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Connecting People to Projects

A New Approach to Measuring Women's Employment in the Middle East and North Africa

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Abstract

Innovations to date in detecting women's employment have focused primarily on improving individual-level questions. This paper explores an alternative approach, using data on household enterprises and asking who participates in these activities. This research uses the latest waves of the Labor Market Panel Surveys for the Arab Republic of Egypt (2018) and Tunisia (2014). The research questions are (1) How do men's and women's employment rates change when adding enterprise-based detection questions to standard individual-level questions? (2) Was the additional market employment detected with project-based approaches classified as subsistence work with individual measurement approaches? (3) For which women is additional employment detected using project-based approaches? The paper presents descriptive results on work based on the different approaches. It also estimates changes in state (being reclassified as working) from adding enterprise-level data. The findings show large increases in employment rates for rural women in both countries when including enterprise-based detection questions.

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Connecting People to Projects: A New Approach to Measuring Women's Employment in the Middle East and North Africa

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1 Introduction

Accurately measuring women's employment is critical to understanding and addressing gender inequality, but this measurement is challenging, particularly in contexts where gender norms undervalue women's participation in market employment. Especially in low- and middle-income countries (LMICs), a substantial share of employment is informal (La Porta and Shleifer 2014) and thus invisible in administrative data, requiring employment to be estimated from surveys. Although the 19th International Conference of Labour Statisticians (ICLS) in 2013 adopted clear new guidelines for employment statistics and the definition of employment (ILO 2013), women's employment is often underreported in surveys. Women may engage in a variety of forms of work. Where the dividing line between market employment, subsistence work, and domestic work is more fluid, women's employment can be mismeasured if surveys are not carefully designed (Anker 1983; Anker and Anker 1989; Desiere and Costa 2019; Discenza et al. 2021; Durazo et al. 2021; Franck and Olsson 2014; Langsten and Salem 2008; Muller and Sousa 2020).

Past innovations have worked to improve measurement of women's employment in individual-level surveys by moving beyond simple keyword detection questions to an activities list or recovery questions to capture more of the "hidden" work done by women (Anker 1983; Anker and Anker 1989; Discenza et al. 2021; Durazo et al. 2021; Langsten and Salem 2008). Keyword questions typically try to detect employment by asking about "work" or a "job" or "main activity." Women, especially in contexts where gender norms emphasize women's roles as homemakers, may not consider their employment a job, identifying primarily as housewives, even if helping in a family business or farm (Franck and Olsson 2014; Muller and Sousa 2020).

Activities lists ask respondents if they engaged in specific, often under-detected local activities (e.g. making cheese, butter, or ghee to sell) (Anker and Anker 1989; Langsten and Salem 2008). Past research from the Arab Republic of Egypt has shown the superiority of the individual activities list in capturing work, compared to keyword detection approaches (Langsten and Salem 2008). Recovery questions take a similar approach, asking if the individual was working on a family farm, for example, and whether the products were intended for market (Discenza et al. 2021; Durazo et al. 2021). These innovations can substantially increase estimates of women's employment, for instance finding 22% more employed women (8.1 percentage points higher employment to population ratio) in Sri Lanka (Discenza et al. 2021). Similarly, Anker and Anker (1989) have shown that estimates of female participation in the market labor force in Egypt can vary from 15% to 34% depending on what questions are asked and whether it is the respondent herself who answers or a proxy.

Innovations to date in detecting women's employment have focused primarily on improving individual-level questions and the training of enumerators, for instance emphasizing the need to interview the individual herself rather than a proxy respondent. We explore an alternative approach, focused on collecting data on farm and non-farm household enterprises and asking who participates in these activities and in what role, and whether these activities are carried out for the purpose of market exchange or for subsistence purposes. In Egypt, compared to an activities list approach, using data on market activities at the household level and who participated in them, urban women's employment rate increased from 20 to 24 percent, while rural women's employment rate increased from 16 to 40 percent (Keo, Krafft, and Fedi 2022).

