ESSAYS ON POVERTY IN SAUDI ARABIA

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ZUSAMMENFASSUNG

Schätzungen zufolge leben in Saudi-Arabien etwa 20 % der Staatsangehörigen in relativer Armut. In Anlehnung an diese Einschätzung besteht das Hauptforschungsziel dieser Arbeit darin, die Ursachen der Armut zu ermitteln. Zu diesem Zweck wurde 2019 eine sozioökonomische Haushaltsbefragung unter 496 saudischen Haushalten in Dammam, einer der großen Metropolen, durchgeführt. Diese Umfrage zählt zu einer der ersten unabhängigen Haushaltsbefragungen in Saudi-Arabien. Zusätzlich nahm eine Teilstichprobe von 166 Haushalten an einem Feldexperiment teil, um die Risiko- und Zeitpräferenzen zu messen.

Armut wird basierend auf der inflationsbereinigten Armutsgrenze des Landes von 6 $ pro Person und Tag als relative Armut definiert. Zur Messung der Armut wurde der Foster-Greer-Thorbecke-Armutsindex (FGT-Index) verwendet. Um die Determinanten der Häufigkeit, Intensität und Schwere von Armut zu analysieren, wurden Logit- und Tobit-Modelle untersucht. Es wurde außerdem ein Modell des diskontierten Nutzens definiert, das die Prospect-Theorie und die quasi-hyperbolische Diskontierung anwendet, um die Risiko- sowie Zeitpräferenzen der Haushaltsvorstände zu messen.

Die Ergebnisse zeigen, dass Arbeitslosigkeit und unzureichende Bildung Schlüsselfaktoren für Armut in Saudi-Arabien sind. Außerdem erhöhen große Familiengrößen, ein geringes Sozialkapital und eine afrikanische Abstammung das Armutsrisiko von Haushalten. Von Frauen geführte Haushalte sind zudem häufiger und stärker von Armut betroffen als von Männern geführte Haushalte. Dies liegt daran, dass viele Frauen aufgrund kultureller Barrieren keine Arbeit suchen. Weibliche Haushaltsvorstände weisen überdies weniger Bildungsjahre als männliche Haushaltsvorstände auf, was sich nachweislich auf ihre Beschäftigungschancen auswirkt. Es wurde jedoch festgestellt, dass Frauen bei gleichem Bildungsniveau mit gleicher Wahrscheinlichkeit einen Job finden.

Des Weiteren untersuchte die Studie den Zusammenhang zwischen Armut und Verhaltensaspekten. Es wurde eine positive Korrelation zwischen Armut und Risikoaversion sowie Ungeduld beobachtet. Ebenfalls wurde das Sozialsystem Saudi-Arabiens untersucht. Sozialleistungen befreien ein Drittel der armen Haushalte aus der Armut. Rund 15 % der armen Haushalte erhalten allerdings keine Unterstützung. Insbesondere Haushalte ohne Personalausweis werden von der Sozialhilfe ausgeschlossen. Derartige Haushalte ohne Zugang zu staatlichen Transferleistungen oder sozialen Netzwerken zeigen eine höhere Risikobereitschaft. Da weibliche Haushaltsvorstände höhere Sozialleistungen als männliche Haushaltsvorstände erhalten, können Sozialhilfezahlungen die geschlechtsspezifische Armutslücke außerdem in gewissem Maße verringern.

Stichwörter: Arabische Welt, soziale Ausgrenzung, städtische Armut, Armutsdeterminanten, Armutslücke, Feminisierung der Armut, Risikobereitschaft, Geduld

ABSTRACT

In Saudi Arabia, it is estimated that around 20% of nationals live in relative poverty. Echoing this estimation, the main research objective of this thesis is to determine the causes of poverty among nationals. For this purpose, a socioeconomic survey was conducted among 496 Saudi households in Dammam, one of the largest metropolitan cities, in 2019. This appears to be one of the first independent household surveys conducted in Saudi Arabia. In addition, a subsample of 166 households took part in a lab-in-the-field experiment to measure the risk and time preferences of household heads.

In this study poverty is conceptualised as *relative poverty*, based on the country's inflation-adjusted poverty line of $6 per person per day. To measure poverty, the Foster–Greer–Thorbecke (FGT) poverty index is used. Moreover, logit and tobit models are studied to analyse the determinants of the prevalence, intensity and severity of poverty. In addition, a discounted utility model is defined that applies prospect theory and quasi-hyperbolic discounting to jointly estimate the risk and time preferences of household heads.

The results show that the key determinants of poverty are unemployment and limited education. Besides, large family sizes, insufficient social capital and being of African descent increase the risk of a household being poor. Moreover, female-headed households are affected by poverty more often and more severely than male-headed households. This is because many women do not seek employment due to cultural barriers. In addition, female household heads have fewer years of education than their male counterparts, which impacts their chances of employment. Nevertheless, it was discovered that females are equally likely to find a job when they have the same educational level as males.

Furthermore, the study examined the relationship between poverty and behavioural aspects. A positive correlation between poverty and risk aversion and impatience was found. The study also enquired into Saudi Arabia's social welfare system. Welfare payments lift one third of poor households out of poverty. However, around 15% of poor households do not receive any support. In particular, households without a national identification card are excluded from social welfare. Those households without access to governmental transfers or social networks were found to be willing to take greater risks. Moreover, female household heads receive higher social welfare payments than male heads. Hence, social welfare payments reduce the gender poverty gap to some extent.

Keywords: Arab World, Social Exclusion, Urban Poverty, Poverty Determinants, Poverty Gap, Feminisation of Poverty, Risk Taking, Patience

الملخص
مقالات عن الفقر في المملكة العربية السعودية

في المملكة العربية السعودية، تشير التقديرات إلى أن حوالي 20٪ من المواطنين يعيشون في فقر نسبي. وعليه، فإن الهدف الرئيسي لهذه الأطروحة هو الوقوف على أسباب الفقر بين المواطنين. لتحقيق هذا الهدف، تم إجراء مسح اجتماعي اقتصادي للأسر والذين بلغ عددهم 496 أسرة سعودية في مدينة الدمام (إحدى المدن السعودية الكبرى)، وذلك في عام 2019. يبدو أن هذا المسح هو واحد من أوائل المسوح الأسرية المستقلة التي أجريت في المملكة العربية السعودية. بالإضافة إلى ذلك، شاركت عينة فرعية من 166 أسرة في تجربة معملية في الميدان لقياس مدى "المخاطرة" و قيمة "الوقت" لدى أرباب الأسر.

هذه الدراسة ترى الفقر على أنه فقر نسبي، استنادًا إلى خط الفقر في الدولة البالغ 6 دولارات للفرد في اليوم. لقياس الفقر، يتم استخدام مؤشر "فوستر جرير ثوربيك" (FGT) للفقر. علاوة على ذلك ، تمت دراسة نماذج "لوجيت وتوبت" لتحليل محددات انتشار الفقر وحدته وشدته. بالإضافة إلى ذلك، يتم تعريف نموذج "المنفعة المخصوم" الذي يطبق نظرية "الاحتمالات" و "الخصم شبه الزائدي" لتقدير مشترك لمدى المخاطرة وقيمة الوقت لأرباب الأسر.

تظهر النتائج أن المحددات الرئيسية للفقر هي البطالة ومحدودية التعليم. إلى جانب ذلك، فإن كبر حجم الأسرة، وعدم كفاية رأس المال الاجتماعي، والانحدار من أصل أفريقي يزيد من خطر أن تصبح الأسرة فقيرة. علاوة على ذلك، فإن الأسر التي تعولها إناث تتأثر في كثير من الأحيان وبشدة بالفقر أكثر من الأسر التي يعولها رجل، وذلك لأن العديد من النساء لا يبحثن عن عمل بسبب الحواجز الثقافية. بالإضافة إلى ذلك، تتمتع ربات الأسر المعيشية بسنوات تعليم أقل من نظرائهن من الذكور، مما يؤثر على فرص عملهن. ومع ذلك، تم اكتشاف أن الإناث تتساوى في احتمالية العثور على وظيفة عندما يكون لديهن نفس المستوى التعليمي.

علاوة على ذلك، تناولت الدراسة العلاقة بين الفقر والجوانب السلوكية. لوحظ وجود علاقة إيجابية بين الفقر وتجنب المخاطرة ونفاد الصبر. استفسرت هذه الدراسة أيضًا عن نظام الرعاية الاجتماعية السعودي. مدفوعات الرعاية الاجتماعية تنتشل ثلث الأسر الفقيرة من براثن الفقر. ومع ذلك، فإن حوالي 15٪ من الأسر الفقيرة لا تتلقى أي من هذا الدعم؛ على وجه الخصوص، يتم استبعاد الأسر التي ليس لديها بطاقة هوية وطنية من الرعاية الاجتماعية، على سبيل المثال. وجد بأن تلك الأسر التي ليس لديها إمكانية الوصول إلى التحويلات الحكومية على استعداد لتحمل مخاطر أكبر. علاوة على ذلك ، تتلقى ربات الأسر مدفوعات رعاية اجتماعية أعلى من تلك التي يعيلها الرجال؛ وبالتالي ، فإن مدفوعات الرعاية الاجتماعية قادرة على تقليص فجوة الفقر بين الجنسين إلى حد ما.

الكلمات المفتاحية: العالم العربي، الإقصاء الاجتماعي، الفقر الحضري، محددات الفقر، فجوة الفقر، تأنيث الفقر، المخاطرة، الصبر

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LIST OF ABBREVIATIONS

FGT	Foster-Greer-Thorbecke
FHH	Female-Headed Household
GASTAT	General Authority for Statistics Saudi Arabia
GDP	Gross Domestic Product
GPS	Global Preference Survey
HEP	Hannover Economic Paper
HH	Household
ICAE	International Conference of Agricultural Economist
ICP	International Conference on Poverty
IMF	International Monetary Fund
MHH	Male-Headed Household
PG	Poverty Gap
PMU	Prince Mohammad bin Fahd University
SAR	Saudi Riyals
US	United States

CHAPTER 1 INTRODUCTION

1.1 Background and Motivation

Owing to the discovery of oil, Saudi Arabia became one of the wealthiest countries in the world (IMF, 2020). Ever since, as part of the 'social contract'[1], the ruling family has been generously passing on the wealth to society (Hertog, 2016). Nevertheless, many Saudi citizens are still living in poverty. Although documentation on the magnitude of poverty in Saudi Arabia is scant, there are several indications that suggest it is a severe issue in the country.

The only official government report on poverty was released in 2005. It stated that 19% of the Saudi population lived in poverty that year (Bin Saeed, 2008). In addition to the government report, there are other technical reports on poverty in Saudi Arabia. In an article entitled 'Saudi Arabia's riches conceal a growing problem of poverty', *The Guardian* claimed that between two and four million native people – roughly 12.5% to 25% of the Saudi population – were living in poverty (Sullivan, 2013). The Borgen Project, a non-profit organisation that focuses on poverty, reported that around 20% of the Saudi population was poor (Koontz, 2015).

Another indication that poverty is a major concern is the number of government initiatives aimed at reducing poverty. The first time that poverty of Saudi nationals became an official government concern was in 2002, after Crown Prince Abdullah visited a Riyadh slum (Al Rushaid, 2010). As a result, the government implemented a comprehensive strategy to fight poverty (Royal Decree Kh/41359, 29 December 2002). This strategy included two initiatives: (i) the establishment of a task team at the Ministry of Social Affairs and (ii) the foundation of the National Fund for Poverty Eradication. The latter focused on providing temporary support in terms of monetary transfers, whereas the task team was charged with the development of a long-term strategy for tackling poverty.

The need to focus on the reduction of poverty was restated in the Ninth National Development Plan (Saudi Ministry of Economy and Planning, 2009). The plan included an additional initiative to fight poverty that was called the Supplementary Support Programme. The programme was aimed at filling the gap between household income and the poverty line. Most recently, the goal to reduce poverty was reaffirmed in Vision 2030 (Kingdom of Saudi Arabia, 2016). Crown Prince Mohammed's ambitious reform package is aimed at diversifying the

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[1] The Saudi social contract is an implicit contract between the ruling family and society. It implies that citizens give their loyalty to the ruling family as long as the ruling family provides for them economically (Thompson, 2019).

economy away from oil and creating a vibrant society and ambitious nations. Currently, the original poverty reduction programmes have been replaced by a broader catalogue of social welfare payments, which are described in more detail in Chapter 2.

Despite the fact that poverty appears to be a severe issue in Saudi Arabia, there have been few publications about the problem until recently. Most of them are unpublished Arab-language works that provide descriptive statistics on the demographic backgrounds of poor households. One of the major findings from this literature is that the heads of poor households have limited – or no – education (Al Qahtani, 2004; Al Shubaiki, 2005; Bin Said, 2007; Al Nuaim, 2010; Al Arwan, 2011; Al Damag, 2014; Efad Center, 2014). In addition, unemployment is observed to be high among the poor (Al Shubaiki, 2005; Bin Said, 2007). Major causes of unemployment identified in the literature include competition from low-paid migrant workers, competition from high-skilled migrant workers, lack of relevant skills among Saudis, cultural barriers that prevent women from working in mixed-gender environments, and the view that certain professions are considered degrading or shameful for Saudis (Al Dosary, Rahman & Aina, 2006; Alhamad, 2014; Bosbait & Wilson, 2005). Next to a lack of education and unemployment, the literature records additional potential reasons for poverty. These are old age, sickness, disabilities, female headship, internal migration, large family size, bad spending behaviour, drug abuse and over-indebtedness (Al Qahtani, 2004; Al Shubaiki, 2005; Bin Said, 2007; Al Nuaim, 2010; Fadaak, 2010; Al Arwan, 2011; Al Anzi, 2013; Al Damag, 2014; Efad Center, 2014).

The aim of this research is to investigate these factors in the context of a rigorous scientific analysis and establish empirical evidence of poverty in urban Saudi Arabia. Given the current transformation of the economy through Vision 2030 (Kingdom of Saudi Arabia, 2016), this research seems timely as it can and can generate important lessons for social protection policy in the country, so that social welfare organisations can design more effective and better targeted support programmes.

1.2 Research Objective

The main research objective is to determine the causes of poverty among Saudi nationals. For this purpose, the thesis addresses the following four research questions:

(A) What are the socioeconomic characteristics of households living below the poverty line?

(B) Are female-headed households more likely to be affected by poverty than male-headed households? If yes, what are the main factors that drive poverty of female-headed households when compared to their male-headed counterparts?

(C) How effective is the social welfare system in lifting both Saudi men and women out of poverty?

(D) Is there a correlation between poverty and people's risk and time preferences?

The thesis will answer research question A in the first essay, research question B in the second essay, research question C in both the first and second essays and research question D in the third essay.

1.3 Methodologies

Throughout this thesis, poverty in Saudi Arabia is defined as *relative poverty*, in which the poverty line is based on average living standards in the country (Foster, 1998). For this purpose, the inflation-adjusted national poverty line of 700 SAR (Saudi Riyal) per person per month ($6 per person per day) is used. Consequently, a household is classified as poor if its income falls below 700 SAR per person per month. The study has selected income as the key indicator of household welfare for two reasons. First, income can be split by its sources, allowing a distinction to be made between income generated by the households themselves and income received in the form of social welfare payments. Second, household heads are more aware of their income than, for example, their consumption expenditures. This is the case because most poor households have few sources of income, mostly wages and government payments.

The **first essay** uses the Foster–Greer–Thorbecke (FGT) poverty index (Foster, Greer & Thorbecke, 1984) to analyse the socioeconomic determinants of the prevalence, intensity and severity of poverty. In total, three models are examined. The first model uses a binary logistic regression to analyse the factors that lead to a household living below the poverty line. The second model uses a tobit regression to study the determinants that impact how far below the poverty line a household lives. The third model also uses a tobit regression with the squared

poverty gap as the dependent variable, hereby giving more weight to the poorest households. All three models use explanatory variables related to household demographics, ethnicity, economic factors, social capital, health and personal attitudes.

In the **second essay**, the FGT poverty index is applied to compare the prevalence, intensity and severity of poverty between male- and female-headed households. Two logit models are used to identify the main factors that drive poverty among female-headed households compared to male-headed households. Both models estimate the probability of a household being poor as a function of household-specific characteristics related to household demographics, human capital, employment, health, social capital and personal attitudes. The second model also includes interaction terms that measure whether key characteristics of the household head have different effects on poverty when household heads are women.

In the **third essay**, the correlation between poverty and risk and time preferences is examined. For this purpose, a discounted utility model is defined, based on prospect theory (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992) and quasi-hyperbolic discounting (Laibson, 1997; O'Donoghue & Rabin, 1999). Then, the risk and time preferences are jointly estimated using a maximum likelihood estimation approach, following Nguyen (2011). Afterwards, the correlation between risk and time preferences and socioeconomic characteristics is determined. These socioeconomic characteristics later serve as control variables in the maximum likelihood estimations to analyse the relationship between risk and time preferences and poverty indicators.

1.4 Data Collection

This thesis is based on a socioeconomic household survey and a lab-in-the-field experiment conducted across the city of Dammam in 2019. The following section elaborates in detail on the data collection process.

1.4.1 Study Area

The first step in the data collection process was to identify a suitable study area. It was learned from the literature that the majority of the poor households in Saudi Arabia live in large metropolitan cities, namely Riyadh, Jeddah, Makah, Medina and Dammam (Al Damag, 2014). Based on this observation, the researchers decided to narrow the scope of the study to urban poverty. Among the large cities, Dammam was selected as an example of a typical metropolitan city, when considering feasibility and access to the study area. In general, in Saudi Arabia,

permission from a local university or government institution is required to do field research. Thanks to an existing collaboration with a local university in the wider Dammam area, the researchers were able to obtain the necessary permissions to conduct field work in Dammam. Another advantage was that the local university provided access to bilingual data collectors through its students.

1.4.2 Poverty Map

The next step in the data collection process was to select a suitable sampling technique. Many household surveys that study poverty are based on a stratified multistage cluster design that often includes probability proportional to population size selection (e.g. Shisana et al., 2010; Mitiku, 2014; Gloede, Menkhoff & Waibel, 2015). However, this method was not feasible in the Saudi context as there was no disaggregated data available about the population size inside the city. Moreover, most secondary demographic and economic data was aggregated by province. Hence, it was unknown where low-income households live in Dammam – for instance, whether they live in particular neighbourhoods or are spread throughout the entire city. To overcome this constraint, a poverty map for Dammam was established. To do so, the city was split into neighbourhoods based on data provided by Google Maps. The neighbourhood names and boundaries on Google Maps were taken from the new digital addressing system (Saudi National Address, 2013); however, most of these neighbourhood names have been in unofficial use for much longer. Among the local community, the poor neighbourhoods were well-known and referred to as the 'old neighbourhoods' located in central Dammam. To scholarly capture that knowledge, the study relied on insider knowledge from local charity organisations. Managers at three charity organisations in Dammam were asked to list the neighbourhoods in which many poor Saudis live. In total, there were 78 neighbourhoods in Dammam, out of which nine were classified as poor neighbourhoods.

1.4.3 Sampling Technique

With the help of the poverty map presented in Figure 1.1, it became possible to design a probability sampling procedure. In the first stage of the sampling procedure, all nine poor neighbourhoods were selected for the survey. The aim was then to pick a random sample of households within each neighbourhood. However, this posed a challenge, in that there is no traditional addressing system within the country, which means that most houses and many small streets are unnamed. Although Saudi Arabia did launch a digital addressing system

(Saudi National Address, 2013), in which addresses are identified via GPS coordinates, these are not visible from the street; moreover, researchers have no access to this system. Therefore, the research first manually identified all the dwellings in the neighbourhoods with the help of satellite images (see Figure 1.2). This approach has been used in other studies, such as Lowther et al. (2009), Wagenaar et al. (2018) and Hagen-Zanker and Hennessey (2020).

Having identified the number of dwellings in each neighbourhood, the study used a systematic sampling technique to draw a random sample. In systematic sampling, one picks a random starting point and then moves in one direction, selecting every *xth* dwelling. This can be done, either until a fixed number of dwellings is reached or until the entire neighbourhood is covered. Considering that the population size per neighbourhood and the proportion of foreigners within each neighbourhood was unknown, the household survey did not select a fixed number of dwellings per neighbourhood. Instead, every tenth dwelling was marked to be interviewed until the entire neighbourhood was covered. This was done to avoid over-representing Saudis living in small neighbourhoods and Saudis living in neighbourhoods with a high percentage of foreigners. Moreover, it ensured that households were chosen across all parts of the neighbourhood. When the data collectors came across a dwelling occupied only by non-Saudis, they skipped that dwelling and moved on to the next marked dwelling.

FIGURE 1.1 EXAMPLE OF SATELLITE IMAGES

Source: Google Maps 2018

The household surveys were conducted from January to April in 2019. 496 households were interviewed; each interview lasted on average 40 minutes. The estimated baseline population for the nine neighbourhoods was 20,000 Saudi households. For a distribution of the number of interviews by neighbourhood, see Table 1.1. In addition, every third household interviewed

was marked to take part in a lab-in-the-field experiment after the interview to measure households' risk and time preferences. Both parts were programmed in Survey Solutions, a software developed by the World Bank for computer-assisted interviews (https://mysurvey.solutions).

TABLE 1.1 NUMBER OF INTERVIEWS BY NEIGHBOURHOOD

Neighbourhood	Number of Interviews
Al Badiyah	129
Al Qadisiyah	82
Al Khalij	69
An Nakhil	62
Al Adamah	42
Al Jalawiyah	40
Al Dawasir	32
Al Qazaz	27
Al Amamrah	13

Source: Own survey

1.4.4 Questionnaire Design

The design of the household survey was based on a detailed questionnaire developed by the *Thailand Vietnam Socioeconomic Panel* (www.tvsep.de). Nevertheless, it was crucial to tailor the questionnaire to the Saudi context. To do so, a mixed-method pre-study was conducted in 2018. This was done in line with the works of Davis (2006) and Hulme and Shepherd (2003), who stressed the need for both quantitative and qualitative methods when identifying the causes of poverty, especially in situations where there is not much prior knowledge available about the research population. The pre-study consisted of a quantitative survey with charity organisations and qualitative interviews with poor households. During the first part, managers of charity organisations were surveyed as experts in the field. Charity organisations have unique insight into poverty in Saudi Arabia, as they come in contact with a considerable number of poor households. At the time of the research, there were 801 charities registered with the Ministry of Labour and Social Development. Of these, 583 provided support for the poor. It was tried to contact all 583 charity organisations; however, some organisations did not have an email address or a contact form. In total, 72 charity managers across all provinces in Saudi Arabia completed the survey about the demographic, economic and social background of the poor.

In addition, the researcher conducted 36 qualitative interviews with poor households in the Eastern Province of Saudi Arabia, so as to gain in-depth insight into the current and historical circumstances of households living in poverty. The findings from the interviews were designed

to help interpret the results from the charity survey. Household heads were selected based on both maximum variation sampling and opportunistic sampling. The aim was to have as diverse a group of households as possible in order to understand the different challenges and circumstances of these households. For example, the researcher interviewed male- and female-headed households; employed, self-employed and unemployed household heads; farmers; disabled and sick household heads; divorced and abandoned families; and widows. The aim of these interviews was to catalogue the types of situations that exist in order to understand their complexity and ramifications.

The results from the pre-study helped in tailoring the questionnaire to the Saudi context. For instance, in many Saudi families, the names of female relatives are seen as private and should not be revealed to outsiders. This was a challenge since individual household members had to be referred back to during the interview. To overcome this challenge, instead of asking for names, the researchers identified household members by their age, gender and relationship to the household head. This gave full anonymity to female household members. Another point was that poor households should not be referred to as *faqir* (the Arabic word for poor), as this can be seen as offensive. Moreover, some local phrases were incorporated to avoid confusion. For example, in Saudi society, private (often anonymous) people who donate money are referred to as the 'good people', and *Jamaia* is the word in Arabic for a group-saving scheme.

1.4.5 Data Collectors

Ten female and eight male were recruited from a local university to serve as data collectors. All of them were Saudi nationals who were fluent in both Arabic and English. This allowed for clear communication between the interviewers and the non-Arabic speaking researcher. Before the start of the survey, all interviewers received extensive training on how to conduct the interviews and were made familiar with the questionnaire through formal channels and role-playing activities. Moreover, some safety standards were employed for female interviewers. It was presumed that it was safe for men to walk through poor neighbourhoods on their own, even at night; however, women walking on their own could face harassment. To avoid this issue, female interviewers travelled in pairs during daylight hours, and at night they were accompanied by a male.

1.4.6 Interview Setup

Prior to starting the survey, several colleagues and friends communicated their concerns about impromptu knocking on Saudi doors due to the conservative nature of the Kingdom. Therefore, several steps were taken to facilitate household collaboration. First, participants were given 50 SAR (around $13) for taking part in the household survey. In addition, children were given an large pack of snacks (including juice, candy and crisps), usually before the household head agreed to take part in the survey. Many parents responded positively to this gesture and subsequently agreed to be interviewed.

Second, Saudi culture was considered with regard to timing. Outside fieldwork should not be conducted during the hot summer season when temperatures get up to 50 degrees Celsius. In addition, most nationals are fasting during Ramadan, which is another reason this is not a good period for research. Hence, the time period from January to April was chosen. Regarding the time of day, there was actually no ideal time for interviewing households. Some households preferred to be interviewed during daylight. Others worked or slept during the day and started their social life at night. Different households had different availability. To overcome this issue and increase their chance of accessing the household head, interviewers came back at different times of the day and on different days of the week.

Third, special attention was given to gender issues. In the Islamic Kingdom of Saudi Arabia, there is strict gender separation in almost all aspects of life, including schools, restaurants and government facilities. Hence, one might have argued that female enumerators should have interviewed only females and male enumerators should have interviewed only males. However, the research experience showed that cross-gender interviewing was possible and beneficial at times. Cross-gender interviewing occurred under the following circumstances: one gender interviewed the other outside the house in public; men interviewed women inside their houses in the presence of additional family members; women interviewed men in the presence of their wives; or men interviewed women through a closed house door. Despite traditional norms, many men preferred to be interviewed by a woman due to the novelty of talking to the other gender. Moreover, many poor Saudi women did not mind talking to men as they were used to dealing with men in official settings – for example, when applying for social welfare or support from charity organisations.

Despite those initial concerns, the household survey was relatively successful overall with a cooperation rate of around 70%. Most households showed a high level of friendliness and hospitality, allowing interviewers to enter their house and serving them drinks and snacks; some even insisted on interviewers coming again for another visit. The high degree of hospitality may be linked to Arabs' Bedouin roots, as nomads had to rely on the hospitality of hosts for survival in the harsh desert climate (Shryock, 2004). The concept of hospitality can, moreover, be found in Islamic teachings (Al Munajid, 2008).

1.4.7 Field Experiment (Risk and Time Preferences)

In addition to the household survey, one third of the households took part in a lab-in-the-field experiment to measure the household's risk and time preferences. The design of the experiment was based on Tanaka, Camerer and Nguyen (2010). In the risk experiment, participants had to make 35 choices between a risky lottery and a less risky lottery. In the time experiment, participants had to make 75 choices between receiving a smaller amount of money today or a larger amount in the future. After the experiment, one of the 110 (35 + 75) choices was randomly selected for the reward. On average, respondents received 110 SAR ($29) for participation in the experiment. For a more detailed description of the experiments, see Chapter 4.

1.4.8 Data Cleaning

Although the questionnaire went through various checks prior to the interviews, conditions and limits were programmed in the tablet software to minimise data errors, some incorrect data and missing values were found to be unavoidable due to the challenging nature of conducting fieldwork in general. Noisy family members, pets, harsh weather conditions (e.g. sandstorms, heat and rain) and impatient/difficult household members all contributed to the challenge. Therefore, there was a need for data cleaning, with the aim of identifying and modifying implausible and missing values from the dataset to improve the quality of the data (Rahm & Do, 2000). Whenever there was doubt, the data was left untouched and outliers were not removed unless the values were obviously incorrect.

The data cleaning procedure can be summarised as a three-step process. In the first step, all data in Arabic was translated to English. In the second step, every variable was investigated in order to identify problems, such as potential implausible values and missing cases. In the third step, data points flagged as implausible or missing were transformed with the help of various

estimation techniques to create a cleaned dataset. In many cases, regression models were designed to estimate values. For instance, missing or implausible salary values were based on the person's age, gender, years of education and sector of employment. Likewise, missing or implausible utility bills were estimated based on the number of rooms, number of household members and monthly household income. Moreover, the data cleaning process relied on official rates for estimation. For example, missing or implausible social welfare payments were transformed with the help of the official rates from the Ministry of Labour and Social Development.

1.5 Results

1.5.1 Research Question A

Research question A – *What are the socioeconomic characteristics of households living below the poverty line? –* is addressed in the **first essay**. It was found that a low level of human capital and unemployment are major determinants of poverty. Regarding human capital, not only do the heads of poor households have limited education, but members of poor households also have on average lower levels of education compared to members of non-poor households. Concerning unemployment, the household head being unemployed greatly increases the likelihood of the household being poor. However, the lack of employment among household members also constitutes an issue. Many adult household members are unable to find employment, and many women do not seek employment for cultural reasons. Further identified factors include large family size, female-headship, being of African descent and lack of social capital.

1.5.2 Research Question B

Research question B – *Are female-headed households more likely to be affected by poverty than male-headed households? If yes, what are the main factors that drive poverty of female-headed households when compared to their male-headed counterparts? –* is answered in the **second essay**. It was discovered that female-headed households are affected by poverty more often and more severely than male-headed households. Two main reasons for the gender gap in poverty outcomes were identified in this study. First, female household heads often do not seek employment due to traditional and cultural barriers. Second, female household heads have fewer years of education than male household heads, which negatively impacts their

employment chances. However, the results showed that females with the same educational level as their male counterparts have the same employment chances.

