

# Who needs security in a crisis? Evidence from an in-the-field choice experiment in Lebanon

Georgios Melios<sup>\*1,2</sup>, Yara Sleiman<sup>2</sup>, Elisabetta Pietrostefani<sup>2,3,4</sup>, and Henrietta Moore<sup>2</sup>

<sup>1</sup>*Department of Psychological & Behavioural Science, London School of Economics and Political Science, London, UK*

<sup>2</sup>*Institute for Global Prosperity, University College London, London, UK*

<sup>3</sup>*Department of Geography and Planning, University of Liverpool*

<sup>4</sup>*Department of Geography & Environment, London School of Economics and Political Science, London, UK*

## Abstract

Who opts for informal work arrangements in times of severe economic uncertainty, and why? While extensive research has been conducted on the effects of informality on the economy, the empirical evidence about which employees enter the informal labour market remains mixed. This study elicits labour preferences for informal work arrangements in Lebanon, a country grappling with severe economic instability. Drawing on qualitative insights, we operationalise informality in the Lebanese labour market and administer an in-the-field choice experiment to elicit job preferences (N=1450) in two Lebanese cities. Our findings show that employees prefer job choices that offer social protection and private insurance but avoid formal contracts. Using an unsupervised clustering technique, we sort informal workers into distinct skill-based groups and show that high-skilled workers self-sort in informality to avoid social security and contracts in an unstable environment. Implications with regard to tax and social security legislation are discussed.

Keywords: Informal labour market, Lebanon, Choice Experiment, Job preferences

---

\*We would like to thank the Leverhulme Trust for providing the necessary funding for this work. In addition to that we are grateful to participants of the CEP, LSE, UCL, and ILO seminars as well as Kristin Fabbe, Bouke Klein Teeselink and Paul Dolan for their valuable comments and discussions on different stages of this paper. All interpretations and errors are solely the authors' responsibility.

# 1 Introduction

Over the past decade, labour markets in the Middle East have been transformed by a variety of global and regional factors (Krafft et al., 2022). Globalisation has opened new avenues for trade and employment, while regional conflicts, economic crises, and migration have reshaped demographic and workforce profiles (Baldwin-Edwards, 2011; Angel-Urdinola and Tanabe, 2012; Malik and Awadallah, 2013; Hackl, 2018). Furthermore, the COVID-19 pandemic and increasingly shorter economic cycles have introduced new uncertainties into these markets (Moussa et al., 2022). Lebanon serves as a unique case study in this context, as it has experienced most of these economic transformations and is currently grappling with a series of socioeconomic and institutional crises that have significantly altered its labour market.

One of the most noticeable labour transformations in the region, and particularly in Lebanon, has been the rise of informality, which has far-reaching implications (Gatti et al., 2014). Informality, a multifaceted phenomenon determined by the relationship or lack thereof between a state and private agents through regulation, contracting, monitoring, and the provision of public services, has become a prominent feature of labour markets in developing countries (Bonnet et al., 2019; Günther and Launov, 2012). Evidence indicates that the implications of informality are profound, correlating with higher income inequalities (Krstić and Sanfey, 2007; Bennett and Rablen, 2015), poorer health outcomes (López-Ruiz et al., 2015), diminished welfare (Harriss-White, 2010), and biased state revenues (Loayza and Rigolini, 2006). Understanding these implications and the driving forces behind the rise of informality is crucial for effective policy design in the face of evolving labour markets. This is of particular importance in contexts where, like Lebanon, informal employment constitutes the majority of the labour market (ILO (2021) estimates >75% in Lebanon).

This paper aims to answer two main questions. First, through extensive fieldwork, we aim to elicit preferences for formal and informal work arrangements in Lebanon. To achieve this, we conducted a series of qualitative focus groups that allow us to contextualise and operationalise informality within the Lebanese labour market and identify the key job characteristics that drive employment decisions. We then implemented a field Discrete Choice Experiment (N=1,450) in two locations - Beirut and El Mina (Tripoli). Second, building on this foundation, we adopt Latent Class Analysis (LCA) to identify typologies of employees who opt for informal work arrangements. In addition to this, we conducted ancillary tests to identify heterogeneous effects within the observed patterns. Taken together, our analyses aim to shed light on the relative value individuals place on different job attributes amidst severe uncertainty. By understanding these preferences, we hope to provide insights that can inform more effective and targeted policy interventions to manage informality in labour markets.

Our paper makes three key contributions. First, to our knowledge, we are the first to study labour supply preferences amidst one of the most severe and prolonged crises globally. The unique context of Lebanon, characterised by an unprecedented decline

in employment rates and hyperinflation, provides an opportune context for this study (Bank, 2021). The situation in Lebanon has compelled workers into precarious working conditions with lower earnings and increased uncertainty (Botha et al., 2021; Assouad, 2023). We provide experimental evidence that employees, under such conditions, prefer work arrangements with longer working hours, no contracts, and no skill requirements, preferences that are consistent across different socioeconomic groups.

Second, we contribute to the ongoing debate on sorting in informal labour markets. While the field grapples with ambiguities surrounding the determinants of informal work, such as it being a last resort to avoid unemployment (Fields, 1990) or a voluntary choice driven by comparative advantage (Maloney, 2004), our clustering analysis reveals a more nuanced structure. We find that both forms of entry coexist, in line with existing theoretical work (Günther and Launov, 2012). Notably, our results indicate that, when faced with weak formal work arrangements, high-skilled workers prefer to evade the costs of formal protection, voluntarily sorting into informal work.

Informality poses significant challenges for research, particularly in developing countries (Lin and Ye, 2009). The transient and unregulated nature of informal work often places it beyond the reach of traditional data collection methods and the capacity of regulatory agencies. These challenges are amplified in times of crisis when resources are stretched thin. Common methods used in the analysis of job attribute valuations, such as duration and job search models (Gronberg and Reed, 1994; Sullivan and To, 2014; Hall and Mueller, 2018) require the use of longitudinal data that are virtually nonexistent in developing countries. Even when such data is available, it often fails to accurately represent informally-employed workers (ILO, 2021). Our paper makes a significant contribution to address these challenges by employing an experimental framework that allows us to elicit preferences for wage and non-wage attributes in a context with limited-to-no micro data on worker preferences.

## 2 Background

Lebanon is presently grappling with a complex socioeconomic and institutional crisis. The influx of more than 1.5 million Syrian refugees following the Syrian crisis in 2011 has exerted immense pressure on the host nation (ILO, 2021; Salti et al., 2022; Demirci and Kırdar, 2023). Over time, the increasingly harsh economic conditions have further strained Lebanon's national economy, infrastructure, and public services. The situation reached a tipping point in October 2019 when macroeconomic stability rapidly declined, causing a significant depreciation of the Lebanese pound and triggering a financial crisis. Inflation soared, and banks imposed unofficial capital controls, eventually leading to a full suspension of US dollar withdrawals from deposit accounts in February 2020. The subsequent COVID-19 pandemic and the Beirut Blast in 2020 further compounded these problems, plunging the nation into deeper socioeconomic turmoil.

During the data collection period (May 2021-July 2021), Lebanon operated under

a regime of multiple exchange rates. These included the central bank's official fixed exchange rate of 1,507.5 Lebanese pounds (LBP) to the US dollar (USD), the commercial bank rate of 3,900 LBP/ USD, and the black market rate, which was approximately 13,000 LBP/ USD ([Lira Rate, 2021](#))<sup>1</sup>. The latter was prone to significant fluctuations due to political instability.

Despite the unofficial devaluation of the Lebanese pound, the minimum wage remained fixed at 675,000 LBP per month<sup>2</sup>. At the official exchange rate, this amounted to 448 USD, but it dwindled to merely 56 USD at the black market rate, a staggering 85% decline from its original value. The failure to adjust the official exchange rate to reflect the real market value led to a severe erosion of purchasing power which in combination with hyperinflation (154.76% in 2021) drove a significant part of the population below the poverty line.

## 2.1 Informal employment in Lebanon

To identify which job attributes distinguish formal from informal work in Lebanon, we adopted a comprehensive methodology encompassing an extensive literature review, the examination of international regulatory frameworks, and the integration of qualitative evidence from original interviews and focus group discussions (FGDs). From this analysis, we identified seven key attributes: social security, health insurance, contracts, working hours, skill requirements, salary, and workplace diversity.

We first draw a distinction between formal and informal work based on guidelines from the 17th International Conference of Labour Statisticians (ICLS) which captures informal employment both within and outside the informal sector ([International Labour Organization \(ILO\), 2003](#)) and is adopted by the Central Administration of Statistics in Lebanon ([CAS and ILO, 2019](#)). To complement these guidelines, we consulted with employment law experts and conducted a total of 14 FGDs in Arabic with Lebanese and non-Lebanese nationals, including men and women of various age groups. Six FGDs were held in each of our case-study locations, Ras Beirut and El Mina. Additionally, we carried out 14 top-up phone interviews with El Mina residents to compensate for the low number of participants in the FGDs in this location. A detailed explanation of the questions addressed in both interviews with legal experts and FGDs, as well as a list of the FGDs conducted can be found in [Section A](#) of the Appendix.

By utilising a combination of ICLS guidelines and multiple qualitative data sources, we triangulated the job attributes that differentiate formal from informal work in Lebanon. We define informal workers in Lebanon as follows:

1. Employees who, in their primary or secondary jobs, are not registered with the

---

<sup>1</sup>As of now (May 2023), the rates are 14,980.4 LBP/ USD for the Central Bank and 94,000 LBP/ USD in the black market.

<sup>2</sup>Starting May 1st, 2023, the government has agreed to raise LBP salaries to 9,000,000 LBP for the private sector ([Today, 2023](#))

National Social Security Fund (NSSF) by their employer;

2. Employers and own-account workers in the informal sector, which includes private unregistered businesses, and
3. Contributing family workers, whose employment is by nature not subject to social security regulations.

Accordingly, the defining feature of formal employment in Lebanon is social security coverage. The NSSF is the single authoritative entity that reports on formal employee-employer relationships (LEADERS, 2019b). Nonetheless, the NSSF's mandate of formal protection fails to cater to several workforce segments due to limited funding and outdated policies. This includes agricultural and construction workers, domestic workers, casual public sector workers, and others within the realm of informality like street vendors and self-employed workers (LEADERS, 2019a). The system is also plagued by significant structural gaps rooted in discriminatory policies (LEADERS, 2019a). A prime example of this is the plight of married female workers who are not accorded equal benefits as their spouses. Eligibility for family allowances only comes into play under certain conditions - if they are widowed or if their spouse is absent or imprisoned. In addition, the "principle of reciprocity" limits migrant workers' access to social protection. Per this principle, foreign workers are eligible for social security only if their home country provides similar protection to Lebanese workers. Only four countries meet this criterion: France, Belgium, the UK and Italy, with Syria being a notable omission despite its significant representation within the country's working population (Tabar et al., 2020). This drives many foreign workers out of the formal labour market, as they are otherwise obliged to contribute to the NSSF without benefiting from its coverage.