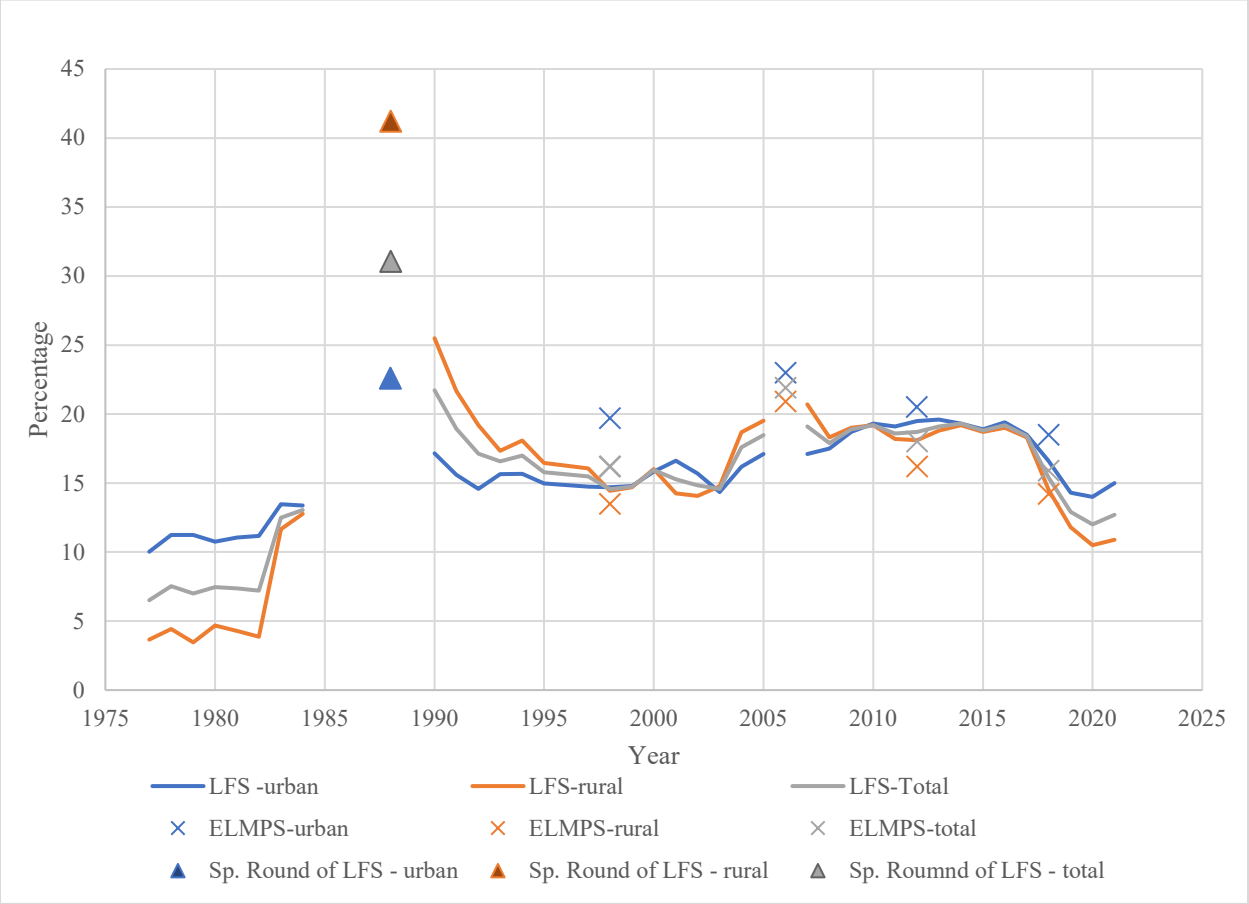
We extend this approach in this paper to Tunisia and present much more detailed analysis for Egypt and Tunisia on whose status is changed by adopting a focus on household enterprises and who participates in them. Our specific research questions are (1) How do men's and women's employment rates change when adding enterprise-based detection questions to standard individual-level questions? (2) Was the additional market employment detected with project-based approaches classified as subsistence work with individual measurement approaches? (3) For which women do we detect additional employment using project-based approaches?

2 Previous efforts to improve the measurement of female labor force participation in Egypt

As an illustration of the challenges and innovations in measuring women's economic participation, this section discusses efforts to improve measurement in Egypt. Efforts to improve the measurement of female labor force participation (FLFP) in Egypt date back to the early 1980s and efforts at the Central Agency of Public Mobilization and Statistics (CAPMAS) to improve the training of enumerators involved in the data collection for the Labor Force Survey (LFS). The enumerators' manual used in 1983 clearly indicated that the definition of the labor force includes many unpaid activities done for the family, mentioning specifically family farming (Anker and Anker 1989). Other changes such as increasing the number of female interviewers and reducing the number of households per interviewer per day were also introduced in that year (Anker and Anker 1989). As shown in Figure 1, this effort paid off with a big increase in the measured FLFP rate from 7% in 1982 to 12% in 1983, with the rural rate in particular tripling from 4% to 12%.[3]

[3] Given the way that CAPMAS presents the data in the LFS Bulletins from 1977 to 2007, we use a somewhat unconventional definition of the FLFP rate, which we are able to reproduce throughout the period. The numerator of the rate is the economically active female population aged 12 to 64 and the denominator is the manpower basis, which is the population age 6 to 64, excluding the permanently disabled, plus the employed population 65 and older. The indicator is calculated in the same way from 2008 to 2021 using the LFS microdata and for the special round of the LFS in October 1988 and the various waves of the ELMPS.

Figure 1. Female labor force participation rates in Egypt (percentages), ages 12-64, 1977-2021



Note: The numerator of the participation rate is the economically active female population aged 12 to 64 and the denominator is the manpower basis, which includes all the population 6 to 64 minus those who are permanently disabled, plus and those 65 and older who are employed. The definition of the economically active population from 1977 to 1984 is limited to market work and those seeking such work. The definition in the special round of the LFS in October 1988 includes subsistence work. From 1990 to 2005, the definition is not explicit about the inclusion of subsistence work. The definition used in the LFS from 2007 to 2021 and that used in all rounds of the ELMPS is limited to market work. The LFS was not carried out in 1986, the year of the population census. In 1987, the design of the LFS was changed to be collected on a quarterly basis rather than in a single annual round. However, no LFS bulletin is available for 1987 or the first half of 1988.
Source: Authors' calculations using data from CAPMAS Annual Bulletin of the Labor Force Survey for LFS series from 1977 to 2005 (CAPMAS, n.d.), from the LFS public use microdata (OAMDI 2023) for LFS series from 2007 to 2021, and from public use microdata series (OAMDI 2019) for ELMPS 1998, 2006, 2012, and 2018.