1.5.3 Research Question C

Research question C – *How effective is the social welfare system in lifting both Saudi men and women out of poverty?* – is examined in both the **first and the second essay.** The social welfare system was found to lift one third of poor households out of poverty. However, around 15% of the poor do not get any welfare payments. In particular, households without a national identification card do not get any payments. Moreover, around half of the poor do not receive enough support to escape poverty. However, for those households, the social welfare payments do reduce the severity of poverty. In addition, it was observed that female-headed households obtain higher payments than male-headed households. Nevertheless, female-headed households remain affected by poverty more often and more severely than their male counterparts.

1.5.4 Research Question D

Research question D – *Is there a correlation between poverty and people's risk and time preferences?* – is studied in the **third essay**. It was found that Saudi households in the poor neighbourhoods of Dammam are comparably risk-averse and loss-averse and are relatively patient. Moreover, the household's risk and time preferences are related to socioeconomic factors. Having stronger religious beliefs is associated with higher willingness to take risks and being more impatient. Similarly, a lack of education and being of Bedouin origin are related to impatience. In addition, poverty is positively correlated with risk aversion and impatience. More specifically, it was observed that households who live in asset poverty are more risk-averse and impatient. Furthermore, households with a higher per capita income take more risks; however, per capita income has no influence on the household's time preferences. A further differentiation of poor households with respect to their social safety nets shows that respondents without access to safety nets take greater risks.

1.6 Conclusion and Policy Implications

This thesis has studied the determinants of poverty in Saudi Arabia. The results show that unemployment, limited education, large family size, insufficient social capital and being of African descent are major causes of why a household is not generating an income above the poverty line. In addition, female-headed households are affected by poverty more often and more severely. This is partly due to cultural barriers that prevent women from joining the labour force, but also due to a lack of education among female household heads. Furthermore, the study found positive correlations between poverty and risk aversion and impatience. The social welfare system is able to offset some of the disadvantages of poor households, but not all of them. Around two-thirds of the households that would be poor without social welfare payments are still poor despite of receiving welfare payments.

Based on the findings from this study, a few policy recommendations can be made. First, more attention should be given to education in poor households. For instance, the authorities could provide training programmes to household heads who have limited education. In addition, authorities should focus on supporting school and university students from disadvantaged families to help them obtain more education. Second, the number of low-skilled jobs available to Saudi citizens should be increased. Currently, many low-skilled jobs are held by foreigners from low-income Asian countries. Therefore, identifying additional sectors for increased "Saudisation"[2] would help the poor to find employment. Third, more women should be encouraged to join the labour force. This could be done, for example, through awareness campaigns to increase the acceptance of females working in mixed-gender environments. Fourth, educational campaigns could help to lessen the number of unplanned pregnancies, which might reduce the number of household members. A final recommendation is to reduce the exclusion error of the social welfare system to make it more effective for poverty elimination.

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[2] The current "Saudisation programme" sets quotas for the percentage of Saudi nationals who have to be employed by each sector.

1.7 Thesis Outline

The three essays on poverty in Saudi Arabia, as outlined in Table 1.2, are organised as follows. Chapter 2 contains the **first essay**, 'The Socioeconomic Determinants of Urban Poverty in Saudi Arabia'. This essay was published as a Hannover Economic Paper (HEP) in 2021. Earlier versions of the paper were presented at the International Conference on Poverty (ICP) in 2020 and at Tropentag in 2021. The **second essay**, entitled 'Poverty and Gender in Saudi Arabia', is presented in Chapter 3. The **third essay**, 'Risk and Time Preferences Among the Urban Poor in Saudi Arabia', is presented in Chapter 4. This essay was submitted to the *American Economic Journal: Applied Economics* in 2022. A former draft of the essay was presented at the International Conference of Agricultural Economists (ICAE) in 2021.

For all three essays, Miriam Al Lily collected the data, estimated the models and wrote the manuscripts. Prof. Dr Hermann Waibel performed the supervisory role for the three essays and provided suggestions on different aspects of the manuscripts. Dr Sabine Liebenehm advised on the third essay. She performed the second supervisory role, advised on the setup of the experiment and provided comments on the content of the manuscript.

TABLE 1.2 OVERVIEW OF ESSAYS

Chapter 2	Title	**The Socioeconomic Determinants of Urban Poverty in Saudi Arabia**
	Authors	*Miriam Al Lily and Hermann Waibel*
	Comments	Published as a working paper in: Hannover Economic Paper, 2021. No. 691, Leibniz Universität Hannover
		Earlier version presented at: ICP 2020: 14. International Conference on Poverty, 17-18 December, Barcelona, Spain (Online)
		and Tropentag 2021, 15-17 September, Stuttgart (Online)
Chapter 3	Title	**Poverty and Gender in Saudi Arabia**
	Authors	*Miriam Al Lily and Hermann Waibel*
	Comments	To be submitted to: *Feminist Economics*
Chapter 4	Title	**Risk and Time Preferences Among the Urban Poor in Saudi Arabia**
	Authors	*Miriam Al Lily, Sabine Liebenehm and Hermann Waibel*
	Comments	Submitted to: *American Economic Journal: Applied Economics*
		Earlier version presented at: ICAE 2021: International Conference of Agricultural Economist, 17-31 August, New Delhi,
		India (Online)

Source: Own elaborations

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CHAPTER 2 THE SOCIOECONOMIC DETERMINANTS OF URBAN POVERTY IN SAUDI ARABIA

Abstract

This chapter presents results from one of the first independent socioeconomic household surveys to study urban poverty among Saudi nationals. This survey was administered to 496 Saudi households in Dammam in 2019. Poverty is conceptualised as relative poverty, which is based on the country's inflation adjusted national poverty line of $6 per person per day. The methodology is based on the Foster-Greer-Thorbecke (FGT) poverty index, which is used to analyse the socioeconomic determinants of the prevalence, intensity, and severity of poverty. The results indicate that education and unemployment are crucial determinants of poverty outcomes. In addition, large family sizes combined with the tradition of having a single breadwinner also pushes households into poverty. Female-headed households are particularly vulnerable. Furthermore, social capital positively impacts the welfare of households, whereas being of African descent has a negative influence. However, health, personal attitudes, and being of Bedouin origin are not significant variables in the model. The social welfare system is able to mitigate some of the disadvantages, but not all. Overall, approximately one third of poor households are being lifted out of poverty by social welfare payments.

Keywords: Arab World, Social Exclusion, Urban Poverty, Poverty Determinants, Poverty Gap

2.1 Introduction

The discovery of oil in the 1930s transformed Saudi Arabia from one of the poorest countries in the world into one of the richest. Since then, the authorities have been generous in their distribution of oil wealth. Two-thirds of the population are employed in public sector jobs, and both health care and education are provided to citizens at no cost (Hertog, 2016). However, economic prosperity has not improved the lives of all nationals equally. This is not surprising, as many studies have emphasised that economic growth alone is not sufficient to eliminate or reduce poverty (e.g. Gupta, Pouw, & Ros-Tonen, 2015; Stiglitz, 2016). However, poverty in Saudi Arabia has received little attention. If at all, poverty in Saudi Arabia has been primarily associated with expatriate workers from low-income countries (Sherry, 2004; Al Ghamdi, 2014). Quantifying the scale of poverty in the country is a challenging task, as regular official statistics on poverty have not been published. The latest official statistics state that 19% of Saudi nationals lived in poverty in 2005 (Bin Saeed, 2008). This was based on the official poverty line at that time, which was 500 Saudi riyals (SAR) per person per month ($4.4[3] per person per day). More recent independent sources have estimated that around 20% of Saudi nationals are living in poverty (Sullivan, 2013; Koontz, 2015).

Given the magnitude of poverty in Saudi Arabia, in 2002 the government implemented a coherent strategy to reduce levels of poverty. This included the establishment of the National Fund for Poverty Eradication which provided financial and non-financial support to poor households (Al Rushaid, 2010). The fund no longer exists in its original form and no other government programme is labelled as poverty reduction. Instead, the fund was replaced with a broader catalogue of social welfare measures consisting of financial support from both the government and charitable organisations. In the Saudi fiscal year 2018/2019, the Ministry of Labor and Social Development granted social welfare payments to 1.3 million citizens, spending a total of 36 billion SAR ($9.6 billion) (Saudi Ministry of Labor and Social Development, 2019). The social welfare catalogue includes programmes for which any citizen below a certain income level is eligible, as well as programmes that target specific groups such as female-headed households, disabled people, and the elderly. In addition, public charities are estimated to make payments to half a million citizens each year, with an estimated annual

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[2] All currency transformations in this chapter are based on the country's fixed market exchange rate of 3.75 SAR per US dollar. This is based on the notion that the official purchasing power parity exchange rate does not accurately reflect purchasing power.

spending of around 2 billion SAR ($0.53 billion), (Saudi Ministry of Labor and Social Development, 2017).

The government's commitment to fighting poverty was reaffirmed in 'Vision 2030' (Kingdom of Saudi Arabia, 2016). This is an ambitious reform package aimed at diversifying the economy away from oil and creating a modern society. It includes the goal of providing the most marginalised citizens with the necessary support. Given the emerging changes in the economic and socio-political system in Saudi Arabia, poverty should be viewed as a fundamental matter that merits further academic attention.

To date, only a small number of relevant publications have focused on poverty in Saudi Arabia. Most are unpublished Arab-language works that provide descriptive statistics on the demographic backgrounds of poor households. These studies have found that the heads of poor households have limited or no education, with reported illiteracy rates among low-income Saudi households ranging from 8% to 56% (Al Qahtani, 2004; Al Shubaiki, 2005; Bin Said, 2007; Al Nuaim, 2010; Al Arwan, 2011; Al Damag, 2014; Efad Center, 2014). In addition, the literature has reported high unemployment rates, large family sizes, and high percentages of internal migrants among those living in poverty in Saudi Arabia (Al Qahtani, 2004; Al Shubaiki, 2005; Bin Said, 2007; Al Nuaim, 2010; Al Arwan, 2011; Al Damag, 2014). There are also indications that female-headed households are more vulnerable to poverty due to the traditional role of women in Saudi society (Fadaak, 2010; Al Anzi, 2013; Efad Center, 2014). Interviews with poor people in Riyadh by Al Qahtani (2004), Al Shubaiki (2005). and Al Nuaim (2010) identified further potential reasons for poverty, namely old age, sickness, disability, the traditional single breadwinner family, drug abuse, and over-indebtedness.

However, a limitation of the above findings is that the studies mainly provided descriptive statistics of poor households without making any comparison with non-poor households. Therefore, the present research sought to address this limitation by developing a logistic regression model that compares the characteristics of poor and non-poor households. The objective was to determine the causes of poverty among Saudi nationals. To achieve this goal, two research questions are addressed: first, why are households not generating enough income by themselves and, second, how effective is the social welfare system in lifting Saudi nationals out of poverty? The remainder of the chapter is structured as follows. Section 2.2 presents the conceptual framework for poverty in Saudi Arabia, while section 2.3 describes the methodology employed. Section 2.4 introduces the sample and the data, with the research

findings presented and discussed in section 2.5. Finally, section 2.6 draws a conclusion and discusses policy implications.

2.2 Conceptualising Poverty in Saudi Arabia

One of the most common employed definitions of poverty in development economics is the poverty headcount ratio, in which a household is classified as poor when its income falls below a defined poverty line (Sen, 2006). If the poverty line is set at the level where households are only able to maintain basic living standards (such as food, shelter and clothing) then the household is said to live in absolute poverty (Ravallion, 2013). The World Bank currently puts the international line of extreme poverty at $1.9 per day per person. According to this standard, no one in Saudi Arabia is 'poor'. The annual reports on the Millennium Development Goals (Saudi Ministry of Economy and Planning, 2014) states that absolute poverty has been non-existent in Saudi Arabia since 2011.

An alternative concept to absolute poverty is relative poverty, where the poverty line is based on the average living standards in a country and, therefore, varies by nation (Foster, 1998). Selecting an appropriate relative poverty line for Saudi Arabia is challenging as no recent official poverty statistics exist. Nevertheless, a national poverty line has been defined in the past, although it has not been officially adjusted since 2005. According to Bin Saeed (2008), the Ministry of Labour and Social Development was working on the basis of a poverty line of 500 SAR per person per month ($4.4 per person per day) in 2005. However, that poverty line may no longer be reasonable, as it has not been adjusted for inflation. Between 2005 and 2019, the Consumer Price Index increased by 36% (General Authority for Statistics [GASTAT], 2019a). Adjusting for inflation results in a poverty line of 700 SAR per person per month for 2019, which is equivalent to $6.2 per person a day.

In addition to the national poverty line, independent studies have sought to identify an appropriate poverty line based on household minimum living standards inside Saudi Arabia. Al Shubaiki (2005) proposed a poverty line of 769 SAR per person per month for 2005, which would translate into an inflation-adjusted rate of 1,046 SAR per person per month for 2019 ($9.8 per day per person). Al Damag (2014), however, suggested that the poverty line should be set as high as 919 SAR per person per day.

A common international definition of relative poverty is an income 50-60% below the country's median/average income. Based on the average and median income of Saudi nationals (GASTAT, 2018), the poverty line would therefore range between 860 SAR and 1370 SAR.

In the following analysis, the national inflation-adjusted poverty line of 700 SAR is used as this is thought to be closest to how Saudi authorities interpreted poverty. However, Table 2.B.2 in the appendix presents robustness tests of variations in the poverty line.

A shortcoming of the above-described poverty headcount measures is that they do not consider how far a household's income is below the poverty line. Therefore, in this study, we also present results for the poverty gap (Foster, Greer & Thorbecke, 1984), which gives higher weight to poorer households.

2.3 Methodology

2.3.1 Methods

The causes of poverty are studied by examining household welfare as a function of household characteristics. In this chapter, income is selected as the key indicator for household welfare. There are two reasons for this. The first is that income can be split by its sources, allowing a distinction to be made between welfare generated by the households themselves and welfare received in the form of social welfare payments. The second reason is that most poor households in our sample had relatively few sources of income, as the majority of income was received in the form of monthly wages or government payments (see Table 2.2). Therefore, due to a lack of records, household heads were more aware of their income than, for example, their consumption expenditure. Thus, we use income as the welfare indicator.

To measure poverty, we apply the Foster-Greer-Thorbecke poverty index FGT (Foster, Greer and Thorbecke, 1984). The index can be mathematically expressed as follows:

(2.1) $FGT_\alpha = \frac{1}{N} \sum_{i=1}^{q} \left(\frac{z - y^*_i}{z} \right)^\alpha$

where N is the population size, q is the number of households below the poverty line, z is the poverty line, y^*_i is the income of households below the poverty line, and α is a 'poverty aversion' parameter. If α = 0, the FGT index measures the poverty head count ratio; if α =1, the FGT index assesses the depth of poverty; and if α = 2, the severity of poverty is calculated.

To identify the reasons why households are not able to generate a sufficient income themselves, all three models are being studied (α = 0, 1 and 2). The first model is a binary logistic regression model in which the sample is separated into poor and non-poor households, based on the gross per-capita income per household without social welfare payments. The binary variable Y is equal to 1 if a household's per-capita income is below the poverty line of 700 SAR per-capita

per month, otherwise it is 0. The resulting binary logistic regression model can be formulated as follows:

(2.2) $P(Y_i = 1) = \alpha + \beta_1 demoghraphics + \beta_2 human\ capital + \beta_3 ethnicty + \beta_4\ economics + \beta_5 health + \beta_6 social\ capital + \beta_7 personal\ attitudes + \varepsilon_i$

The second model is a Tobit model used to analyse the FGT poverty gap, as employed in Akerele et al. (2012), Asogwa, Okwoche and Umeh (2012), Duniya and Rekwot (2015) and Woldie, Haji and Mehare (2020). The dependent variable, 'poverty gap', is equal to 0 if the household's gross per-capita income excluding social welfare is above the poverty line (Z) of 700 SAR, otherwise it is $PG = (Z - Y)/Z$. The Tobit regression model can be expressed as follows:

(2.3) $PG_i = \alpha + \beta_1 demographics + \beta_2 human\ capital + \beta_3 ethnicity + \beta_4\ economics + \beta_5 health + \beta_6 social\ capital + \beta_7 personal\ attitudes + \varepsilon_i$

The final model uses the squared poverty gap as the dependent variable. Because the index gives more weight to the poorest households, it can provide information on what would have to be done to help the poor out of the most severe level of poverty.

(2.4) $PG_i^2 = \alpha + \beta_1 demographics + \beta_2 human\ capital + \beta_3 ethnicity + \beta_4\ economics + \beta_5 health + \beta_6 social\ capital + \beta_7 personal\ attitudes + \varepsilon_i$

2.3.2 Model Specification

Household Demographics

This section describes the independent variables used in the regression models. The first set of variables are related to the demographics of the household, as differences in these have been widely found to cause variations in income (Pestieau, 1989; Lam, 1997). Most models explaining differences in social welfare at the household level include variables related to age, household composition, and education (e.g. Coulombe & McKay, 1996; Mukherjee & Benson, 2003; Amuedo-Dorantes, 2004; Mok, Gan & Sanyal, 2007; Rupasingha & Goetz, 2007; Achia, Wangombe & Khadioli, 2010; Sekhampu, 2013; Tran, Tran, & Nguyen, 2020). In addition, some models also consider the gender and marital status of household heads and a variable related to race or ethnicity (see, for example, Achia, Wangombe & Khadioli, 2010; Sekhampu, 2013; Tran, Tran, & Nguyen, 2020).

The model used to study poverty in Saudi Arabia therefore includes the age, gender, and years of education of the household head, the average years of education of the adult household members, and several variables related to household composition and ethnicity. Specifically, six variables describe the household composition, of which the first four are related to household size. Following Mukherjee and Benson (2003) and Mok, Gan and Sanyal (2007), the variable household size is split by age group and gender. The first variable measured the number of children in the household. For this purpose, all members below the age of 19 are classified as children, as household members rarely start to generate an income before that age.[4] The next two variables describe the number of male and female adult household members (ages 19-60). The reason for splitting the variable by gender is because in the traditional Saudi context, male and female household members have very different roles in the household. The final variable related to household size is the number of elderly household members. Elderly people are defined as household members above 60 years of age, as 60 is the official retirement age in Saudi Arabia. A further variable used to describe household composition is the number of additional dependants outside the current household. Additional dependants commonly include parents, siblings, children, or additional wives. Moreover, the model incorporates a dummy variable measuring whether the household head has multiple wives. Given that there is just one household in the sample with more than two wives, this variable is not categorical.

Ethnicity

The model captures differences in ethnicity through two variables. The first is a dummy variable indicating whether a household is of Bedouin origin. The Bedouins (nomads) traditionally moved through the desert with their sheep, camel, and/or goat herds, and are known for their strong tribal ties. Over the last 100 years, most Bedouins have settled down (Uthaymin, 1986); however, being of Bedouin origin has become a form of ethnic identity within Saudi society.

The second ethnic variable is being of African descent. Several waves of migration have taken place that involved Africans arriving in the Gulf. First, Africans arrived as Muslim pilgrims in medieval times (Lewis, 1992). Following this, in the 18th century the Ottoman Empire started bringing African slaves to Saudi Arabia (Lewis, 1992). This continued until slavery was abolished in 1962. Moroever, large waves of migrant workers have been arriving in the Gulf since 1980s (Fernandez, 2011; Flahaux & De Haas, 2016). The dummy variable African

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[4] In the research sample, only 0.1% of the household members below the age of 19 earned an income.

descendant is based on the skin colour of the household head. Culturally speaking, being of African descent is a sensitive topic in Saudi Arabia, and one which people do not discuss as some of the African-Arabs are former slaves and descending from a slave can be viewed as shameful in society.

Economic Factors, Social Capital, and Health

In addition to demographic factors, a growing body of literature stresses the importance of economic and social factors as well as health in explaining income inequality (Wagstaff, 2002; Rupasingha & Goetz, 2007; Weaver & Habibov, 2012). Hence, the regression model for poverty in Saudi Arabia includes the employment status and health of the household head and household members. Social capital, as described by Collier (2002), refers to externalities that arise from human interactions. In Saudi Arabia, most social capital is provided by the immediate and extended family, with strong family connections forming an integral part of Arab society. The tribal system in Arab regions has existed for several thousand years and remains a firmly anchored component of modern society in these areas. Alongside specific behaviour patterns, the tribal system is also associated with a strong sense of collective support (Cooke, 2014; Tannous, 1947). Therefore, the model includes a variable describing the family connections of the household head. In this research household heads were asked to rank their family connections on a five point Likert scale ranging from 'we are very close' to 'we are not in touch at all'. The assumption is that strong family connections should provide a safety net in case of hardship.

Personal Attitudes

Finally, the model includes two variables relating to the risk and time preferences of households. More recent literature has indicated that living in poverty causes stress and anxiety, which in turn makes individuals more risk averse and impatient (Haushofer & Fehr, 2014). However, this can foster economic decision making that hinders households' prospects of escaping poverty (Tanaka, Camerer, & Nguyen 2010). For instance, risk averse and impatient people might invest less in human capital and health, save less, and be less likely to become an entrepreneur. Risk and time preferences were measured through two survey questions asking household heads to provide a global assessment of their willingness to take risks and give up something now in order to gain more in the future. This method has proven to be an effective measure of risk and time preferences and has been applied in many studies (e.g. Dohmen et al., 2011; Gloede, Menkhoff, & Waibel, 2015). Having laid out the parameters of the regression

model used for poverty in Saudi Arabia, the next section will provide more detailed information on the variables included in the model.

2.4 Data and Descriptive Statistics

2.4.1 Data Collection

The data used in this chapter originates from a socio-economic household survey[5] conducted in Dammam, the largest city in the Eastern province of Saudi Arabia. The city has low-income neighbourhoods which are typical of urban poverty in Saudi. The majority of poor households are based in the large metropolitan cities, namely Riyadh, Jeddah, Makah, Medina and Dammam (Al Damag, 2014). Dammam was chosen due to the legal, cultural, and logistic feasibility of accessing the study population.

To select an appropriate sampling strategy for the main household survey, we first had to identify the distribution of poverty across Dammam. We therefore split the city into neighbourhoods based on data obtained from Google Maps. Through informal interviews with local community members, it became apparent that the poor neighbourhoods were well known among the local community. They were referred to as the 'old neighbourhoods' and are located in central Dammam. However, it was difficult to scientifically exact the location of the poor neighbourhoods. Therefore, to create a detailed poverty map, we relied on insider knowledge from local charity managers. We found that there were 78 neighbourhoods in Dammam, of which nine were identified as neighbourhoods where many poor Saudi households live. The results are summarised in Figure 2.1.

Because the emphasis of the research was on poor urban Saudi households, we selected all nine neighbourhoods characterised as poor for the survey. Within each neighbourhood, we identified the dwellings through satellite images. We then randomly selected Saudi households via systematic sampling, whereby every tenth dwelling was marked to be interviewed. As the target population of this research was Saudi nationals, dwellings occupied by foreigners were excluded. Therefore, if an enumerator came across a household occupied by foreigners, they moved on to the next marked dwelling without conducting the interview. In total, 496 households were interviewed. The advantage of this sampling technique was that the resulting data provided a representative sample of poor Saudi households in these neighbourhoods, with

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[5] In fact, this may be one of the first research-based household surveys in Saudi Arabia.

more households selected in larger neighbourhoods and more households interviewed in neighbourhoods with a larger Saudi population. However, it should be noted that the oversampling of poor Saudi households and the exclusion of foreigners means the selected sample is not a representative sample of the entire population.

FIGURE 2.1 NEIGHBOURHOODS IN DAMMAM
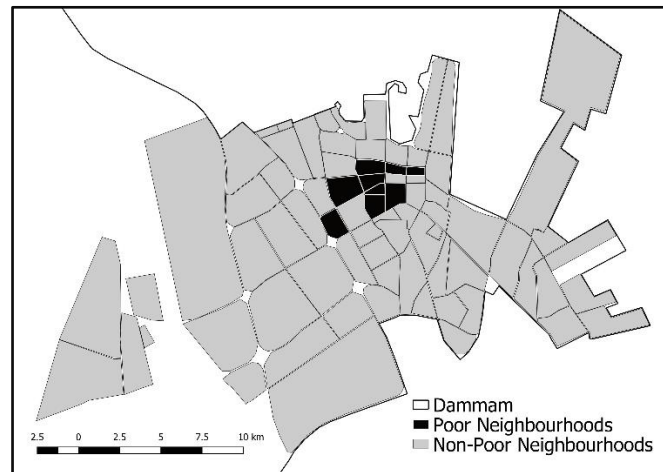
Source: Own data

The household survey itself was administered on tablets using an app called Survey Solutions, which was designed by the World Bank. The design of the questionnaire was based on the detailed 2017 questionnaire developed by the *Thailand–Vietnam Socioeconomic Panel* (www.tvsep.de). However, it was crucial to tailor the questionnaire to the Saudi context. To achieve this, a mixed-method pre-study was conducted in 2018. This comprised two parts. In the first part, a quantitative survey was conducted with managers of charity organisations who were deemed experts in the field. In the second part, 36 qualitative interviews with poor households were conducted to gain in-depth insight into the current and historical circumstances of households living in relative poverty. The results from the pre-study helped tailor the questionnaire to the Saudi context.

2.4.2 Descriptive Statistics

Household Demographics and Ethnicity

This section provides an overview of the descriptive statistics of the research sample (see Table 2.1). Starting with demographics, households in the sample had, on average, 6.5 household members compared to the national average of 5.8 members (GASTAT, 2017). A more detailed breakdown of the population pyramid can be found in Figure 2.A.1 in the appendix. Moreover, 14% of the households were female-headed. Of these, 41% of female heads were widowed,

26% divorced, 13% abandoned (separated without legal divorce), and in 11% of cases the husband was in prison.

Despite popular perceptions, it was rare for men to have more than one wife, with only 3.3% of the married men having a second wife (2% of households) and only 0.3% having a third wife. No household had the maximum permitted number of four wives. In terms of ethnicity, 43% of the household heads classified themselves as Bedouin and 18% were of African descent. It is important to note that the two ethnic groups are not exclusive. An individual can be of both African descent and Bedouin.

Human Capital

Regarding human capital, the average household head went to school for seven years. Household members[6] had, on average, eight years of schooling. Among the household heads, 24% had no formal education, 27% had only completed primary school, 20% had finished high school, and 10% held a higher degree of education (i.e. bachelor or diploma). Examination of educational level by age group reveals that the number of years spent in education has increased enormously, from three years for people born in the 1950s to 11 years for people born in the 1990s. The reason for that is that formal education is relatively new to Saudi Arabia. Although the first government department for education was established in 1926, it was not until the 1950s that education became more broadly accessible due to funding from oil revenues (Al Rawaf & Simmons, 1991). At first, education was only for men. Female education formally started in the 1960s; however, it took another 30 years for female education to become widely accepted, as many parents were initially sceptical due to the traditional role of women in the local culture (Al Rawaf & Simmons, 1991). Nowadays, education is provided to both genders free of charge and students at public universities even receive a monthly stipend of around 1,000 SAR ($267) per month.

Another observation is that the educational level of poor households in the research sample trailed behind the national average across all age groups (GASTAT, 2017). Across people born in the 1950s, the difference in number of years spent in education between the poor in the research sample and Saudi Arabia as a whole was relatively small – two years. However, the gap increased to seven years for people born in the 1980s. The fact that poor households receive

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[6] Throughout the chapter, the terminology 'household members' excludes the household head.

less education holds true for both genders. For a more detailed breakdown of household education level by age group, see Figure 2.A.2 in the appendix.

To comprehend this lack of education, households were asked to give their reasons for dropping out of education. Common causes across all age groups and gender were disliking education (25%), bad grades (8%), and being unable to afford the school supplies (11%). In addition, the household heads of older generations reported that there was no school when they were young (7%). Moreover, in the past, getting married was a major reason for women to leave education. Of the females born before the 1980s, 42% mentioned this as a reason, compared with only 5% of women born after 2000. Men born after 2000 seem to struggle with health and disability as 25% stated this as a reason for leaving education, while only 1% of the men born before the 1980s did so. The actual health situation of men is unlikely to have changed dramatically, especially as the problem does not seem to be common among females born after 2000 (only 5% mentioned it as a reason). Hence, it could be argued that this is simply a socially acceptable 'excuse' used by men for dropping out of school. Further research would be needed to interpret these results in more depth.

Economic Factors

Analysis of the economic characteristics of households reveals that public sector jobs paid the highest salaries. Household members employed in the public sector (excluding the military) received, on average, a salary of 6,044 SAR ($1,612) per month. Among public sector jobs, the military sector paid the highest salaries as a risk premium was included, with household members in military occupations being paid 7,864 SAR ($2,097). By contrast, self-employed household members received the lowest average monthly income of 3,071 SAR ($819). Private sector employees earnt 4,664 SAR ($1,238) on average. Moreover, 9% of household heads classified themselves as unemployed (looking for a job) and 36% reported being in the non-labour force. The latter primarily consisted of retired heads and female heads who did not want to work.

In 55% of households, the head was the sole breadwinner. It was rare for wives to work. In 88% of the male-headed households, the wife was not in employment. Furthermore, female household members in general were much less likely to be in employment. For instance, whereas 46% of adult male household members (ages 19-60) were employed, only 16% of adult female members (ages 19-60) were in employment. The self-reported rate of unemployment among all adult household members (ages 19-60) was 54%. For comparison, the official unemployment rate in Saudi Arabia stood at 12.5% in the first quarter of 2019 (GASTAT, 2019b).