Given the limitations of the NSSF in providing comprehensive social protection, there is a growing market for private health insurance in Lebanon. Many companies offer private insurance to their employees, either as a supplement to NSSF coverage or as a primary source of health insurance, especially for workers in the formal private sector (CAS and ILO, 2019). Private health insurance usually offers a wider range of services and a greater choice of healthcare providers compared to public insurance. However, it can also be more expensive and less accessible for low-income workers in agriculture, trade, or elementary occupations (CAS and ILO, 2019)

Employers are also obligated by law to provide written employment contracts to their employees, regardless of the type of employment arrangement. While they are typically associated with formal work arrangements, contracts can also be offered in informal jobs to help define the terms and conditions of employment, including job responsibilities, working hours and wages (Tabar et al., 2020). This imparts a more formal character to the job, signifying a commitment to clarity and mutual understanding between employers and workers. However, within a context of exchange rate volatility and wage fluctuations, employees may have a preference for more flexible arrangements that provide greater adaptability (Colombo et al., 2019)

In line with previous work, our literature review and topic modelling (Nikolenko et al., 2017) of the FGDs (Appendix A) also indicate that informal jobs commonly require longer working hours, offer lower wages, and have lower skill demands compared to formal jobs. Some workers may be self-employed, working until the job at hand is finished without regulated working hours or overtime pay (Maloney, 2004). Others may work in unregulated industries, such as agriculture or construction, where there are no set limits on the working day (Bonnet et al., 2019).

With regard to wages, the literature consistently finds that informal jobs tend to pay less than formal ones. This wage gap can be attributed to various factors, such as the lack of minimum wage laws in the informal sector, the lower bargaining power of informal workers, and the generally lower productivity of informal enterprises (Bargain and Kwenda, 2014). In some cases, informal workers might earn only a fraction of what their formal counterparts make, even when they perform similar tasks.

As for skill demands, informal jobs often require fewer formal qualifications compared to formal jobs. Many informal jobs are in low-skilled occupations, such as manual labour or simple service work (CAS and ILO, 2019). At the same time, it's important to note that informal workers might have a wide range of informal or tacit skills, even if they lack formal qualifications. However, these skills are often undervalued or unrecognised in the labour market, which contributes to the lower wages and poorer working conditions experienced by many informal workers (Bonnet et al., 2019).

Finally, Lebanon's deeply entrenched political and sectarian divisions have a profound impact on employment dynamics. While sectarian considerations are not directly tied to the formal or informal nature of a job, we argue that they constitute a significant determinant of job choices in Lebanon. Workers tend to gravitate towards jobs within their own sectarian or communal networks due to shared cultural norms and social backgrounds. This preference for homogeneity can be driven by perceptions of increased access to promotion opportunities and benefits through sectarian affiliations (Makdisi and Marktanner, 2009; Cammett, 2014). As such, we incorporate varying levels of diversity in the choice sets to effectively capture the influence of sectarian considerations in employment decisions. All these considerations are translated into attributes that are specified in the experimental design section of the paper.

### 3 Experimental Design

Building on the comprehensive literature review, the examination of international regulatory frameworks, and the integration of qualitative evidence, seven attributes for the experimental design were selected (Section 2). These attributes, significant in job choice decisions in Lebanon and likely to differentiate formal from informal work, were chosen for their tractability (CAS and ILO, 2019). Included are: monthly salary, working hours, skills and experience, workplace diversity, social security, private insurance, and work contract.

In the experiment, respondents were sequentially presented with 18 distinct choice sets and prompted to select between two generic (unlabeled) job scenarios. Each job profile was characterised by a unique combination of the seven attributes. The full set of attributes and levels included in the choice sets is presented in Table 1. Any job-specific attributes not explicitly mentioned were conveyed to respondents as being identical across profiles within a choice set.

Attribute	Levels
Monthly Salary (LBP)	less than 450,000
	450,000 to 999,999
	1,000,000 to 1,999,999
	2,000,000 to 3,500,000
Weekly working hours	More than 3,500,000
	48 hours or less
Skills and Experience	More than 48 hours
	Skills and experience required in this job
Diversity	Skills and experience not required in this job
	No diversity in the workplace
	Some diversity in the workplace
Social Security	A lot of diversity in the workplace
	No social security
Private Insurance	Social security
	No private insurance
Contract	Private insurance
	No contract
	Contract

Table 1: DCE Attributes and Levels

Notes: At the time of the survey, local dollars was converted at a rate of 3,900 LBP. "Fresh" dollars coming from outside Lebanon, could be converted at a rate of 13,000 LBP, corresponding to the average black market rate in the three months before survey administration ([Lira Rate, 2021](#)). The local USD equivalents of the monthly salaries at the time of data collection were the following. 1: Less than 450,000 (less than 115 USD); 2: 450,000-999,000 (115-256 USD); 3: 1,000,000-1,999,999 (257-512 USD); 4: 2,000,000-3,500,000 (513-897 USD); More than 3,500,000 (more than 898 USD)

The process of attribute and level selection was aimed at accurately reflecting differences in formal and informal working arrangements. For the salary attribute levels, we referred to the distribution of monthly labour income in the Labor Force and Household Living Conditions Survey [CAS and ILO \(2019\)](#). This careful pre-study allowed us to design the job profiles with high face validity ([Carson et al., 1994](#)).

Given these attributes and levels, the full factorial design for the experiment includes 480 choice sets. To decrease the number of tasks to a manageable number and reduce

cognitive load, we implement a fractional factorial design based on D-efficiency<sup>3</sup>. To achieve higher D-efficiency for the experiment we conducted a pilot study involving 70 respondents who shared similar characteristics to our sample. We then refined the experimental design using coefficients from the preliminary regression analysis of the pilot data following (WHO, 2012). Respondents were also requested to give feedback regarding the clarity of the questions and the survey experiment, and the survey was refined accordingly. The final questionnaire was approximately 30 minutes long and contained a screener to collect information on household and individual-level demographics to allow for preference heterogeneity analysis.

## 4 Survey Design and Data

The experiment was conducted between May and July 2021 in two distinct Lebanese cities, Beirut and Tripoli, specifically within the areas of Ras Beirut and the El Mina. These sites were chosen to provide the best possible representation of the Lebanese labour market, given the funding constraints and COVID-19 restrictions. The surveys were carried out in person by a team of 40 field researchers who adhered to all necessary precautions to protect both themselves and the respondents against COVID-19<sup>4</sup>. The full survey is provided in the online submission.

### 4.1 Sampling

The surveys were conducted using a two-stage sampling design, with representative samples proportionally stratified by nationality (Lebanese and non-Lebanese) drawn from the comprehensive population count. We used separate sampling frames for Lebanese and non-Lebanese populations, calculating the sample size with a 95 percent level of confidence and a 5 percent margin of error<sup>5</sup>. The total sample size was 1,450 respondents with 761 respondents in the El Mina and 689 respondents in Ras Beirut. Figure A1 in the appendix illustrates the geographic scope of the samples for each city<sup>6</sup>.

---

<sup>3</sup>The traditional orthogonal fractional factorial designs minimise correlations between attributes to zero, whereas statistically efficient designs, otherwise known as D-optimal designs, maximise the information recovered from a full-factorial design. The most common way to measure this is D-efficiency (Hall et al., 2001), which minimises the D-error, i.e. the determinant of the inverse of the variance-covariance matrix. The D-error in turn is based on the specification and estimated parameter values for nonlinear models.

<sup>4</sup>The research methodology and COVID-19 guidelines were approved by the UCL Research Ethics Committee (ID: 1059/006) and the American University of Beirut Institutional Review Board (ID: SBS-2018-0635)

<sup>5</sup>The sample size for non-Lebanese was calculated using the same formula, but by applying a finite population correction factor that accounts for the smaller population size of non-Lebanese.

<sup>6</sup>Cadastral population estimates were 27,111 Lebanese and 3,600 Non-Lebanese for casastres Ras Beirut Ain El Mreisseh and 18,940 Lebanese and 7,200 non-Lebanese for cadastres Mina 3 and Mina Jardin in 2020 (UNHCR et al., 2020; UN-Habitat, 2016).



## 4.2 Summary Statistics

This subsection provides an overview of key demographic and economic variables from the collected data. Table 2 presents descriptive statistics for key variables from the collected data in El Mina ( $n = 761$ ) and Ras Beirut ( $n = 689$ ) sites. Our sample closely aligns with national data (CAS and ILO, 2019) by capturing essential observables such as male gender, age distribution, household headship, educational attainment, employment status, informal employment, and self-employment. This comprehensive representation ensures the validity of our findings to the larger population.

Between our two location, we observe a slightly larger share of men and younger respondents in Ras Beirut and equivalent shares of Lebanese respondents across both subsamples. Roughly half of the respondents in both areas are household heads (i.e. primary household income earners). The average monthly income in Ras Beirut (365.28 USD) exceeds the average income in El Mina (131.03 USD). Income was standardised based on the different LBP-to-USD values.<sup>7</sup> Among 1,450 respondents, 1,373 (94.7 percent) reported the currency of earnings. Out of those, 88.6 percent were paid in Lebanese pounds (LBP), and only 9.8 percent were paid in "fresh" dollars exchanged at the black-market rate.<sup>8</sup>

The data also reveals key insights about employment status and wage disparities among the respondents. Over half of the individuals in both El Mina (53 percent) and Ras Beirut (58 percent) are employed. The majority of those employed are informal workers, making up 69 percent and 66 percent in El Mina and Ras Beirut respectively. The remaining respondents are either unemployed or inactive. Wage inequalities between formal and informal workers are observed for both regions with formal earnings exceeding informal earnings by more than twofold on average.

## 5 Empirical Framework

The empirical analysis of our work is theoretically grounded on a canonical random utility model. The main assumption of this model is that individuals choose the option that gives them the maximum utility among the two presented alternatives at each iteration. To visualise how the overall utility can be decomposed into partial utilities and how these depend on respondents' characteristics and preferences, let  $i = 1, \dots, I$  index individuals,  $j = 1, \dots, J$  jobs, and  $a = 1, \dots, A$  attributes. Individual  $i$  maximises utility from job  $j$ ,  $U_{ij} \in \{R\}$  with

---

<sup>7</sup>Income in local dollars was converted at a rate of 3,900 LBP. For *Fresh Dollars*, a rate of 13,000 LBP was used, corresponding to the average black market rate in the three months before survey administration (Lira Rate, 2021).

<sup>8</sup>"Fresh" dollars refers to money denominated in USD in the Lebanese Banking system that is either in cash or received through an international wire transfer. *Fresh Dollars*, unlike local dollars or LBP, are not subject to any transfer or withdrawal restrictions.