Around 1987, the ILO conducted Methods Test Surveys in Egypt and India designed to test the effects of questionnaire design, sex of interviewer, labor force definition, and self/proxy status on the reporting of women's labor force participation. The Egypt Methods Test survey was carried

out in cooperation with CAPMAS (Anker and Anker 1989). The survey indicated that in the one-week reference period 12% of Egyptian women participated in wage or salary employment, 37% participated in market work, and nearly 80% participated in "standard" work, which is the equivalent of the extended work definition (market plus subsistence work).

In October 1988, a special round of the Labor Force Survey was carried out (Fergany 1990). The special round adopted the resolution of the 13th ICLS held in 1982, which states that "persons engaged in the production of economic goods and services for own and household consumption should be considered in self-employment" and therefore as a labor force participant (Anker 1983; ILO 1982). However, there was no way of operationalizing the 13th ICLS condition for this kind of work to count as employment, which stipulates that such work should only be included in employment "if such production comprises an important contribution to the total consumption of the household." In practice, all production and processing of primary commodities for purposes of own household consumption ended up being included.[4] Furthermore, no separate measures for market and subsistence work were reported. As shown in Figure 1, this extended definition of employment resulted in a large increase in the measured female labor force participation rate to 31%, with the rural rate reaching over 41%. This definition was maintained in theory in subsequent rounds of the LFS, but its application gradually waned as less emphasis was placed on the inclusion of subsistence work. As a result, the measured FLFP rate in the LFS declined to 22% in 1990 and 17% in 1992, stabilizing at that level for a couple of years and then declining further to 15% in 1997. The measured FLFP rate remained roughly at that level through 2003, with the urban rate exceeding the rural rate in 2001 and 2002 for the first time since the early 1980s.

In the meantime, the first wave of the Egypt Labor Market Panel Survey (ELMPS) was conducted in 1998 as a collaboration between the Economic Research Forum and CAPMAS (Assaad and Barsoum 2000). That questionnaire made a clear distinction between market and subsistence work and included a series of eight questions about specific activities to detect employment in a short reference period of seven days and long reference period of three months for those who answered that they were not working in the seven-day reference period. As shown in Figure 1, this resulted in a somewhat higher measured FLFP rate overall (16%), and a much higher rural rate of 20% even when explicitly limiting the definition of employment to market work. A similar approach was followed in the 2006 wave of the ELMPS (Assaad 2009), but the number of detection questions was increased to 13. This resulted in an even higher overall rate of 22% and a rural rate of 23%.

Based on the experience gained from the ELMPS surveys, CAPMAS made further efforts to improve the measurement of the FLFP rate. Although the questionnaire used in the LFS did not explicitly change to include the innovations introduced by the ELMPS until the first quarter of 2007, there were substantial increases in the measured FLFP rates in the LFS as early as 2004 as seen in Figure 1. Since 2007, the LFS questionnaire explicitly distinguishes between market work and subsistence work, the distinction subsequently adopted by the 19th ICLS, and includes a series of 12 keyword detection questions for those reporting not working in the 7-day reference period.

[4] The 19th ICLS held in 2013 further limited the definition of "employment" to work for pay or profit (or market work) and defined other forms of work, which include "own-use production work" (ILO 2013).

The effect of these modifications is readily apparent in the results for 2007, but as the emphasis on measuring female labor force participation waned, the measured rate declined in 2008, specifically in rural areas. Nevertheless, the measured FLFP rate remained stable at a relatively elevated level for the next nine years (just under 20%), compared to the period before the methodological innovations were introduced. The overall rate measured by the ELMPS in 2012 was very close to the overall rate measured by the LFS, but, as shown in Figure 1, the ELMPS reported a larger gap between the rates in urban and rural areas than the LFS. The decline in the FLFP rate continued through 2020 in the LFS but was sharper in rural areas. Some recovery in the rate was observed in 2021.[5] There is no clear measurement-related explanation for the sharp decline in FLFP rates in 2018 and 2019, although the decline in 2020 can be clearly attributed to the pandemic (See ILO and ERF 2022).

3 Data and methods

3.1 Surveys

This research uses the latest waves of the Labor Market Panel Surveys for Egypt (ELMPS 2018) and Tunisia (TLMPS 2014). These surveys were carried out by the Economic Research Forum (ERF) in collaboration with the respective national statistical offices. Publicly accessible microdata are available through ERF's Open Access Microdata Initiative (Assaad et al. 2016; Krafft, Assaad, and Rahman 2021; OAMDI 2016; 2019). The surveys are nationally representative after the application of sample weights, which are used throughout. The TLMPS 2014 sampled 16,430 individuals in 4,521 households and the ELMPS 2018 sampled 61,231 individuals in 15,746 households. Our analyses focus on working age individuals aged 15-64.