TABLE 2.1 DESCRIPTIVE STATISTICS OF THE VARIABLES

Variable	Description	Mean	Std. Dev.
Household Demographics			
Age of Household (HH) Head	Age in Years	48.44	13.96
Gender of HH Head	Dummy: 0=Male, 1=Female	0.14	0.35
HH Members (including Head)	Number of HH Members	6.46	3.37
Members (Ages 0–18)	Number of HH Members	2.63	2.45
Male Members (Ages 19–60)	Number of HH Members	1.05	1.47
Female Members (Ages 19–60)	Number of HH Members	1.63	1.33
Members (Ages 60+)	Number of HH Members	0.14	0.36
Dependency Ratio	Dependency Ratio	1.09	1.05
Additional Dependants	Number outside HH	0.37	1.32
Multiple Wives	1=More than 1 Wife, 0=Otherwise	0.02	0.15
Ethnicity			
Bedouin	Dummy: 1=Bedouin, 0=Non-Bedouin	0.43	0.50
Africa Descent	Dummy: 1=African Descent, 0=Otherwise	0.18	0.39
Human Capital			
Years of Education HH Head	Years of Schooling	7.27	4.88
Head No Formal Education	Dummy: 1=Yes, 0=Otherwise	0.24	0.43
Head Primary School	Dummy: 1=Yes, 0=Otherwise	0.27	0.45
Head Secondary School	Dummy: 1=Yes, 0=Otherwise	0.18	0.38
Head High School	Dummy: 1=Yes, 0=Otherwise	0.20	0.40
Head University	Dummy: 1=Yes, 0=Otherwise	0.10	0.31
Average Years of Education Adult HH Members (Ages 19-60)	Average Years of Schooling	8.26	4.66
Economic Factors			
Head Unemployed	Dummy: 1=Yes, 0=Otherwise	0.09	0.29
Head Employed by the Military	Dummy: 1=Yes, 0=Otherwise	0.09	0.28
Head Employed by the Public Sector	Dummy: 1=Yes, 0=Otherwise	0.12	0.32
Head Employed by the Private Sector	Dummy: 1=Yes, 0=Otherwise	0.25	0.43
Head Self-Employed	Dummy: 1=Yes, 0=Otherwise	0.09	0.29
Head Non-Labour Force	Dummy: 1=Yes, 0=Otherwise	0.36	0.48
Share of HH Members Employed	Share of HH Members	0.14	0.21
Health			
Head Unhealthy	Dummy: 1=Unhealthy, 0=Healthy	0.08	0.28
Number of HH Member Unhealthy	Number of HH Members	0.17	0.43
Social Capital			
Family Relationships	1=We are Very Close 2=We are Close 3=We are neither Close nor Not Close 4=We are Not So Close 5=We are Very Not Close 6=We are Not in Touch at All	2.04	1.14
Personal Attitudes			
Risk Taking	Scale: 0–10; 0=Unwilling to Take Risk, 10=Fully Prepared to Take Risk	3.91	3.54
Patience	Scale: 0–10; 0=Unwilling to Wait and 1=Fully Prepared to Wait	4.66	3.87
Household Finance			
HH Income Excluding Social Welfare	Gross Per-Capita Income in SAR	1108 ($295)	1101 ($294)
HH Income Including Social Welfare	Gross Per-Capita Income in SAR	1320 ($352)	1075 ($291)
HH Consumption	Per-Capita Consumption in SAR	1060 ($283)	671 ($181)
Share of Indebted HHs	Share of HH	0.38	0.49
Debt Service Ratio	Loan Payments/Gross Income	0.24	0.16
Share of HH with Savings	Share of HH	0.10	0.31
Amount of Savings	Average Amount in SAR	67,071 ($17,886)	107,994 ($29,188)

Source: Own survey

Health, Social Capital, and Personal Attitudes

Overall, 8% of household heads were categorised as unhealthy (defined as being disabled or sick for more than 1 month in the last year, and having a level of sickness or disability which caused major limitations in completing daily tasks). In terms of social capital, on average household heads had a close relationship with family members living outside the household. Moreover, household heads described themselves as relatively unwilling to take risks and slightly unwilling to wait. A more detailed breakdown of the risk and time preferences of household heads is presented in Figures 2.A.5 and 2.A.6 in the appendix.

Household Finance

The financial situation of the households showed that, on average, their gross monthly per-capita income was 1,320 SAR ($352). This was calculated from the total annual gross income of the household. The latter includes all income received from employment, the government, charity organisations, friends or family members, 'good people' (a local term referring to private individuals who give donations to the poor, often anonymously) and in-kind donations. It is important to note that because there is no income tax in Saudi Arabia, gross income can be interpreted as income after taxes and subsidies. Excluding all the income and in-kind donations received from social welfare payments, the gross monthly per-capita income excluding social welfare declines to 1,108 SAR ($299). Figure 2.2 presents the cumulative frequency distributions of household income with and without social welfare payments.

FIGURE 2.2 HOUSEHOLD MONTHLY GROSS PER-CAPITA INCOME
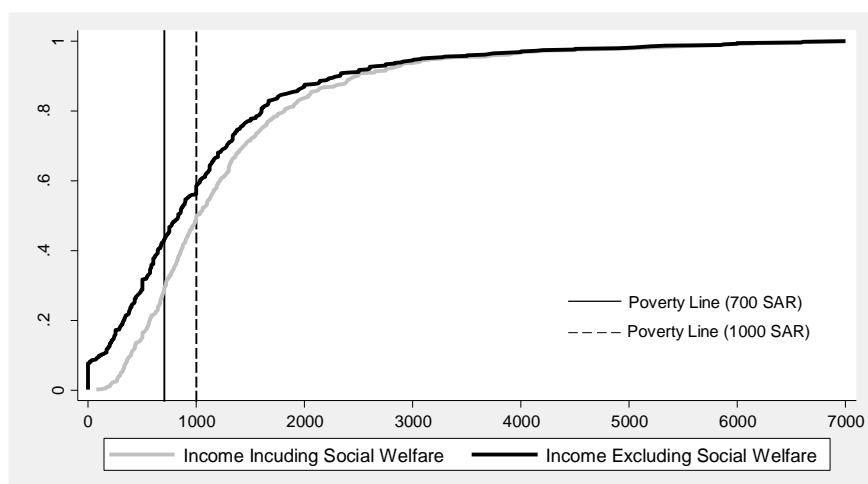
Source: Own survey

Furthermore, on average, households received 23% of their income or 212 SAR ($56) per person per month from social welfare payments. These are payments made by the citizens account programme, traditional social security, and charity organisations (for more details see Table 2.3). Female-headed households were more heavily reliant on social welfare, with 48% of their income coming from social welfare. Moreover, the percentage of total income from social welfare declined with rising income. However, it appears that even households belonging to the Saudi middle class received social welfare payments (Table 2.2).

Most of the households (90%) did not have any savings and were living from 'paycheck to paycheck'. Figure 2.A.4. in the appendix reveals that even higher income households tended to have no savings at all. Conversely, 38% of households were in debt. The most common reasons for households taking out a loan were to buy a car, purchase furniture, and cover the costs of marriage. Of the in-debt households, 6% could be described as over indebted, with a debt to service ratio above 50%. A detailed breakdown of the household debt service ratios can be found in Figure 2.A.3 in the appendix.

TABLE 2.2 SOURCES OF HOUSEHOLD INCOME BY GENDER AND INCOME QUINTILE

Percentage of Total Income	Total	Gender		Income Quintile				
	All Households	Male Headed	Female Headed	Lowest	Second	Third	Fourth	Highest
Wages	0.48	0.53	0.20	0.26	0.38	0.52	0.60	0.65
Business	0.08	0.08	0.08	0.16	0.10	0.06	0.02	0.06
Pension	0.15	0.17	0.07	0.10	0.17	0.17	0.18	0.15
Remittances	0.03	0.01	0.16	0.07	0.04	0.01	0.01	0.02
Hafiz[7]	0.002	0.002	0.000	0.001	0.000	0.003	0.002	0.002
Student Allowance[8]	0.02	0.02	0.02	0.01	0.02	0.02	0.03	0.01
Social Welfare Payments								
Social Security	0.08	0.05	0.25	0.07	0.11	0.09	0.06	0.05
Citizens Account[9]	0.12	0.12	0.14	0.26	0.14	0.10	0.08	0.03
Charity Organisation[10]	0.03	0.02	0.09	0.08	0.04	0.01	0.01	0.01

Source: Own survey.

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[7] Hafiz is a programme targeting young Saudis struggling to find a job. It provides financial assistance of up to 2,000 SAR ($533) per month for initially one year.

[8] Saudi students receive around 1,000 SAR ($267) per month depending on the subject regardless of income.

[9] The citizens account programme was released in December 2017 to offset the negative impact of rising fuel, water and electricity costs as well as the newly imposed VAT, on low-income households.

[10] Most of the charity organisations are public charities financed through donations and public funds. Therefore, they can be seen as part of the social welfare programme.

2.5 Model Results and Discussion

This section first analyses the factors that are likely to hinder households from generating an income above the poverty line. Thereafter, it examines the ability of the social welfare system to lift households above the poverty line. Finally, the analysis considers the depth and severity of poverty.

2.5.1 Determinants of the Poverty Head Count Ratio

Household Demographics

The poverty head count ratio model presented in Table 2.3 examines why a household income without social welfare payments is below the poverty line. The results of the regression models suggest that demographic*s* play a vital role in explaining the variation in poverty outcomes. Household composition, age, gender, and ethnicity are all statistically significant. The following discussion addresses each of these components. In general, almost all household members constituted a burden for the household. Splitting the variable ***household size*** by age group revealed that each additional child and each additional male or female household member increased the likelihood of the household being poor. The reason for this is that most of the adult household members are unemployed.

In general, once an adult male in Saudi culture has his own income, he will, in all likelihood, move out of his parents' household to marry and form his own household; hence there is only a short period of time during which male adults are employed and part of the household. During this period, they save up money for a dowry and other marriage expenses. Culturally, women are not supposed to live by themselves – they are expected to live with a male relative. A woman's ability to leave her parents' household thus depend on her marriage prospects. However, divorced women are not popular in the marriage market, especially if they have children. Further, if a female household member does not get married before the age of 30, she might be too old to find a husband and thus have to live with a male relative for the rest of her life. Hence, female household members consist not only of grown-up children but also wives, sisters, aunts, or cousins who are divorced or have never married.

By contrast, the number of ***elderly household members*** had no significant effect on household income. These household members were often the parents of the household head. Some elderly household members received a pension or widow benefits from the government, while others were fully dependent on the household head. There could also be a reverse causality, as

household heads with higher income are more likely to take care of their parents. One could also argue that having multiple wives would be a particular financial burden for the household head. However, it transpired that having *multiple wives* was negatively correlated with poverty. One explanation for this could be that only wealthier household heads have additional wives. Alternatively, it could also be that having multiple wives increases the pressure on the male household head to provide a sufficient income.

The *age* of a household head is often interpreted as a proxy for his/her work experience. As expected, it reduced the household's likelihood of being poor, as older individuals tend to have more work experience and hence receive higher salaries. Age square was positive, indicating that the benefits from additional work experience are higher for younger individuals than for older individuals, the latter of whom already have a substantial amount of work experience.

Female-headed households are often disadvantaged because society allocates them the role of mother and caretaker of the house; hence, they have less access to resources such as education. Saudi Arabia, with its traditional Islamic culture, is arguably no exception. Even after adjusting for differences in education (alongside other factors), female-headed households' risk of being poor was 30 percentage points higher than that of male-headed households. In Saudi Arabia, women are not supposed to live by themselves without a male household head. Therefore, for a woman to become head of the household, female-headed households have usually experienced some form of a shock. Such shocks include divorce, being abandoned, death of the household head, the household head being in prison, or the household head being sick, disabled, or addicted to drugs.

Ethnicity

Regarding ethnicity, the results indicate that identifying oneself as Bedouin had no significant influence on poverty. However, the findings did suggest that people of African descent were more likely to be poor. One could theoretically argue that this is due to some form of discrimination in society; yet there is no evidence of such discrimination in contemporary Saudi society. Hence, it appears more likely that historic disadvantages are continuing to influence African descendants. It should be noted, however, that the findings are not entirely robust to changes in the poverty line (Table 2.B.2, Appendix).

Human Capital

Education is one of the leading factors explaining the differences in income. Each year of education accrued by the household head reduced the probability of being poor by 5.5 percentage points. In addition, a household with higher educated members was also correlated with lower poverty. This is why it is particularly concerning that poor households are not able to provide their children with as much education as wealthier households. As outlined in the descriptive statistics, the average years of education accrued by people living in poor households is below the national average.

Economic Factors

Economic causes of poverty also explained a large proportion of the differences in income. The single most devastating factor was the household head being unemployed. Such a household was 53 percentage points more likely to be poor. Another concern was the lack of household members (other than the head) in employment. As outlined in the descriptive statistics, in many households the head was the sole breadwinner. Traditionally, wives are expected to take care of the household and children and are not supposed to be in employment. In addition, the descriptive statistics suggest that many adult male and female household members were struggling to find a job. Conversely, household members in employment had a strong positive effect on households' per-capita income.

One of the main reasons for the high unemployment rate among household members is the lack of human capital. According to GATSTAT (2019b), 73% of employed people in Saudi Arabia hold a university degree, among whom 7.4% hold a postgraduate degree. Only 0.8% of employed people are illiterate, 3.7% have a primary school education, 10% have finished secondary school, and 11% have completed high school. Comparing the level of education of Saudi nationals who have managed to secure a job with that of the poor, as described in the previous section, revealed that the lack of education is a prevailing concern. Beyond the lack of education, the literature also identified other causes for unemployment, including competition from low-paid migrant workers, cultural barriers preventing women from working in mixed-gender environments, and/or the view that certain professions are degrading or shameful for nationals (Bosbait & Wilson, 2005; Al Dossary, Rahman, & Aina, 2006; Al Hamad, 2014).

TABLE 2.3 LOGIT MODEL ESTIMATES OF THE POVERTY HEAD COUNT RATIO

	Coefficient	Std. Error	Marginal Effects
Household Demographics			
Age of Household (HH) Head	-0.177***	0.060	-0.042***
Age of HH Head ^2	0.002***	0.001	0.0004***
Gender of HH Head	1.219***	0.441	0.296***
Members (Ages 0–18)	0.504***	0.076	0.120***
Male Members (Ages 19-60)	0.423***	0.127	0.101***
Female Members (Ages 19-60)	0.437***	0.134	0.104***
Members (Ages 60+)	-0.016	0.430	-0.004
Multiple Wives	-2.629**	1.288	-0.359***
Additional Dependants	0.104	0.107	0.025
Ethnicity			
Bedouin	-0.089	0.271	-0.021
African Descent	0.654*	0.368	0.160*
Human Capital			
Years of Education HH Head	-0.233***	0.037	-0.055***
Average Years of Education Adult HH Members (Ages 19-60)	-0.094***	0.035	-0.022***
Economic Factors			
Head Unemployed	2.575***	0.588	0.534***
Share of HH Members Employed	-6.755***	1.163	-1.610***
Health			
Head Unhealthy	0.099	0.503	0.024
Number of HH Member Unhealthy	0.160	0.361	0.038
Social Capital			
Family Relationships	0.251**	0.122	0.060**
Personal Attitudes			
Risk Taking	0.031	0.040	0.007
Patience	-0.0004	0.036	-0.0001
Observations	496		
Pseudo R^2	0.461		

Note: * P<0.10, ** P<0.05, *** P<0.01.
Source: Own survey

Health, Social Capital, and Personal Attitudes

Contrary to expectations, the health of the household head and the number of unhealthy household members had no significant impact on poverty. This could be because in Saudi Arabia, access to health care is provided to all citizens free of charge.

By contrast, social capital, measured as the relationship with immediate and extended family members, significantly reduced the odds of poverty. This was because households with stronger family connections were more likely to receive financial support from family members. However, households mainly received help from family members when their income was exceptionally low. In this sense, the family acted as insurance in times of special hardship. In addition, social capital might provide indirect financial benefits. In particular, family members might help a person to secure a job or promotion. However, the social status of the family is likely to determine how valuable such connections are. Hence, poor households (whose extended family members are also more likely to be poor) might benefit less from social

capital than wealthier households, whose extended families are also more likely to be wealthy and occupy high-ranking positions in society. This concept of social capital in Arab society can be linked to the Arabic concept of '*Wasta*'. This is similar to the idea of nepotism and can help a person to find a job even if it is above their current qualification level (Harbi, Thursfield, & Bright, 2017; Thompson, 2019).

Bedouin families, who are all considered tribal, had stronger family connections (Kendall tau b = −0.0857, p = 0.0402, highlights the correlation between being Bedouin and the strength of family connections). Nevertheless, in the logit regression model, being Bedouin was shown to have no effect on poverty. It may be the case that the positive effects of stronger family connections were offset by other factors. One concern is that traditional strong family ties are weakening (Thompson, 2019), a reason for which is thought to be internal migration. Due to urbanisation, many individuals have become internal migrants in Saudi Arabia (Basha, 1988; Al Bassan, 2011). However, in the sample, there was no correlation between weak family connections and internal migration (Kendall tau b = 0.0139, p = 0.7405). Moreover, on average, internal migrants had lower incomes than non-migrants; however, this difference was no longer significant after adjusting for the education levels and family sizes of households.

Finally, the risk and time preferences of household heads were not significantly correlated with poverty.

2.5.2 Social Welfare and the Poverty Head Count Ratio

Having examined the reasons why household are not generating an income above the poverty line by themselves, the focus now shifts to the ability of the social welfare system to lift households out of poverty. In general, social welfare payments lifted 33% of the poor households out of poverty (less than 700 SAR). However, 14% of the poor households did not receive any social welfare payments and the remaining 53% did not receive enough social welfare to escape poverty. As Figure 2.3 indicates, some of the poorest households are excluded from social welfare payments, despite other households with a similar income receiving almost 100% of their income from social welfare.

FIGURE 2.3 SHARE OF INCOME FROM SOCIAL WELFARE PAYMENTS COMPARED TO TOTAL INCOME
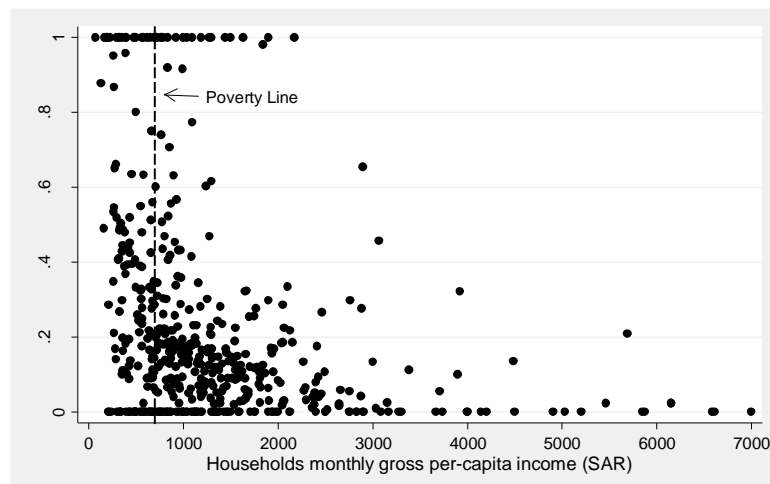
Source: Own survey

Several reasons can be derived for the exclusion of certain poor households. First, some households might have felt ashamed to apply for social welfare or may have been unaware of how to apply. Illiteracy (combined with the fact that many of the applications have to be conducted online) could have been a barrier for some households, although this relationship was not statistically significant. Second, Saudi nationals without a national ID card are not able to apply for social welfare or hold a formal job. Of the households in the research sample, 8.6% reported having issues with their national IDs. This could hinder them in their efforts to obtain employment and social welfare payments. Indeed, having no ID cards had a statistically significant negative impact on households' likelihood of receiving social welfare payments (Pearson Chi2 = 7.357, p = 0.007). Third, female-headed households whose husbands have abandoned them without a divorce might not immediately receive benefits, as the women first have to raise their cases in court. However, no significant relationship in this regard was found. However, it was found that women whose husbands were in prison were statistically less likely to receive social welfare (Pearson Chi2 = 3.587, p = 0.058), despite being eligible. Indeed, there is perhaps a certain stigma attached to applying for social welfare payments under these circumstances.

By contrast, some of the highest earners received social welfare payments. This could suggest that some higher-income households provide inaccurate information in their applications, as they are apparently still able to obtain such benefits.

2.5.3 Poverty Gap

Thus far, the data analysis has focused on why a household is above or below the poverty line, but not on the intensity of poverty. This subsection studies the depth and severity of poverty by analysing the poverty gap. In Table 2.4 it is clear that all the factors found to determine the incidence of poverty also determine the depth of poverty (measured through the poverty gap). Likewise, almost the same factors explain the severity of poverty (measured through the squared poverty gap). The only exceptions are the age of the household head and the number of male adult household members; which have no impact on the severity of poverty. Although male household members might struggle to prevent the family from falling into poverty, they can prevent the family falling into severe poverty. Unlike female household members, male members have more access to low-paid employment. Even if the male member cannot find formal employment, he might always be able to find some form of informal employment, such as selling items on the street or helping out neighbours. Similarly, on average, younger household heads have a lower income than older household heads; however, household heads of all ages are equally able to prevent the family from falling into severe poverty.

The social welfare system plays an important role in reducing the overall depth and severity of poverty. Although the poverty gap index excluding social welfare payments (measuring the depth of poverty) stood at 0.22, it declined to 0.10 when such payments were included. Likewise, the squared poverty gap index (measuring the severity of poverty) changed from 0.16 excluding social welfare payments to 0.05 including social welfare payments. For a detailed breakdown of the poverty gap excluding and including social welfare payments, see Figure 2.A.7 in the appendix. Nevertheless, social welfare has not managed to entirely eradicate relative poverty. In order to lift the remaining households out of poverty, the social welfare programme would need to pay an extra 11 billion SAR per annum, or 0.4% of 2019 GDP (GASTAT, 2019c). This estimate is based on an average remaining poverty gap of 231 SAR per person per month and an estimated 4.1 million Saudi nationals in poverty (Sullivan, 2013; Koontz, 2015; GASTAT, 2017). However, a key difficulty in this regard is to ensure that the money is actually reaching the poor. Alternatively, the existing social welfare system could be replaced with a universal basic income. Paying all 20 million Saudi nationals (GASTAT, 2017) 700 SAR per month would cost 168 billion SAR, or 6% of 2019 GDP.

TABLE 2.4 TOBIT MODEL ESTIMATES OF THE POVERTY GAP

	Poverty Gap Coefficients	Std. Error	Poverty Gap ^2 Coefficients	Std. Error
Household Demographics				
Age of Household (HH) Head	-0.016*	0.008	-0.007	0.008
Age of HH Head ^2	0.002**	0.0001	0.0001	0.0001
Gender of HH Head	0.273***	0.057	0.269***	0.051
Members (Ages 0–18)	0.050***	0.009	0.032***	0.008
Male Members (Ages 19-60)	0.032**	0.016	0.023	0.014
Female Members (Ages 19-60)	0.042**	0.018	0.033**	0.016
Members (Ages 60+)	-0.056	0.067	-0.056	0.061
Multiple Wives	-0.411***	0.151	-0.277**	0.136
Additional Dependants	0.016	0.014	0.012	0.013
Ethnicity				
Bedouin	0.025	0.042	0.029	0.038
African Descent	0.106**	0.050	0.107**	0.045
Human Capital				
Years of Education HH Head	-0.036***	0.005	-0.027***	0.005
Average Years of Education Adult HH Members (Ages 19-60)	-0.019***	0.005	-0.016***	0.005
Economic Factors				
Head Unemployed	0.553***	0.064	0.589***	0.057
Share of HH Members Employed	-1.326***	0.169	-1.237***	0.156
Health				
Head Unhealthy	0.029	0.072	0.051	0.065
Number of HH Member Unhealthy	0.049	0.048	0.043	0.043
Social Capital				
Family Relationships	0.047***	0.018	0.040**	0.016
Personal Attitudes				
Risk Taking	-0.004	0.006	-0.007	0.006
Patience	-0.002	0.006	-0.001	0.005
Observations	496		496	
Pseudo R^2	0.501		0.549	

Note: * P<0.10, ** P<0.05, *** P<0.01.
Source: Own survey

2.6 Conclusions and Policy Implications

This chapter analysed the causes of urban poverty in Saudi Arabia. It found that the lack of human capital is a major determinant of poverty. Consequently, the observation that members of poor households accrue fewer years of education than non-poor households is a major concern. Potentially, a vicious circle may be created between poverty and human capital. The second major poverty determinant is unemployment. Unemployment is particularly high among household members (excluding the head) with a self-reported unemployment rate of 50% among the adult household members. Aside from human capital and unemployment, a large family size increases the risk of a household falling into poverty. Traditionally, the male-household head is supposed to be the sole breadwinner of the family, supporting his wife, children, and adult dependants (most commonly parents and siblings). Therefore, the larger the household, the greater the number of members that have to be supported by just one breadwinner. Female-headed households were found to be particularly vulnerable to poverty

due to women's traditional roles as the mother and caretaker of the household. Likewise, being of African descent increased the risk of a household being poor. Moreover, social capital (defined as the household heads relationship with his immediate and extended family) had a positive impact on households' welfare. By contrast, health, personnel attitudes, and being of Bedouin origin were not found to be correlated with poverty. Furthermore, it was found that the social welfare system is able to reduce the occurrence, depth, and severity of poverty. Around one third of poor households were lifted out of poverty by social welfare support. However, around 14% did not receive any support. In particular, households without a national ID card were often excluded.

Based on our findings, several policy implications can be derived. First, educational support initiatives should be made available to school and university students from disadvantaged families. To bridge the gap in education between poor and non-poor people, both financial and non-financial support should be considered. Increasing levels of education would also long-term help Saudis from poor families find a job and would thus reduce the level of unemployment. However, it would take time for the increase in human capital to bear fruit. Therefore, the authorities should increase the number of low-skilled jobs available to citizens. The government has already introduced one initiative along these lines – the 'Nitaqat' programme ("Saudisation programme"). This sets quotas for the percentage of Saudi nationals who have to be employed in each sector. Identifying additional sectors for increased "Saudisation" could immediately help the poor to find a job. Moreover, strengthening the role of women will need to form an integral part of poverty reduction in Saudi Arabia. Indeed, increasing women's participation in the workforce is a key aspect of 'Vision 2030'; hence the authorities have implemented new regulations to support women in the labour market. These include allowing women to drive and hold management positions, as well as antidiscrimination laws in the labour market. Increased female participation in the labour force would be beneficial for both male and female-headed households. Given that large family sizes were found to be a determinant of poverty, in addition to encouraging more women to work, educational campaigns could help to limit the number of unplanned pregnancies and reduce the financial burdens on households.

It will take time for all of the above policy recommendations to change the lives of poor Saudi households. In the meantime, additional financial support from the government would provide them with more immediate benefits. However, a key challenge is to identify the households who are eligible in order to minimise inclusion and exclusion errors. A first step to including

more households in the social welfare system would be to address the fact that a small number of households have no official national ID card. Without this, household members struggle to seek formal employment or claim social welfare payments. Hence, solving this issue would be extremely beneficial. Some of the households in the survey had recently managed to obtain IDs, while others were in the process of obtaining IDs. This suggests that the authorities are already addressing this concern. A further step towards addressing the issue of exclusion would be to replace the existing social welfare system with a universal basic income, which would pay all Saudi citizens a monthly allowance regardless of their financial circumstances.

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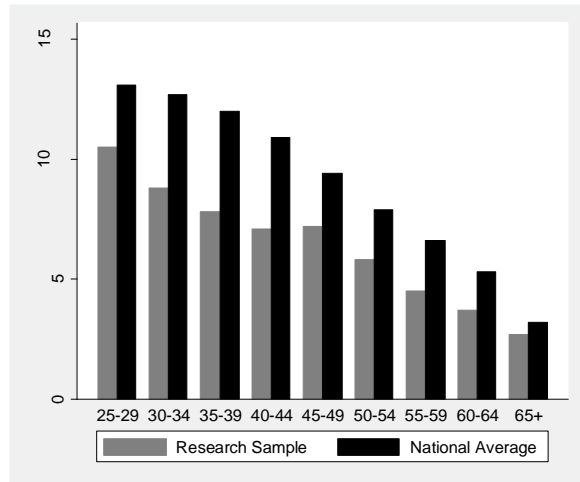
Appendix 2.A Additional Descriptive Statistics

FIGURE 2.A.1 POPULATION PYRAMID

FIGURE 2.A.2 AVERAGE YEARS OF EDUCATION

Source: Own survey and GASTAT (2017)
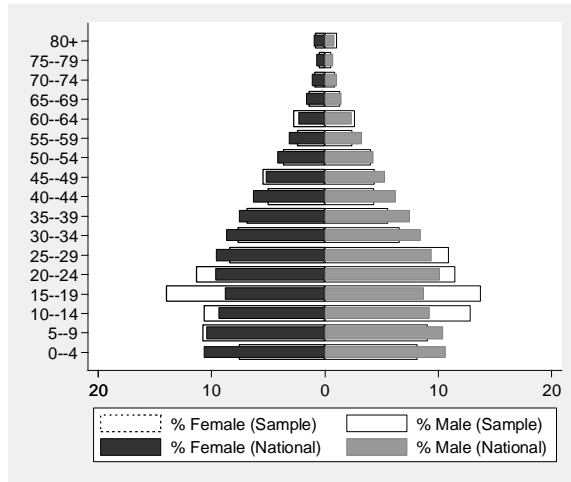
Source: Own survey and GASTAT (2017).