Table 2: Summary statistics

	El Mina, Tripoli <sup>1</sup>			Ras Beirut, Beirut <sup>2</sup>			Total			National <sup>3</sup>	
	N	Mean	SD	N	Mean	SD	N	Mean	SD	Mean	SD
<b>Demographics</b>											
Male	758	0.52	0.50	689	0.63	0.48	1,447	0.57	0.50	0.48	0.50
Age	757	41.50	15.39	678	39.78	16.51	1,435	40.69	15.94	38.80	2.04
Lebanese	761	0.67	0.47	689	0.68	0.47	1,450	0.68	0.47	0.80	0.40
Household Head	726	0.46	0.50	519	0.42	0.49	1,245	0.44	0.50	0.26	0.44
<b>Education</b>											
None	753	0.03	0.16	670	0.02	0.14	1,423	0.02	0.15	0.16	0.36
Primary	753	0.27	0.45	670	0.07	0.26	1,423	0.18	0.38	0.26	0.44
Complementary	753	0.33	0.47	670	0.16	0.36	1,423	0.25	0.43	0.22	0.41
Secondary	753	0.11	0.31	670	0.17	0.37	1,423	0.14	0.34	0.16	0.36
University	753	0.18	0.39	670	0.50	0.50	1,423	0.33	0.47	0.21	0.41
<b>Employment</b>											
Employed	761	0.36	0.48	689	0.51	0.50	1,450	0.43	0.50	0.31	0.46
<i>Informal Employment</i>	407	0.69	0.46	400	0.66	0.48	807	0.67	0.47	0.55	0.50
Contributing Family Worker	761	0.01	0.10	689	0.01	0.10	1,450	0.01	0.10	0.00	0.06
Self Employed	761	0.17	0.37	689	0.06	0.24	1,450	0.12	0.32	0.08	0.28
Unemployed	761	0.23	0.42	689	0.21	0.41	1,450	0.22	0.42	0.10	0.50
Inactive	761	0.23	0.42	689	0.21	0.41	1,450	0.22	0.42	0.06	0.23
<b>Income (USD)</b>											
Total	567	131.03	472.79	408	365.28	807.69	975	229.05	645.86	871	680.28
Employed	330	124.71	353.74	305	381.88	876.92	635	248.23	669.92	887	687.78
Informal	224	94.04	138.09	212	241.86	473.45	436	165.91	352.10	568.00	470.56
Formal	106	189.52	587.66	93	701.08	1369.23	199	428.59	1053.85	1198.07	709.30
N	761			689			1,447				

Notes: Statistics are shown for the two sampled areas (1. El Mina and 2. Ras Beirut) separately as well as for the full sample. 3. National indicates the summary statistics from the nationally representative 2019 Labour Force survey that allows us to compare the validity of our samples in comparison to Lebanon (CAS and ILO, 2019).

$$U_{ij} = u_i(X_j) + \varepsilon_{ij} \quad (1)$$

where a job  $X_j$  is simply a vector of  $A$  attributes  $X_j = [X_{j1}, \dots, X_{jA}]$ .  $u_i(X_j)$  represents the individual specific utility over the given job characteristics and  $\varepsilon_{ij} \in \{R\}$  is an individual-job specific error term. An individual  $i$  chooses the job  $j$  out of choice set  $\Omega$  if it results in the highest possible utility, given constraints. Formally  $j$  will be the choice  $\forall j' \neq j \in \Omega, U_{ij} > U_{ij'}$  and  $\varepsilon_{ij}$  is considered random.

Assuming linear sub-utility, we can infer that the probability individual  $i$  chooses job  $j$  is:

$$P_{ij} = Pr(\varepsilon_{ij'} - \varepsilon_{ij} < (X_j - X_{j'})' \beta_i) \forall j' \neq j \in \Omega \quad (2)$$

In order to derive the discrete choice models, we impose an assumption on the distribution on the individual-job specific error term so that  $\varepsilon_{ij}$  is distributed i.i.d.. In addition to that, assuming heterogeneity in preferences we obtain the following conditional logit model:

$$P_{ij} = \frac{\exp(X_j' \beta_i)}{\sum_{j \in \Omega} \exp(X_j' \beta_i)} \quad (3)$$

To allow decision makers to have different preferences, we assume a parametric form that depends on some parameters  $\theta$ , the unconditional probability over the distribution of  $\beta_i$ , we derive:

$$P_{ij}(\beta_i) = \int \frac{\exp(X_j' \beta_i)}{\sum_{j \in \Omega} \exp(X_j' \beta_i)} f(\beta | \theta) d\beta \quad (4)$$

These assumptions allow a model highly relevant to this study as it enables us to look at labour supply considering the specific characteristics of the Lebanese case (Datta, 2019). At first, this setup does not require us to look at choices under the spectrum of a representative agent, allowing for a distribution of preferences that do not directly derive from observables. A second advantage is that this model relaxes the assumptions of income maximisation and allows' agents utility to be driven by other attributes that are important in job choices. In this setting, in a model of a job choice that depends on salary (S), working hours (H), skills and experience (E), diversity (D), social security (I), private insurance (P) and contract (C), the utilities for the two choices would be:

$$U_{i1} = \alpha + \beta_1 S_{i1} + \beta_2 H_{i1} + \beta_3 E_{i1} + \beta_4 D_{i1} + \beta_5 I_{i1} + \beta_6 P_{i1} + \beta_7 C_{i1} + \varepsilon_{i1} \quad (5)$$

$$U_{i2} = \alpha + \beta_1 S_{i2} + \beta_2 H_{i2} + \beta_3 E_{i2} + \beta_4 D_{i2} + \beta_5 I_{i2} + \beta_6 P_{i2} + \beta_7 C_{i2} + \varepsilon_{i2} \quad (6)$$

The choice for alternative 1 holds that:

$$U_{i1} - U_{i2} = \alpha + \beta_1 (S_{i1} - S_{i2}) + \beta_2 H_{i2} + \beta_3 E_{i2} + \beta_4 D_{i2} + \beta_5 I_{i2} + \beta_6 P_{i2} + \beta_7 C_{i2} + \varepsilon_{i2} \quad (7)$$

As respondents' choices on job profiles depend on the alternative, we have estimated conditional logit models for both the full sample and both field sites individually. The use of conditional logit models is considered appropriate for unlabeled and randomly ordered choices in discrete choice settings [Hauber et al. \(2016\)](#). In the following section, we present all results as average semi-elasticities following [Valet et al. \(2021\)](#).

## 6 Results

Following the estimation strategy of [Hainmueller et al. \(2014\)](#) for forced-choice discrete choice experiments, we regress respondents' choices of each task on dummy variables for each attribute level. Each coefficient captures the percentage change in the respondent's probability of choosing a given profile if the attribute level changes to the presented value from the baseline category and in relation to other levels.<sup>9</sup> Hence, the baseline model is:

$$Choice_{ijk} = \theta_0 + \theta_1 S_{ijk} + \theta_2 H_{ijk} + \theta_3 E_{ijk} + \theta_4 D_{ijk} + \theta_5 I_{ijk} + \theta_6 P_{ijk} + \theta_7 C_{ijk} + \varepsilon_{ijk} \quad (8)$$

where  $Choice_{ijk}$  refers to the outcome variable (the choice individual  $i$  made in task  $j$  in place  $k$  and  $S, H, E, D, I, P, C$  are dummy variables that correspond to the levels of each attribute. Fig. 1 shows the baseline estimates as average semi-elasticities for the full sample, modelled as grand mean effects. The corresponding estimates are presented in Table A2.<sup>10</sup> Coefficients represent the average likelihood (and the 95 % CI) of selecting a job profile if it includes the corresponding job attribute.

Results show that respondents are more likely to accept job offers with higher salary levels. The base probability of choosing a job offer decreases by 37 percent when the monthly salary offered is below 450,000 LBP and by 26.8 percent when earnings are between 450,000 LBP and 999,999 LBP. At the median salary bracket of 1,000,000 LBP to 1,999,999 LBP, respondents were more likely to accept than reject offers with a base probability of 5.5 percent. When presented with the highest bracket of 2,000,000 LBP to 3,500,000 LBP, respondents were 28.7 percent more likely to opt for the job.

Regarding working hours, respondents reveal a significant preference for choices that exceed full-time employment hours. This preference may reflect a strategic response to the prevailing economic conditions. As respondents grapple with diminishing income and purchasing power, they are likely leaning towards jobs with extended hours to compensate for their lost income and counterbalance their deteriorating purchasing power. This finding is consistent with previous research on overwork during economic downturns ([Bluestone and Rose, 1997](#); [Bell and Blanchflower, 2011](#)).

<sup>9</sup>To correct for within-respondent correlation, choices, and standard errors are clustered at the respondent level.

<sup>10</sup>Results in the table are interpreted with respect to the reference category for each attribute. Estimates associated with salary are compared against a baseline of *less than 450,000 LBP*, working hours against *48 hours or less*, and the remaining against the absence of the attribute.

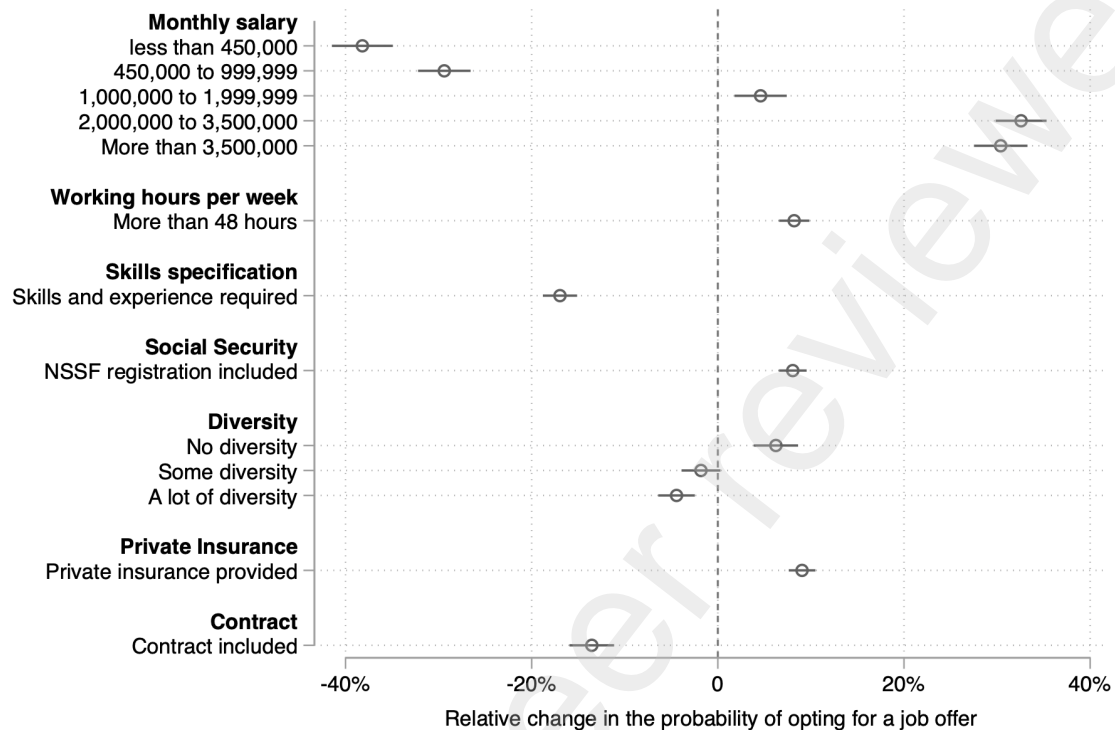


Figure 1: Baseline estimation of preferences for work attributes in the full sample

In addition, respondents value flexibility in skill requirements. A specified prerequisite of skills and experience decreases the probability of choosing a job offer by 16.9 percent. Taking together these non-monetary preferences, it appears that in the current context of multiple crises and high unemployment, workers signal maximum availability to any job offered. In other words, respondents lean towards less 'desirable' jobs - a pattern echoing the "sully effect of recessions" Barlevy (2002); Radchenko (2017).