3.2 Detection of employment and work

3.2.1 Individual questions

The data collection instrument for the LMPSs is made up of household and individual questionnaires. The individual questionnaire uses a short reference period of seven days to detect the current labor force status and a long reference period of three months to detect the usual labor force status. Enumerators are instructed to administer the individual questionnaire to the individual him or herself, and collect data from proxy respondents only after three separate visits are made to attempt to meet the individual him or herself.[6] Besides a direct question on whether the individual was employed during the relevant reference period, those who answer in the negative are asked a standard keyword list made up of 15 different activities to detect work for pay or profit in line with the recommendations regarding the measurement of "employment" of the 19th ICLS, with any affirmative answer in either reference period sending the individual to the employment module. We refer to a "yes" in any of the employment or keyword questions as

[5] Quarterly data reveals that the decline in the FLFP rate in 2020 was likely induced by the pandemic and was sharpest in the second and third quarters (ILO and ERF 2022).
[6] Parents or guardians of children 6 to 14 can decide whether or not to allow these children to respond for themselves or to respond on their behalf.

"market work," which is, per the ICLS, synonymous with "employment." Market work or employment may be measured in a 7-day or 3-month reference period.

A separate set of yes/no keyword questions detect participation in subsistence and domestic work in the past 7 days. Subsistence work involves own-use production of goods (within the 2008 system of national accounts (SNA) production boundary) (ILO 2013). This covers producing or processing for storage agricultural, fishing, hunting and gathering products, collecting or processing for storage mining and forestry products, including firewood, fetching water, and manufacturing household goods (ILO 2013). Once involvement in a subsistence activity is detected, the questionnaire enquires about the number of hours per week spent on that activity. A similar set of questions applies to domestic activities (also known as indirect and direct care work), such as cooking, laundry, cleaning, and direct care work. In this paper, our focus is on "market work" or employment and on "subsistence work," which we collectively refer to as "extended work," setting aside for the moment engagement in direct and indirect care work.[7]

There is no equivalent set of subsistence and domestic work questions for the 3-months reference period, so the same levels of participation in subsistence and domestic activities are assumed for the 7-day and 3-month reference periods. Any individual engaged in either market or subsistence work (but not solely domestic work) is considered to be engaged in "extended" work in either the 7-day or 3-months reference periods.

3.2.2 Project-based household questions

The household questionnaire contains detailed modules on household farm and non-farm enterprises. Each of these modules is administered to the most knowledgeable individual about the activity. The non-farm enterprise module enquires separately about each non-farm activity that the household engages in and asks the respondent to identify up to three household members involved in the activity in the past three months in the order of their involvement.[8] Non-farm enterprises are necessarily all market-oriented, so there is no difference in market and subsistence definitions for those working in these enterprises.

The farm module is divided into sub-sections on livestock, crop production, and other farm products (such as dairy, eggs, honey, oil, fish, etc.). For each type of livestock that the household currently owns, the questionnaire enquires about the primary person who takes care of the animal and about up to two other household members who participate in caring for the animal. The questionnaire also enquires whether the household has consumed or sold any of the animals during the past 12 months to determine whether the activity is for the purpose of market exchange or exclusively for the household's own consumption.

[7] Our "extended work" definition is equivalent to the ICLS-19 concept of "work under the System of National Accounts production boundary." The new concept of "work" under ICLS-19 includes unpaid direct and indirect care work performed within households (ILO 2013).

[8] The TLMPS 2014 questionnaire asks about up to 6 individual household members' involvement in non-agricultural enterprises, but does not ask about individual involvement in agricultural crops or other agricultural products.

For each crop that the household has cultivated in the past 12 months, the questionnaire enquires about who in the household has worked the most on the crop and about up to two other individuals who worked on the crop in the past 12 months. There are also questions about the amounts sold and the amounts of the crops consumed by the household over the past 12 months to determine whether production was for the market or for subsistence purposes.

Finally, for the production of other agricultural products such as dairy, eggs, oil, or fish, the questionnaire only enquires about sales of these products over the past 12 months and about up to three household members who may have been involved in their production. Unfortunately, the questionnaire does not enquire about those engaged in this other agricultural production exclusively for purposes of household consumption.

In our analyses, any household member that is mentioned as being involved in either a non-agricultural household enterprise, in the production of a type of livestock or crop that has been sold by the household in the previous 12 months, or in the production of the other agricultural products, is considered to be engaged in "market added" work or "added employment" even if they were not reported as being employed in the individual questionnaire. This is therefore our most comprehensive measure of "market work" or employment.

Any individual engaged in the production of livestock or crops exclusively for household consumption in the past 12 months is included in the "extended added" work category even if they did not report being involved in subsistence work in the individual questionnaire. By necessity, the "market added" and "extended added" statuses are for a 12-month reference periods since these were the reference periods used in the crops and other agricultural products modules.[9] Our main focus in this paper is to compare these "added" employment and work definitions using project data to the market and extended work definitions obtained exclusively from an approach that focuses on individual responses on their activities.