FIGURE 2.A.3 DEBT SERVICE RATIO
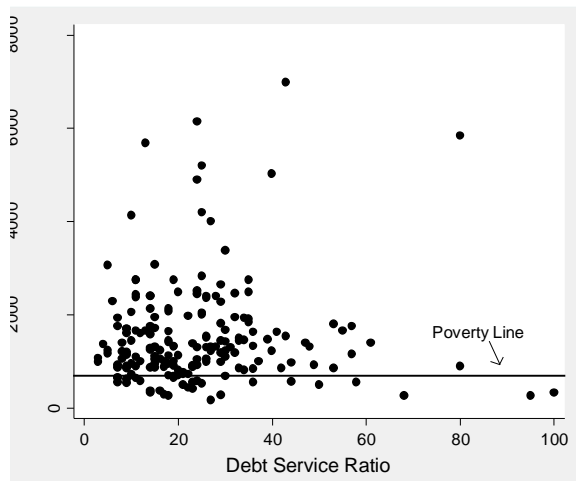
FIGURE 2.A.4 SAVINGS
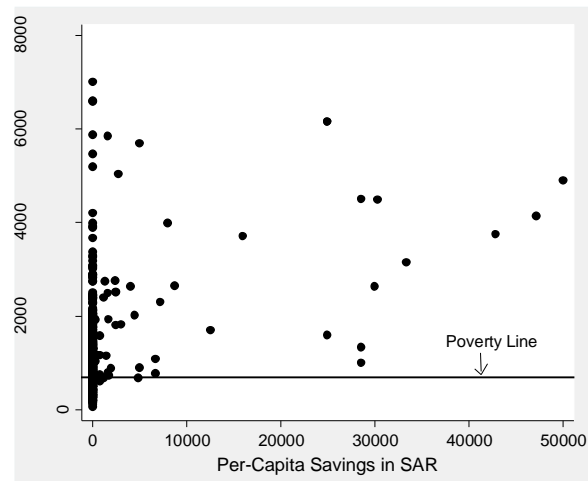
Source: Own survey

Source: Own survey

FIGURE 2.A.5 RISK TAKING
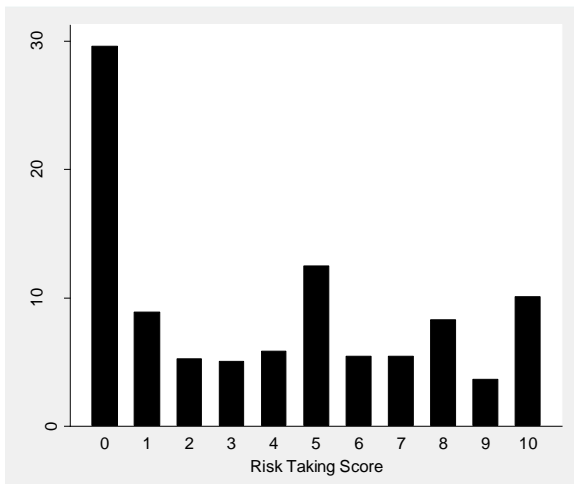
FIGURE 2.A.6 PATIENCE
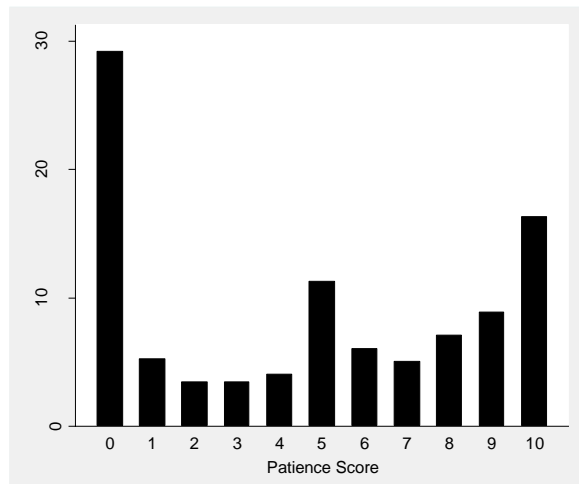
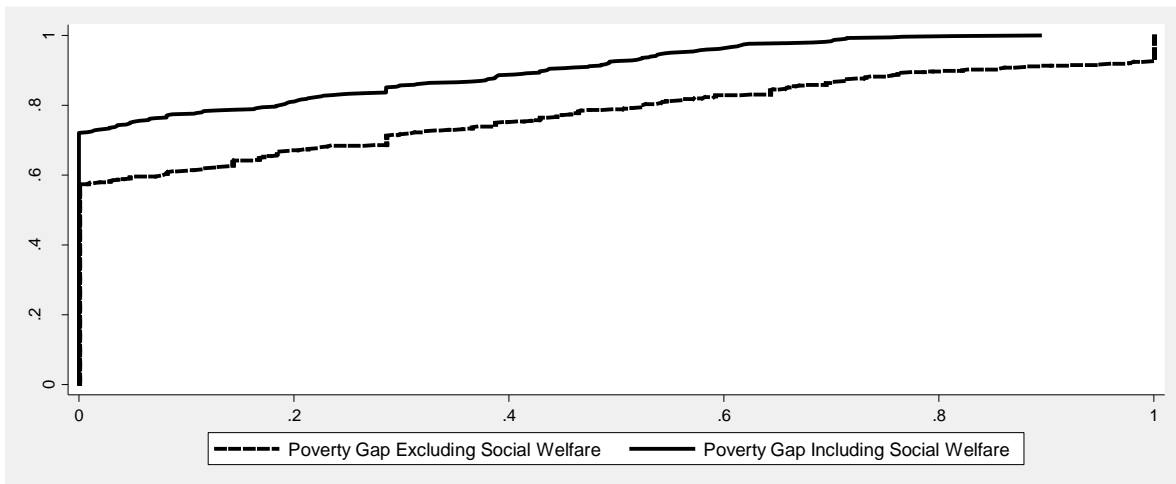*Source:* Own survey

Source: Own survey

FIGURE 2.A.7 POVERTY GAP

Source: Own survey

Appendix 2.B Robustness Checks

TABLE 2.B.1 ROBUSTNESS CHECK POVERTY LINE (MARGINAL EFFECTS)

Explanatory Variables	Poverty Line (500)	Poverty Line (600)	Poverty Line (700)	Poverty Line (800)	Poverty Line (900)	Poverty Line (1,000)	Poverty Line (1,400)
Household Demographics							
Age of Household (HH) Head	-0.025***	-0.034***	-0.042***	-0.033**	-0.037***	-0.029**	-0.009*
Age of HH Head ^2	0.0003***	0.0003***	0.0004***	0.0003**	0.0003***	0.0003**	0.0001
Gender of HH Head	0.258***	0.297***	0.296***	0.208**	0.178**	0.175***	0.033
Members (Ages 0–18)	0.065***	0.090***	0.120***	0.137***	0.155***	0.130***	0.054***
Male Members (Ages 19-60)	-0.001	0.036	0.101***	0.103***	0.101***	0.085***	0.048***
Female Members (Ages 19-60)	0.030	0.055**	0.104***	0.118***	0.118***	0.084***	0.043***
Members (Ages 60+)	-0.013	-0.039	-0.004	0.078	-0.001	-0.009	0.016
Multiple Wives	-0.171***	-0.287***	-0.359***	-0.224	-0.411**	-0.410*	-0.237
Additional Dependants	0.014	0.037*	0.025	0.036	0.046*	0.041*	0.026*
Ethnicity							
Bedouin	-0.006	0.003	-0.021	0.028	0.011	-0.021	-0.020
African Descent	0.073	0.115	0.160*	0.151*	0.020	0.045	0.047*
Human Capital							
Years of Education HH Head	-0.032***	-0.050***	-0.055***	-0.053***	-0.053***	-0.045***	-0.021***
Average Years of Education Adult HH Members (Ages 19-60)	-0.016***	-0.017**	-0.022***	-0.029***	-0.027***	-0.022***	-0.010***
Economic Factors							
Head Unemployed	0.610***	0.610***	0.534***	0.459***	0.374***	0.315***	0.100***
Share of HH Members Employed	-0.952***	-1.291***	-1.610***	-1.547***	-1.181***	-1.020***	-0.208***
Health							
Head Unhealthy	0.057	-0.007	0.024	0.010	0.052	0.081	-0.005
Number of HH Member Unhealthy	0.093*	0.033	0.038	0.042	0.065	0.018	-0.018
Social Capital							
Family Relationships	0.030*	0.062**	0.060**	0.039	0.042	0.038	0.009
Personal Attitudes							
Risk Taking	0.0004	0.003	0.007	-0.002	-0.007	-0.004	0.004
Patience	-0.009	-0.009	-0.0001	0.003	0.003	-0.004	-0.002
Observations	496	496	496	496	496	496	496
Pseudo R^2	0.522	0.481	0.461	0.436	0.450	0.423	0.400

Note: * P<0.10, ** P<0.05, *** P<0.01.
Source: Own survey

CHAPTER 3 POVERTY AND GENDER IN SAUDI ARABIA

Abstract

This chapter addresses the issue of poverty among female household heads in urban Saudi Arabia. The empirical basis of this study is a socioeconomic household survey conducted among 496 Saudi households in the city of Dammam in 2019. The methodology is based on the Foster–Greer–Thorbecke (FGT) poverty index, which is used to measure the prevalence, depth and severity of poverty. Moreover, we apply a logit model to identify the factors correlated with poverty for female- and male-headed households. The results show that female-headed households are more often and more severely affected by poverty than male-headed households, even when considering higher social security subsidies for women. One reason for the gender poverty gap is related to traditional and cultural barriers that prevent women from joining the labour force. Another issue observed is that female household heads have fewer years of education compared to male household heads. This lack of education was discovered to hinder female household heads' employment chances. However, we have shown that female and male employment seekers are equally likely to find a job after adjusting for differences in educational levels.

3.1 Introduction

The 'feminisation of poverty' has been a widely discussed topic in the literature (Pearce, 1978; Chant, 2006; Kim & Choi, 2013; Bradshaw, Chant & Linneker, 2019; Anglade, Useche & Deere, 2022). Women are viewed as especially vulnerable to poverty due to their traditional roles as caretakers for children and the elderly and as housekeepers (Buvinić & Gupta, 1997; Chant, 2007; Bradshaw, Chant & Linneker, 2019). Hence, society grants women less access to resources such as education, employment, land and capital (Deer & Doss, 2006; Duflo, 2012). This makes it harder for a female to assume the role of the household's 'breadwinner' in the case of her husband's death or divorce.

In the Kingdom of Saudi Arabia, where traditional Islamic roots are omnipresent, a gender wealth gap can be expected. Women in Saudi Arabia are traditionally expected to stay at home and take care of the inside of the house domain, whereas men are supposed to handle everything related to the outside of the house domain (Al Lily, 2018). Until recently, this has made it almost impossible for a woman to earn a living. However, nowadays, the empowerment of women has become a central element of Saudi Arabia's reform aspirations (Vision 2030: Kingdom of Saudi Arabia, 2016). Owing to major changes in women's rights and gender equality, the life of women in Saudi Arabia is transforming at a fast pace (Krimly, 2019; Nugali, 2020). For example, in 2019, the law that made it mandatory for a woman to get permission from her legal guardian (usually her husband or father) in order to work was abolished (Hannon, 2019). Following these reforms, more and more women are entering the labour force. Women have even been appointed to key leadership positions such as ambassadors (Al Khudair, 2020).

Nevertheless, the state's attempt to change the role of women in the country is challenging (Al Bakr et al., 2017). For many years, society has told women that the domain outside of the house is dangerous and reserved only for men. Nowadays, women are supposed to enter this traditionally male-dominated territory and start working in mixed-gender environments. This is difficult and will take time. Many women still feel that it is the male's role to earn a living and that women cannot be expected to work outside the house, especially not in mixed-gender environments (Al Sharif, Yingling & Zhang, 2019). Furthermore, despite the legal possibility, a woman's male relatives might still not approve of her intention to work outside the house.

Moreover, even when a woman's family accepts her decision to take a job in a mixed-gender environment, she might face further obstacles. For example, in the absence of a public transportation network, women must resort to travelling to and from work by taking a taxi, riding in a car with a driver or driving themselves. Although women's right to drive was promulgated in 2018, few women have a driver's licence, and many women do not feel comfortable driving (Al Sharif & Ulrich-Schad, 2019). Another obstacle is the lack of affordable childcare, especially for women with young children (Al Sharif & Ulrich-Schad, 2019). An additional challenge is that occasionally, an employer might expect women to remove their Niqaab (a black fabric covering the face), which is something they might not be comfortable with for religious reasons (Sian et al., 2020). Additionally, as Naseem and Dhruva (2017) suggest, women in Saudi Arabia lack networking and training opportunities, do not have much work experience and are more limited in terms of daily working hours. The above overview of the possibilities and constraints for women to become the sole breadwinner of a household nurtures the hypothesis of asymmetric well-being between female- and male-headed households. However, there is limited empirical evidence regarding poverty among female-headed households in Saudi Arabia. As a proxy, Al Mosaed (2018) found that there is a high percentage of women receiving social security.

The lack of studies on female poverty is also noticeable in other Arab countries. The few studies on this topic describe ambiguous results. For example, while Al Azzawi (2018) and Ghazouani and Goaied (2001) found a higher share of female-headed households in urban areas in Egypt and Tunisia, this was not the case in rural areas. Other studies in Egypt (Iqbal, 2006; Ramadan, Hlasny & Intini, 2018), Jordan (Iqbal, 2006; Ramadan, Hlasny & Intini, 2018), Palestine (Ramadan, Hlasny & Intini, 2018), Tunisia (Iqbal, 2006; Bibi & Chatti, 2010; Ramadan, Hlasny & Intini, 2018), Syria (Hamati, 2019) and Morocco (Lanjouw, 2005) did not find significant gender-specific differences in poverty.

Given the uncertainty in the literature regarding gender-specific poverty in Saudi Arabia and the Arab world in general, the study presented in this chapter is well-motivated. For the empirical basis of this study, we rely on one of the first independent socioeconomic household surveys conducted in Saudi Arabia. The survey was conducted among 496 households across nine poor neighbourhoods in the City of Dammam in early 2019. With this unique dataset, we can address several research questions. First, to what extent are there differences in poverty between female- and male-headed households in Saudi Arabia? Second, what are the main factors that drive poverty of female-headed households as compared to their male-headed

counterparts? Third, what is the role of Saudi Arabia's social welfare system in alleviating poverty among female- and male-headed households? The remainder of the chapter is structured as follows. Section 3.2 outlines the methodology, Section 3.3 presents the household survey data, Section 3.4 analyses the results and Section 3.5 provides conclusions and policy recommendations.

3.2 Methodology

3.2.1 Definition of Poverty in Saudi Arabia

To study poverty in Saudi Arabia, it is crucial to first determine an appropriate poverty line to identify the poor. As Saudi Arabia has almost no households living in absolute poverty (Saudi Ministry of Economy and Planning, 2014), this study concentrates on a relative poverty line. According to Bin Saeed (2008), the Ministry of Labour set the national poverty line at 500 SAR (Saudi riyals) per person per month ($4.40 per person per day[11]) in 2005. However, considering that poverty is not a widely discussed topic in Saudi Arabia and that there are no recent official poverty statistics, there is no information on whether the official poverty line has been updated since 2005. Regardless, given rising price levels, a poverty line set in 2005 is no longer reasonable in 2019. Therefore, this study will work with an inflation-adjusted poverty line. From 2005 to 2019, the Consumer Price Index increased by 36% (General Authority for Statistics [GASTAT], 2019), resulting in an inflation-adjusted new poverty line of 700 SAR per person per month for 2019 ($6.20 per person per day).

In addition to the official poverty line, independent studies have suggested other poverty lines. Al Shubaiki (2005) started by setting the minimum living standards for a household in Saudi Arabia and then determined the amount needed to afford those standards. She estimated a poverty line of 769 SAR per person per month for 2005, which translates to an inflation-adjusted rate of 1,046 SAR per person per month for 2019 ($9.80 per day per person). Similarly, Al Damag (2014) proposed a poverty line of 919 SAR per person per month ($8.20 per day per person). Moreover, in accordance with an income of 50–60% below the country's median/average income (a common international definition of relative poverty), the poverty line would lie between 860 SAR and 1,370 SAR per person per month (between $7.60 and $12.20 per day per person) (GASTAT, 2018). The main analysis of this chapter will use the

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[11] All currency transformations in this chapter are based on the country's fixed market exchange rate of 3.75 SAR per dollar. This is in turn based on the notion that the official purchasing power parity exchange rate is not a very accurate reflection of purchasing power.

national inflation-adjusted poverty line of 700 SAR per person per month ($6.20 per person per day). However, due to the uncertainty surrounding poverty in Saudi Arabia, robustness checks with varying poverty lines can be found in the Appendix.

3.2.2 Definition of a Female-Headed Household

When studying poverty in female-headed households, one key analytical challenge is how to best define a female-headed household. Studies such as those by Buvinić and Gupta (1997), Horrell and Krishnan (2007) and Klasen, Lechtenfeld and Povel (2015) have stressed the importance of distinguishing between *de jure* female-headed households (e.g. widowed, divorced, abandoned and single women) and *de facto* female-headed households (households in which the man is only temporarily absent). A typical *de facto* female-headed household is one in which the male head has migrated to an urban area to seek employment, while his wife has remained in the village. These households are often thought to be relatively well-off due to the remittances received from the husband's job (Buvinic & Gupta, 1997). While these typical *de facto* female-headed households do not exist in Saudi Arabia, situations arise in which the male head works relatively far away from his home and only infrequently comes home – for example, on the weekends. Culturally speaking, such a household would still be classified as male-headed; therefore, this study did not include these households in the female-headed category.

In addition to the above, other forms of ambiguity of headship in the Saudi context exist. For instance, once male children are older, the moment can arrive when they become the household head, especially if they have a job. In the analysis, the variable of 'female-headed' is based on a household's self-reported headship, as household members themselves are the best informed about who is mainly in charge of the home.

3.2.3 Empirical Strategy

Household poverty analysis is based on the gross per capita income of female- and male-headed households. Household gross monthly per capita income comprises all income received from employment, the government, charity organisations, friends or family members, in-kind donations and 'good people' (a local term referring to private individuals who give donations to the poor, often anonymously). Because there is no income tax in Saudi Arabia, the gross monthly per capita income can also be interpreted as the household monthly income after taxes and subsidies.

The first research question examines the extent to which there are differences in poverty between female- and male-headed households in Saudi Arabia. To address this research question, we study the Foster–Greer–Thorbecke (FGT) poverty index (Foster, Greer & Thorbecke, 1984). The index can be mathematically expressed as follows:

$$(3.1) \quad FGT_\alpha = \frac{1}{N} \sum_{i=1}^{q} \left(\frac{z - y^*_i}{z} \right)^\alpha$$

where N is the population size, q is the number of households below the poverty line of 700 SAR, z is the poverty line, y^*_i is the income of households below the poverty line and α is a 'poverty aversion' parameter. If α = 0, the FGT index measures the poverty head count ratio; if α = 1, the FGT index assesses the depth of poverty; and if α = 2, the severity of poverty is calculated.

The second research question seeks to determine the main factors that drive poverty of female-headed households as compared to their male-headed counterparts. To answer this question, two logit models are being studied. Both models estimate the probability of a household being poor as a function of household-specific characteristics. For this purpose, households are split into two categories: poor, where income (Y) is less than or equal to 700 SAR, and non-poor. The first model takes on the following form:

$$(3.2) \quad P(Y_i = 1) = \alpha + \beta FHH_i + \gamma X_i + \varepsilon_i$$

where FHH is a dummy variable for female-headed households and X is a vector of household characteristics related to household demographics, human capital, economic factors, health, social capital and personal attitudes. Specifically, the model includes the following variables: age of the household head, number of household members, percentage share of children, additional dependants and years of education of the household head and household members. Further added controls are employment of the household head, labour force participation of the household head and the share of household members in employment. In addition, the model includes health of the household head and the number of unhealthy household members, as well as the household head's relationship with his/her family. Lastly, there are two variables measuring personal attitudes regarding risk-taking and patience (time preference). A more detailed description of the variables included in the model can be found in the descriptive statistics of Section 3.3.2.

The second model includes the same variables as the first model but contains additional interaction terms between the characteristics of the household head and the gender of the household head. The resulting logit regression can be expressed as follows:

$$(3.3)\ P(Y_i = 1) = \alpha\ +\ \beta FHH_i\ +\ \gamma X_i\ +\ \delta FHH_i x X_i + \varepsilon_i$$

3.3 Household Survey Data

3.3.1 Data Collection and Sampling

The data used in this study come from a socioeconomic household survey conducted by the authors. The survey took place in Dammam, one of the largest metropolitan cities in Saudi Arabia, in 2019. Dammam has been selected as a typical example of urban poverty in the country. It was chosen based on the accessibility of the study population, which was facilitated through cooperation with a local university.

The survey aimed to select a representative sample of poor and non-poor Saudi households. Therefore, the researchers first identified, with the help of insider knowledge from local charity managers, the neighbourhoods in which many poor Saudi households live. In total, nine neighbourhoods in Dammam were identified that contained many poor Saudi households. Within the nine neighbourhoods, Saudi households were randomly selected via systematic sampling, whereby every tenth dwelling was selected to be interviewed. The dwellings were identified with the help of satellite image data from Google Maps. The research team then approached the marked dwellings and interviewed the household heads. If the household head was a foreigner, the household was excluded from the study. To increase participation, households received 50 SAR ($13) for taking part in the survey. Moreover, the research team consisted of both female and male interviewers, as female household heads were often more comfortable being interviewed by a female. In total, 496 Saudi households were interviewed.[12]

3.3.2 Descriptive Statistics

In our sample, 70 out of 496 households were headed by females. Respondents gave four main reasons for a household to be female-headed. The first is the death of a husband, which applied to 41% of the female heads. A common reason for this is the often large age gap between a husband and his wife at marriage. The second most common explanation for female headship

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[12] For a more detailed description of the data collection process, see Al Lily and Waibel (2021).

is divorce. This applied to 26% of our sample. The observation that most female household heads are either widowed or divorced is in line with previous studies by Fadaak (2010) and the Efad Center (2014). In addition, there are reasons such as separation without divorce and the husband being in prison, which was observed in 13% and 11% of the female-headed households, respectively. Exceptional cases were that females never married and lost their male provider such as their father or brother.

To gain an initial understanding of the economic situation of the female-headed households, Table 3.1 provides an overview of their financial situation. On average, female-headed households had a per capita income of 1,000 SAR ($270), which was 350 SAR ($93) lower than the average income of male-headed households. Studying the sources of income reveals that male-headed households received more money from wage employment and pensions, whereas female-headed households received more remittances and higher social welfare payments. Figure 3.1 provides an overview of the distribution of income.

TABLE 3.1 THE FINANCIAL SITUATION OF FEMALE- AND MALE-HEADED HOUSEHOLDS

Variable	Description	Female-Headed	Male-Headed	Diff.
Monthly Income	Gross Per Capita Income in SAR	1019 SAR	1369 SAR	-350**
		$272	*$365*	
		(912)	(1093)	
Income from Wages	Per Capita Income in SAR	334	816	-482***
		(737)	(982)	
Income from Business	Per Capita Income in SAR	35	92	-57
		(103)	(368)	
Income from Pension	Per Capita Income in SAR	84	244	-160**
		(306)	(651)	
Income from Remittances	Per Capita Income in SAR	114	14	100***
		(302)	(138)	
Income Social Welfare Payments	Per Capita Income in SAR	431	173	258***
		(449)	(234)	
Income Others	Per Capita Income in SAR	21	30	-10
		(124)	(84)	

Note: * P<0.10, ** P<0.05, *** P<0.01 two-sided t-test. Standard errors in parentheses.
Source: Own survey

The social welfare system in Saudi Arabia consists of three main pillars. The first pillar is social security benefits. Those eligible for social security benefits are the disabled, orphans, men and women above the age of 60 and women who are divorced, widowed, abandoned by their husband or for other reasons are without a breadwinner. Healthy adult men below the age of 60 are usually not eligible for social security benefits in Saudi Arabia. The second pillar is the Citizen Account Program. This programme was introduced in 2017 to offset rising living costs for low-income families. All households with an income below a certain threshold are eligible. The threshold varies depending on the age and number of household members. The third pillar

is charity organisations. Both public and private charity organisations provide financial support to households in need. In addition, there are some smaller social welfare programmes. For example, the transportation programme called Wusool provides females with up to 800 SAR ($213) per month to cover the costs of transportation. It has benefitted 60,000 Saudi women so far (Saudi Press Agency, 2019). In addition, the child support programme called Qurrah covers part of day care costs, and around 3,000 women have benefited from this programme (Saudi Press Agency, 2020). However, none of the households in our sample received any benefits from these programmes.

FIGURE 3.1 HOUSEHOLDS MONTHLY PER CAPITA INCOME

Source: Own survey

The above information suggests that the social welfare system in Saudi Arabia generally favours women over men. However, we find that both genders were equally likely to receive social welfare payments when they were poor. Of the households that were classified as poor without social welfare payments, 84% of the female-headed households compared to 86% of the male-headed households were receiving social welfare. This difference was not significant. However, the poor female-headed households received, on average, a significantly higher amount than the male-headed households. On average, a female-headed household received 552 SAR per capita ($147) compared to 272 SAR per capita ($73) for male-headed households. Since female-headed households were poorer without social welfare payments, both genders were equally likely to be lifted out of poverty by social welfare. Around one third of the poor households were lifted out of poverty across both genders. A more detailed description of the distribution of social welfare payments can be found in Figures 3.A.7 and 3.A.8 in the Appendix.

In summary, our data suggest that, on average, poor female-headed households received a higher amount of social welfare payments than poor male-headed households. However, no gender difference was found in the share of households that were lifted out of poverty as a result of social security support payments.

Having focused on the financial aspects of female-headed households, attention now turns to the socioeconomic characteristics of female- and male-headed households (see Table 3.2). These include demographic factors, human and social capital, health, employment and personal attitudes. We find that male-headed households had, on average, more household members and dependents living outside the household. This is because adult men are expected to take care of their parents and female siblings if they are in need. Moreover, male household heads were more educated, having an average of four more years of education than female heads. When formal education was first introduced in 1962, it was only for males, and it took until the 1990s for female education to become more broadly acceptable in Saudi Arabia (Al Rawaf & Simmons, 1991). Therefore, most older women in Saudi Arabia have no education. Moreover, when resources are scarce, male education might be prioritised over female education, as is the case in other countries (Subrahmanian, 2005). Furthermore, interestingly, adult members in female-headed households were less educated than members in male-headed households.

Looking at employment, female-headed households were less likely to be employed. On the one hand, this was due to the fact that female heads were more likely to be unemployed (looking for a job, but not finding one based on self-reporting). On the other hand, it was also because many female-household heads were not part of the labour force (not working and not looking for work). In particular, elderly women and women with young children reported not working and not looking for work. In the literature, as highlighted in the introduction, the lack of affordable day care facilities, transportation issues and cultural values have been identified as the key reasons for women not to seek employment (Al Sharif & Ulrich-Schad, 2019).

Looking at the health situation of the households reveals that female heads were more likely to be unhealthy, with unhealthy defined as being disabled or sick for more than one month in the last year and having a level of sickness or disability that caused major limitations in completing daily tasks. This difference appeared even though there was no difference in the average age between female and male heads. In Saudi Arabia, health care is provided to all citizens free of charge. Hence, it is unlikely that female heads have less access to health care. This suggests that other factors are responsible for the difference, such as a less nutritious diet, increased exposure to stress and anxiety and less medical knowledge. Moreover, female-headed households had, on average, more unhealthy household members.

TABLE 3.2 DESCRIPTIVE STATISTICS OF THE HOUSEHOLD CHARACTERISTICS

Variable	Description	Female-Headed	Male-Headed	Diff.
Household Demographics				
Age of Household Head	Age in Years	48.70	48.40	0.30
		(15.86)	(13.65)	
Number of Household Members	Number of HH Members	5.21	6.66	-1.45***
		(3.43)	(3.32)	
Share of HH Members (≤18 Age)	Share of HH Members	0.35	0.37	-0.02
		(0.29)	(0.26)	
Additional Dependants	Number outside HH	0.06	0.42	-0.36**
		(0.29)	(1.41)	
Human Capital				
Years of Education Household Head	Years of Schooling	3.70	7.85	-4.15***
		(4.73)	(4.66)	
Average Years of Education Adult HH Members (Ages 19–60)	Average Years of Schooling	5.65	8.69	-3.04***
		(4.75)	(4.50)	
Employment				
Head Employed	Dummy: 1=Yes, 0 Otherwise	0.19	0.50	-0.31***
		(0.39)	(0.50)	
Head Self-Employed	Dummy: 1=Yes, 0 Otherwise	0.07	0.10	-0.02
		(0.26)	(0.30)	
Head Unemployed	Dummy: 1=Yes, 0 Otherwise	0.17	0.08	0.09**
		(0.38)	(0.27)	
Head Non-Labour Force	Dummy: 1=Yes, 0 Otherwise	0.57	0.33	0.25***
		(0.50)	(0.47)	
Head Non-Labour Force (Age 19–60)	Dummy: 1=Yes, 0 Otherwise	0.37	0.17	0.20***
		(0.49)	(0.38)	
Share of HH Members Employed	Share of HH Members	0.09	0.14	-0.06**
		(0.19)	(0.21)	
Health				
Head Unhealthy	Dummy: 1=Unhealthy, 0=Healthy	0.17	0.07	0.10***
		(0.38)	(0.25)	
Number of HH Members Unhealthy	Number of HH Members	0.29	0.15	0.13**
		(0.51)	(0.41)	
Social Capital				
Family Relationships	Scale: 0–6; 1=We Are Very Close to 6=We Are Not in Touch at All	2.49	1.96	0.52***
		(1.25)	(1.11)	
Kids Outside the HH	Dummy: 1=Yes, 0 Otherwise	0.36	0.22	0.14**
		(0.48)	(0.42)	
Father Died	Dummy: 1=Yes, 0 Otherwise	0.63	0.72	-0.09
		(0.49)	(0.45)	
Number of Brothers	Number of Brothers	3.41	4.12	-0.71
		(2.25)	(3.80)	
Personal Attitudes				
Risk-taking	Scale: 0–10; 0=Unwilling to Take Risk, 10=Fully Prepared to Take Risk	3.40	3.99	-0.59
		(3.15)	(3.59)	
Patience	Scale: 0–10; 0=Unwilling to Wait, 1=Fully Prepared to Wait	4.63	4.67	-0.04
		(3.82)	(3.88)	
Happiness Score	Scale: 0–10; 0=Very Unhappy, 1=Very Happy	6.59	6.52	-0.06
		(2.56)	(2.73)	

Note: Standard errors in parentheses. * $P<0.10$, ** $P<0.05$, *** $P<0.01$ two-sided t-test.
Source: Own survey

When it comes to social relations, female heads had, on average, a closer relationship with their families than male heads. Female heads also had more children living outside of the home. Those children not only constituted grown-up children that moved out of the household, but also children living with an ex-husband. Regarding personal attitudes, there were no significant differences between female- and male-headed households. Both had a similar attitude towards risk-taking, patience and happiness. More details about the distribution of the personal attitude variables can be found in Tables 3.A.1 to 3.A.6 in the Appendix.