In terms of job security, the findings suggest that respondents value formal employment arrangements that offer health and pension benefits, such as social security and private insurance, yet they place a negative valuation on work contracts. This observed aversion to contracts could initially be interpreted as a preference for informality and flexible work arrangements. However, in the current context, it might be more revealing of the influence of inflation uncertainty and its implications on wage expectations.

In an environment of high inflation, the value of a fixed wage contract can deviate substantially from anticipated real wages, leading to increased financial risks for employees. These risks heighten the costs associated with wage contract negotiations and foster a negative perception of such agreements (Holland, 1984). This understanding aligns with recurring themes from qualitative focus group discussions (Appendix A) conducted for this study, where the relationship between inflation and contract aversion was frequently

mentioned. Therefore, what may initially be interpreted as a disinclination towards formal contractual arrangements could indeed represent a complex array of adaptive strategies employed by workers in response to economically challenging circumstances.

## 6.1 Preferences by location

We proceed to estimate the results separately for our two study areas, Ras Beirut and the Mina, to explore cross-regional differences in job preferences. Figure 2 shows the results, estimated similarly as grand mean effects. Table A1 presents the corresponding average semi-elasticities. The direction of effects is similar and the preference structure is as previously described. Notable differences are observed for social security coverage with respondents in the Mina placing a relatively higher valuation on the attribute.

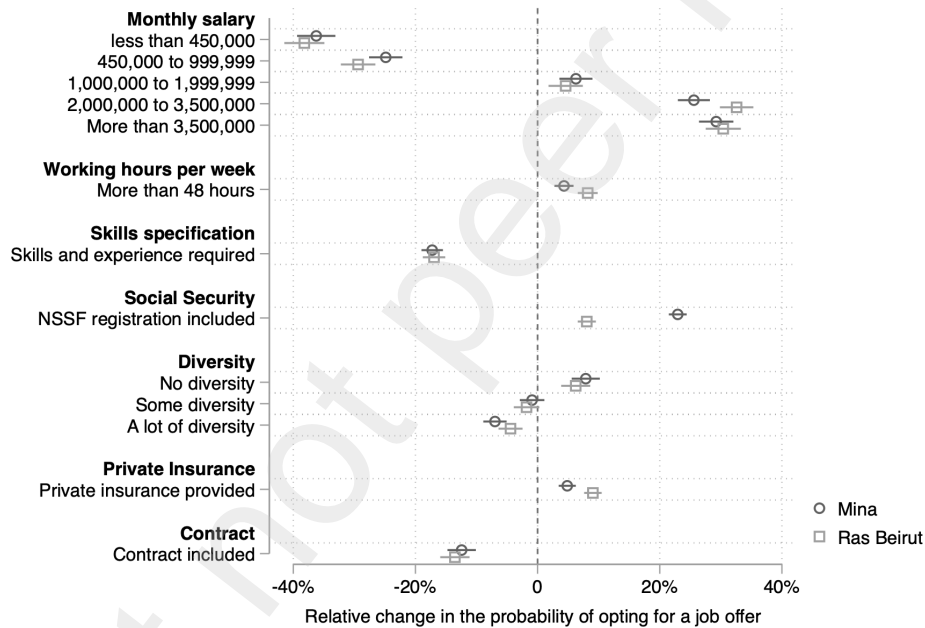


Figure 2: Preferences for job profiles, full sample

## 6.2 Preferences by Employment Status

We now focus our analysis on differences in job preferences between those currently employed formally and informally. Figure 3 shows the results separately for formal and informal workers. We estimate again the average semi-elasticities in contrast to the grand mean from the coefficients of Table A2 (Model 1 and Model 2) with a full interaction model to formally test for differences between workers (Model 3 of Table A2).

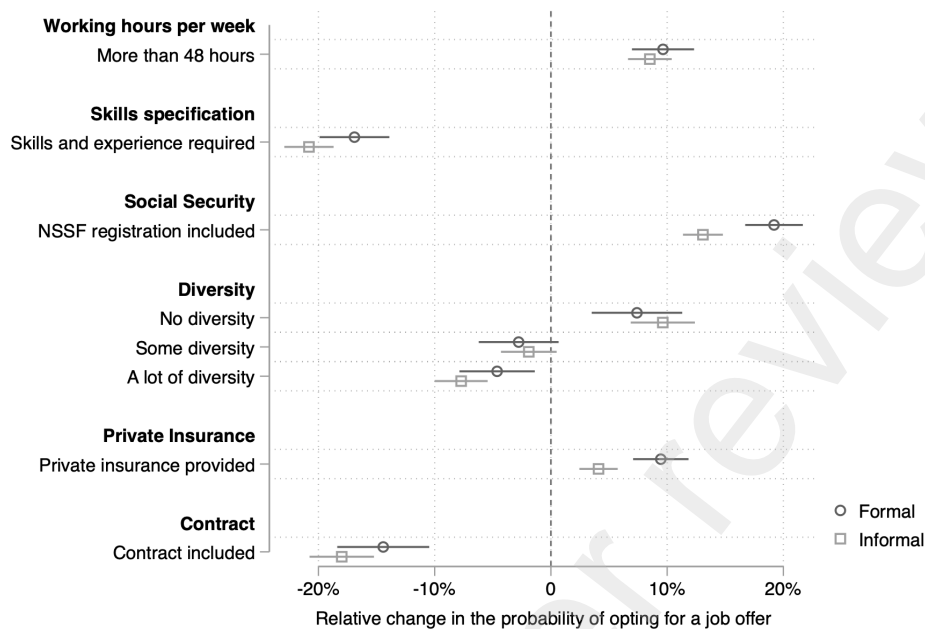


Figure 3: Results by employment type

The observed effects are in the direction one would expect when workers sort into distinct employment arrangements based on their preferences. Compared to formal workers, informal workers place a significantly lower valuation on choices with social security and private insurance. They are also significantly less likely to opt for jobs with skill requirements. With regard to income, informal workers exhibit a significantly higher preference for a high salary range exceeding 3,500,000 LBP. Consistent with this finding, monthly income for informal workers in Beirut and El Mina falls behind formal labour earnings, at the mean (see Table 2). Thus, workers in the informal labour market exhibit a comparatively higher marginal utility of income.

Overall, informal workers in Lebanon assign relatively less importance to formal employment attributes. Despite the modest differences in effect sizes, their preference for informal attributes, such as flexibility in skill requirements and the absence of a contractual agreement, takes precedence over formal benefits like private insurance and social security. This suggests that, on average, for informal workers in Lebanon, working formally is not preferred to informal employment, and thus a sizeable amount of informal arrangements in Lebanon might correspond to voluntary entry.

### 6.3 Who selects into informality?

To explore this finding more thoroughly, we draw on previous research that has examined the determinants of informal employment. In particular, we consider two contrast-

ing hypotheses - the segmentation hypothesis and the comparative advantage hypothesis (Günther and Launov, 2012; Cunningham and Maloney, 2001). Combined, these hypotheses indicate that the informal labour market is not homogeneous in terms of worker preferences, but consists of two distinct sub-segments, an upper-tier and lower-tier segment. The upper-tier group is composed of highly skilled workers with relatively high wages. They sort into the informal sector voluntarily out of comparative advantage considerations. In contrast, the lower-tier segment includes lower-skilled workers who are rationed out of the formal sector.

Building on this premise, we explore job preferences for a segmented informal labour market by identifying distinct typologies of informal workers using Latent Class Analysis (LCA). In particular, we use a generalised structural equation model and a logistic link function, regressing six indicators - education, income, nationality, work experience, gender, and firm size - on a latent class variable. The choice of indicators was based on the labour market segmentation literature (e.g. Günther and Launov, 2012; Cunningham and Maloney, 2001). All continuous variables are dichotomised to simplify the interpretation and avoid potential complications from non-normally distributed scales.

Binary indicators from numerical variables - income, experience, and firm size - are constructed using the corresponding median value. Experience is proxied by the number of years spent in one's current job, and firm size is measured by the number of workers in the enterprise. The reference category is represented by cases below the median for each where  $\tilde{x}_{income} = 1,000,000$ ,  $\tilde{x}_{experience} = 2 - 5$ ,  $\tilde{x}_{size} = 10 - 19$ . Dichotomous indicators include education, gender, and nationality. Reference categories for each are, respectively respondents with below-university level education, male respondents and non-Lebanese respondents.

We conduct the class enumeration process to identify the model that best represents the underlying structure of the data. We started with a one-class model and proceeded to test models of up to three classes. Goodness of fit was assessed using the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) (Appendix A.2).<sup>11</sup> We opt for the two-class solution suggested by the BIC. This decision is also driven by theoretical considerations surrounding the structure of the informal labour market in developing countries (Günther and Launov, 2012).

We interpret the two classes using the item-response probabilities displayed in Section 6.3. Lower levels of income, education, and firm size, predict membership in Class 1 (n=388;71.6%). In contrast, Class 2 (n=154;28.4%) exhibits a higher probability of above-median income, education, and firm size. Workers in Class 2 were also more likely to be female and less likely to have above-median experience, proxied by the number of years in the current job. Given these results, we label these classes as “Unskilled” (Class

---

<sup>11</sup>We observe a discrepancy between the model suggested by the AIC and the model suggested by the BIC. This occasionally occurs because while both criteria balance model fit and complexity, they weigh these factors differently. AIC tends to favor more complex models as it imposes a less stringent penalty for additional parameters compared to BIC. BIC is generally considered to be more reliable for model selection in larger samples, as it places a stronger penalty on model complexity.



1) and “Skilled” (Class 2) and proceed to estimate the average semi-elasticities for each sub-segment separately along with a full interaction model to formally test for differences between workers in each class (details in Table A3).