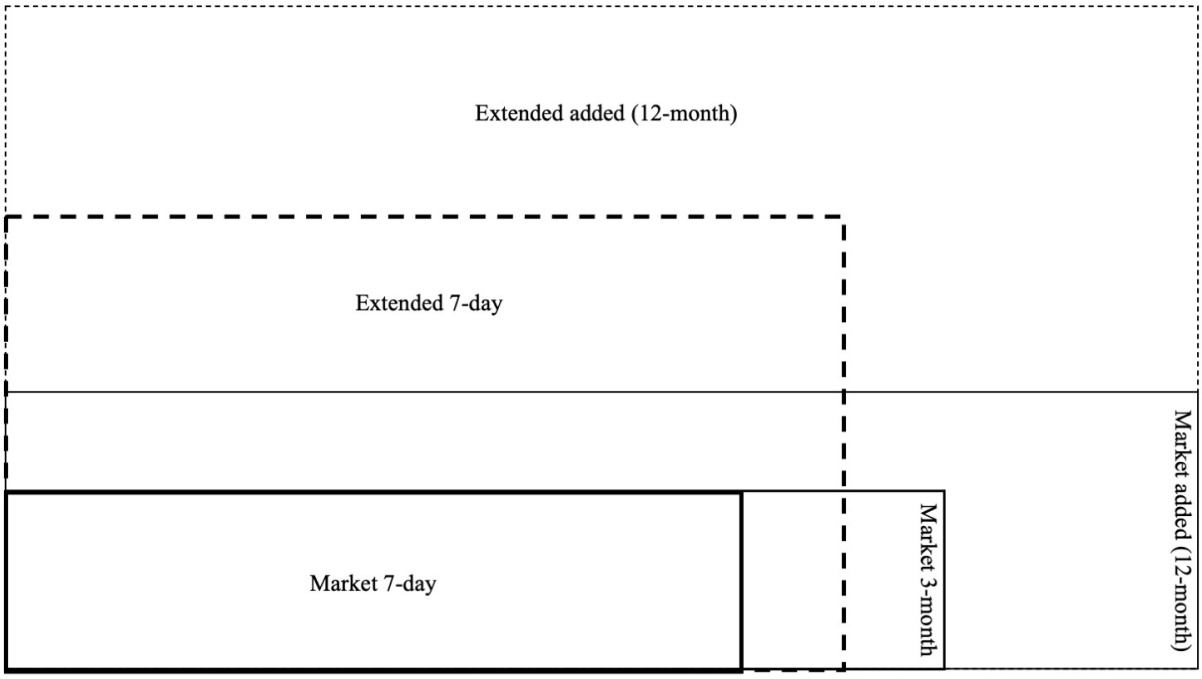
The various measures of work presented in the paper are laid out conceptually in Figure 2, which is not drawn to scale. The market 7-day definition of work is the narrowest and corresponds to the definition of employment currently used in the Egyptian LFS and the Tunisian Employment Survey. It is subsumed in all the other work definitions. The extended 7-day definition of work adds to the market 7-day definition those engaged in subsistence activities as ascertained by the individual questionnaire, while the market 3-month definition adds those who were employed in the three months reference period, but not in the 7-day reference period, again as ascertained by the individual questionnaire. This may include some individuals engaged in subsistence but not market work in the 7-day reference period. The extended 3-month definition of work includes all those engaged in market work or employment in the three-month reference period, as well as those engaged in subsistence work in the 7-day reference period.[10] The added market definition (12 months) is our most comprehensive definition of employment. It adds to the market 3-month definition those who reported to be engaged in household agricultural or non-agricultural

[9] Due to the absence of information about individual household members' involvement in crops and other agricultural products in Tunisia, our "added" measures only include added involvement in non-agricultural enterprises and livestock rearing in the Tunisia setting.

[10] As mentioned earlier, we do not have a separate measure in the individual questionnaire for those engaged in subsistence work in the three-month period but not in the 7-day period.

projects that sold goods or services in the market in the past 12 months, as ascertained by the household questionnaire. The added extended definition (12 months) *adds* to the subsistence three-month and added market definitions those individuals who were not detected in subsistence work in the individual questionnaire but were reported to be engaged in household agricultural crop or livestock production activities that did not sell any products to the market in the past 12 months. It is, thus, the most comprehensive definition of work we present, keeping in mind that domestic work (direct and indirect care work) is outside the scope of our analysis.

Figure 2. Conceptual diagram: overlap between different work definitions



Source: Authors' creation
Notes: Not to scale. Extended 3-month is the union of extended 7-day and market 3-month

3.3 Covariates

We examine how detection of employment or work depends on the characteristics of specific projects, including the type of project (livestock, crops, other agriculture, or non-farm enterprise). We compare detection by characteristics such as whether the non-farm enterprise is inside or outside an establishment; whether the livestock are all small/medium or some are large; and whether the crop area is below the median or at or above it, as these may influence whether women perceive and report employment or work. We further explore individuals' rank (primary worker or secondary) in the enterprise as a possible explanation for underreporting of employment/work.

In order to assess whose work is better measured under different definitions, we compare participation in work according to each definition by a variety of individual and household characteristics. On the individual level, as well as the key covariate of sex, we look at differences by age group, educational attainment, marital status, and urban/rural location. We also examine

whether individuals who are only detected by the enterprise-based questions, but not the individual-based methods of detecting employment, report working in the retrospective data in the past 12 months (to assess whether time frames drive differences) or report ever working (both measured in terms of the market definition of work).