3.4 Results and Discussions

3.4.1 Poverty among Female- and Male-Headed Households

This section starts by addressing the first research question, regarding the extent to which there are differences in poverty between female- and male-headed households in Saudi Arabia. This section will then discuss the third research question, which is focused on determining the role of Saudi Arabia's social welfare system in alleviating poverty among female- and male-headed households.

The results in Table 3.3 show that female-headed households had a higher poverty head-count ratio paralleled to their male-headed counterparts. In total, 50% of the female-headed households lived in poverty compared to 26% of the male-headed households. This implies that female-headed households were 24 percentage points more likely to be poor. The observation that female-headed households are overrepresented among the poor is robust to changes in the poverty line (see Table 3.A.1 in the Appendix). While this result was to be expected due to the traditional role of women in Arab societies, this is one of the first studies to be able to document this. As outlined in the introduction, other studies have found only limited evidence for the overrepresentation of female-headed households among the poor in the Arab world (Lanjouw, 2005; Iqbal, 2006; Bibi & Chatti, 2010; Al Azzawi, 2015; Al Azzawi, 2018; Ramadan, Hlasny & Intini, 2018; Hamati, 2019).

The above shows that female-headed households were more likely to live below the poverty line than male-headed households. However, female-headed households might also live further below the poverty line. For this purpose, we also studied the poverty gap index to measure the intensity and severity of poverty. As can be seen in Table 3.3, female-headed households stayed further below the poverty line based on the poverty gap index and were more severely affected by poverty based on the squared poverty gap index.

TABLE 3.3 DIFFERENCES IN POVERTY HEAD COUNT RATIO BETWEEN FEMALE- AND MALE-HEADED HOUSEHOLDS WITH AND WITHOUT SOCIAL WELFARE PAYMENTS

Poverty Rate	Female-Headed	Male-Headed	Diff.
Poverty Head-Count Ratio <u>Including</u> Social Welfare	0.50	0.26	0.24***
Poverty Head-Count Ratio <u>Excluding</u> Social Welfare	0.73	0.38	0.34***
Poverty Gap Index <u>Including</u> Social Welfare	0.20	0.08	0.13***
Squared Poverty Gap Index <u>Including</u> Social Welfare	0.10	0.04	0.07***
Poverty Gap Index <u>Excluding</u> Social Welfare	0.53	0.17	0.36***
Squared Poverty Gap Index <u>Excluding</u> Social Welfare	0.44	0.11	0.33***

Note: * P<0.10, ** P<0.05, *** P<0.01 two-sided t-test.
Source: Own survey

Having a closer look at the role the social welfare system plays shows that without social welfare payments, the probability of a female-headed household being poor was 34 percentage points higher than a male-headed household (when including social welfare payments, it was 24 percentage points higher). Hence, social welfare payments were able to offset some of the disadvantages of female-headed households. Moreover, social welfare payments were able to reduce the intensity and severity of poverty more strongly for female-headed households than for male-headed households, as can be seen by the poverty gap and the square poverty gap in Table 3.3. The reason for this is that female-headed households received, on average, higher social welfare payments than male-headed households (as outlined in the descriptive statistics). Nevertheless, whether including or excluding social welfare payments, female-headed households remained worse off than their male counterparts. Moreover, across both genders, only one third of poor households were lifted out of poverty by social welfare payments. The remaining households did not receive enough (or any) social welfare to escape poverty.

3.4.2 Determinants of Poverty among Female- and Male-Headed Households

In this section, we study the second research question, regarding the main factors that drive poverty of female-headed households as compared to their male-headed counterparts. Table 3.4 illustrates the results of the logit regression models as outlined in Section 3.2.3. One of the key factors explaining poverty outcomes was education. Each additional year of education obtained by the household head reduced the likelihood to be poor by six percentage points. However, as stated in the descriptive statistics, female heads had, on average, four years less education than male heads. Hence, education can explain some part of the gender gap in poverty. Female and male household heads equally benefitted from education, as can be seen from the insignificant interaction term between education and gender of the household head in Model 2.

Another key factor explaining poverty outcomes was employment. For a female household head, being unemployed (unsuccessfully looking for work) was a guarantee for poverty. In the sample, all households with an unemployed head lived below the poverty line. For male-headed households, unemployment of the household head strongly increased the likelihood of poverty. Since female household heads were more often unemployed than male household heads (see Section 3.3.2), unemployment adds to the gender difference in poverty. However, on closer inspection, the increased likelihood of female heads to be unemployed was no longer significant after adjusting for differences in education (p=0.315) [13] . In addition to unemployment, another issue was that many household heads were not in the labour force (not working and not looking for work). Over half of the female household heads and one third of the male household heads are in the non-labour force, as outlined in the descriptive statistics. However, households with a head in the non-labour force were approximately 20 percentage points more likely to be poor. Furthermore, both genders were equally negatively impacted by a household head in the non-labour force. This can be seen in the insignificant interaction term in Model 2 in Table 3.4. Lastly, the share of adult household members in employment strongly reduced the probability to be poor. However, additional breadwinners were not common in the sample; only 40% of households had more than one breadwinner.

Another significant determinant of poverty was social capital measured by the relationship of the household head to his/her family. When it comes to social capital, male-headed households were disadvantaged because, on average, male household heads were not as close to their families as female household heads. However, it was found that social capital reduces the probability of poverty. This is because household heads with a close relationship to their family can expect to receive more remittances from their family in times of need. Despite this, a female head with the same social capital did not receive more remittances than a male head, as can be seen from the insignificant interaction term.

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[13] The results are based on a logit model with head unemployed as the dependent variable and education and gender of the household head as the independent variable.

TABLE 3.4 FACTORS CORRELATED WITH POVERTY

Logit Models (Poverty Line=700 SAR excluding social welfare payments)	Model 1 Coefficients	Standard Errors	Marginal Effects	Model 2 Coefficients	Standard Errors	Marginal Effects
Household Demographics						
Female-Headed	1.05**	0.43	0.26**	1.12	1.15	0.27
Age of Household (HH) Head	-0.19***	0.06	-0.04***	-0.18***	0.59	-0.04***
Age of HH Head^2	0.002***	0.001	0.0004***	0.002***	0.001	0.0004***
Number of HH Members	0.38***	0.06	0.01***	0.39***	0.06	0.09***
Share HH Members (≤18 Age)	1.36**	0.69	0.32**	1.31*	0.70	0.31*
Additional Dependants	0.17	0.11	0.04	0.17	0.11	0.04
Human Capital						
Years of Education HH Head	-0.24***	0.04	-0.06***	-0.24***	0.04	-0.06***
Average Years of Education Adult HH Members (Age 19–60)	-0.09***	0.03	-0.02***	-0.09**	0.03	-0.02**
Years of Education HH Head x Gender HH Head				-0.0004	0.09	-0.0001
Employment						
Head Unemployed	3.13***	0.64	0.60***	3.17***	0.64	0.60***
Head Non-Labour Force	0.96***	0.37	0.23***	0.88**	0.39	0.21**
Share of HH Members Employed	-6.51***	1.12	-1.55***	-6.54***	1.13	-1.55***
Head Unemployed x Gender HH Head				Omitted[14]		
Head Non-Labour Force x Gender HH Head				0.63	0.89	0.15
Health						
Head Unhealthy	-0.06	0.49	-0.01	-0.06	0.55	-0.13
Number of HH Members Unhealthy	0.13	0.34	0.03	0.18	0.35	0.42
Head Unhealthy x Gender HH Head				-0.07	1.23	-0.16
Social Capital						
Family Relationship	0.27**	0.12	0.06**	0.28**	0.13	0.07**
Family Relationship x Gender HH Head				-0.17	0.36	-0.04
Personal Attitudes						
Risk-taking	0.03	0.04	0.01	0.03	0.04	0.006
Patience	-0.004	0.04	-0.001	-0.004	0.04	-0.001
Observations	496			496		
Pseudo. R^2	0.46			0.46		

Note: * P<0.10, ** P<0.05, *** P<0.01.
Source: Own survey

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[14] This variable had to be excluded because all unemployed female-headed households lived below the poverty line.

In addition, having more household members had a negative impact on poverty outcomes. Since female-headed households had, on average, less members than male-headed households (see descriptive statistics), the number of household members does not explain why female-headed households are poorer. Moreover, the variables 'age of the household head' and 'share of household members below 19' significantly impacted poverty. However, no differences were observed between female- and male-headed households (see descriptive statistics). Across both genders, older household members were less likely to be poor, and a higher share of children in the household increased the probability to be poor. Furthermore, health and personal attitudes were not significant determinants of poverty in the model.

Even after adjusting for differences in socioeconomic characteristics, female-headed households were 26 percentage points more likely to be poor. This shows that there are additional disadvantages for female-headed households that have not been captured by the model.

3.5 Summary, Conclusions and Policy Recommendations

This chapter has analysed poverty among female-headed households in low-income neighbourhoods in Saudi Arabia. It was found that female-headed households are more often and more severely affected by poverty than male-headed households. The main reasons for this outcome are related to differences in education and employment. Education was observed to be one of the key determinants of poverty, and female household heads lack education compared to male heads. This lack of education was discovered to exert influence over female heads' employment chances. In general, in our sample, female household heads are more often unemployed (unsuccessfully looking for work) than male heads. However, this difference was no longer significant after adjusting for differences in education. This implies that if female heads have the same educational level as their male counterparts, they will also have the same employment chances. Another key determinant of poverty is the household head not being in the labour force (not working and not looking for work). Around half of the female heads are in the non-labour force compared to one third of the male heads. Therefore, the fact that many female household heads are not even looking for employment adds to the gender poverty gap.

While differences in socioeconomic characteristics explain a large portion of the variation in poverty across the genders, they cannot explain all of it. Female household heads are around 26 percentage points more likely to be poor than male heads, even after adjusting for differences in socioeconomic characteristics. Further research is needed to fully understand the

reasons for this. Finally, this chapter examined the role that social welfare plays in regard to poverty across the genders. It was found that social welfare payments are able to offset some of the disadvantages of female-headed households, since female household heads receive, on average, higher social welfare payments. Nevertheless, even when including social welfare payments, female-headed households remain worse off than their male counterparts. Moreover, social welfare payments are only able to lift around one third of the female- and male-headed households out of poverty.

A couple of policy recommendations can be drawn from the above findings. First, to address the lack of education of female household heads, authorities could provide more training programmes for women to enhance women's employment opportunities. Another policy recommendation is to encourage female household heads to join the labour force. Awareness campaigns could increase the acceptance of females working in mixed-gender environments. Moreover, extending existing childcare and transportation programmes could be considerably beneficial. A final recommendation is to reduce the exclusion error of the social welfare system and increase the effectiveness of the programme for poverty elimination. Further research is needed to shed more light on the regulations and mechanisms of the social welfare system.

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Appendix

FIGURE 3.A.1 HAPPINESS MALE
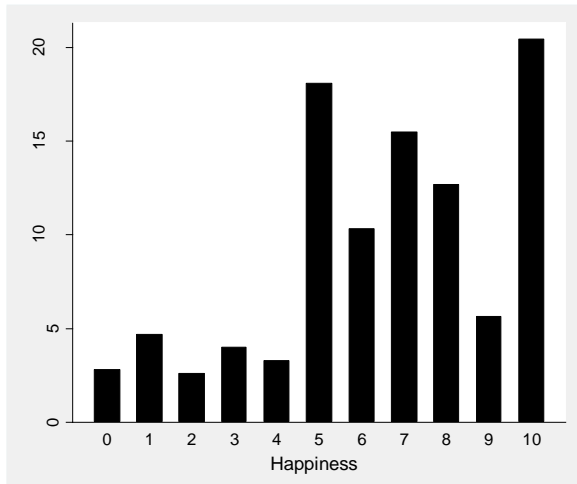
Source: Own survey
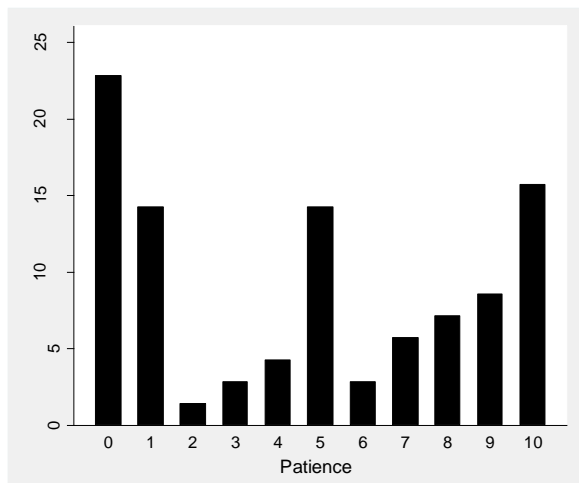
FIGURE 3.A.2 HAPPINESS FEMALE
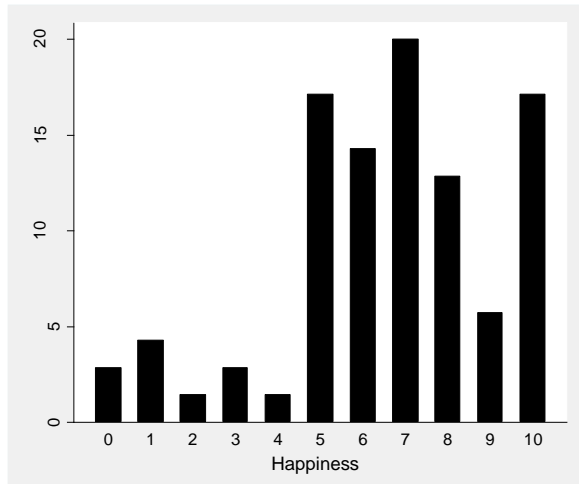
Source: Own survey
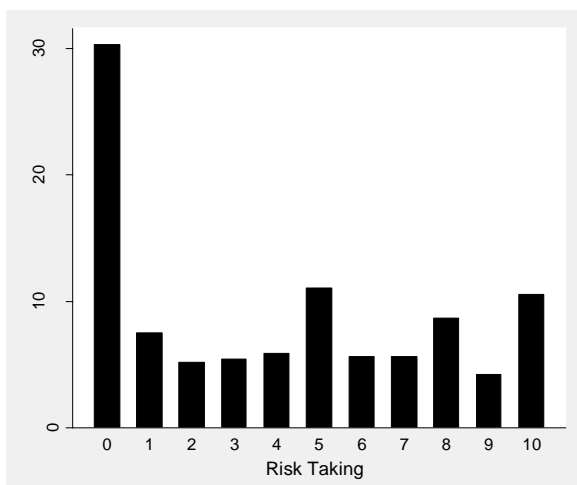
FIGURE 3.A.3 PATIENCE MALE
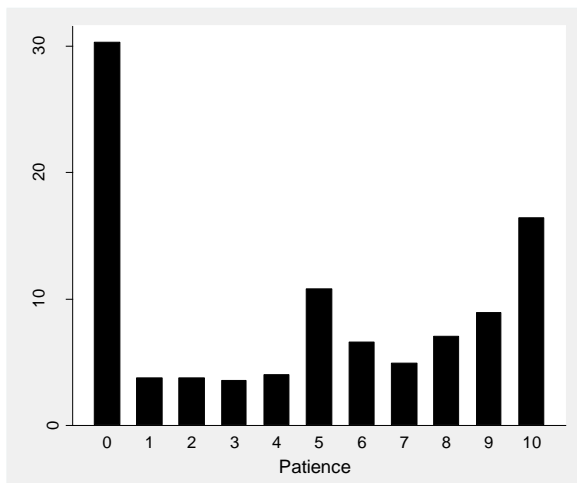
Source: Own survey

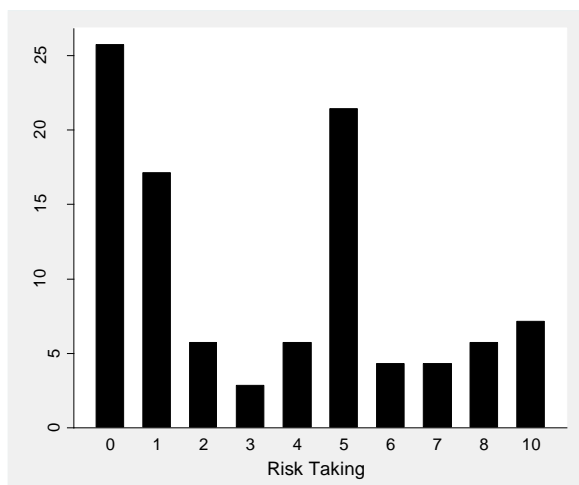FIGURE 3.A.4 PATIENCE FEMALE

Source: Own survey

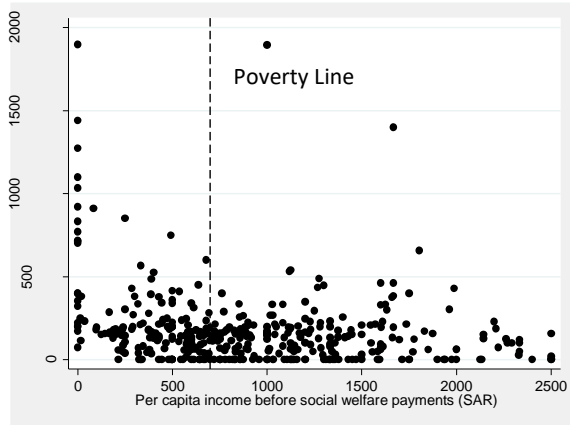FIGURE 3.A.5 RISK TAKING MALE

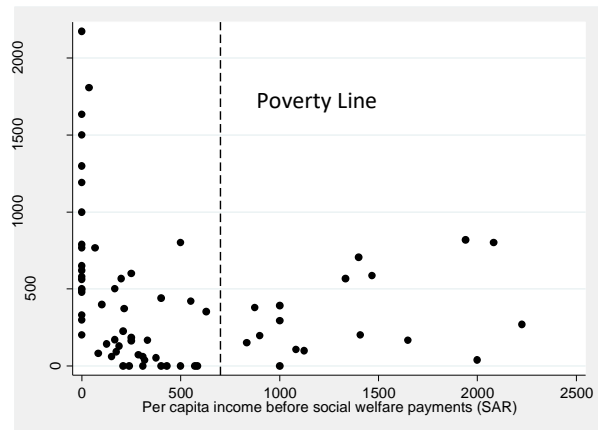*Source:* Own survey

FIGURE 3.A.6 RISK TAKING FEMALE

Source: Own survey

FIGURE 3.A.7 SOCIAL WELFARE PAYMENTS MHH

Source: Own survey

FIGURE 3.A.8 SOCIAL WELFARE PAYMENTS FHH

Source: Own survey

TABLE 3.A.1 POVERTY HEAD COUNT RATIO AT VARYING POVERTY LINES

Poverty Rate	Female-Headed	Male-Headed	Diff.
Poverty Head-Count Ratio (Poverty Line= 500 SAR)	0.39	0.13	0.26***
Poverty Head-Count Ratio (Poverty Line=600 SAR)	0.46	0.18	0.28***
Poverty Head-Count Ratio (Poverty Line=700 SAR)	0.50	0.26	0.24***
Poverty Head-Count Ratio (Poverty Line=800 SAR)	0.54	0.32	0.22***
Poverty Head-Count Ratio (Poverty Line=900 SAR)	0.59	0.40	0.18***
Poverty Head-Count Ratio (Poverty Line=1,000 SAR)	0.66	0.47	0.19***

Note: * P<0.10, ** P<0.05, *** P<0.01.
Source: Own survey

CHAPTER 4 RISK AND TIME PREFERENCES AMONG THE URBAN POOR IN SAUDI ARABIA

Abstract

This chapter is the first empirical research exploring the behavioral aspects of poverty in Saudi Arabia. It is based on a socioeconomic household survey and a lab-in-the field experiment to measure risk and time preferences among Saudi nationals living in the poor neighborhoods of Dammam. In total, 166 respondents took part in the study conducted in 2019. We define a discounted utility model, where we apply prospect theory and quasi-hyperbolic discounting. We then jointly estimate the risk and time preferences of the model using a maximum likelihood approach. Our results suggest that, on average, poor urban Saudis exhibit high levels of risk aversion and patience that are similar to other studies conducted with Muslim respondents in a rural setting. The level of risk aversion and patience is, however, higher than in other comparable studies in Asia and the US. In addition, we find that risk aversion and impatience are positively correlated with poverty. A further differentiation of poor households with respect to their social safety nets shows that respondents without access to governmental transfers or social networks are associated with a higher willingness to take risk.

4.1 Introduction

Risk and time preferences can influence economic decisions related to education, labor market outcomes, investments, health, and migration. Therefore, they have real-world consequences that ultimately affect wealth.[15] Consequently, understanding poor people's risk and time preferences is essential to design effective strategies that will help the poor escape poverty. Although this may be applicable across all regions of the world, it is of particular interest in closed societies and in countries where cultural or religious rules are a major determinant of daily life. The Kingdom of Saudi Arabia falls into this category. In Saudi Arabia, religious and social norms regulate almost every aspect of daily life. For instance, in many public and private spaces, there are separated sections for men and women (i.e., in government buildings, schools, universities, and restaurants). Moreover, Saudi Arabia has strongly protected its cultural norms from outside influences (mainly "Western values"). Until recently[16], the country did not issue any tourist visas and only allowed pilgrims and expatriate workers (who live in separated compounds) to enter the Kingdom.

Because of Saudi Arabia's prominent role in the Arab region as well as in world politics, empirical economic research is highly relevant. This chapter aims to analyze the correlation between poverty and risk and time preferences in Saudi Arabia, a cultural environment of which, to date, there is little knowledge. Against conventional beliefs, there is a considerably high level of relative poverty in the country – although there is little hard evidence based on scientifically rigorous studies. There are technical reports (e.g., Koontz, 2015) and reports in the international press (Sullivan, 2013). According to these reports, it is estimated that around 20% of the Saudi population live in poverty, with the majority of them living in large cities (Al Damag, 2014). The overall research objective of the chapter is to enhance our understanding of the possible correlation between urban poverty and risk and time preferences in the Kingdom. It is the first study to conduct a socioeconomic survey and an incentivized lab-in-the-field experiment to investigate risk and time preferences among a sample of Saudi respondents living in poor urban neighborhoods.

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[15] See Hong, Kubik, and Stein (2004), Ashraf, Karlan, and Yin (2006), Bonin et al. (2007), Anderson and Mellor (2008), Jaeger et al. (2010), Dohmen and Falk (2011), Outreville (2015), Dawson and Henley (2015), Hsieh, Parker and van Praag (2017), Schildberg-Hörisch (2018), and Dustmann et al. (2020).

[16] Recently, Saudi Arabia has been opening up by issuing tourist visas, allowing more foreign research teams to enter the country and removing the religious police (*Mutawa*); nevertheless, the country remains protective of its cultural values.

An essential component of the study's conceptualization is the recognition of the unique cultural setting. Saudi culture is mainly shaped by two identities, namely being Muslim and being Arab (Thompson, 2019). In Islam, risk taking should be generally avoided (Noor, Ismail & Shafiai, 2018). In particular, risks associated with gambling are prohibited; however, risks associated with entrepreneurship are acceptable (Al Suwailem, 2011). Regarding patience, the Qur'an also provides guidance: "all men and women who are patient in adversity […] for them has God readied forgiveness of sins and a mighty reward" (Qur'an 33:35).

In addition to Islam, Saudi Arabia's historical Arab roots might shape risk taking and patience. However, cultural research into this matter are limited and mainly based on anecdotal evidence. Nevertheless, they suggest that, overall, Arabs are patient and cautious when it comes to risk taking. For example, Wunderle (2006) describes Arab culture as exhibiting uncertainty avoidance, which manifests itself through strict laws and rules, resistance to change, and cautiousness in negotiations. In addition, Alon and Brett (2007) observe that Arabs are patient in negotiations and prefer to take their time to get to know the other party. Moreover, Arabs have a patient approach to time. Usually, meetings do not start at an exact time, but rather whenever the other party arrives. Therefore, overall, taking Saudi Arabia's Islamic and Arab cultural background into consideration, one would expect Saudis to be relatively risk averse and patient.

The empirical basis of our analysis is a sample of 166 respondents from 9 poor urban neighborhoods in Dammam, one of the 5 big cities in Saudi Arabia. The respondents participated in both a household survey and an incentivized lab-in-the-field experiment to elicit their risk and time preferences, following Tanaka, Camerer and Nguyen's (2010) approach. We apply prospect theory (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992) and quasi-hyperbolic discounting (Laibson, 1997; O'Donoghue & Rabin, 1999) and estimate the risk and time preference parameters using Nguyen's (2011) maximum likelihood approach.

Our results show that Saudi households in the poor neighborhoods of Dammam are comparably risk averse, loss averse, and patient. In addition, the households' level of risk taking and impatience is related to stronger religious beliefs. Furthermore, a lack of education and coming from a family with Bedouin roots are associated with impatience. Regarding correlations with poverty, our findings suggest a positive correlation with risk aversion and impatience. Finally, our results highlight the role of social safety nets among the urban poor in Saudi Arabia, as

poorer households without access to social safety nets have higher levels of risk taking than richer households.

The remainder of the chapter is structured as follows. Section 4.2 reviews the relevant literature related to poverty and risk and time preferences. Section 4.3 presents the conceptual framework, Section 4.4 outlines the estimation approach, and Section 4.5 describes the data collection process. Section 4.6 discusses the research findings, and Section 4.7 summarizes the study and presents the conclusions.

4.2 Literature Review

Many studies have suggested that poor individuals are more risk averse and have higher discount rates than wealthier individuals (Fisher, 1930; Arrow, 1970; Klasen & Povel, 2013; Haushofer & Fehr, 2014). Empirical support for this intuition is, however, not conclusive. In this section, we will review the studies that have focused on either rural households (primarily engaged in agriculture) in developing countries in Asia, Africa and Latin America or urban households in developed countries in North America and Europe.

In developing countries, empirical evidence in the literature suggests that the correlation between poverty and risk and time preferences is not universal. There are substantial variations by country and the type of poverty indicator examined (i.e., income or wealth). After analyzing the relationship between wealth and risk taking, Binswanger (1980), Liebenehm and Waibel (2014), and Vieider et al. (2019) find no relationship in India, Mali and Burkina Faso, and Vietnam, respectively. In contrast, other studies observe a positive relationship between risk taking and wealth in Ethiopia and Pakistan (Yesuf & Bluffstone, 2009; Ahmad, Afzal & Rauf, 2019). Using income instead of wealth as a poverty indicator, studies conducted in Thailand, Vietnam, Pakistan, Ethiopia and West Africa show that households with higher income have higher levels of risk taking (Tanaka et al., 2010; Gloede, Menkhoff & Waibel, 2013; Liebenehm & Waibel, 2014; Vieider et al., 2018; Ahmad et al., 2019; Vieider et al., 2019). The exceptions are Nguyen (2010) and Nguyen (2011), who report that, in a sample of Vietnamese fishermen, risk taking is not correlated with income. Moreover, Cardenas and Carpenter (2013) find no significant relationship between income and risk preference in Latin America.

Regarding time preferences, Pender (1996), Yesuf and Bluffstone (2009) and Liebenehm and Waibel (2014) observe that wealthier farmers in India, Ethiopia and West Africa are more patient. Furthermore, Tanaka et al. (2010) and Liebenehm and Waibel (2014) find a positive

relationship between income and patience. In contrast, Kirby et al. (2002) and Anderson et al. (2004), report no correlation between poverty and time preferences in Bolivia and Vietnam, respectively.

In developed countries, the relationship between welfare and risk and time preferences is less conflicting. In general, the literature reports a positive relationship between risk aversion and poverty, measured in terms of either income or wealth. Empirical studies conducted in Germany, Denmark, Norway, Italy, and the US find that households with higher income and wealth are less risk averse (Donkers, Melenberg & Van Soest, 2001; Guiso & Paiella, 2008; Dohmen et al., 2011; Fang, Hanna & Chatterjee, 2013; Hopland, Matsen & Strom, 2016). One notable exception is Barsky et al. (1997), who discover that, in the US, risk aversion increases with higher income and wealth until the middle of the distribution, after which it starts to decrease. This implies an inverted u-shaped relationship between risk aversion and both income and wealth. In addition, Lawrance (1991) finds that low-income US households are more impatient than high-income households, and Harrison, Lau and Williams (2002) observe a positive relationship between patience and both income and wealth in Denmark.

The above literature shows that regional and cultural variations matter when aiming to understand the relationship between poverty and risk and time preferences. However, one region that has been excluded from the literature so far is the Middle East. An exception is the Global Preference Survey (GPS), which measures people's risk and time preferences across 76 countries, including Middle Eastern countries (Falk et al., 2018). According to the GPS, Saudis are among the least risk averse people in the world, yet they are relatively patient. In principle, the GPS results can serve as a point of departure for this study. However, while the GPS uses a survey approach, in this chapter, we investigate the relationship between welfare indicators and risk and time preferences on the basis of lab-in-the-field experiment.