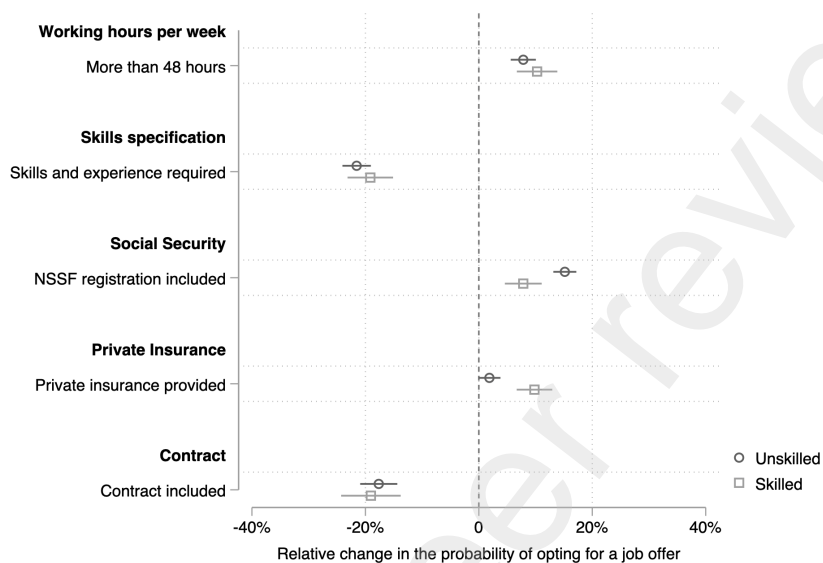


Figure 4: Results by LCA class

The analysis reveals heterogeneous preferences among informal worker subgroups, predominantly for social security, the main defining feature of formal employment in Lebanon. On one hand, unskilled informal workers are, on average, almost as likely as formal workers to opt for jobs with social security (see Table A3). On the other hand, skilled informal workers exhibit significantly lower preferences for formal social protection as they are 14.7 % less likely to opt for alternatives with security. These results suggest that, when presented with weak formal arrangements, respondents in the skilled group are more likely to evade the costs of formal protection and sort voluntarily into informal work. This resonates with the Lebanese context where working informally may be further enabled by the lack of trust in the state to deliver on social protection promises and future pension benefits.

### 6.3.1 Heterogeneity Analysis

Table A6 presents a heterogeneity analysis of preferences for four key demographics: gender, age, nationality, and educational attainment. Reference groups for each are respectively: males, youth (15-24 years old), Lebanese, and respondents with below university-level education.

Regarding gender differences, results show that females value security and formal arrangements more than male respondents, which aligns with prior work on gendered job

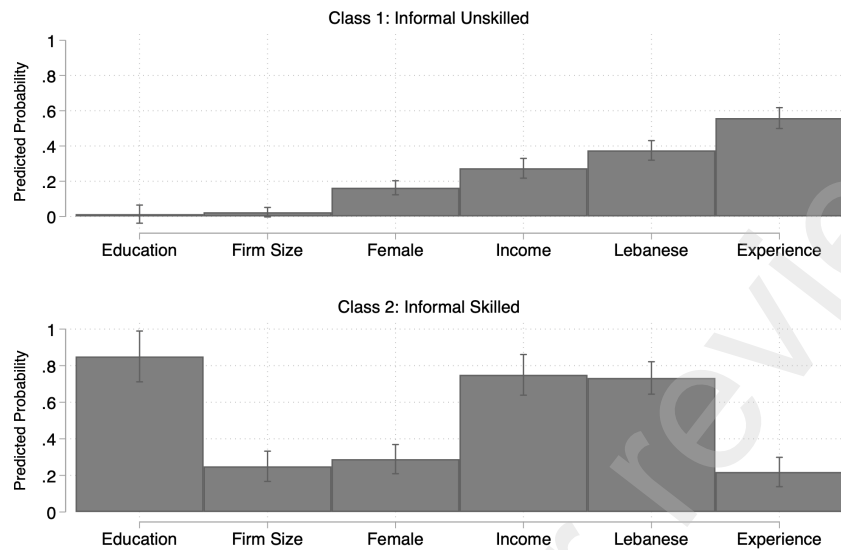


Figure 5: Latent Class Analysis

preferences (Fagan and Warren, 2001). More specifically, we observe that women were more likely to choose profiles with social security, private insurance, and skill requirements for work arrangements without longer working hours. With regards to age group variations, the only significant differences observed concerned social security and salary levels.

Lastly, regarding education, university graduates appear to value higher earnings and longer working hours. In addition to that, valued social security less than those with lower attainment, yet placed a significantly higher value on private health insurance. This further reinforces our previous findings where a sub-segment of higher-skilled workers are found less likely to opt for formal arrangements.

Interesting insights arise when we focus on the subset of Lebanese nationals which place significant value on social security and private insurance. Given the fragmented nature of the Lebanese social welfare program, it is unsurprising that non-Lebanese display a lower preference for formal protection. As previously indicated, access to social security benefits for foreigners in Lebanon is subject to the principle of reciprocity. Therefore, many non-Lebanese are required to contribute to the NSSF while being excluded from its services (LEADERS, 2019b).

### 6.3.2 Robustness Checks

Our analyses require a number of assumptions about the nature of labour market choices and the collected sample. This section explores the sensitivity of our results in a number of different robustness exercises. First, we will test the sensitivity of results with regard

to sampling, particularly with respect to income. Then we will attempt to test whether the ordering or total number of tasks resulted in priming or cognitive fatigue biases to our estimates. Lastly, we use the Bonferroni correction (Table A10) and a marginal means (MMs) (Fig. A2) estimation to test the sensitivity of our results on empirical strategy decisions.

Tables A8 and A7 in the Appendix present the results in the full sample when we win-sorize the sample at 99% and 95% with respect to income. Table A9 presents the results when we account for priming and cognitive fatigue by considering only the first 6 and only the last 6 choices of each respondent respectively. Results across all specifications remain virtually the same.

One of the main advantages of conjoint experiments is the fact that they allow for the possibility of testing many hypotheses at once. However, these multiple comparisons stemming from multiple levels may raise the size of estimated average marginal component effect (AMCEs). For a robustness test of the main results, we rerun the baseline model using Bonferroni adjustment for multiple comparisons (Table A10). The Bonferroni correction produces highly conservative estimates that should allow us to test the limits of our estimates. As shown, the substantive results we reach largely remain intact.

Lastly we test whether choosing average semi-elasticities, AMCEs or MMs substantially affects our results. In Fig. A2 we show the MMs estimation (Clayton et al., 2023), which represents individuals' average choice. Compared to the AMCE, MMs are capable of describing respondents' work arrangement choices at an absolute level, while remaining insensitive to the baseline category choice in subgroup comparison. Under all specifications, results remain substantially the same.

## 7 Limitations

Our study has several considerations worth noting. Determining preferences for work arrangements is challenging due to the indirect observability of wage and non-wage attributes. While recent evidence suggests that Discrete Choice Experiments outperform other methods for eliciting such preferences Feld et al. (2022), these experiments still have limitations.

One significant limitation is the potential lack of generalizability. As Discrete Choice Experiments present hypothetical choices, it is unclear whether people use the same decision-making criteria in real-life situations. Therefore, we are eliciting behavioural intentions, not actual behaviours. To address this, we carefully designed the experiment to ensure the proposed choices were as realistic as possible. We refined every choice set during the pilot test in the field, using qualitative insights from participants.

A second limitation is that our experiment, due to the context and limited funds, is not nationally representative. While effect sizes across the two sites do not significantly differ, our sample may not fully reflect the nation's demographics or other key characteristics. However, we have done our best to compare our samples with the nation on key

observables, such as demographics, income, religion, and nationality.

Future research could explore this issue in different contexts or examine other job attributes that might capture aspects of informality in crisis contexts. Also, finding a feasible way to validate the results of this experiment with a revealed preference approach using real jobs would provide valuable insights into the drivers of self-selection into informality.

## 8 Conclusions

Informal labour - marked by undocumented work arrangements, insufficient legal safeguards, and lack of social security - is an important issue as it affects more than 2 billion individuals globally (ILO, 2021). This phenomenon is especially pronounced in the Middle East and North Africa (MENA) region, where a confluence of political unrest, economic adversities, and entrenched societal practices has fostered a substantial prevalence of informal work arrangements. While numerous studies examine the effects of informal labour on income inequalities (Krstić and Sanfey, 2007; Bennett and Rablen, 2015), health outcomes (López-Ruiz et al., 2015), social welfare (Harriss-White, 2010), and state revenues (Loayza and Rigolini, 2006), there is a dearth of empirical research that elicits labour supply preferences in the region. This study bridges this gap by identifying preferences toward informal work arrangements in Lebanon, a country that mirrors regional trends in labour informality.

Our research also highlights the importance of treating selection into informality as a moving factor rather than a fixed one. A large body of prior research suggests that entry may be involuntary where informal work is regarded as a last-resort strategy to avoid involuntary unemployment (Fields, 1990), or it may be a voluntary choice based on comparative advantage considerations (Maloney, 2004). Most recent theory has combined these polar views and evidenced a more complex structure where the two forms co-exist (Günther and Launov, 2012). Our findings provide empirical evidence of the latter and suggest that both are true but for different typologies of employees. Hence, our results demonstrate the deficiency of models trying to explain differences between formal and informal employment by static factors such as institutional differences or macroeconomic conditions. Instead, our findings point towards the need for a more nuanced understanding of what drives self-selection in informality in different contexts to fully appreciate the potential impacts of informal employment. A possible direction for future research is to examine the relative effectiveness of different policies in reducing the levels of self-selection to informal work arrangements.

## **Acknowledgements**

We are particularly grateful for the extensive research carried out by citizen scientists who played a key role in the data collection phase of this project: Fawaz Chehab, Manuella Chawiche, Dina Arakji, Fouad Bou Mjahed, Grace Abi Faraj, Mohamad Kaawach, Zainab Alawieh, Sarah Jilinkirian, Nazih Adra, Waseem Al Sakhleh, Mohamad Esrawi, Hussein El Moullem, Ellisar Bou Hussein, Rahaf Zaher, Lory Yacoubian, Salaheddine Naous, Osama Ghaya, Ghassan Bakri, Maya Chalabi, Abdulkarim Janki, Sageda Moubarak, Mahmoud Sleiman, Hiba Chaarani, Heba Haji, Amina Saad, Houda Kabbara, Bassem Zawdeh, Mohammad Said Khalaf, Sara Badawiyeh, Mohammad Kanoun, Aya Ashram, Sara Captan, Alaa Merehby, Taha Mersally. We would like to thank all the residents of Ras Beirut and the Mina who participated in the survey. Thanks to Mariam Daher, Joana Dabaj, Mayssa Jallad, Sara Maasarani, Diala Makki, Nikolay Mintchev for their support and contributions throughout the project. We would also like to thank various partners and local stakeholders including Catalytic Action, and the Neighbourhood Initiative at the American University of Beirut. We are grateful to all the above for their important contributions. We are also particularly grateful for the generous funding that the Leverhulme Trust (Project Title: Supporting Macroeconomic Stability and Prosperity in an Age of Mass Displacement - Grant RPG-2019-326) and ESRC (RELIEF - Grant ES/P008003/1) provided without which this study wouldn't have been possible. All interpretations and errors are solely the authors' responsibility.