3.4 Methods

We present descriptive results on rates of engagement in work overall, by definition and country. We then analyze the different rates and the additional work detected descriptively according to various project and individual characteristics and by country. These analyses allow us to quantify differences in detection of women's work by method, as well as identify the specific groups whose work status changes depending on whether we rely exclusively on information from the individual-level questionnaire versus information from both the individual-level and enterprise-level modules.

We also estimate changes in state from adding enterprise-level data. We specifically examine, compared to no change, whether women are, with the addition of enterprise data, reclassified as engaged in market work (i.e. employed) or in subsistence work (compared to no change). We likewise estimate whether, among women who are not classified as employed in the 3-month definition, women who were classified as subsistence only under the three-month definition with individual data are then reclassified as market employed with the addition of enterprise data. We estimate these changes with logit models and present marginal effects.

4 Hypotheses

We test a number of specific hypotheses in our multivariate models:

H1: Women's rates of engagement in different kinds of work will increase more than men's when adding enterprise-based detection questions to standard individual level questions.

H2: Those women who report being engaged in only subsistence work in the individual questionnaire are more likely to be detected as engaged in market work (employment) in enterprise-based questions than women who are not engaged in subsistence work in individual questions.

For example, rural women in Egypt may raise poultry for both own-consumption and market purposes, so report subsistence activities in the individual questionnaire, but at the enterprise-level questions, they are found to be working on tending livestock that is meant for the market.

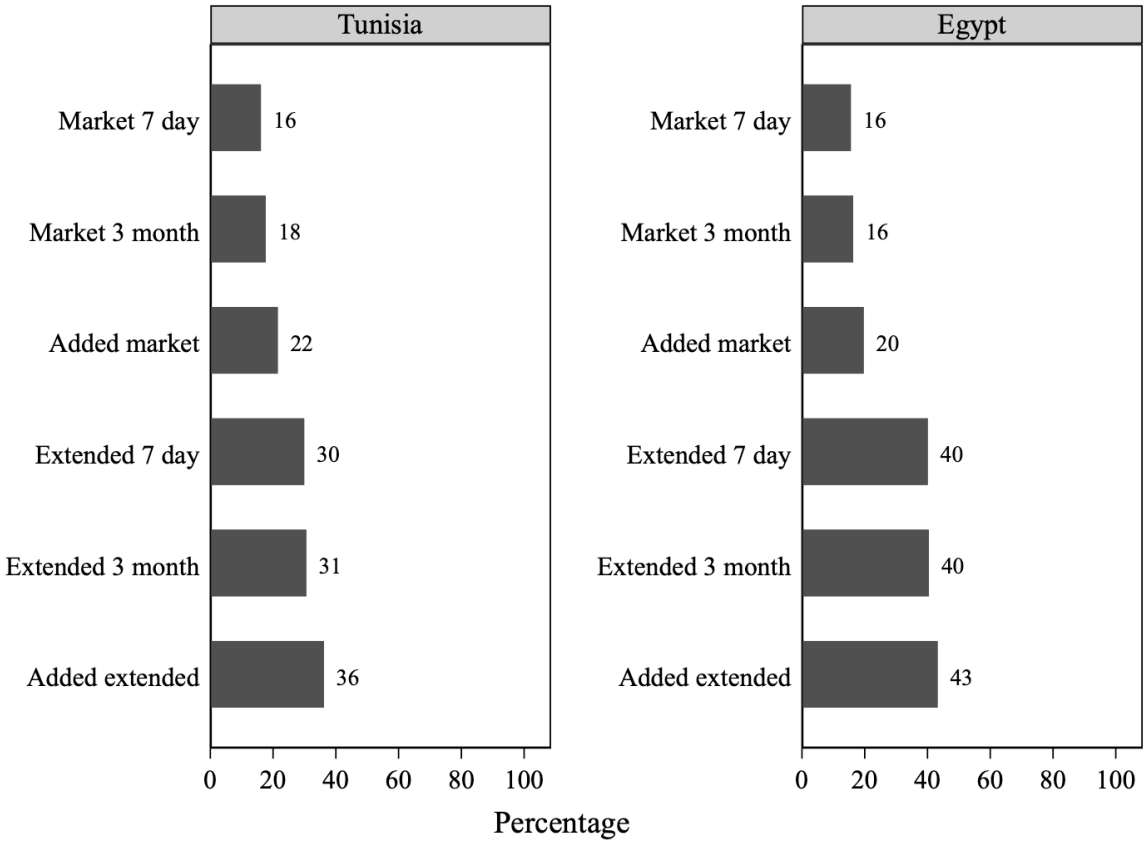
H3: Women's employment rate will increase more for women who have lower employment rates in the standard individual detection questions (less educated, rural, older, and married women specifically).