4.3 Conceptual Framework

The basic idea for our conceptual approach was developed by Andersen et al. (2008), who argue that discount rates tend to be overestimated when individuals' actual risk preferences are ignored. For this reason, they recommend that risk and time preferences should be jointly estimated. Nguyen (2011), Harrison, Lau and Rutström (2011), and Coller, Harrison and Rutström (2012) further developed this idea. We follow Nguyen (2011) and define a discounted utility model, where we apply prospect theory to define the utility function (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992) and quasi-hyperbolic discounting to define the

discounting function (Laibson 1997; O'Donoghue & Rabin, 1999). Thus, the discounted utility of a monetary prospect (x) at a time (t) is modelled as follows:

(4.1) $U(x, t) = PT(x)D(t),$

where PT is the utility function and D is the discount function. The utility function under prospect theory can be expressed as:

(4.2) $PT(x, p; y, 1-p) = \begin{cases} v(y) + w(p)(v(x) - v(y)), x > y > 0 \text{ or } x < y < 0 \\ w(p)v(x) + w(1-p)v(y), x < 0 < y, \end{cases}$

where the value of the binary prospect (x, y) with probabilities (p, $1-p$) is described based on individuals' value (v) and weighting functions (w). In defining the reference point, we follow Liebenehm and Waibel (2014) and use zero as the reference point. However, as a robustness check, we also estimated the risk and time preferences using the lower of the two payouts as a reference point when both x and y are either positive or negative, and zero otherwise (see Table 4.B.2 in the Appendix). The value function models losses and gains separately:

(4.3) $v(x) = \begin{cases} x^\sigma, \text{if } x \geq 0 \\ -\lambda(-x)^\sigma, \text{if } x < 0, \end{cases}$

where σ reflects risk aversion and λ reflects loss aversion. For risk-averse individuals, σ is below 1, meaning that the value function is concave for gains and convex for losses. Typically, λ is above 1, as losses loom larger than gains. The weighting function of the model is based on Prelec (1998):

(4.4) $w(p) = \dfrac{1}{exp[ln(1/p)]^\alpha},$

where α is the probability weighting parameter. If α is less than 1, individuals tend to underweight large probabilities and overweight small probabilities. The discount function (D) applied in the model follows quasi-hyperbolic discounting:

(4.5) $D(t; \beta, \delta) = \beta exp(-\delta t)$ for $t > 0$,

where δ is the discount rate and β is the present bias parameter. The discount rate is between 0 and 1, and the greater δ is, the greater the discrimination of future values. The present bias β is typically below 1, and the smaller beta is, the larger the costs associated with future values.

As stated in the introduction, we expect Saudis to be relatively risk averse and patient. Although the GPS (Falk et al., 2018) found Saudis to be risk takers, based on our literature review of Arab culture and Islamic values, we hypothesize that poorer Saudis in particular are comparably risk averse. Therefore, with respect to the three risk aversion parameters, we expect α and σ to be below 1, and λ to be above 1. With respect to the two-time preference parameters, we expect δ to be relatively small and β to be below 1.

4.4 Methodology

We simultaneously estimate the five parameters of the discounted utility model (α, β, δ, λ, σ) specified in equation (1) using a maximum likelihood estimation approach, following Nguyen (2011). In the lab-in-the-field experiment (described in more detail in Section 4.5.2), participants had to make several choices between two prospects, A and B, in both the risk experiment and the time experiment. We assume that the first switch from option A to option B in each series adequately reflects a respondent's preference for option B over option A. We therefore assume that, at this switching point, a respondent's perceived utility of option B is greater than their perceived utility of option A. The utility of options A and B for a decision task j received by participant i can be expressed as follows:

$$(4.6) \qquad U_i^{A;j} = PT_i^{A;j}(X_i; Z^{A;j}) D_i(t^{A;j}; X_i) + \varepsilon_i^{A;j}$$

$$(4.7) \qquad U_i^{B;j} = PT_i^{B;j}(X_i; Z^{B;j}) D_i(t^{B;j}; X_i) + \varepsilon_i^{B;j},$$

where PT_i^j is the utility function under prospect theory, X_i is a vector of individuals' characteristics observed in the household survey, D_i is the quasi-hyperbolic discounting function, Z^j reflects the probabilities and payoffs of scenario j, and ε_i^j is an independent and identically normally distributed error term. The utility of each lottery pair is calculated by the latent index ∇U_i^j

$$(4.8) \qquad \nabla U_i^j = U_i^{B,j} - U_i^{A,j}.$$

The latent index, based on concealed preferences, is then linked to the observed choices using a standard cumulative normal distribution function $\Phi(\nabla U_i^j)$. The conditional log-likelihood of choosing option B can then be written as:

$$(4.9) \qquad lnL_i\big(\alpha, \beta, \delta, \lambda, \sigma; X_i, Z^j, y^j\big) =$$

$$\sum_{j=1}^{110}\{[ln\ \Phi(\nabla U_i^j)|y_i^j = 1] + [ln\ (1 - \Phi(\nabla U_i^j))|y_i^j = 0]\}$$

and depends on the utility function parameters under prospect theory (alpha, sigma, lambda), the discount function parameters (delta and beta), and 110 observed binary choices in the risk and time experiment. Participants' choices y_i^j were coded 1 if participant i in scenario j chose option B and 0 otherwise. The maximum likelihood estimation of the parameters can be expressed as:

(4.10) $\qquad (\hat{\alpha}, \hat{\beta}, \hat{\delta}, \hat{\lambda}, \hat{\sigma}) = arg\ max\ L(\alpha, \beta, \delta, \lambda, \sigma;\ X, Z, \text{y}).$

The function has been written in Stata 14 to estimate the risk and time preference parameters and evaluate their correlation with socioeconomic characteristics and poverty indicators.

4.5 Data

This study is based on a socioeconomic household survey conducted with 496 households randomly selected from poor neighborhoods across the city of Dammam and an incentivized lab-in-the-field experiment conducted with a random subsample of 166 respondents. Dammam is a city in the Eastern province of Saudi Arabia with a population of around 1.2 million. Poverty in Dammam is typical of poverty in Saudi Arabia, as the vast majority of poor households live in the large metropolitan cities, namely Riyadh, Jeddah, Makah, Medina, and Dammam (Al Damag, 2014).

4.5.1 Household Survey and Respondents' Characteristics

To identify a sample that is representative of the urban poor population in Dammam, with the help of insider knowledge from charity organizations, we initially identified nine neighbourhoods in which there are many poor Saudi households. All the poor neighbourhoods were located in central Dammam and were often referred to by the local community as "the old neighbourhoods." We then determined the dwellings within those nine neighbourhoods through satellite image data and randomly marked every tenth dwelling to be interviewed. Since the household survey focused on Saudi nationals, dwellings occupied by foreigners were excluded from the study. In total, 496 Saudi households were interviewed. The estimated baseline population in the nine neighbourhoods was approximately 60,000 households or 300,000 people, of which 20,000 were Saudi households (130,000 people) and the remainder were foreign households. Of the 496 interviewed households, every third household was

selected to also take part in the field experiment, and therefore 166 households took part in both the household survey and the field experiment. As an incentive to take part in the household survey, participants received a fixed payment of 50 SAR ($13.30) for completing the survey.

Table 4.1 presents the characteristics of our analytical sample of 166 households. On average, household heads were aged 46 years, and 17% of the household heads were women. Moreover, on average, a household head received seven years of education, while 28% had received no formal school education. Only 10% of respondents had a university degree. Additionally, 44% of the household heads self-classified themselves as Bedouins (descendants of pastoral nomads). Although most of the Bedouins in Saudi Arabia have settled down nowadays, being a descendant of Bedouins has become a form of ethnic identity within Saudi society.

We also asked respondents to self-assess their degree of religiosity on a 4-point Likert scale ranging from "very strongly religious" to "not very religious"[17]. On average, Saudis describe themselves as moderately religious.

Regarding monetary poverty indicators, it was found that households' average monthly income per capita was 1,264 SAR ($337)[18]. The household's monthly income per capita comprises all income received from employment, the government, charity organizations, friends or family members, "good people" (a local term referring to private individuals who give donations to the poor, often anonymously), and in-kind donations. Since there is no income tax in Saudi Arabia, it can also be interpreted as the household's monthly income after taxes and subsidies.

Furthermore, 10% of the household heads were self-employed and earned a living by selling goods or services either from home or outside the home. However, the majority worked in the private and public sectors. The household's average monthly consumption per capita was 1,023 SAR ($273), implying that, on average, households were able to save some money each month. On average, households had total financial assets of 6,561 SAR ($1,750). The variable "financial asset" includes cash savings, deposits at banks, and savings through communal saving schemes.

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[17] The possible answer "not religious at all" was excluded, as all Saudis are Muslims by law and being "not religious" would be illegal. That said, there are non-Muslim expats in Saudi.

[18] All the currency conversions in this chapter are based on the country's fixed market exchange rate of 3.75 SAR per US dollar. This was based on the notion that the official purchasing power parity exchange rate is not a very accurate reflection of purchasing power.

TABLE 4.1 DESCRIPTIVE STATISTICS OF THE HOUSEHOLD HEADS' CHARACTERISTICS

Variable	Description	Mean	SD
Age of Household Head (HH)	Age in Years	45.60	13.02
Gender of HH	Dummy: 1 = Female, 0 = Male	0.17	0.38
Household Size	Number of Household Members	6.63	3.60
Head Bedouin	Dummy: 1 = Bedouin, 0 = Non-Bedouin	0.44	0.50
Head Religiosity	1 = Not Very Religious	2.33	0.64
	2 = Moderately Religious		
	3 = Strongly Religious		
	4 = Very Strongly Religious		
Years of Education HH	Years of Education	6.96	4.98
Years of Education Female HH	Years of Education	3.24	4.82
Head No Formal Education	Dummy: 1 = Yes, 0 = No	0.28	0.45
Female Head No Formal Education	Dummy: 1 = Yes, 0 = No	0.66	0.48
Head Primary School	Dummy: 1 = Yes, 0 = No	0.21	0.41
Head Secondary School	Dummy: 1 = Yes, 0 = No	0.20	0.41
Head High School	Dummy: 1 = Yes, 0 = No	0.20	0.40
Head University	Dummy: 1 = Yes, 0 = No	0.10	0.30
Head Unemployed	Dummy: 1 = Yes, 0 = No	0.05	0.23
Head Employed by the Military	Dummy: 1 = Yes, 0 = No	0.10	0.30
Head Employed by the Public Sector	Dummy: 1 = Yes, 0 = No	0.14	0.35
Head Employed by the Private Sector	Dummy: 1 = Yes, 0 = No	0.28	0.45
Head Self-employed	Dummy: 1 = Yes, 0 = No	0.10	0.30
Head Not in Labor Force	Dummy: 1 = Yes, 0 = No	0.34	0.47
Household Income	Income per Capita in SAR	1,264 ($337)	1,031 ($275)
Household Consumption	Consumption per Capita in SAR	1,023 ($273)	617 ($165)
Household Financial Assets	Financial Assets in SAR	6,561 ($1,750)	35,667 ($9,511)
House/Apartment Ownership	Dummy: 1 = Yes, 0 = No	0.19	0.39

Note: N =166
Source: Own survey

4.5.2 Lab-in-the-Field Experiment

The design of our lab-in-the-field experiment to elicit risk and time preferences is based on Tanaka et al. (2010) and has been applied by other studies, such as those conducted by Nguyen (2011), Liebenehm and Waibel (2014), and Ackert et al. (2020). The experiment consisted of two parts: one to estimate participants' risk preferences, and one to estimate their time preferences. Both parts were programmed in Survey Solutions, a software solution developed by the World Bank for computer-assisted interviews (https://mysurvey.solutions). In the risk experiment, participants made 35 choices between a risky and a less risky lottery. The probabilities of the lotteries were illustrated on the tablet with two colored balls, similar to the paper-based approach used by Liebenehm and Waibel (2014). For example, if there was a 30% chance to get a payment x and a 70% chance to get a payment y, participants would see a "bag" on the tablet with three blue balls and seven green balls (see Figure 4.A.1 in the Appendix). To further help participants to visualize the decision, interviewers showed participants an actual bag with

different colored balls at the beginning of the experiment. The first 28 choices included only positive payoffs. The last seven choices also included negative payoffs to measure participants' loss aversion. However, since participants received a fixed payment of 50 SAR ($13.30) for taking part in the household survey, the possibility that participants suffered any overall loss for taking part in the experiment was excluded for ethical reasons. The payoff structure of each lottery is shown in Table 4.A.1 in the Appendix. Moreover, to avoid giving participants the impression that the experiment is related to gambling in any way, the words used to describe the lotteries were carefully selected and based on terminology used in statistics school textbooks. For example, the Arabic word for "lottery" was replaced with the Arabic word for "option." Additionally, the word for "chips" (used, for example, in Liebenehm and Waibel, 2014) was replaced with the word for "balls." The careful wording proved to be effective, as none of the participants declined to take part in the experiment for cultural reasons.

After completing the risk experiment, the time experiment was carried out. In this experiment, participants were asked to make 75 choices between receiving a smaller amount today or a larger amount at various times in the future. A detailed description of the payoffs and time frames is shown in Table 4.A.2 in the Appendix. In the risk and time experiments, participants had to make a total of 110 (35 + 75) choices. No monotonic switching was enforced. [19] This was done as a robustness check. Subjects that switched many times between option A and option B were removed from the research sample. In total, 5 observations were deleted, meaning that the final sample size was 166.

After respondents had completed both experiments, 1 of the 110 choices was randomly selected, and the participant received the reward according to the decision they had made.[20] On average, respondents received 110 SAR ($29), equivalent to 2.6 times the average daily per capita income, for taking part in the experiment. The highest payment a household could receive was 1,500 SAR ($400) (equivalent to 1.2 times the average monthly per capita income). In the studies conducted by Tanaka et al. (2010) and Nguyen (2010), the highest payoff was 1,700,000 Vietnamese dongs equivalent to 1.7 times the average monthly household income.

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[19] In monotonic switching, once a participant switches to option B in a series, the participant immediately moves on to the next series without making the remaining choices in the series.

[20] It should be noted that all delayed payments were in fact made immediately. This was done due to logistic and budget constraints. However, participants were not made aware of the fact that all payments were made immediately, neither ex-ante nor ex-post.

Figure 4.B.1, 4.B.2 and 4.B.3 in the Appendix provide a detailed breakdown of the distribution of the risk and time preferences of poor urban Saudis.

4.6 Findings

Our presentation of the research findings starts with the average risk and time preferences of the Saudi households in our sample. Subsequently, we examine the correlation between risk and time preferences and the household's socioeconomic characteristics. Next, we study the correlation between risk and time preferences and monetary poverty measures such as income and assets, and finally, we look at safety nets.

4.6.1 Average Risk and Time Preferences of the Urban Poor in Saudi Arabia

Table 4.2 shows the average parameter estimates of our sample. The **probability weighting** parameter α is below 1, indicating that, in general, households overweight the probability of unlikely events and underweight the probability of likely events. This is consistent with the tenets of prospect theory and aligns with the results of other studies (e.g., Abdellaoui, 2000; Tanaka et al., 2010; Nguyen, 2011; Liebenehm & Waibel, 2014; Chai & Ngai, 2020). The magnitude of the probability weighting parameter suggests that respondents were not assessing probabilities very accurately. This observation is in line with Abdeldayem and Darwish (2018), who report that Arabs in general are not good at probability assessments. The parameter σ approximates **risk aversion**. Since σ is < 1, it suggests that, on average, poor rural household heads in Saudi Arabia are risk averse. Moreover, compared to other studies adopting the same methodology (see Table 4.B.1 in the Appendix), the poor urban Saudi households are among the most risk averse. This finding is in contrast to the result of Falk et al. (2018) that Saudis are among the least risk averse people in the world. However, the result is in line with our expectation that Islam and Arab culture discourage risk taking. The **loss aversion** parameter λ is well above 1, which indicates that, on average, our respondents are loss averse. This observation is in line with other studies, such as Tanaka et al. (2010), Nguyen (2011), Liu (2013), Liebenehm and Waibel (2014), and Ackert et al. (2020).

Respondents' **time preferences** are measured by the parameters of present bias (β) and discount rate (δ). The larger the discount rate and the smaller the present bias parameter, the more impatient a respondent is. Compared to other studies adopting a similar methodology (see Table 4.B.1 in the Appendix), the respondents in our sample exhibit a low discount rate. The average estimate of the present bias parameter among our sample is smaller than that in three

of the four comparable studies depicted in Table 4.B.1; however, it is high compared to observations from a large-scale survey on international time discounting conducted in 45 countries (Wang, Rieger & Hens, 2016). Therefore, in the absence of a clear threshold, we interpret the low discount rate and the present bias parameters as an indication of a relatively high level of patience.

This finding is in line with our expectation that Saudis' Islamic and Arab roots encourage patience. In summary, the average parameter estimates indicate that poor urban households in Saudi Arabia are comparably risk averse and loss averse, overweight small probabilities and underweight large probabilities, and are relatively patient.

TABLE 4.2 ESTIMATIONS OF RISK AND TIME PREFERENCE PARAMETERS

Parameters	Coefficients	Robust Standard Errors
Probability Weight (α)	0.25***	(0.02)
Risk Aversion (σ)	0.24***	(0.008)
Loss Aversion (λ)	2.40***	(0.15)
Time Preferences (δ)	0.004***	(0.0005)
Present Bias (β)	0.74***	(0.02)

Note: N = 18,260 (Number of Clusters = 166).   * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Own survey.

As part of our robustness checks, we tested the sensitivity of our parameter estimates to alternative reference points. Table 4.B.2 in the Appendix shows that the estimates obtained in Table 4.2 remain quantitatively and qualitatively unchanged. In addition, we examined if a standard expected utility model in which α and λ equals one would fit our data, but we had to reject this hypothesis as can been seen in Table 4.B.3 in the Appendix.

4.6.2 The Correlation of Risk and Time Preferences with Socioeconomic Characteristics

In the next step, we investigate how the risk and time preference parameters correlate with respondents' socioeconomic characteristics, such as gender, age, education, Bedouin heritage, and religion. Table 4.3 shows significant correlations between the risk and time parameters and the two culturally important factors, namely religion and Bedouin heritage, as well as education. There is, however, no significant correlation with gender or age.

More specifically, stronger *religious* beliefs are associated with a lower level of risk aversion. Given that Islam discourages risk taking, initially, this finding seems unexpected. However, all Saudis are Muslims, and people only vary in the intensity of their religious beliefs. In this setting, people with a stronger faith in God might believe that an outcome is ultimately dependent on God's will alone. Therefore, a stronger belief may encourage risk-taking

behaviour. This observation is in line with other studies conducted with Muslim respondents in West Africa and Pakistan (Liebenehm & Waibel, 2014; Ahmad et al., 2019).

Furthermore, Table 4.3 indicates a significant negative correlation between religious belief and the parameter of present bias. In other words, a stronger religious belief is associated with a greater present bias, which contradicts the notion that Islam values patience. However, as stated above, in Saudi Arabia, people only vary in terms of the intensity of their religious beliefs. People with deep religious convictions might feel that they should be satisfied with what they can have today and not desire to have more in the future. The concept of contentment (Qana'ah), to be satisfied with what one has and not to desire more, is a deeply rooted concept in Islam (Ali, 2014).

Regarding the ***Bedouin heritage***, we observe a positive correlation with the discount rate (albeit only significant at the 10% level). This positive correlation indicates that individuals of Bedouin origin are less patient. This could be explained by the fact that the nomadic lifestyle forced Bedouins to focus on short-term investments, as they stayed in a place for only a short period of time. Therefore, all the benefits needed to be extracted in the short term.

Finally, *education* is associated with a lower present bias, as indicated by the positive correlation coefficient. This is in line with other studies that found a positive relationship between education and patience (Wang, Rieger & Hens, 2009; Liebenehm & Waibel, 2014; Perez-Arce, 2017).

TABLE 4.3 RISK AND TIME PREFERENCES AND SOCIOECONOMIC CHARACTERISTICS

Independent Variable	Probability Weight (α)	Risk Aversion (σ)	Loss Aversion (λ)	Discount Rate (δ)	Present Bias (β)
Gender	−0.027	0.006	−0.632	0.003	0.025
	(0.051)	(0.026)	(0.410)	(0.002)	(0.068)
Age	0.001	0.001	0.015	−0.0001	−0.0001
	(0.002)	(0.001)	(0.015)	(0.0001)	(0.002)
Education	0.003	0.002	−0.028	−0.0001	0.018***
	(0.005)	(0.003)	(0.039)	(0.0001)	(0.006)
Bedouin	−0.068	−0.037	−0.253	0.004*	−0.051
	(0.055)	(0.025)	(0.320)	(0.002)	(0.052)
Religiosity	−0.029	0.028**	−0.084	−0.001	−0.076**
	(0.026)	(0.013)	(0.217)	(0.001)	(0.036)

Note: Robust Standard Errors in Parenthesis. N = 18,260 (Number of Clusters = 166). * p < 0.10, ** p < 0.05, *** p < 0.01
Source: Own survey.

4.6.3 The Correlation of Risk and Time Preferences with Poverty Indicators

In this subsection, we analyse the correlation of risk and time preferences with monetary poverty indicators, namely household income per capita and assets. All the regression models in this subsection control for the socioeconomic variables discussed in the previous subsection.

Table 4.4 shows the correlation of the risk and time preference parameters with ***income.*** We run two models. In the first model, we show the correlation with income per capita, and in the second model, we show the correlation with income terciles. We obtain a positive correlation coefficient between per capita income and the risk aversion parameter. In other words, richer respondents are associated with lower levels of risk aversion. Splitting household income into terciles in the second model indicates that respondents in the middle income category are associated with higher levels of risk aversion than those in the upper income category.

Poverty can also be defined in terms of ***assets***, namely a household that does not have sufficient assets may be above the income poverty line but below the asset poverty line and is therefore considered structurally poor (Carter & Barret, 2006; Chiwaula, Witt & Waibel, 2011). As shown in Table 4.5, we run two different specifications with asset indicators, namely property assets and financial assets. In model 1, the binary variable property assets is equal to 1 if the household owns a house or an apartment, and 0 otherwise. In Table 4.5, we can observe a positive correlation between property assets and the present bias parameter. In other words, respondents who own property are associated with a smaller preference for the present. In model 2, we use the financial asset indicator, following the concept of financial asset poverty based on Haveman and Wolff (2004). A household is classified as financial asset poor if the household's savings are not sufficient to allow the household to live above the poverty line for at least 3 months. For the analysis, the inflation-adjusted national poverty line of 700 SAR per person per month is used (Bin Saeed 2008; GASTAT [General Authority for Statistics] 2019)[21].

Table 4.5 shows that financially asset poor respondents are associated with higher levels of risk aversion and loss aversion, and greater discounting of the future. In summary, our analysis of the correlations between risk and time preference parameters and different monetary poverty indicators suggests that among our urban sample in Saudi Arabia, poverty is correlated with risk aversion and impatience. This result is consistent with those of other studies conducted in

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[21] Robustness checks at the poverty lines of 500 SAR and 1,500 SAR have been conducted to ensure the results are not driven by the selection of the poverty line.

developed countries that generally find a positive relationship between poverty and risk aversion and impatience (Donkers, Melenberg & Van Soest, 2001; Guiso & Paiella, 2008; Dohmen et al., 2011; Hopland, Matsen & Strom, 2013; Fang, Hanna & Chatterjee, 2013).

4.6.4 Social Safety Nets and Risk and Time Preferences

The previous section has shown that households in the lowest income tercile had no significant different risk and time preferences than households in the highest income tercile. However, a main feature in which households in the lowest income tercile vary is their access to social safety nets. Studies (e.g., Dercon, 2002) have highlighted the potential impact that social safety nets have on risk and time preferences. Therefore, social safety nets deserve further attention in this section.

In the Saudi context, there are two types of social safety net: social welfare payments from the government, and social capital provided by the immediate and extended family. In our sample, 80% of the households receive some level of social welfare payments. We therefore consider households that receive at least 10% of their total household income from social transfers as being dependent on these governmental payments and compare them with those below the 10% threshold. Following this differentiation, approximately 58% of households receive more than 10% of their income from social transfers (see Table 4.B.4 in the Appendix for the split by tercile). The main observation from the analysis in Table 4.6 is that households in the lowest income tercile that received no considerable social welfare payments were significantly less loss averse than households in the middle and highest income terciles.

In addition to the government, the immediate and extended family can act as a social safety net (Witoelar, 2013). In the Arab region, the traditional tribal system has been associated with a strong sense of collective support (Tannous, 1947; Cooke, 2014). This is why private, family-based support systems in Saudi Arabia can be considered as a safety net in times of hardship. However, some households (7% in our sample) have lost touch with their families, and this could change their behavioural attitudes (see Table 4.B.5 in the Appendix for the split by tercile).

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TABLE 4.4 CORRELATION BETWEEN INCOME AND RISK AND TIME PREFERENCES AND INCOME

Model	Independent Variable	Probability Weight (α)	Risk Aversion (σ)	Loss Aversion (λ)	Discount Rate (δ)	Present Bias (β)
1	Log income per capita	0.058	0.041*	−0.313	0.001	0.032
		(0.041)	(0.024)	(0.358)	(0.001)	(0.041)
2	(Ref = Highest Income Tercile)					
	Middle Income Tercile	−0.110*	−0.097***	0.681	−0.001	−0.028
		(0.058)	(0.035)	(0.656)	(0.002)	(0.079)
	Lowest Income Tercile	−0.027	−0.036	−0.248	−0.003	−0.022
		(0.077)	(0.035)	(0.523)	(0.002)	(0.066)

Note: Additional control variables include Gender, Age, Education, Bedouin, and Religion. Robust standard errors are in parenthesis. N = 18,260 (Number of Clusters = 166). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Source: Own survey.

TABLE 4.5 CORRELATION BETWEEN ASSETS AND RISK AND TIME PREFERENCES AND ASSETS

Model	Independent Variable	Probability Weight (α)	Risk Aversion (σ)	Loss Aversion (λ)	Discount Rate (δ)	Present Bias (β)
1	House/Apartment Ownership	0.002	0.004	0.477	−0.002	0.166**
		(0.051)	(0.024)	(0.404)	(0.001)	(0.071)
2	Financial Asset Poverty	0.064	−0.072**	1.400***	0.002**	−0.075
		(0.046)	(0.036)	(0.452)	(0.001)	(0.071)

Note: Additional control variables include Gender, Age, Education, Bedouin, and Religion. Robust standard errors are in parenthesis. N = 18,260 (Number of Clusters = 166). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Source: Own survey.

TABLE 4.6 SOCIAL WELFARE PAYMENTS AND RISK AND TIME PREFERENCES

Independent Variable	Probability Weight (α)	Risk Aversion (σ)	Loss Aversion (λ)	Discount Rate (δ)	Present Bias (β)
(Ref = Highest and Middle Income Tercile)					
Lowest Inc. T. (No Considerable SW)	0.057	0.050	−1.361***	−0.003	−0.016
	(0.094)	(0.032)	(0.467)	(0.002)	(0.068)
Lowest Inc. T. (Considerable SW)	0.043	0.006	0.142	−0.0007	−0.021
	(0.058)	(0.036)	(0.520)	(0.003)	(0.069)

Note: Additional control variables include Gender, Age, Education, Bedouin, and Religion. Robust standard errors are in parenthesis. N = 18,260 (Number of Clusters = 166). * p < 0.10, ** p < 0.05, *** p < 0.01
Source: Own survey.

TABLE 4.7 SOCIAL CAPITAL AND RISK AND TIME PREFERENCES

Independent Variable	Probability Weight (α)	Risk Aversion (σ)	Loss Aversion (λ)	Discount Rate (δ)	Present Bias (β)
(Ref = Highest and Middle Income Tercile)					
Lowest Inc. T. (No Social Capital)	0.154	0.195**	−1.907***	−0.003	0.101
	(0.150)	(0.081)	(0.663)	(0.005)	(0.163)
Lowest Inc. T. (Have Social Capital)	0.057	0.030	−0.588	−0.002	−0.018
	(0.063)	(0.036)	(0.447)	(0.002)	(0.061)

Note: Additional control variables include Gender, Age, Education, Bedouin, and Religion. Robust standard errors are in parenthesis. N = 18,260 (Number of Clusters = 166). * p < 0.10, ** p < 0.05, *** p < 0.01
Source: Own survey.

Table 4.7 reports results of the influence of social safety nets. We find that households in the lowest income tercile without social capital were associated with greater risk taking and lower loss aversion than those in the middle and highest income terciles.

Taking the results from Tables 4.6 and 4.7 together, it was observed that poor households without access to social safety nets are associated with a higher level of risk taking, especially in the loss domain, than richer households. One explanation for this could be that poor households in the absence of social safety nets are forced to take greater risks (even if losses are involved) just to survive.

4.7 Summary and Conclusions

The objective of this chapter has been to improve our understanding of poor people's behavioural attitudes towards risk and time, in this case residents living in the poor neighbourhoods in the city of Dammam in Saudi Arabia. We performed a comparison with the few studies conducted in Vietnam (Tanaka et al., 2010; Nguyen 2011), Mali and Burkina Faso (Liebenehm & Waibel, 2014), and in the US (Ackert et al., 2020) and contributed empirical evidence to the sparse literature that examines Saudi Arabia (Falk et al., 2018).

To that end, we simultaneously estimated risk and time preference parameters applying prospect theory and quasi-hyperbolic discounting to the underlying discounted utility model. We also estimated correlations between the preference parameters and specific socio-economic characteristics of poor urban residents in Saudi Arabia.

We found that, on average, residents of poor neighborhoods in Damman city are similarly risk-averse and patient as their Muslim counterparts from rural areas in Mali and Burkina Faso (Liebenehm and Waibel 2014). Furthermore, their levels of risk aversion and patience are higher than those of villagers from Vietnam (Tanaka et al. 2010; Nguyen 2011) or students from the US (Ackert et al. 2019). The average results are hence confirming our initial expectations that were based on the Saudi Arabia's Islamic and Arab cultural background.

In addition, we found that risk and time preferences are correlated with religious beliefs, having Bedouin roots, and wealth (measured in terms of income and assets).

With respect to the correlation between religion and risk preferences, our result correspond with findings in other studies conducted with Muslim respondents in West Africa and Pakistan (Liebenehm & Waibel, 2014; Ahmad et al., 2019) that found a positive association between stronger religious beliefs and higher levels of risk taking. With respect to the correlation

between religion and time preferences, however, we found that a stronger belief is related to a stronger preference for the presence, which contradicts Liebenehm and Waibel's (2014) finding. The result appears nevertheless sensible, as the contentment concept is deeply rooted in Islam (Ali, 2014). Moreover, we discovered that respondents with a Bedouin background exhibit a higher discount rate than non-Bedouin respondents.