# Appendix

## A.1 Interviews and Focus Groups

To ascertain which job attributes distinguish formal from informal work in Lebanon, we complemented our desk-based investigation with original qualitative data by conducting interviews and focus group discussions (FGDs).

Three consultations were conducted with Lebanese legal experts to acquire theoretical and practical insights into the Lebanese labour regulations and its caveats. One of these consultations was a member of Legal Agenda, a Beirut-based nonprofit research and advocacy organization whose aim is to improve community well-being by that legal means can be used effectively to secure the rights of marginalized groups and strengthen rights discourse.

Location	Number	Number of participants	Date
Focus Groups El Mina	6	20 7 Adult Female 5 Adult Male 8 Youth (Leb and non-Leb)	10-20 October 2020
Focus Groups Hamra	6	24 10 Adult Female 9 Adult Male 5 Youth	15-25 September 2020
Additional Interviews	14	14 7 Adult Female 5 Adult Male 2 Youth	1-15 December 2020
Telephone Call			

Table A1: List of Focus Groups and additional interviews

A total of 14 Focus Group Discussions (FDGs) were conducted in Arabic with Lebanese and non-Lebanese nationals, female and male, youth and adult participants. Six FGDs were held in each of our case-study locations, Ras Beirut and El Mina. Finally, we implemented 14 top-up interviews through phone calls with El Mina residents to compensate for the low number of participants during the FGDs. Participants were asked to identify their profession, their education if they are currently working or not. They were then asked to discuss their choice of employment, their job security and whether they had a contract or not. They were also asked about the quality of their employment with regards to their workplace, flexible working arrangements, whether their job provides them with opportunities to gain experience and whether they received any additional benefits from their jobs (health insurance or social security). FGDs and interviews were recorded and transcribed. Topic modelling was then conducted to delimit the main themes ([Nikolenko](#)

et al., 2017) covered in order to delimit formal and informal employment attributes. Table A1 lists the 58 respondents from Hamra and El Mina who discussed their experience accessing the labour market in Lebanon, their job at the time and the dates they were consulted.

## A.2 Sampling

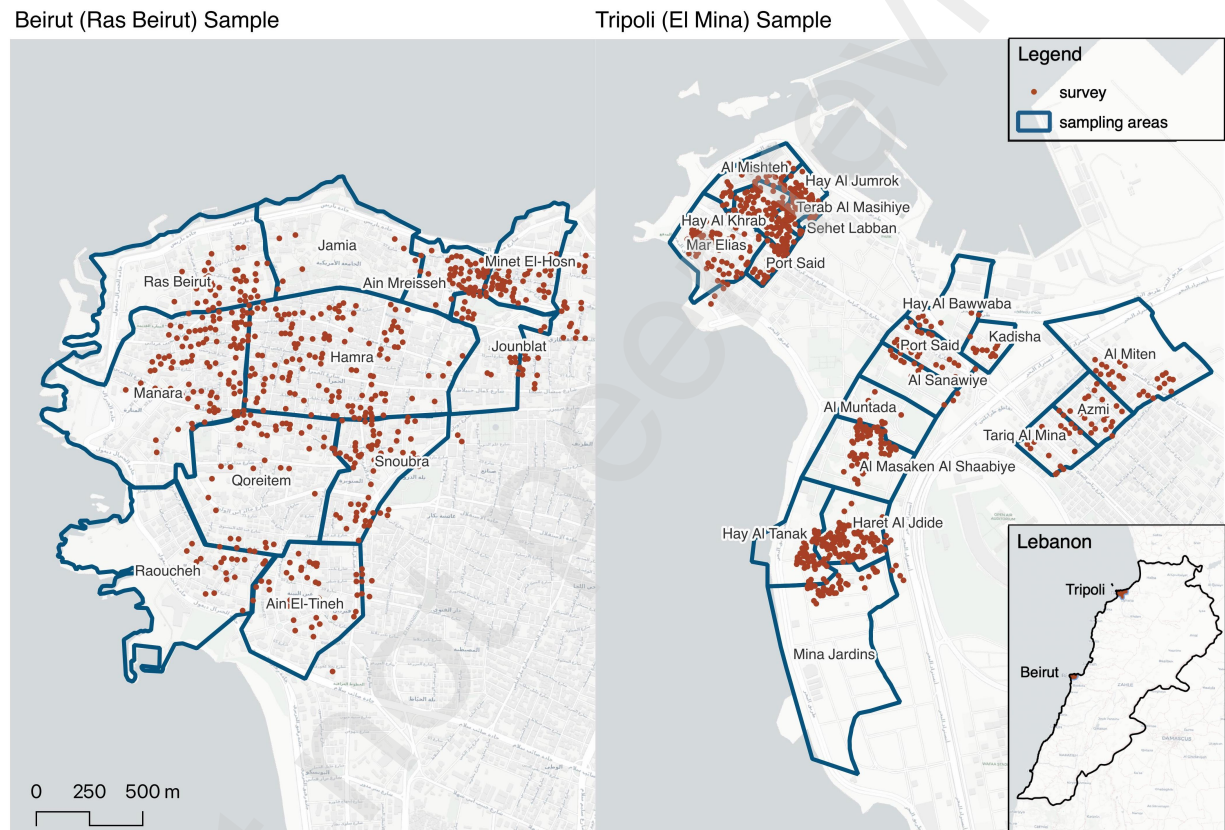


Figure A1: Sampling distribution

Table A2: AMCEs for the main specification, by type of employment and by skills

	Full Sample	Formal	Informal	Skilled	Unskilled
450,000 to 999,999	0.10*** (0.02)	0.10** (0.04)	0.11*** (0.03)	0.15*** (0.06)	0.10*** (0.04)
1,000,000 to 1,999,999	0.43*** (0.02)	0.45*** (0.04)	0.50*** (0.03)	0.59*** (0.06)	0.47*** (0.03)
2,000,000 to 3,500,000	0.66*** (0.02)	0.73*** (0.04)	0.79*** (0.03)	0.96*** (0.05)	0.73*** (0.03)
More than 3,500,000	0.67*** (0.02)	0.70*** (0.04)	0.84*** (0.03)	0.86*** (0.05)	0.83*** (0.03)
More than 48 hours	0.12*** (0.01)	0.19*** (0.03)	0.17*** (0.02)	0.21*** (0.04)	0.16*** (0.02)
Skills and experience required	-0.34*** (0.01)	-0.34*** (0.03)	-0.42*** (0.02)	-0.38*** (0.04)	-0.43*** (0.03)
Social security	0.32*** (0.01)	0.38*** (0.03)	0.26*** (0.02)	0.16*** (0.03)	0.30*** (0.02)
Some diversity	-0.09*** (0.01)	-0.10*** (0.03)	-0.12*** (0.02)	-0.11** (0.04)	-0.12*** (0.03)
A lot of diversity	-0.13*** (0.01)	-0.12*** (0.03)	-0.17*** (0.02)	-0.14*** (0.04)	-0.19*** (0.03)
Private insurance	0.14*** (0.01)	0.19*** (0.02)	0.08*** (0.02)	0.20*** (0.03)	0.04* (0.02)
Contract	-0.26*** (0.02)	-0.29*** (0.04)	-0.36*** (0.03)	-0.38*** (0.05)	-0.35*** (0.03)
Observations	51876	9540	19440	5544	13896
Respondents	1441	265	540	386	154

Notes: The table shows the estimated average marginal component effect (AMCEs). Column 1 shows the results for the full sample, Column 2 for the respondents that are currently formally employed, Column 3 for those informally employed, Column 4 for those with high skills, and Column 5 for those with low skills. Standard errors are given in parentheses. Asterisks denote significance at the 0.01 (\*\*\*), 0.05 (\*\*), and 0.1 (\*) level.



Table A3: AMCEs for the Interaction Effects between Informality and skills

	Informal	Skilled Informal
450,000 to 999,999	0.01 (0.05)	0.06 (0.07)
1,000,000 to 1,999,999	0.06 (0.05)	0.11* (0.07)
2,000,000 to 3,500,000	0.06 (0.05)	0.23*** (0.06)
More than 3,500,000	0.14*** (0.05)	0.02 (0.06)
More than 48 hours	-0.02 (0.03)	0.05 (0.04)
Skills and experience required	-0.08** (0.04)	0.05 (0.05)
Social security	-0.12*** (0.03)	-0.15*** (0.04)
Some diversity	-0.01 (0.04)	0.00 (0.05)
A lot of diversity	-0.05 (0.04)	0.05 (0.05)
Private insurance	-0.11*** (0.03)	0.16*** (0.04)
Contract	-0.07 (0.05)	-0.03 (0.06)
Observations	28980	19440
Respondents	805	540

Notes: The table shows the estimated average marginal component effect (AMCEs). Coefficients represent interaction terms, isolating differential attribute effects for Informal and Skilled Informal employment categories (columns 1 and 2 respectively). Other definitions are as in Table A2

Table A4: LCA Fit Indices

Model	N	AIC <sup>a</sup>	BIC <sup>b</sup>
1 Class	542	3443.61	3469.38
2 Classes	542	3263.17	3319.01
3 Classes	542	3242.72	3328.63

Notes: <sup>a</sup> Akaike Information Criterion <sup>b</sup> Bayesian Information Criterion

Table A5: AMCEs by site

	Baseline		
	Full Sample	Mina	Ras Beirut
450,000 to 999,999 LBP	0.102*** (0.018)	0.114*** (0.025)	0.088*** (0.026)
1,000,000 to 1,999,999 LBP	0.426*** (0.018)	0.425*** (0.024)	0.428*** (0.026)
2,000,000 to 3,500,000 LBP	0.658*** (0.016)	0.618*** (0.023)	0.708*** (0.024)
More than 3,500,000 LBP	0.666*** (0.017)	0.655*** (0.024)	0.686*** (0.025)
More than 48 hours	0.122*** (0.011)	0.086*** (0.016)	0.164*** (0.017)
Skills and experience required	-0.339*** (0.013)	-0.345*** (0.018)	-0.339*** (0.019)
Social security	0.317*** (0.011)	0.459*** (0.015)	0.161*** (0.015)
Some diversity in the workplace	-0.085*** (0.014)	-0.088*** (0.020)	-0.080*** (0.021)
A lot of diversity in the workplace	-0.129*** (0.014)	-0.149*** (0.019)	-0.107*** (0.020)
Private Insurance	0.137*** (0.010)	0.097*** (0.014)	0.181*** (0.015)
Contract	-0.258*** (0.017)	-0.249*** (0.024)	-0.271*** (0.024)
N	51876	27108	24768

Notes: The table shows the estimated average marginal component effect (AMCEs). Coefficients represent interaction terms, isolating differential attribute effects for Ras Beirut and Mina (columns 2 and 3 respectively). Other definitions are as in Table A2

Table A6: AMCEs for heterogeneity analysis on gender, age, nationality and education

