
Equivalized Income Threshold	QR 2,969	QR 3,502	QR 2,969
Low-Income Incidence (%)	15.2 (13.43 – 16.93)	12.9 (11.27 – 14.54)	9.0 (7.62 – 10.43)
Low-Income Intensity (%)	4.1 (3.51 – 4.67)	4.1 (3.46 – 4.79)	2.9 (2.33 – 3.46)

Note:
Numbers in parenthesis are the 95 per cent confidence intervals
Source of data: Computed from QSA's LFSs, 2006 and 2008

Using the relative threshold, low-income intensity among the Qatari households in the *LFSs* is around 4 per cent for both years. Using the 2006 threshold for incomes in 2008, the intensity of low incomes falls to 2.9 per cent.

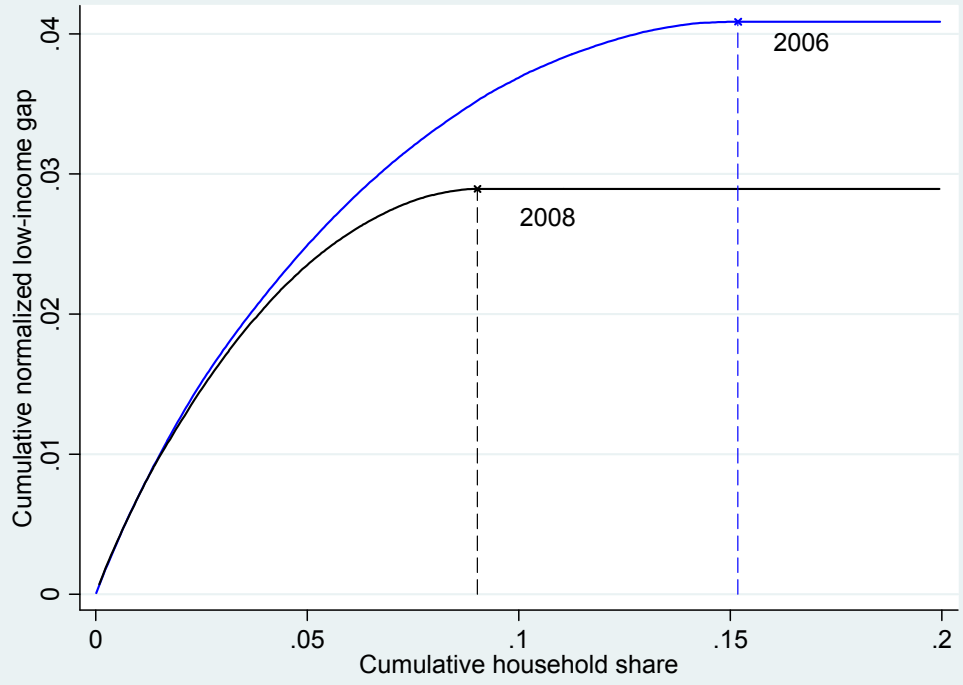
The incidence and intensity of low incomes can be conveniently displayed through *TIP* curves, a graphical device proposed by Jenkins and Lambert (1997)[25]. Starting with the poorest Qatari households, along the horizontal (x) axis we measure the cumulative share of these households at successively

[25] Jenkins, S. and P. Lambert (1997), 'Three 'I's of Poverty Curves, with an Analysis of UK Poverty Trends,' *Oxford Economic Papers,* 49, 317-27.

higher levels of equivalized incomes. When we have covered the poorest 15 per cent of the population in 2006 and 9 per cent in 2008, we have covered all households with equivalized incomes below the threshold. On the vertical (*y*) axis we measure the cumulative normalized low-income gap (averaged over all households).

The normalized low-income gap is the gap between the household's income and the low-income threshold, expressed as a proportion of the threshold itself. So when we reach the last (richest) low-income household, the *TIP* curve becomes horizontal. The point on the *y*-axis where this occurs gives the intensity measure, P_1 and the point along the *x*-axis is the incidence, P_0. In Figure 3.3 we present *TIP* curves for 2006 and 2008, using the 2006 income threshold in both cases. The incidence and intensity measures fall as we move from 2006 to 2008 (Figure A1.3).

Figure A1.3 **TIP Curves for Qatari Households, LFS 2006 and 2008**



Source of data: Computed from QSA's LFSs, 2006 and 2008

Low-Income Incidence: Children and Individuals

The incidence rates of low incomes reported in the previous section are the proportions of *households* with income below a given threshold. All too often these low-income households are the larger ones, with many adult and child members. As a result the proportions of individuals and children who live in low-income households are substantially higher than the proportions of households. In Table A1.5 we present incidence rates for households, adult individuals and children (those under 14).

Low-income incidence in Table A1.5 is based on the 2006-based threshold income level. In 2006, 15 per cent of households received employment income below half the median and over 20 per cent of children in Qatar lived in these households, and 18 per cent of all adults also lived in low-income households. This pattern confirms the expectation that the poorest households are also the largest ones. In 2008 the same pattern is evident but at lower levels.

Table A1.5 **Low-Income Incidence, LFS 2006 and 2008 Qatari Households, Individuals and Children**

	Incidence		
	2006	2008	
	%	2006 Threshold %	2008 Threshold %
Households	15.2	9.0	12.9
Individuals	19.2	10.9	15.6
Child (under 14)	20.8	12.5	17.8
Adults	18.3	10.0	14.4

Source of data: Computed from QSA's LFSs, 2006 and 2008

Conclusion

This section examines the distribution of employment income amongst Qatari households in 2006 and 2008 using Qatar Statistics Authority's Labour Force Surveys for 2006 and 2008. In the US and Europe, the level of economic activity in 2008 had already slowed substantially because of the financial crisis.

From the published national accounts estimates, it would appear that the effects on Qatar would be felt a little later. The findings show that mean household incomes from employment in 2008 were substantially above their 2006 levels, even when adjusted for changes in the CPI. Mean monthly household employment income per adult equivalent (equivalized income) in 2006 was QR 6,694, rising to QR 10,363 in 2008, or QR 7,918 when expressed in 2006 purchasing power. According to the surveys, 2008 real equivalized employment incomes were 19 per cent higher than they were in 2006, an annual growth of around 9 per cent.

The distribution of equivalized employment income across households was largely unchanged over the period 2006 to 2008. The Gini coefficient was around 0.31 in both years and the other indices of inequality showed a very marginal reduction in overall income inequality, a reduction that might well be due to sampling variation.

In 2006 the equivalized income of the poorest household in the top 10 per cent of earners was 4.6 times that of the richest household in the bottom 10 per cent, a figure that fell to 4.5 in 2008. Based on the national account estimates, the effects of the financial crisis may only have occurred in the later stages of 2008/early 2009, hence it would be useful to analyse the 2009 *LFS* to uncover any income distributional impact of the global financial crisis