Finally, with respect to the correlation between poverty and preferences, we conclude that poverty is associated with a higher level of risk aversion, loss aversion, and impatience. The relation between poverty and risk aversion has been confirmed by other studies conducted with Muslim respondents in a rural setting (Liebenehm & Waibel, 2014; Ahmad et al., 2019), by other rural studies in Asia and Africa (e.g. Yesuf & Bluffstone, 2009; Tanaka et al., 2010; Vieider et al., 2018; Vieider et al., 2019), and by many studies in the developed world (e.g., Donkers, Melenberg & Van Soest, 2001; Guiso & Paiella, 2008; Dohmen et al., 2011; Hopland, Matsen & Strom, 2013; Fang, Hanna & Chatterjee, 2013). Moreover, many other studies across different regions, confirm the correlation between poverty and impatience found among our urban poor respondents in Saudi Arabia (e.g., Pender, 1996; Yesuf & Bluffstone, 2009; Tanaka et al., 2010; Nguyen, 2011; Liebenehm & Waibel, 2014).

A further differentiation of poor households with respect to their social safety nets showed that respondents without access to such safety nets are associated with a higher willingness to take risk. This observation resembles the situation in affluent societies like the US, where the most vulnerable members of society are less risk averse (Barsky et al., 1997). If the poor are risk takers this should tell policy makers to provide situation-specific opportunities such as micro-credit for small-scale enterprises or entrepreneurial training rather than consumption subsidies.

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Appendix 4.A Experimental Design

TABLE 4.A.1 PAYOFFS IN THE RISK PREFERENCE EXPERIMENT

Decision	Series 1 Option A		Option B		Series 2 Option A		Option B		Series 3 Option A		Option B	
	30%	70%	10%	90%	90%	10%	70%	30%	50%	50%	50%	50%
1	80	20	136	10	80	60	108	10	50	-8	60	-42
2	80	20	150	10	80	60	112	10	8	-8	60	-42
3	80	20	166	10	80	60	116	10	2	-8	60	-42
4	80	20	186	10	80	60	120	10	2	-8	60	-32
5	80	20	212	10	80	60	124	10	2	-16	60	-32
6	80	20	250	10	80	60	130	10	2	-16	60	-28
7	80	20	300	10	80	60	136	10	2	-16	60	-22
8	80	20	370	10	80	60	144	10				
9	80	20	440	10	80	60	154	10				
10	80	20	600	10	80	60	166	10				
11	80	20	800	10	80	60	180	10				
12	80	20	1000	10	80	60	200	10				
13	80	20	1200	10	80	60	220	10				
14	80	20	1500	10	80	60	260	10				

Source: Own survey.

TABLE 4.A.2 PAYOFFS IN THE TIME PREFERENCE EXPERIMENT

Decision	Option A		Option B		Option A		Option B		Option A		Option B		Option A		Option B	
	Series 1				Series 5				Series 9				Series 13			
1	120	1 week	20	today	300	1 month	50	today	30	3 months	5	today	60	3 days	10	today
2	120	1 week	40	today	300	1 month	100	today	30	3 months	10	today	60	3 days	20	today
3	120	1 week	60	today	300	1 month	150	today	30	3 months	15	today	60	3 days	30	today
4	120	1 week	80	today	300	1 month	200	today	30	3 months	20	today	60	3 days	40	today
5	120	1 week	100	today	300	1 month	250	today	30	3 months	25	today	60	3 days	50	today
	Series 2				Series 6				Series 10				Series 14			
1	120	1 month	20	today	300	3 months	50	today	240	3 days	40	today	60	2 weeks	10	today
2	120	1 month	40	today	300	3 months	100	today	240	3 days	80	today	60	2 weeks	20	today
3	120	1 month	60	today	300	3 months	150	today	240	3 days	120	today	60	2 weeks	30	today
4	120	1 month	80	today	300	3 months	200	today	240	3 days	160	today	60	2 weeks	40	today
5	120	1 month	100	today	300	3 months	250	today	240	3 days	200	today	60	2 weeks	50	today
	Series 3				Series 7				Series 11				Series 15			
1	120	3 months	20	today	30	1 week	5	today	240	2 weeks	40	today	60	2 months	10	today
2	120	3 months	40	today	30	1 week	10	today	240	2 weeks	80	today	60	2 months	20	today
3	120	3 months	60	today	30	1 week	15	today	240	2 weeks	120	today	60	2 months	30	today
4	120	3 months	80	today	30	1 week	20	today	240	2 weeks	160	today	60	2 months	40	today
5	120	3 months	100	today	30	1 week	25	today	240	2 weeks	200	today	60	2 months	50	today
	Series 4				Series 8				Series 12							
1	300	1 week	50	today	30	1 month	5	today	240	2 months	40	today				
2	300	1 week	100	today	30	1 month	10	today	240	2 months	80	today				
3	300	1 week	150	today	30	1 month	15	today	240	2 months	120	today				
4	300	1 week	200	today	30	1 month	20	today	240	2 months	160	today				
5	300	1 week	250	today	30	1 month	25	today	240	2 months	200	today				

Source: Own survey

FIGURE 4.A.1 PICTURE CARD ILLUSTRATING THE CHOICE BETWEEN TWO LOTTERIES
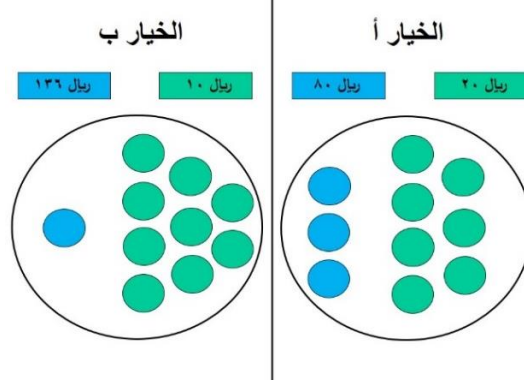
Source: Own survey.

Appendix 4.B Additional Figures and Tables

TABLE 4.B.1 COMPARISON OF RISK AND TIME PREFERENCE PARAMETERS

Study	(1)	(2)	(3)	(4)	Current Study
Country	Vietnam	Vietnam	Mali and Burkina Faso	USA	Saudi Arabia
Respondents	Rural Villages	Fishermen	Cattle Farmers	Bachelor Students	Poor Urban Neighborhoods
Probability Weight (α)	0.74	0.96	0.133	0.747	0.25
Risk Aversion (σ)	0.59	1.012	0.112	0.858	0.24
Loss Aversion (λ)	2.63	3.255	1.351	1.602	2.40
Time Preferences (δ)	0.078	0.28	0.001	0.099	0.004
Present Bias (β)	0.82	0.72	0.942	1.023	0.74

Source: (1) Tanaka, Camerer and Nguyen (2010), (2) Nguyen (2011), (3) Liebenehm and Waibel (2014), (4) Ackert et al., (2020)

TABLE 4.B.2 ROBUSTNESS CHECK REFERENCE POINT

Parameters	Reference Point=Zero	Reference Point= Lower Payout
Probability Weight (α)	0.25***	0.38***
	(0.02)	(0.04)
Risk Aversion (σ)	0.24***	0.24***
	(0.008)	(0.008)
Loss Aversion (λ)	2.40***	2.46***
	(0.15)	(0.17)
Time Preferences (δ)	0.004***	0.004***
	(0.0005)	(0.0005)
Present Bias (β)	0.74***	0.74***
	(0.02)	(0.02)

Note: Robust standard errors in parentheses. N = 18,260 (Number of Clusters = 166). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Source: Own survey

TABLE 4.B.3 ROBUSTNESS CHECK STANDARD EXPECTED UTILITY THEORY

Test	P-Value
H0: $\alpha=1$	0.000
H0: $\lambda=1$	0.000
H0: $\delta=0.078$	0.000
H0: $\beta=1$	0.000

Source: Own survey.

TABLE 4.B.4 DESCRIPTIVE STATISTICS OF SOCIAL WELFARE PAYMENTS BY TERCILE

	Mean	St. Dev.
Receive no Considerable Social Welfare Payments		
Highest Income Tercile	0.211	0.408
Second Highest Income Tercile	0.108	0.311
Lowest Income Tercile	0.096	0.295
Receive Considerable Social Welfare Payments		
Highest Income Tercile	0.120	0.326
Second Highest Income Tercile	0.229	0.420
Lowest Income Tercile	0.235	0.424

Source: Own survey.

TABLE 4.B.5 DESCRIPTIVE STATISTICS OF SOCIAL CAPITAL PAYMENTS BY TERCILE

	Mean	St. Dev.
Have Social Capital		
Highest Income Tercile	0.307	0.461
Second Highest Income Tercile	0.313	0.464
Lowest Income Tercile	0.313	0.464
Have no Social Capital		
Highest Income Tercile	0.024	0.153
Second Highest Income Tercile	0.024	0.153
Lowest Income Tercile	0.018	0.133

Source: Own survey.

FIGURE 4.B.1 DISTRIBUTION OF RISK AVERSION
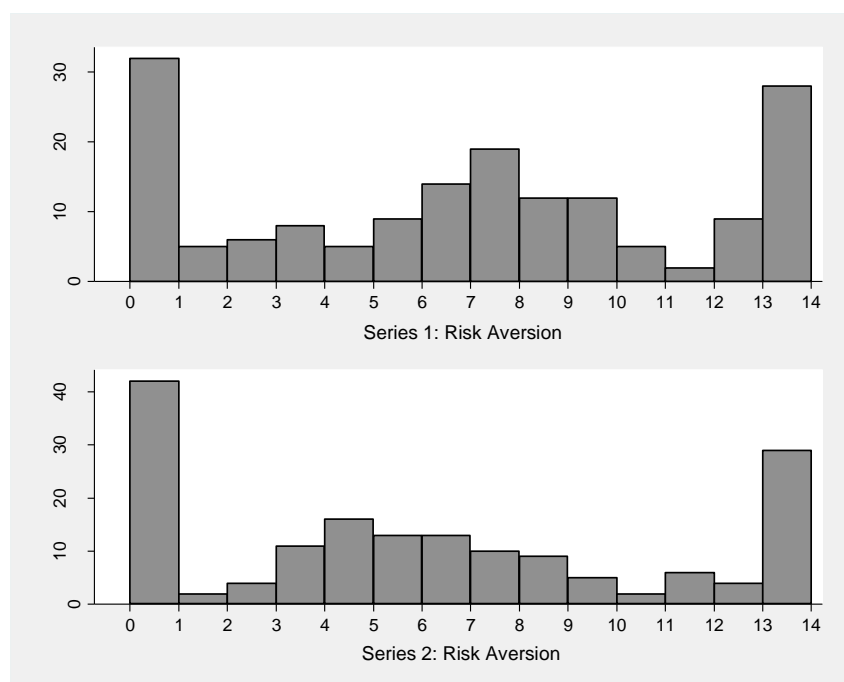
Note: Higher numbers, representing later switching points, indicate a higher level of risk aversion.
Source: Own survey

FIGURE 4.B.2 DISTRIBUTION OF LOSS AVERSION
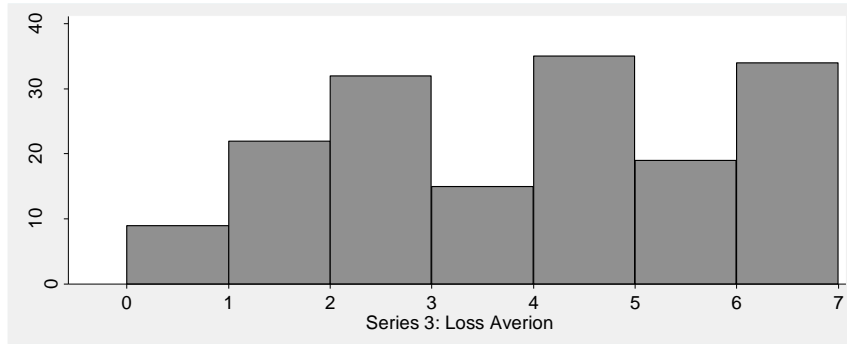
Note: Higher numbers, representing later switching points, indicate a higher level of loss aversion.
Source: Own survey

FIGURE 4.B.3 DISTRIBUTION OF TIME PREFERENCES
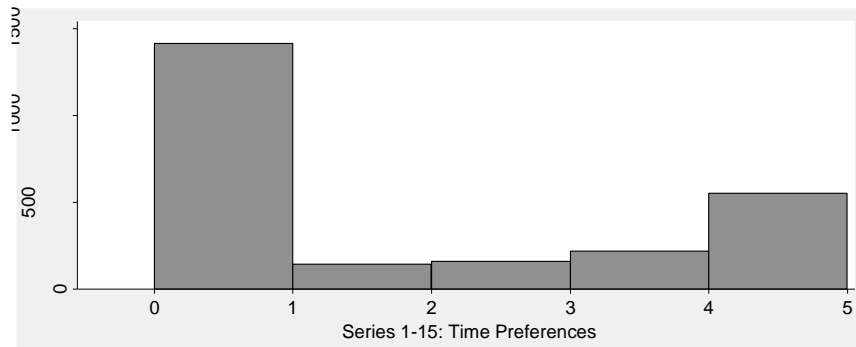
Note: Higher numbers, representing later switching points, indicate greater impatience.
Source: Own survey

Survey Solutions

Determinants of Poverty in Saudi Arabia

SURVEY IDENTIFICATION INFORMATION
QUESTIONNAIRE DESCRIPTION

SECTION 1 HOUSEHOLD MEMBERS
No sub-sections, Rosters: 2, Questions: 20.

SECTION 2 HOUSEHOLD FINANCE
Sub-sections: 9, Rosters: 3, Questions: 57.

SECTION 3 HOUSEHOLD EDUCATION
No sub-sections, Rosters: 1, Questions: 13.

SECTION 4 FAMILY HISTORY
No sub-sections, No rosters, Questions: 26.

SECTION 5 HEALTH
No sub-sections, Rosters: 1, Questions: 12.

SECTION 6 SHOCKS
No sub-sections, Rosters: 2, Questions: 12.

SECTION 7 HOUSEHOLD EXPENDITURE
No sub-sections, No rosters, Questions: 22, Static texts: 1.

SECTION 8 ASSETS
No sub-sections, No rosters, Questions: 12.

SECTION 9 PERSONAL ATTITUDES
No sub-sections, No rosters, Questions: 10.

SECTION 1 HOUSEHOLD MEMBERS

| Consent | SINGLE-SELECT | Intro |
| | SCOPE: IDENTIFYING | |

I We are a team of researchers from Prince Mohammad bin Fahd University and we are doing a survey about the living situation of Saudi households. The aim of the research is to better understand the chal
And 442 other symbols [1]

01 ◯ I agree to participate
02 ◯ I don't agree to participate

Neighbourhood SINGLE-SELECT Q1_Neighbourhood
SCOPE: IDENTIFYING

01 ◯ Al Badiyah
02 ◯ Al Qadisiyah
03 ◯ Al Qazaz
04 ◯ Al Adamah
05 ◯ Al Khalij
06 ◯ Al Dawasir
07 ◯ Al Amamrah
08 ◯ An Nakhil
09 ◯ Al Aziziyah
10 ◯ Al Jalawiyah
11 ◯ As Zuhur
12 ◯ Al Jamiyin
13 ◯ Badr
14 ◯ Ash Shati Ash Sharqi
15 ◯ Ghirnatah

House Code as assigned by the research TEXT Q1a_Housecode
SCOPE: IDENTIFYING

....

Apartment Number (only needed for apartments) TEXT Q1b_Housecode
SCOPE: IDENTIFYING

....

Name of Interviewer TEXT Q2_Interviewer
SCOPE: IDENTIFYING

....

Date and Time of Interview DATE: CURRENT TIME Q3_DateandTime
SCOPE: IDENTIFYING

....

GPS coordinates GPS GPS
SCOPE: IDENTIFYING

N ‾

W ‾

A ‾

How many household members lived here (between Rabi 1439 II– Jumada I 1440). NUMERIC: INTEGER Q5_Number

- -

V1 self>0 && self<26
M1 Household must have at least one member

SECTION 1 HOUSEHOLD MEMBERS
Roster: HOUSEHOLD MEMBERS
generated by numeric question Q5_Number hhroster

Relationship to Household Head

V1 `((hhroster.Count(x=>x.Q8_Relationship==1))==1) ||(((hhro ster.Count(x=>x.Q8_Relationship==1))>1) && Q8_Relationsh ip!=1) && (!((hhroster.Count(x=>x.Q8_Relationship==1))== 0));`

M1 Household has no head or household has multiple heads

SINGLE-SELECT	Q8_Relationship

01 ◯ Head
02 ◯ First Wife/Husband
03 ◯ Son/Daughter from First Wife
04 ◯ Second Wife
05 ◯ Son/Daughter from Second Wife
06 ◯ Third Wife
07 ◯ Son/Daughter from Third Wife
08 ◯ Fourth Wife
09 ◯ Son/Daughter from Fourth Wife
10 ◯ Son/Daughter in Law
11 ◯ Father/Mother
12 ◯ Parents in Law
13 ◯ Sister/Brother
14 ◯ Siblings in Law
15 ◯ Grandchild
16 ◯ Nephew/Niece

And 3 other symbols [1]

Others, please specify

E `Q8_Relationship==90`

TEXT	Q8_Others

Gender

SINGLE-SELECT	Q7_Gender

01 ◯ Female
02 ◯ Male

Age (Years)

V1 `self<130`
M1 Person appears to old

NUMERIC: INTEGER	Q6_Age

Age (Month)

E `Q6_Age<2`
V1 `self<25`
M1 The number of month can not be more than 24 (2 Years)

NUMERIC: INTEGER	Q6_Ageb

How many other people (non-household members) were financially dependent on you (between Rabi 1439 II– Jumada I 1440)?

V1 `self<20`

NUMERIC: INTEGER	Q9_Additional

SECTION 1 HOUSEHOLD MEMBERS
Roster: OTHER DEPENDANTS
generated by numeric question `Q9_Additional`

E `Q9_Additional>0`

hhroster2

Relationship to Household Head	SINGLE-SELECT	Q9c_Relationship

02 ⭕ First Wife/Husband
03 ⭕ Son/Daughter from First Wife
04 ⭕ Second Wife
05 ⭕ Son/Daughter from Second Wife
06 ⭕ Third Wife
07 ⭕ Son/Daughter from Third Wife
08 ⭕ Fourth Wife
09 ⭕ Son/Daughter from Fourth Wife
10 ⭕ Son/Daughter in Law
11 ⭕ Father/Mother
12 ⭕ Father/ Mother in Law
13 ⭕ Sister/Brother
14 ⭕ Grandchild
15 ⭕ Nephew/Niece
16 ⭕ Cousin
17 ⭕ Uncle/Aunt

And 1 other symbols [2]

Others, please specify	TEXT	Q9c_Others
E Q9c_Relationship==90	....	

Gender	SINGLE-SELECT	Q9b_Gender

01 ⭕ Female
02 ⭕ Male

Age (Year)	NUMERIC: INTEGER	Q9a_age
V1 self<100		
M1 Person appears to old	----------------------------------.	

Age (Month)	NUMERIC: INTEGER	Q9a_Ageb
E Q9a_age<2		
V1 self<25		
M1 The number of month can not be more than 24 (2 Years)	----------------------------------.	

Is the household head the sole provider for this person?	SINGLE-SELECT	Q9d_provider

01 ⭕ Yes, I am the only one providing for this person
02 ⭕ No, this person also receives money from other people, the government and/or charity organisations.

SECTION 2 HOUSEHOLD FINANCE

SECTION 2 HOUSEHOLD FINANCE
Roster: OCCUPATION
generated by numeric question Q5_Number   Occupation

Main Occupation %Q8_Relationship% (%Q7_Gender%, %Q6_Age%) (between Rabi 1439 II– Jumada I 1440) E !(Q6_Age<=12)	SINGLE-SELECT Q10_Occupation 01 ◯ Employed by the military 02 ◯ Employed by the public sector 03 ◯ Employed by the private sector 04 ◯ Self-Employed working not from home 05 ◯ Self-Employed working from home 06 ◯ Unemployed 07 ◯ Housewife 08 ◯ Retired with pension 09 ◯ Retired without pension 10 ◯ In Education 90 ◯ Other
Please specify E Q10_Occupation.InList(2,3,4,5,90)	TEXT Q10_specify ···
Money received by %Q8_Relationship% %Q7_Gender% %Q6_Age% from main occupation (on average per month) E Q10_Occupation.InList(1,2,3,4,5,90) V1 self<100000	NUMERIC: INTEGER Q10a_Money — — — — — — — — — — — — — — — — — ·
For how many month did %Q8_Relationship% %Q7_Gender% %Q6_Age% receive money (between Rabi 1439 II– Jumada I 1440)? E Q10_Occupation.InList(1,2,3,4,5,90) V1 self<13 M1 Maximum number of month per year 12.	NUMERIC: INTEGER Q10b_Month — — — — — — — — — — — — — — — — — ·
How did %Q8_Relationship% %Q7_Gender% %Q6_Age% go to his/her main occupation? I Multiple Choices Possible E Q10_Occupation.InList(1,2,3,4,90)	MULTI-SELECT Q10c_Transport 01 ☐ Car 02 ☐ Taxi/Driver 03 ☐ Walking 04 ☐ Rideshare 05 ☐ Bus 90 ☐ Other
Please specify E Q10c_Transport.Contains(90)	TEXT Q10c_other ···
Secondary Occupation %Q8_Relationship% %Q7_Gender% %Q6_Age% (between Rabi 1439 II– Jumada I 1440) E !(Q6_Age<=12)	SINGLE-SELECT Q11_SecondOccupation 01 ◯ Employed by the military 02 ◯ Employed by the public sector 03 ◯ Employed by the private sector 04 ◯ Self-Employed working not from home 05 ◯ Self-Employed working from home 06 ◯ Unemployed 07 ◯ Housewife 08 ◯ Retired with pension 09 ◯ Retired without pension 10 ◯ In Education 90 ◯ Other 11 ◯ None

Please specify	TEXT	Q11_specify

E Q11_SecondOccupation.InList(2,3,4,5,90)

....

Money received by %Q8_Relationship% %Q7_Gender% %Q6_Age% from second occupation (on average per month)	NUMERIC: INTEGER	Q11a_Money

E Q11_SecondOccupation.InList(1,2,3,4,5,90)
V1 self<100000

- .

For how many month did %Q8_Relationship% %Q7_Gender% %Q6_Age% receive money (between Rabi 1439 II– Jumada I 1440)?	NUMERIC: INTEGER	Q11b_Month

E Q11_SecondOccupation.InList(1,2,3,4,5,90)
V1 Q11b_Month<13
M1 Maximum number of month per year 12.

- .

How did %Q8_Relationship% %Q7_Gender% %Q6_Age% go to his/her second occupation?	MULTI-SELECT	Q11c_Transport

I Multiple Choices Possible
E Q11_SecondOccupation.InList(1,2,3,4,90)

01 ☐ Car
02 ☐ Taxi/Driver
03 ☐ Walking
04 ☐ Rideshare
05 ☐ Bus
90 ☐ Other

Please specify	TEXT	Q11c_other

E Q11c_Transport.Contains(90)

....

SECTION 2 HOUSEHOLD FINANCE
Roster: GOVERNMENT SUPPORT
generated by numeric question Q5_Number

Government

Did %Q8_Relationship% %Q7_Gender% %Q6_Age% receive any of the following financial supports from the government (between Rabi 1439 II– Jumada I 1440)?	MULTI-SELECT	Q12_Government

I Multiple Choices Possible

01 ☐ Pension
02 ☐ Hafiz (Unemployment Benefits)
03 ☐ Disability Benefits
04 ☐ Widow Benefits
05 ☐ Divorced Benefits
06 ☐ Husband in Prison Benefits
07 ☐ Citizen Account Program (Water, Electricity...)
08 ☐ Money from Quran School
09 ☐ Money from University
10 ☐ Money from other schools
11 ☐ Hassab Almwatan
12 ☐ Did not receive any money from the government
90 ☐ Other

Please specify	TEXT	Q12_other

E Q12_Government.Contains(90)

....

SECTION 2 HOUSEHOLD FINANCE / GOVERNMENT SUPPORT
Roster: AMOUNT RECEIVED
generated by multi-select question Q12_Government

Governmentsub

E Q12_Government.ContainsAny(1,2,3,4,5,6,7,8,9,10,90)

How much money did he/she received from the government (on average per month)?	TEXT	Q12a_Money
E Q12_Government.ContainsAny(1,2,3,4,5,6,7,8,9,10,90)	....	

For how many month did he/she receive money (between Rabi 1439 II– Jumada I 1440).	TEXT	Q12b_Duration
E Q12_Government.ContainsAny(1,2,3,4,5,6,7,8,9,10,90)	....	

Did your household receive money from charity organisation(between Rabi 1439 II – Jumada I 1440)?	SINGLE-SELECT Q13_Charity 01 ◯ Yes 02 ◯ No

SECTION 2 HOUSEHOLD FINANCE
CHARITY SUPPORT
E Q13_Charity==1

How much money did your household receive on average per month?	TEXT	Q13a_Money
E Q13_Charity==1	....	

For how many month did your household receive money (between Rabi 1439 II – Jumada I 1440)?	TEXT	Q13b_Duration
E Q13_Charity==1	....	

Did your household receive any of the following non-financial supports from charities (between Rab 1439 II - Jumada I 1440)? I Multiple Choices Possible	MULTI-SELECT Q14a_Type 01 ☐ Food Donations 02 ☐ Clothing Donations 03 ☐ Did not receive non-financial support 90 ☐ Other

Other, please specify	TEXT	Q14a_Other
E Q14a_Type.Contains(90)	....	

Did your household receive any money from "good people" (between Rabi 1439 II – Jumada I 1440)?	SINGLE-SELECT Q15_GoodPeople 01 ◯ Yes 02 ◯ No

SECTION 2 HOUSEHOLD FINANCE
MONEY FROM "GOOD PEOPLE"
E Q15_GoodPeople==1

How much money did your household receive on average per month?	TEXT	Q15a_Money
E Q15_GoodPeople==1	....	

For how many month did your household receive money from "good people" (between Rabi 1439 II – Jumada I 1440)?	TEXT	Q15b_Duration
E Q15_GoodPeople==1	....	

Did your household receive non-financial support from "good people" (between Rabi 1439 II – Jumada I 1440)?	SINGLE-SELECT Q16_GoodFood 01 ◯ Yes 02 ◯ No

Did your household receive any of the following non-financial supporst from "good people" (between Rabi 1439 II – Jumada I 1440)? I Multiple Choices Possible	MULTI-SELECT Q16a_Type 01 ☐ Food Donations 02 ☐ Clothing Donations 03 ☐ Did not receive non-financial support 90 ☐ Other

Other, please specify E Q16a_Type.Contains(90)	TEXT Q16a_Other ....

Did you had a bank loan (between Rabi 1439 II – Jumada I 1440)?	SINGLE-SELECT Q17_Bankloan 01 ◯ Yes 02 ◯ No

SECTION 2 HOUSEHOLD FINANCE
BANK LOAN

E Q17_Bankloan==1

How much money did you initially receive from the bank?	NUMERIC: INTEGER Q17a_Money – ·

How much money did you pay back on average per month (between Rabi 1439 II – Jumada I 1440)?	NUMERIC: INTEGER Q17b_Back – ·

Why did you take the loan?	MULTI-SELECT Q17c_why 01 ☐ To cover wedding costs and/or dowry 02 ☐ To buy furniture and equipment for the house 03 ☐ To buy a car 04 ☐ To pay back money to relatives/friends 05 ☐ Due to a death in the family 06 ☐ Due to a divorce in the family 07 ☐ Due to job loss 08 ☐ To cover costs for Eid and Ramadan 09 ☐ To cover health costs 10 ☐ To pay water and/or electricity bills 90 ☐ Other

Other, please specify E Q17c_why.Contains(90)	TEXT Q17c_Other ....

Did you owe any money to relatives/friends (that are non-household members) (between Rabi 1439 II – Jumada I 1440)?	SINGLE-SELECT Q18_Debt_Relatives 01 ◯ Yes 02 ◯ No

SECTION 2 HOUSEHOLD FINANCE
DEBT RELATIVES AND FRIENDS

E Q18_Debt_Relatives==1

How much money did you borrow from your relatives/friends initially?	NUMERIC: INTEGER Q18a_Money
	- .
How much did you pay back on average per month (between Rabi 1439 II – Jumada I 1440)?	NUMERIC: INTEGER Q18b_Back
	- .

Why did you take money from relatives/friends?

I Multiple Choices Possible

MULTI-SELECT Q18c_why
- 01 ☐ To cover wedding costs and/or dowry
- 02 ☐ To buy furniture and equipment for the house
- 03 ☐ To buy a car
- 04 ☐ To pay back money to relatives/friends
- 05 ☐ Due to a death in the family
- 06 ☐ Due to a divorce in the family
- 07 ☐ Due to job loss
- 08 ☐ To cover costs for Eid and Ramadan
- 09 ☐ To cover health costs
- 10 ☐ To pay water and/or electricity bills
- 90 ☐ Other

Other, please specify

E Q18c_why.Contains(90)

TEXT Q18c_Other

....

How are you related to the relatives/friends that gave you money?

MULTI-SELECT Q18d_Relation
- 01 ☐ Friend
- 02 ☐ Son/Daughter
- 03 ☐ Son/ Daughter in Law
- 04 ☐ Father/Mother
- 05 ☐ Father/ Mother in Law
- 06 ☐ Sister/Brother
- 07 ☐ Grandchild
- 08 ☐ Nephew/Niece
- 09 ☐ Cousin
- 10 ☐ Uncle/Aunt
- 90 ☐ Other

Other, please specify

E Q18d_Relation.Contains(90)

TEXT Q18d_Other

....

Did relatives/friends (that are non-household members) owe you any money (between Rabi 1439 II – Jumada I 1440)?

SINGLE-SELECT Q19_Lending
- 01 ◯ Yes
- 02 ◯ No

SECTION 2 HOUSEHOLD FINANCE
LEND RELATIVES AND FRIENDS
E Q19_Lending==1

How much money did you give them initially?	NUMERIC: INTEGER Q19a_Money
	- .
How much money did you get back (between Rabi 1439 II – Jumada I 1440)?	NUMERIC: INTEGER Q19b_Back
	- .