5 Results

5.1 Detecting additional work through projects

Substantial additional employment and work is detected for rural women when adding enterprise-based detection. Figure 8, in the appendix, shows rates of engagement in various types of work across definitions, sex, and location. There are only small differences across definitions for men and for women in urban areas. However, for rural women (displayed in Figure 3), differences are substantial. For instance, while with the market 7-day definition only 16% of rural women in Tunisia are employed, this rises to 22% with the added market definition. Likewise, in Egypt, while 16% of rural women are employed with the market 7-day definition, this rises to 20% with the added market definition. Additional subsistence work is detected for rural women as well. In Tunisia the extended 7-day work rate is 30% for rural women but the added extended definition is 36%. Likewise, in Egypt, the extended 7-day rate of work is 40%, and this rises to 43% in the added extended definition.

Figure 3. Rates of engagement (percentages) in various kinds of work by definition and country, rural women aged 15-64

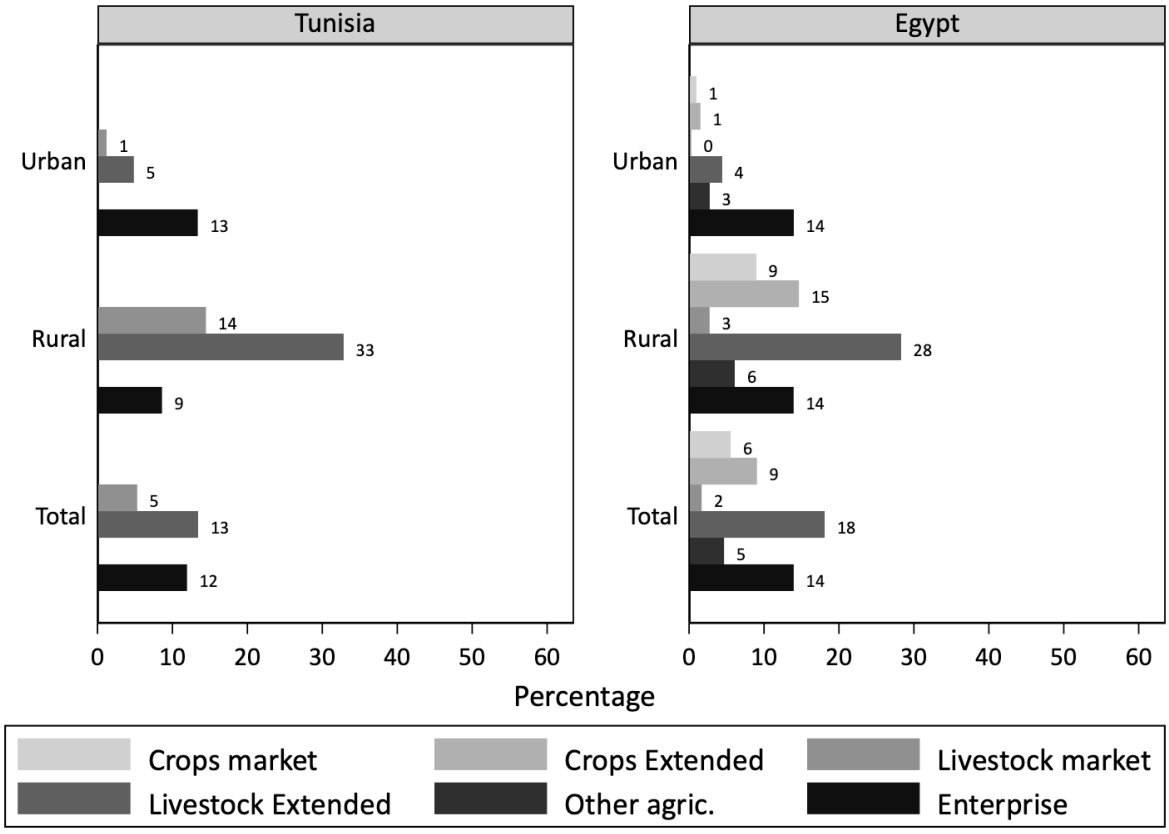


Source: Authors' calculations based on TLMPS 2014, ELMPS 2018

A key driver of the quantity of additional employment detected with an enterprise-based approach is the prevalence of different project types. Figure 4 presents, on the household level, the percentage of households with the different types of activities (crops, livestock, and other agricultural or non-agricultural enterprises, distinguishing between market and extended

definitions for crops and livestock). Some urban households (13%-14% across countries) have non-agricultural enterprises, but few have crops or livestock. In rural areas, extended livestock is common (28%-33% across countries, which is substantially higher than market livestock at 14% in Tunisia and 3% in Egypt). Where we can detect it, in Egypt, extended crops (15%) is appreciably higher than market crops (9%). Non-farm enterprises are also frequent in rural areas, 9% in Tunisia and 14% in Egypt (all market). Other agricultural enterprises are somewhat less common (6% in rural Egypt), also all market.