	Female	Youth	Lebanese	University
450,000 to 999,999	0.01 (0.04)	0.16** (0.07)	0.01 (0.04)	0.02 (0.04)
1,000,000 to 1,999,999	-0.10*** (0.04)	0.12 (0.07)	0.01 (0.04)	0.08** (0.04)
2,000,000 to 3,500,000	-0.22*** (0.03)	0.09 (0.07)	0.06* (0.03)	0.21*** (0.04)
More than 3,500,000	-0.27*** (0.03)	-0.01 (0.07)	-0.06 (0.04)	0.07** (0.04)
More than 48 hours	-0.12*** (0.02)	-0.05 (0.06)	0.02 (0.02)	0.06*** (0.02)
Skills and experience required	0.13*** (0.03)	0.05 (0.05)	0.05* (0.03)	-0.02 (0.03)
Social security	0.05** (0.02)	-0.29*** (0.05)	0.17*** (0.02)	-0.16*** (0.02)
Some diversity	0.05* (0.03)	0.03 (0.06)	0.00 (0.03)	0.02 (0.03)
A lot of diversity	0.06** (0.03)	0.00 (0.06)	0.08*** (0.03)	0.08*** (0.03)
Private insurance	0.07*** (0.02)	-0.03 (0.05)	0.07*** (0.02)	0.13*** (0.02)
Contract	0.16*** (0.03)	0.16*** (0.05)	0.07** (0.04)	-0.01 (0.04)
Observations	51768	51336	51876	51768
Respondents	1438	1426	1441	1438

Notes: The table shows the estimated average marginal component effect (AMCEs). Coefficients represent interaction terms, isolating differential attribute effects for Females, Young respondents, Lebanese Nationals and University graduates (columns 1-4 respectively). Other definitions are as in Table A2

Table A7: Winsorised replication (99% of income) of Table A2

	Full Sample	Formal	Informal	Skilled	Unskilled
450,000 to 999,999	0.12*** (0.02)	0.11** (0.05)	0.13*** (0.03)	0.18*** (0.07)	0.11*** (0.04)
1,000,000 to 1,999,999	0.44*** (0.02)	0.48*** (0.05)	0.51*** (0.03)	0.61*** (0.07)	0.47*** (0.04)
2,000,000 to 3,500,000	0.67*** (0.02)	0.75*** (0.05)	0.79*** (0.03)	0.95*** (0.06)	0.73*** (0.04)
More than 3,500,000	0.68*** (0.02)	0.73*** (0.05)	0.83*** (0.03)	0.85*** (0.06)	0.83*** (0.04)
More than 48 hours	0.12*** (0.01)	0.19*** (0.03)	0.16*** (0.02)	0.21*** (0.04)	0.15*** (0.02)
Skills and experience required	-0.35*** (0.02)	-0.36*** (0.04)	-0.41*** (0.02)	-0.39*** (0.05)	-0.41*** (0.03)
Social security	0.33*** (0.01)	0.41*** (0.03)	0.27*** (0.02)	0.18*** (0.04)	0.31*** (0.02)
Some diversity	-0.09*** (0.02)	-0.13*** (0.04)	-0.11*** (0.03)	-0.09* (0.05)	-0.11*** (0.03)
A lot of diversity	-0.13*** (0.02)	-0.14*** (0.04)	-0.18*** (0.03)	-0.12** (0.05)	-0.20*** (0.03)
Private insurance	0.13*** (0.01)	0.20*** (0.03)	0.08*** (0.02)	0.17*** (0.04)	0.05** (0.02)
Contract	-0.27*** (0.02)	-0.29*** (0.05)	-0.36*** (0.03)	-0.37*** (0.06)	-0.36*** (0.04)
Observations	34524	6984	15516	4140	11376

Notes: The table shows the estimated average marginal component effect (AMCEs). The sample is winsorised at 99% of the reported income of respondents. Column 1 shows the results for the full sample, Column 2 for the respondents that are currently formally employed, Column 3 for those informally employed, Column 4 for those with high skills, and Column 5 for those with low skills. Standard errors are given in parentheses. Asterisks denote significance at the 0.01 (\*\*\*), 0.05 (\*\*) and 0.1 (\*) level.

Table A8: Winsorised replication (95% of income) of Table A2

	Full Sample	Formal	Informal	Skilled	Unskilled
450,000 to 999,999	0.12*** (0.02)	0.11** (0.05)	0.12*** (0.03)	0.17** (0.07)	0.11*** (0.04)
1,000,000 to 1,999,999	0.44*** (0.02)	0.46*** (0.05)	0.50*** (0.03)	0.61*** (0.07)	0.47*** (0.04)
2,000,000 to 3,500,000	0.66*** (0.02)	0.72*** (0.05)	0.78*** (0.03)	0.94*** (0.07)	0.74*** (0.04)
More than 3,500,000	0.66*** (0.02)	0.69*** (0.05)	0.82*** (0.03)	0.81*** (0.07)	0.83*** (0.04)
More than 48 hours	0.11*** (0.01)	0.17*** (0.03)	0.15*** (0.02)	0.17*** (0.04)	0.14*** (0.02)
Skills and experience required	-0.35*** (0.02)	-0.34*** (0.04)	-0.40*** (0.02)	-0.35*** (0.05)	-0.42*** (0.03)
Social security	0.33*** (0.01)	0.41*** (0.03)	0.29*** (0.02)	0.20*** (0.04)	0.31*** (0.02)
Some diversity	-0.09*** (0.02)	-0.13*** (0.04)	-0.11*** (0.03)	-0.10* (0.06)	-0.12*** (0.03)
A lot of diversity	-0.13*** (0.02)	-0.13*** (0.04)	-0.18*** (0.03)	-0.11** (0.05)	-0.20*** (0.03)
Private insurance	0.13*** (0.01)	0.17*** (0.03)	0.09*** (0.02)	0.19*** (0.04)	0.05** (0.02)
Contract	-0.26*** (0.02)	-0.29*** (0.05)	-0.36*** (0.03)	-0.36*** (0.07)	-0.36*** (0.04)
Observations	32724	6264	14940	3636	11304

Notes: The table shows the estimated average marginal component effect (AMCEs). The sample is winsorised at 95% of the reported income of respondents. Column 1 shows the results for the full sample, Column 2 for the respondents that are currently formally employed, Column 3 for those informally employed, Column 4 for those with high skills, and Column 5 for those with low skills. Standard errors are given in parentheses. Asterisks denote significance at the 0.01 (\*\*\*), 0.05 (\*\*), and 0.1 (\*) level.

Table A9: Testing cognitive fatigue by removing choice sets

	Full Sample	Formal	Informal
450,000 to 999,999	0.07*** (0.02)	0.05 (0.05)	0.08** (0.03)
1,000,000 to 1,999,999	0.55*** (0.03)	0.59*** (0.06)	0.67*** (0.04)
2,000,000 to 3,500,000	0.66*** (0.02)	0.73*** (0.04)	0.79*** (0.03)
More than 3,500,000	0.50*** (0.02)	0.51*** (0.05)	0.62*** (0.03)
More than 48 hours	0.28*** (0.02)	0.37*** (0.04)	0.35*** (0.03)
Skills and experience required	-0.61*** (0.02)	-0.65*** (0.05)	-0.75*** (0.03)
Social security	0.35*** (0.01)	0.42*** (0.03)	0.30*** (0.02)
Some diversity	-0.08*** (0.02)	-0.09** (0.04)	-0.09*** (0.03)
A lot of diversity	-0.22*** (0.02)	-0.24*** (0.04)	-0.30*** (0.03)
Private insurance	0.08*** (0.01)	0.11*** (0.03)	-0.00 (0.02)
Contract	-0.35*** (0.02)	-0.39*** (0.05)	-0.47*** (0.03)
Observations	40348	7420	15120

Notes: The table shows the estimated average marginal component effect (AMCEs) with reduced choice sets (14 instead of 18). Coefficients represent interaction terms, isolating differential attribute effects for the main sample, formal and informal employees (columns 1-3 respectively). Other definitions are as in Table A2

Table A10: Bonferroni adjustment

	Bonferroni Adjustment	Main Estimation
450,000 to 999,999	0.10*** (0.02)	0.10*** (0.02)
1,000,000 to 1,999,999	0.43*** (0.02)	0.43*** (0.02)
2,000,000 to 3,500,000	0.66*** (0.02)	0.66*** (0.02)
More than 3,500,000	0.67*** (0.02)	0.67*** (0.02)
More than 48 hours	0.12*** (0.01)	0.12*** (0.01)
Skills and experience required	-0.34*** (0.01)	-0.34*** (0.01)
Social security	0.32*** (0.01)	0.32*** (0.01)
Some diversity	-0.09*** (0.01)	-0.09*** (0.01)
A lot of diversity	-0.13*** (0.01)	-0.13*** (0.01)
Private insurance	0.14*** (0.01)	0.14*** (0.01)
Contract	-0.26*** (0.02)	-0.26*** (0.02)
Observations	51876	51876

Notes: The table shows the estimated Bonferroni Adjustment in comparison to the Main Estimation of Table A2. All definitions are as in Table A2