How are you related to the relatives/friends you gave money?	MULTI-SELECT	Q19d_Relation

01 ☐ Friend
02 ☐ Son/Daughter
03 ☐ Son/ Daughter in Law
04 ☐ Father/Mother
05 ☐ Father/ Mother in Law
06 ☐ Sister/Brother
07 ☐ Grandchild
08 ☐ Nephew/Niece
09 ☐ Cousin
10 ☐ Uncle/Aunt
90 ☐ Other

Other, please specify	TEXT	Q19d_Other

E Q19d_Relation.Contains(90)

....

Did you receive any money from relatives/friends (that are non-household members) as a gift (between Rabi 1439 II – Jumada I 1440)?	SINGLE-SELECT	Q20_Gifts

01 ○ Yes
02 ○ No

SECTION 2 HOUSEHOLD FINANCE
GIFTS RECEIVED

E Q20_Gifts==1

How much money did you get?	NUMERIC: INTEGER	Q20a_Money

- ·

How are you related to the relatives/friends that gave you money?	SINGLE-SELECT	Q20b_Relation

01 ○ Friend
02 ○ Son/Daughter
03 ○ Son/ Daughter in Law
04 ○ Father/Mother
05 ○ Father/ Mother in Law
06 ○ Sister/Brother
07 ○ Grandchild
08 ○ Nephew/Niece
09 ○ Cousin
10 ○ Uncle/Aunt
90 ○ Other

Other, please specify	TEXT	Q20b_Other

E Q20b_Relation==90

....

Did you give any money to relatives/friends (that are non-household members) as a gift (between Rabi 1439 II – Jumada I 1440)?	SINGLE-SELECT	Q21_Giftgiving

01 ○ Yes
02 ○ No

SECTION 2 HOUSEHOLD FINANCE
GIFTS GIVEN

E Q21_Giftgiving==1

How much money did you give?	NUMERIC: INTEGER	Q21a_Money

- ·

How are you related to the relatives/friends that you gave money to?	MULTI-SELECT	Q21b_Relation
	01 ☐ Friend	
	02 ☐ Son/Daughter	
	03 ☐ Son/ Daughter in Law	
	04 ☐ Father/Mother	
	05 ☐ Father/ Mother in Law	
	06 ☐ Sister/Brother	
	07 ☐ Grandchild	
	08 ☐ Nephew/Niece	
	09 ☐ Cousin	
	10 ☐ Uncle/Aunt	
	90 ☐ Other	

Other, please specify

E Q21b_Relation.Contains(90)

TEXT   Q21b_Other

....

Did you had any savings (at the end of Jumada I 1440)?	SINGLE-SELECT	Q22_Savings
	01 ○ Yes	
	02 ○ No	

SECTION 2 HOUSEHOLD FINANCE
SAVINGS

E Q22_Savings==1

How much savings did you have?	NUMERIC: INTEGER	Q22_Money

Did you take part in Jamaia (between Rabi 1439 II – Jumada I 1440)?	SINGLE-SELECT	Q23_Jamaia
	01 ○ Yes	
	02 ○ No	

SECTION 2 HOUSEHOLD FINANCE
JAMAIA

E Q23_Jamaia==1

How much money did you get or are expecting to get?	NUMERIC: INTEGER	Q23a_Money

How much money did you pay on average per month?	NUMERIC: INTEGER	Q23b_Rate

SECTION 3 HOUSEHOLD EDUCATION

SECTION 3 HOUSEHOLD EDUCATION
Roster: EDUCATION
generated by numeric question Q5_Number

Education

What is %Q8_Relationship% %Q7_Gender% %Q6_Age% highest level of education	SINGLE-SELECT	Q24_Education

E !(Q6_Age<=6)

- 01 ◯ Illiterate
- 02 ◯ Primary School
- 03 ◯ Secondary School
- 04 ◯ High School
- 05 ◯ Diploma
- 06 ◯ Bachelor
- 07 ◯ Master
- 08 ◯ PhD
- 09 ◯ Quran School
- 90 ◯ Other

Others, please specify

TEXT Q24_Other

E Q24_Education==90

....

How many years of education did %Q8_Relationship% %Q7_Gender% %Q6_Age% receive until now? (From primary school until university)

NUMERIC: INTEGER Q25_YearsEdu

E !(Q6_Age<=6)
V1 self<36 && self>=0
M1 The years should be less than35

- .

Did %Q8_Relationship% %Q7_Gender% %Q6_Age% leave education?

SINGLE-SELECT Q26_LeftEdu

E !(Q6_Age<=6)

- 01 ◯ Yes
- 02 ◯ No

What were the reasons for leaving school?

MULTI-SELECT Q27_reasons

I Multiple Choices Possible
E Q26_LeftEdu==1

- 01 ☐ Did not like education
- 02 ☐ Had bad grades
- 03 ☐ Had to earn money because father died
- 04 ☐ Had to earn money because father got sick
- 05 ☐ Got married
- 06 ☐ Parents forced him/her to leave education
- 07 ☐ Had to help with the family business
- 08 ☐ Had to take care of siblings at home
- 09 ☐ A family member became sick and needed help
- 10 ☐ Family could not afford the school supplies
- 11 ☐ Family could not afford the school lunches
- 12 ☐ Was too sick/disabled to go to school
- 13 ☐ Grievance because of death
- 14 ☐ Father retired
- 15 ☐ Father lost his job
- 16 ☐ Finished school

And 1 other symbols [3]

Other, please specify

TEXT Q27_Other

E Q27_reasons.Contains(90)

....

Is missing %Q8_Relationship% %Q7_Gender% %Q6_Age% more than 3 days of school per month, but has not left school for good? (between Rabi 1439 II– Jumada I 1440) E Q26_LeftEdu==2	SINGLE-SELECT Q28_MissingEdu 01 ◯ Yes 02 ◯ No
What were the reasons for missing school? I Multiple Choices Possible E Q28_MissingEdu==1	MULTI-SELECT Q28b_reasons 01 ☐ Did not like education 02 ☐ Had bad grades 03 ☐ Had to earn money because father died 04 ☐ Had to earn money because father got sick 05 ☐ Got married 06 ☐ Parents forced him/her to leave education 07 ☐ Had to help with the family business 08 ☐ Had to take care of siblings at home 09 ☐ A family member became sick and needed help 10 ☐ Family could not afford the school supplies 11 ☐ Family could not afford the school lunches 12 ☐ Was too sick/disabled to go to school 13 ☐ Grievance because of death 14 ☐ Father retired 15 ☐ Father lost his job 16 ☐ Finished school And 1 other symbols [4]
Other, please specify E Q28b_reasons.Contains(90)	TEXT Q28_Other ....
What is the highest level of education your father had?	SINGLE-SELECT Q29_EduFather 01 ◯ Illiterate 02 ◯ Primary School 03 ◯ Secondary School 04 ◯ High School 05 ◯ Diploma 06 ◯ Bachelor 07 ◯ Master 08 ◯ PhD 09 ◯ Quran School 90 ◯ Other
Other, please specify E Q29_EduFather==90	TEXT Q29_Other ....

What is the highest level of education your mother had?	SINGLE-SELECT	Q30_EduMother
	01 ◯ Illiterate	
	02 ◯ Primary School	
	03 ◯ Secondary School	
	04 ◯ High School	
	05 ◯ Diploma	
	06 ◯ Bachelor	
	07 ◯ Master	
	08 ◯ PhD	
	09 ◯ Quran School	
	90 ◯ Other	

Other, please specify	TEXT	Q30_Other
E Q30_EduMother==90	....	

SECTION 4 FAMILY HISTORY

Is your family Bedouin?	SINGLE-SELECT	Q31_Bedouin
	01 ◯ Yes	
	02 ◯ No	

Is your family Tribal?	SINGLE-SELECT	Q32_Tribal
	01 ◯ Yes	
	02 ◯ No	

How would you describe the financial situation of your extended family compared to yours?	SINGLE-SELECT	Q33_CompareOthers
	01 ◯ They are much better off	
	02 ◯ They are a little bit better off	
	03 ◯ Very Similar	
	04 ◯ They are a little bit worse off	
	05 ◯ They are much worse off	

How many kids of yours have moved out already?	NUMERIC: INTEGER	Q34_KidsMoved
V1 self<25		
M1 Are you sure the number of kids is correct?	_____	

How many brothers do you have?	NUMERIC: INTEGER	Q35_Brothers
V1 self<20		
M1 Are you sure you have that many brothers?	_____	

How many sisters do you have?	NUMERIC: INTEGER	Q36_Sisters
V1 self<20		
M1 Are you sure you have that many sisters?	_____	

What was your fathers job?	MULTI-SELECT	Q37_FatherJob
	01 ☐ Military	
	02 ☐ Public Sector	
	03 ☐ Private Sector	
	04 ☐ Taking care of sheep	
	05 ☐ Taking care of goats	
	06 ☐ Taking care of camels	
	07 ☐ Other working not from home, specify	
	08 ☐ Working from home, specify	
	09 ☐ Unemployed	

Please specify	TEXT	Q37_Specify
E Q37_FatherJob.ContainsAny(2,3,7,8)	....	

How much money did your father earn per month?	NUMERIC: INTEGER	Q38_SalaryFather
V1 self<100000	- ·	

What was your grandfathers job (Dad's side)?	MULTI-SELECT	Q39_GrandfatherJob
	01 ☐ Military	
	02 ☐ Public Sector	
	03 ☐ Private Sector	
	04 ☐ Taking care of sheep	
	05 ☐ Taking care of goats	
	06 ☐ Taking care of camels	
	07 ☐ Other working not from home, specify	
	08 ☐ Working from home, specify	
	09 ☐ Unemployed	

Please specify	TEXT	Q39_Specify
E Q39_GrandfatherJob.ContainsAny(2,3,7,8)	....	

How old were you when you got married?	NUMERIC: INTEGER	Q40_AgeMarriage
V1 self<100	- ·	

How old was your spouse when you got married?	NUMERIC: INTEGER	Q41_AgeMarriageSpouse
V1 self<100	- ·	

How much was the dowry?	NUMERIC: INTEGER	Q42_Dowry
V1 self<500000	- ·	

What was your families connection to your spouse?	SINGLE-SELECT	Q43_Spouserelation
	01 ○ First grade cousin	
	02 ○ Cousin but not first grade	
	03 ○ Other relative	
	04 ○ Not a relative	

How would you describe your relationship with your family?	SINGLE-SELECT	Q44_RelationFamily
	01 ○ We are very close	
	02 ○ We are close	
	03 ○ Neither close nor not close	
	04 ○ Not so close	
	05 ○ Very not close	
	06 ○ We are not in touch at all	

How often do you meet with your siblings?	SINGLE-SELECT	Q45_Siblings
	01 ○ More than once per week	
	02 ○ Once per week	
	03 ○ At least once per month	
	04 ○ Less than once per month	
	05 ○ Never	
	06 ○ Don't have any siblings	

How often do you meet with your parents?	SINGLE-SELECT	Q46_Parents
	01 ○ More than once per week	
	02 ○ Once per week	
	03 ○ At least once per month	
	04 ○ Less than once per month	
	05 ○ Never	
	06 ○ Parents died	

How often do you meet with your cousins?	SINGLE-SELECT	Q47_Cousins
	01 ○ More than once per week	
	02 ○ Once per week	
	03 ○ At least once per month	
	04 ○ Less than once per month	
	05 ○ Never	

How often do you meet with your uncles?	SINGLE-SELECT	Q48_Uncles
	01 ○ More than once per week	
	02 ○ Once per week	
	03 ○ At least once per month	
	04 ○ Less than once per month	
	05 ○ Never	

How often do you have large family gatherings (50 people or more)?	SINGLE-SELECT	Q49_Gathering
	01 ○ More than once per week	
	02 ○ Once per week	
	03 ○ At least once per month	
	04 ○ Less than once per month	
	05 ○ Never	

Were you born in the town you live now?	SINGLE-SELECT	Q50_Born
	01 ○ Yes	
	02 ○ No	

In which city were you born?	TEXT	Q50_HomeTown
E Q50_Born==2	....	

In which city does your father live?	TEXT	Q51_KmFather
I (write n/a if dead)	....	

In which city does your oldest uncle live?	TEXT	Q52_KmUncle
I (write n/a if dead)	....	

In which city does your oldest brother live?	TEXT	Q53_KmBrother
I (write n/a if dead)	....	

SECTION 5 HEALTH

SECTION 5 HEALTH
Roster: HEALTH ROSTER
generated by numeric question Q5_Number

Healthroster

How healthy was %Q8_Relationship% %Q7_Gender% %Q6_Age% (between Rabi 1439 II– Jumada I 1440)	SINGLE-SELECT 01 ⭘ Healthy 02 ⭘ Not so healthy 03 ⭘ Sick 04 ⭘ Disabled	Q55_Health

What was the severity of the sickness? E Q55_Health.InList(2,3)	SINGLE-SELECT 01 ⭘ Can still work or go to school or complete daily tasks without limitation 02 ⭘ Can work or go to school or complete daily tasks with only minor limitation 03 ⭘ Can work or go to school or complete daily tasks with major limitation 04 ⭘ Cannot work or go to school or complete daily tasks 05 ⭘ Needs extensive care at home	Q56a_Sickness

What was the duration of the sickness? E Q55_Health.InList(2,3)	SINGLE-SELECT 01 ⭘ One week or less 02 ⭘ More than one week but less than one month 03 ⭘ Between 1 month and 3 month 04 ⭘ Between 3 month and 1 year 05 ⭘ Several years 06 ⭘ Life Time	Q56b_Duration

What was the treatment for sickness? I Multiple Choices Possible E Q55_Health.InList(2,3)	MULTI-SELECT 01 ☐ Did nothing 02 ☐ Went to a government hospital 03 ☐ Went to a private hospital 04 ☐ Went to a government clinic 05 ☐ Only consulted a pharmacy 06 ☐ Went to a Quran healer 07 ☐ Traditional Medicine 08 ☐ Self Treatment 09 ☐ Others	Q56c_Treatment

Others, please specify E Q56c_Treatment.Contains(90)	TEXT	Q56c_Other

Why did you choose the treatment you did? I Multiple Choices Possible E Q55_Health.InList(2,3)	MULTI-SELECT 01 ☐ I did not choose a treatment because treatment was not necessary 02 ☐ Private facilities too expensive 03 ☐ Transport to facility too expensive 04 ☐ The quality of government facilities is low 90 ☐ Other	Q56d_Reasons

Others, please specify E Q56d_Reasons.Contains(90)	TEXT	Q56d_Other

What is the severity of the disability?	SINGLE-SELECT	Q57a_Disability

E Q55_Health.InList(4)

01 ◯ Can still work or go to school or complete daily tasks without limitation
02 ◯ Can work or go to school or complete daily tasks with only minor limitation
03 ◯ Can work or go to school or complete daily tasks with major limitation
04 ◯ Cannot work or go to school or complete daily tasks
05 ◯ Needs extensive care at home

What was the treatment for the disability?	MULTI-SELECT	Q57b_Treatment

I Multiple Choices Possible
E Q55_Health.InList(4)

01 ☐ Did nothing
02 ☐ Went to a government hospital
03 ☐ Went to a private hospital
04 ☐ Went to a government clinic
05 ☐ Only consulted a pharmacy
06 ☐ Went to a Quran healer
07 ☐ Traditional Medicine
08 ☐ Self Treatment
90 ☐ Others

Others, please specify	TEXT	Q57b_Other

E Q57b_Treatment.Contains(90)

....

Why did you choose the treatment you did?	MULTI-SELECT	Q57c_Reasons

I Multiple Choices Possible
E Q55_Health.InList(4)

01 ☐ I did not choose a treatment because treatment was not necessary
02 ☐ Private facilities too expensive
03 ☐ Transport to facility too expensive
04 ☐ The quality of government facilities is low
90 ☐ Other

Others, please specify	TEXT	Q57c_Other

E Q57c_Reasons.Contains(90)

....

SECTION 6 SHOCKS

What were the three worst shocks in your life?	MULTI-SELECT	Q58_Worstshocks

01 ☐ Household head lost his/her job
02 ☐ Household member lost his/her job
03 ☐ Household head died
04 ☐ Household member died
05 ☐ Father died
06 ☐ Mother died
07 ☐ Household head got sick
08 ☐ Household member got sick
09 ☐ Household head had a bad car accident
10 ☐ Household member had a bad car accident
11 ☐ Collapse of business
12 ☐ Divorce
13 ☐ Abandoned
14 ☐ Household head in prison (specify why)
15 ☐ Household head got addicted to drugs
90 ☐ Other, specify

Please specify why the household head was in prison	TEXT	Q58_specify

E Q58_worstshocks.Contains(14)

....

Other, please specify	TEXT	Q58_other

E Q58_worstshocks.Contains(90)

....

SECTION 6 SHOCKS
Roster: SHOCKS
generated by multi-select question Q58_Worstshocks   Shocks

What was the severity of the shock?	MULTI-SELECT	Q59a

01 ☐ It changed the course of my whole life
02 ☐ It resulted in some financial loss
03 ☐ It resulted in large financial loss
04 ☐ It caused me some emotional pain
05 ☐ It caused me large emotional pain
06 ☐ It did not affect me at all

How did you cope with the shock (%rostertitle%)?	MULTI-SELECT	Q59_Response

I Multiple Choices Possible

01 ☐ Took up an additional job
02 ☐ Left school
03 ☐ Took children out of school
04 ☐ Had to move to another town
05 ☐ Had to borrow money from a bank
06 ☐ Had to borrow money from relatives/friends
07 ☐ Had to apply for support from the government
08 ☐ Had to apply for support from charities
09 ☐ Prayed to God for help
10 ☐ Did nothing
90 ☐ Other

Which other shock	TEXT	Q59_Other

E Q59_Response.Contains(90)

....

Did any additional shocks happen to you (between Rabi 1435 II– Jumada I 1440)	MULTI-SELECT	Q60_shocks

01 ☐ Household head lost his/her job
02 ☐ Household member lost his/her job
03 ☐ Household head died
04 ☐ Household member died
05 ☐ Father died
06 ☐ Mother died
07 ☐ Household head got sick
08 ☐ Household member got sick
09 ☐ Household head had a bad car accident
10 ☐ Household member had a bad car accident
11 ☐ Collapse of business
12 ☐ Divorce
13 ☐ Abandoned
14 ☐ Household head in prison (specify why)
15 ☐ Household head got addicted to drugs
90 ☐ Other, specify

Please specify why the household head was in prison	TEXT	Q60_specify

E Q60_shocks.Contains(14)

....

Other, please specify	TEXT	Q60_other

E Q60_shocks.Contains(90)

....

SECTION 6 SHOCKS
Roster: SHOCKS 5 YEARS
generated by multi-select question Q60_shocks   Shocks5

What was the severity of the shock?	MULTI-SELECT	Q60b

01 ☐ It changed the course of my whole life
02 ☐ It resulted in some financial loss
03 ☐ It resulted in large financial loss
04 ☐ It caused me some emotional pain
05 ☐ It caused me large emotional pain
06 ☐ It did not affect me at all

How did you cope with the shock (%rostertitle%)?	MULTI-SELECT	Q60a_Response
I Multiple Choices Possible	01 ☐ Took up an additional job 02 ☐ Left school 03 ☐ Took children out of school 04 ☐ Had to move to another town 05 ☐ Had to borrow money from a bank 06 ☐ Had to borrow money from relatives/friends 07 ☐ Had to apply for support from the government 08 ☐ Had to apply for support from charities 09 ☐ Prayed to God for help 10 ☐ Did nothing 90 ☐ Other	

Which other shock	TEXT	Q60a_Other
E Q60a_Response.Contains(90)	···	

SECTION 7 HOUSEHOLD EXPENDITURE

STATIC TEXT

How much do you spent on the following items on average in a normal month (between Rabi 1439 II– Jumada I 1440)? In SAR

Food cooked at home	NUMERIC: INTEGER	Q61_1
V1 self<20000		

Food bought in restaurants	NUMERIC: INTEGER	Q61_2
V1 self<50000		

Water and Elecricity	NUMERIC: INTEGER	Q61_4
V1 self<50000		

Toiletries	NUMERIC: INTEGER	Q61_5
V1 self<5000		

Cleaning products	NUMERIC: INTEGER	Q61_6
V1 self<5000		

Baby supplies	NUMERIC: INTEGER	Q61_7
V1 self<50000		

Cloth, shoes, bags and accessories	NUMERIC: INTEGER	Q61_8
V1 self<100000		

Hair dresser and other beauty services	NUMERIC: INTEGER	Q61_9
V1 self<100000		

Cigarettes	NUMERIC: INTEGER	Q61_10
V1 self<5000		

Petrol	NUMERIC: INTEGER	Q61_11
V1 `self<5000`	--------------------------------	
Taxis	NUMERIC: INTEGER	Q61_12
V1 `self<10000`	--------------------------------	
Other form of transport	NUMERIC: INTEGER	Q61_13
V1 `self<10000`	--------------------------------	
Mobile Phone	NUMERIC: INTEGER	Q61_14
V1 `self<5000`	--------------------------------	
Internet	NUMERIC: INTEGER	Q61_15
V1 `self<2000`	--------------------------------	
School supplies (per school year)	NUMERIC: INTEGER	Q61_16
V1 `self<5000`	--------------------------------	
School lunches	NUMERIC: INTEGER	Q61_17
V1 `self<5000`	--------------------------------	
School bus	NUMERIC: INTEGER	Q61_18
V1 `self<20000`	--------------------------------	
Medicine	NUMERIC: INTEGER	Q61_19
V1 `self<50000`	--------------------------------	
Doctors/hospital Fees	NUMERIC: INTEGER	Q61_20
V1 `self<100000`	--------------------------------	
Celebrations at home	NUMERIC: INTEGER	Q61_21

Recreation and entertainment	NUMERIC: INTEGER	Q61_22

Rent	NUMERIC: INTEGER	Q61_23

SECTION 8 ASSETS

Do you own the house you live in?	SINGLE-SELECT	Q62_House
	01 ◯ Yes	
	02 ◯ No	
Did you buy it or inherited it?	SINGLE-SELECT	Q62a_House
E `Q62_House==1`	01 ◯ Bought it	
	02 ◯ Inherited it	
	90 ◯ Other	

Others, please specify	TEXT	Q62a_Other
E Q62a_House.InList(90)	....	
What is todays value of the house in SAR?	NUMERIC: INTEGER	Q62b_house
E Q62_House==1	- ·	
What type of dwelling do you live in?	SINGLE-SELECT	Q63_Dwelling
	01 ◯ Traditional mud house	
	02 ◯ Concrete house	
	03 ◯ Flat in a traditional mud house	
	04 ◯ Flat in concrete house	
	05 ◯ House other	
	06 ◯ Flat other	
How would you describe the condition of your dwelling?	SINGLE-SELECT	Q63b_Condition
	01 ◯ Very Bad	
	02 ◯ Bad	
	03 ◯ Medium	
	04 ◯ Good	
	05 ◯ Very Good	
Please specify	TEXT	Q63_Other
E Q63_Dwelling.InList(5,6)	....	
What is the size of the accommodation in m2?	NUMERIC: INTEGER	Q64_SizeHouse
V1 self<2000	- ·	
Number of rooms	NUMERIC: INTEGER	Q65_NoRooms
V1 self<100	- ·	
Do you have the following items?	MULTI-SELECT: YES/NO	Q66_Assets
	01 ☐ / ☐ Car	
	02 ☐ / ☐ TV	
	03 ☐ / ☐ Satellite	
	04 ☐ / ☐ Regular Phone	
	05 ☐ / ☐ Mobile Phone	
	06 ☐ / ☐ Smart Phone	
	07 ☐ / ☐ Tablet	
	08 ☐ / ☐ Refrigerator	
	09 ☐ / ☐ Stove	
	10 ☐ / ☐ Oven	
	11 ☐ / ☐ Microwave	
	12 ☐ / ☐ Air Conditioning	
	13 ☐ / ☐ Washing Machine	
	14 ☐ / ☐ Vacuum Cleaner	
	15 ☐ / ☐ Internet	
	16 ☐ / ☐ Electric Fan	
	And 5 other symbols [5]	
How old is the car (in years)?	NUMERIC: INTEGER	Q66a_Car
E Q66_Assets.Yes.Contains(1)	- ·	
V1 self>1950		

What is the value of the gold jewellery?	NUMERIC: INTEGER	Q66a_Gold
E Q66_Assets.Yes.Contains(18)	- .	

SECTION 9 PERSONAL ATTITUDES

Are you generally a person who is fully prepared to take risks or do you try to avoid taking risk?	SINGLE-SELECT Q67_Risk
	00 ◯ 0 = unwilling to take risks
	01 ◯ 1
	02 ◯ 2
	03 ◯ 3
	04 ◯ 4
	05 ◯ 5
	06 ◯ 6
	07 ◯ 7
	08 ◯ 8
	09 ◯ 9
	10 ◯ 10 = fully prepared to take risks

Are you generally a person who is fully prepared to give up something now in order to gain more in the future?	SINGLE-SELECT Q67_Future
	00 ◯ 0 = unwilling to wait
	01 ◯ 1
	02 ◯ 2
	03 ◯ 3
	04 ◯ 4
	05 ◯ 5
	06 ◯ 6
	07 ◯ 7
	08 ◯ 8
	09 ◯ 9
	10 ◯ 10 = fully prepared to wait

How religious would you consider yourself?	SINGLE-SELECT Q69_Religion
	01 ◯ Very strongly religious
	02 ◯ Strongly religious
	03 ◯ Moderate religious
	04 ◯ Not very religious

How happy are you with your life?	SINGLE-SELECT Q71_Happiness
	00 ◯ 0 = very unhappy
	01 ◯ 1
	02 ◯ 2
	03 ◯ 3
	04 ◯ 4
	05 ◯ 5
	06 ◯ 6
	07 ◯ 7
	08 ◯ 8
	09 ◯ 9
	10 ◯ 10 = very happy

How would you describe your living situation compared to your neighbours?	SINGLE-SELECT Q72_Comparing
	01 ◯ They are much better off
	02 ◯ They are a little bit better off
	03 ◯ Very Similar
	04 ◯ They are a little bit worse off
	05 ◯ They are much worse off

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How would you describe your living situation compared other families in Saudi Arabia?	SINGLE-SELECT Q73_Comparing 01 ○ They are much better off 02 ○ They are a little bit better off 03 ○ Very Similar 04 ○ They are a little bit worse off 05 ○ They are much worse off
Among the following, which do you think are the 3 most important reasons for why rich people have high incomes?	MULTI-SELECT Q74_ReasonsPoverty 01 ☐ Coming from a wealthy family 02 ☐ Good education 03 ☐ Hard work/effort 04 ☐ Wasta (knowing the right people) 05 ☐ Gods will 06 ☐ Luck 07 ☐ Corruption 90 ☐ Other
Other, please specify E Q74_ReasonsPoverty.Contains(90)	TEXT Q74_Other ....
Skin colour of household head I (to be completed by interviewer)	SINGLE-SELECT Q75_SkinColour 01 ○ Very light 02 ○ Light 03 ○ Medium dark 04 ○ Dark 05 ○ Very dark
Any other interesting observations during the interview I (to be completed by interviewer)	TEXT Q76_Commnets ....

APPENDIX

[1] Q8_Relationship: Relationship to Household Head
Categories: 1: Head, 2: First Wife/Husband, 3: Son/Daughter from First Wife, 4: Second Wife, 5: Son/Daughter from Second Wife, 6: Third Wife, 7: Son/Daughter from Third Wife, 8: Fourth Wife, 9: Son/Daughter from Fourth Wife, 10: Son/Daughter in Law, 11: Father/Mother, 12: Parents in Law, 13: Sister/Brother, 14: Siblings in Law, 15: Grandchild, 16: Nephew/Niece, 17: Cousin, 18: Uncle/Aunt, 90: Other

[2] Q9c_Relationship: Relationship to Household Head
Categories: 2: First Wife/Husband, 3: Son/Daughter from First Wife, 4: Second Wife, 5: Son/Daughter from Second Wife, 6: Third Wife, 7: Son/Daughter from Third Wife, 8: Fourth Wife, 9: Son/Daughter from Fourth Wife, 10: Son/Daughter in Law, 11: Father/Mother, 12: Father/ Mother in Law, 13: Sister/Brother, 14: Grandchild, 15: Nephew/Niece, 16: Cousin, 17: Uncle/Aunt, 90: Other

[3] Q27_reasons: What were the reasons for leaving school?
Categories: 1: Did not like education, 2: Had bad grades, 3: Had to earn money because father died, 4: Had to earn money because father got sick, 5: Got married, 6: Parents forced him/her to leave education, 7: Had to help with the family business, 8: Had to take care of siblings at home, 9: A family member became sick and needed help, 10: Family could not afford the school supplies, 11: Family could not afford the school lunches, 12: Was too sick/disabled to go to school, 13: Grievance because of death, 14: Father retired, 15: Father lost his job, 16: Finished school, 90: Other

[4] Q28b_reasons: What were the reasons for missing school?
Categories: 1: Did not like education, 2: Had bad grades, 3: Had to earn money because father died, 4: Had to earn money because father got sick, 5: Got married, 6: Parents forced him/her to leave education, 7: Had to help with the family business, 8: Had to take care of siblings at home, 9: A family member became sick and needed help, 10: Family could not afford the school supplies, 11: Family could not afford the school lunches, 12: Was too sick/disabled to go to school, 13: Grievance because of death, 14: Father retired, 15: Father lost his job, 16: Finished school, 90: Other

[5] Q66_Assets: Do you have the following items?
Categories: 1: Car, 2: TV, 3: Satellite, 4: Regular Phone, 5: Mobile Phone, 6: Smart Phone, 7: Tablet, 8: Refrigerator, 9: Stove, 10: Oven, 11: Microwave, 12: Air Conditioning, 13: Washing Machine, 14: Vacuum Cleaner, 15: Internet, 16: Electric Fan, 17: Computer, 18: Gold Jewellery, 19: Bed, 20: Traditional Sofa (on the floor), 21: Standard Sofa