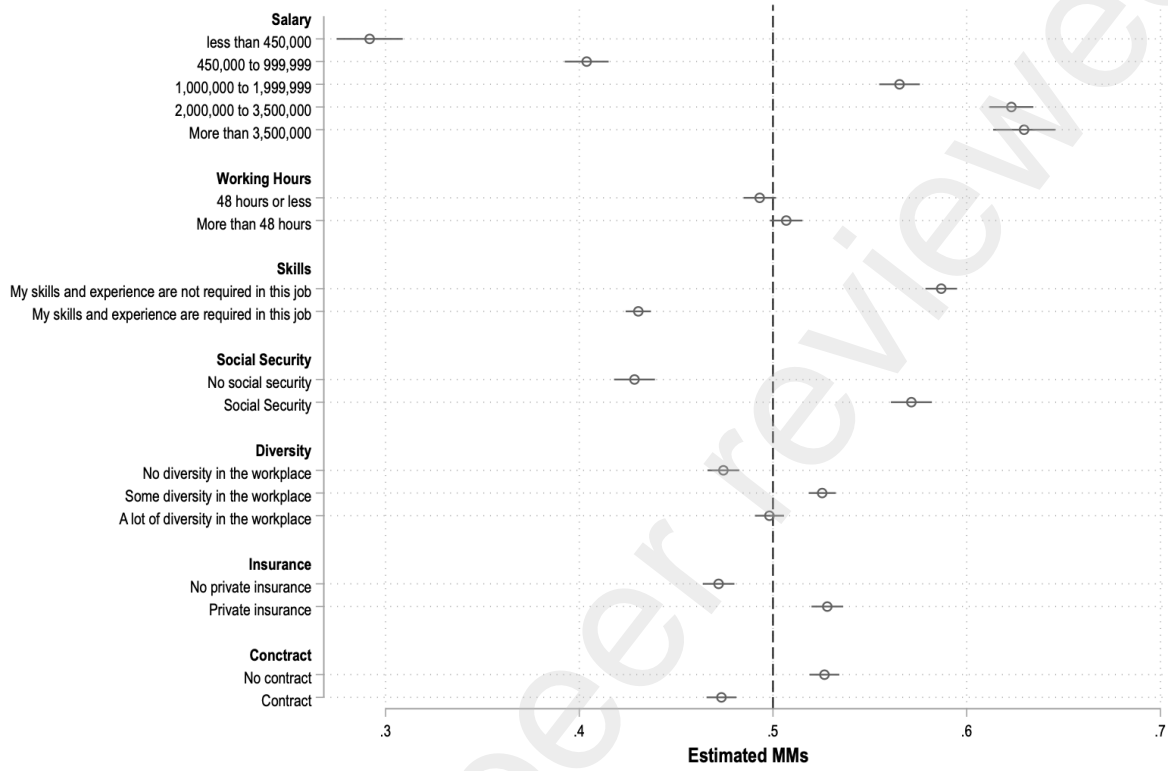


Figure A2: Marginal Means of Main estimation



## References

- Angel-Urdinola, D. F. and Tanabe, K. (2012), 'Micro-determinants of informal employment in the middle east and north africa region'.
- Assouad, L. (2023), 'Rethinking the lebanese economic miracle: the extreme concentration of income and wealth in lebanon, 2005–2014', *Journal of Development Economics* **161**, 103003.
- Baldwin-Edwards, M. (2011), 'Labour immigration and labour markets in the gcc countries: national patterns and trends'.
- Bank, W. (2021), *Lebanon Economic Monitor, Spring 2021: Lebanon Sinking (to the Top 3)*, World Bank.
- Bargain, O. and Kwenda, P. (2014), 'The informal sector wage gap: New evidence using quantile estimations on panel data', *Economic Development and Cultural Change* **63**(1), 117–153.
- Barlevy, G. (2002), 'The sullyng effect of recessions', *The Review of Economic Studies* **69**(1), 65–96.
- Bell, D. N. and Blanchflower, D. G. (2011), 'Young people and the great recession', *Oxford Review of Economic Policy* **27**(2), 241–267.
- Bennett, J. and Rablen, M. D. (2015), 'Self-employment, wage employment, and informality in a developing economy', *Oxford Economic Papers* **67**(2), 227–244.
- Bluestone, B. and Rose, S. (1997), 'Unraveling an economic enigma: overworked and underemployed', *American Prospect* pp. 58–69.
- Bonnet, F., Vanek, J. and Chen, M. (2019), 'Women and men in the informal economy: A statistical brief', *International Labour Office, Geneva*. **20**.
- Botha, F., de New, J. P., de New, S. C., Ribar, D. C. and Salamanca, N. (2021), 'Implications of covid-19 labour market shocks for inequality in financial wellbeing', *Journal of population economics* **34**(2), 655–689.
- Cammett, M. (2014), *Compassionate communalism: Welfare and sectarianism in Lebanon*, Cornell University Press.
- Carson, R. T., Louviere, J. J., Anderson, D. A., Arabie, P., Bunch, D. S., Hensher, D. A., Johnson, R. M., Kuhfeld, W. F., Steinberg, D., Swait, J. et al. (1994), 'Experimental analysis of choice', *Marketing letters* **5**(4), 351–367.
- CAS and ILO (2019), 'Labour Force and Household Living Conditions Survey (LFHLCS) in Lebanon 2018–2019'.

- Clayton, K., Horiuchi, Y., Kaufman, A. R., King, G., Komisarchik, M., Ebanks, D., Katz, J. N., King, G., Evans, G., King, G. et al. (2023), 'Correcting measurement error bias in conjoint survey experiments', *American Journal of Political Science* **12**(B2), 1–11.
- Colombo, E., Menna, L. and Tirelli, P. (2019), 'Informality and the labor market effects of financial crises', *World Development* **119**, 1–22.
- Cunningham, W. V. and Maloney, W. F. (2001), 'Heterogeneity among Mexico's microenterprises: An application of factor and cluster analysis', *Economic Development and Cultural Change* **50**(1), 131–156.
- Datta, N. (2019), 'Willing to pay for security: a discrete choice experiment to analyse labour supply preferences'.
- Demirci, M. and Kırdar, M. G. (2023), 'The labor market integration of Syrian refugees in Turkey', *World Development* **162**, 106138.
- Fagan, C. and Warren, T. (2001), 'Gender, employment and working time preferences in Europe'.
- Feld, B., Nagy, A. and Osman, A. (2022), 'What do jobseekers want? Comparing methods to estimate reservation wages and the value of job attributes', *Journal of Development Economics* **159**, 102978.
- Fields, G. S. (1990), Labour market modelling and the urban informal sector: Theory and evidence, in D. Turnham, B. Salome and A. Schwarz, eds, 'The Informal Sector Revisited', Organisation for Economic Co-operation and Development, Paris.
- Gatti, R., Angel-Urdinola, D. F., Silva, J. and Bodor, A. (2014), *Striving for better jobs: the challenge of informality in the Middle East and North Africa*, World Bank Publications.
- Gronberg, T. J. and Reed, W. R. (1994), 'Estimating workers' marginal willingness to pay for job attributes using duration data', *Journal of Human Resources* pp. 911–931.
- Günther, I. and Launov, A. (2012), 'Informal employment in developing countries: Opportunity or last resort?', *Journal of development economics* **97**(1), 88–98.
- Hackl, A. (2018), 'Mobility equity in a globalized world: Reducing inequalities in the sustainable development agenda', *World development* **112**, 150–162.
- Hainmueller, J., Hopkins, D. J. and Yamamoto, T. (2014), 'Causal inference in conjoint analysis: Understanding multidimensional choices via stated preference experiments', *Political analysis* **22**(1), 1–30.

- Hall, J., Kenny, P., King, M., Louviere, J., Viney, R. and Yeoh, A. (2001), 'Using stated preference discrete choice modeling to evaluate the introduction of varicella vaccination', *Health Economics* **11**(5), 457–465.
- Hall, R. E. and Mueller, A. I. (2018), 'Wage dispersion and search behavior: The importance of nonwage job values', *Journal of Political Economy* **126**(4), 1594–1637.
- Harriss-White, B. (2010), 'Work and wellbeing in informal economies: The regulative roles of institutions of identity and the state', *World development* **38**(2), 170–183.
- Hauber, A. B., González, J. M., Groothuis-Oudshoorn, C. G., Prior, T., Marshall, D. A., Cunningham, C., IJzerman, M. J. and Bridges, J. F. (2016), 'Statistical methods for the analysis of discrete choice experiments: a report of the ispor conjoint analysis good research practices task force', *Value in health* **19**(4), 300–315.
- Holland, A. S. (1984), 'The impact of inflation uncertainty on the labor market', *Federal Reserve Bank of St. Louis Review* (August/September 1984).
- ILO (2021), Assessing informality and vulnerability among disadvantaged groups in lebanon: A survey of lebanese, and syrian and palestinian refugees, in 'Technical Report'.
- International Labour Organization (ILO) (2003), Guidelines concerning a statistical definition of informal employment, in 'Seventeenth International Conference of Labour Statisticians'.
- Krafft, C., Assaad, R., Marouani, M. A., Cheung, R., LaPlante, A. et al. (2022), Are labour markets in the middle east and north africa recovering from the covid-19 pandemic?, in 'Economic Research Forum Working Papers', number SWP20223.
- Krstić, G. and Sanfey, P. (2007), 'Mobility, poverty and well-being among the informally employed in Bosnia and Herzegovina', *Economic Systems* **31**(3), 311–335.
- LEADERS (2019a), 'Dignity at stake: Challenges to accessing decent work in lebanon'.  
URL: <https://reliefweb.int/sites/reliefweb.int/files/resources/69774.pdf>
- LEADERS (2019b), 'The labour sector in lebanon: Legal framework, challenges, and opportunities'.  
URL: <https://reliefweb.int/sites/reliefweb.int/files/resources/69776.pdf>
- Lin, S. and Ye, H. (2009), 'Does inflation targeting make a difference in developing countries?', *Journal of Development economics* **89**(1), 118–123.
- Lira Rate (2021), 'USD to LBP in black market: Dollar to LBP'.  
URL: <https://lirarate.org/>

- Loayza, N. and Rigolini, J. (2006), *Informality trends and cycles*, World Bank Publications.
- López-Ruiz, M., Artazcoz, L., Martínez, J. M., Rojas, M. and Benavides, F. G. (2015), 'Informal employment and health status in Central America', *BMC public health* **15**(1), 1–12.
- Makdisi, S. and Marktanner, M. (2009), 'Trapped by consociationalism: The case of Lebanon', *Topics in Middle Eastern and North African Economies* **11**.
- Malik, A. and Awadallah, B. (2013), 'The economics of the Arab Spring', *World Development* **45**, 296–313.
- Maloney, W. F. (2004), 'Informality revisited', *World Development* **32**(7), 1159–1178.
- Moussa, W., Salti, N., Irani, A., Al Mokdad, R., Jamaluddine, Z., Chaaban, J. and Ghattas, H. (2022), 'The impact of cash transfers on Syrian refugee children in Lebanon', *World Development* **150**, 105711.
- Nikolenko, S. I., Koltcov, S. and Koltsova, O. (2017), 'Topic modelling for qualitative studies', *Journal of Information Science* **43**(1), 88–102.
- Radchenko, N. (2017), 'Informal employment in developing economies: Multiple heterogeneity', *The Journal of Development Studies* **53**(4), 495–513.
- Salti, N., Chaaban, J., Moussa, W., Irani, A., Al Mokdad, R., Jamaluddine, Z. and Ghattas, H. (2022), 'The impact of cash transfers on Syrian refugees in Lebanon: Evidence from a multidimensional regression discontinuity design', *Journal of Development Economics* **155**, 102803.
- Sullivan, P. and To, T. (2014), 'Search and nonwage job characteristics', *Journal of Human Resources* **49**(2), 472–507.
- Tabar, P., Denison, A. and Alkhomassy, M. (2020), 'Access to social protection by immigrants, emigrants and resident nationals in Lebanon', *Migration and social protection in Europe and beyond* **3**, 183.
- Today, L. (2023), 'Cabinet raises minimum wage in the private sector to 119 million', *L'Orient Today*.  
**URL:** <https://today.lorientlejour.com/article/1335054/cabinet-raises-minimum-wage-in-the-private-sector-to-119-million.html>
- UN-Habitat (2016), Tripoli City Profile (Updated Sep 2017), Technical report, UN-Habitat, Lebanon.

UNHCR, UNICEF and WFP (2020), Vulnerability Assessment of Syrian Refugees in Lebanon, Technical report, Lebanon.

Valet, P., Sauer, C. and Tolsma, J. (2021), 'Preferences for work arrangements: A discrete choice experiment', *PloS one* **16**(7), e0254483.

WHO (2012), 'User guide with case studies: how to conduct a discrete choice experiment for health workforce recruitment and retention in remote and rural areas'.