Figure 4. Percentage of households with crops (by market or subsistence), livestock (by market or extended), other agricultural enterprises, or non-agricultural enterprises, by uran-rural location and country

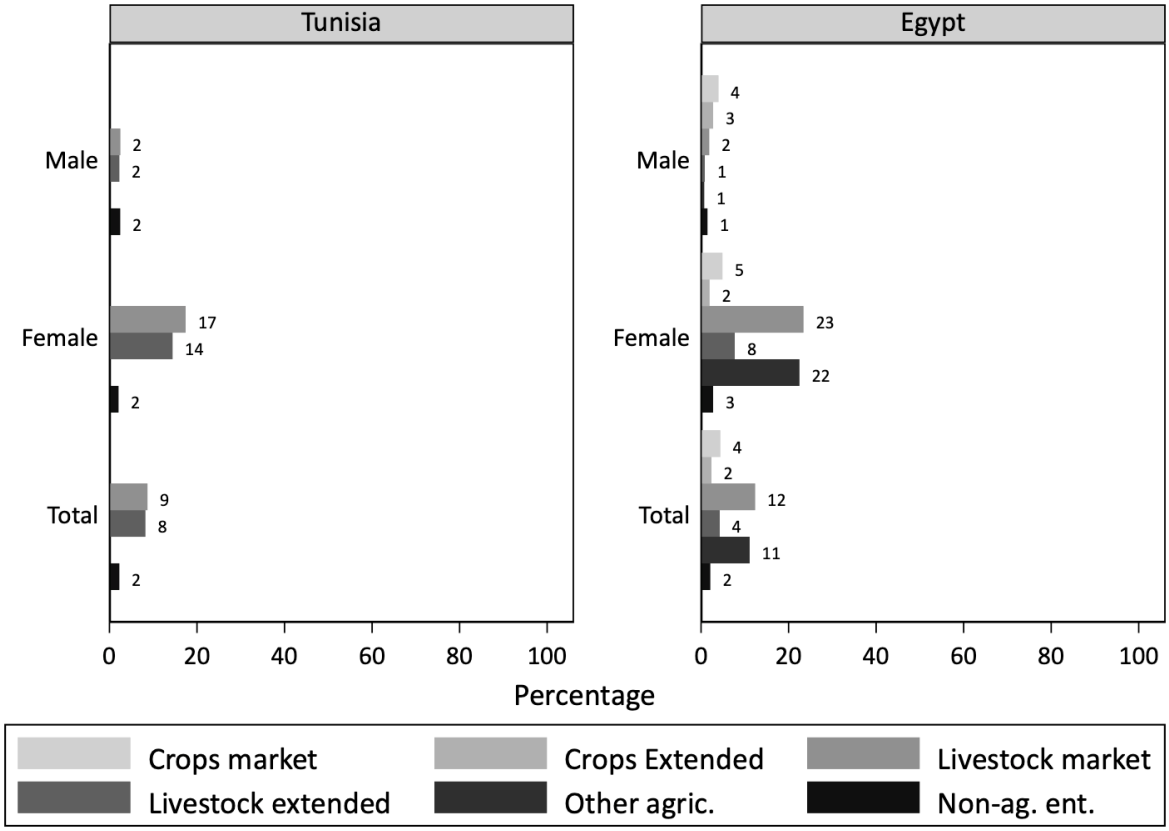


Source: Authors' calculations based on TLMPS 2014, ELMPS 2018
Notes: Tunisia only showing for categories where we can detect individual participation

Conditional on having a project, it is particularly women's employment where there is increased detection with the added, enterprise-based approach. Figure 5 shows the percentage point increase in employment or work rates, conditional on having a particular project type. In Tunisia, when a household has market livestock, the project approach increases women's employment rates by 17 percentage points, and likewise 23 percentage points in Egypt. In Tunisia, there is also a large increase in extended livestock work (14 percentage points for women) and in Egypt a large increase in employment rates with other agricultural activities (22 percentage points for

women). When households have these projects, women's participation often goes undetected without project-based questions.

Figure 5. Percentage point increase in employment/work rates, ages 15-64, conditional on household having project type by project type, sex and country



Source: Authors' calculations based on TLMPS 2014, ELMPS 2018

The characteristics of projects often matter for whether or not women's employment is reported. Table 1 shows the share (percentage) of employment/work rates with the added market and added subsistence definitions that was *not* detected with the 3-month work definition, by enterprise characteristics.[11] In Tunisia, 15%, and in Egypt 14% of market employment for those participating in non-farm enterprises that was detected with the additional definition was *not* detected with the 3-month definition. There were small differences, not consistent across countries, in whether this share was higher for enterprises operating all outside a fixed establishment (19% outside in Tunisia vs. 12% inside; 12% for outside in Egypt vs. 16% for inside).[12]

[11] It is not possible to show this unconditionally as changes in the employment rate for all women, since not all women are in enterprises.

[12] An establishment is defined as a fixed locale exclusively devoted to work. Thus, a home or a field is considered "outside a fixed establishment."

Table 1. Share (percentage) of employment/work rates with added definition not detected in 3-month definition, conditional on employment in a project, by project characteristics, and country, women aged 15-64

	Tunisia	Egypt, Arab Rep.
Additional employment market definition		
Non-farm enterprise in or out of an establishment		
All outside	18.9	12.0
Inside (one or more)	11.7	16.4
Total	15.0	14.0
Livestock size		
All small/medium	55.7	48.3
Large (some or all)	52.5	26.4
Total	55.2	38.6
Crop land area		
Below median		18.7
Median or above		16.2
Total		17.0
Additional work extended definition		
Livestock size		
All small/medium	34.5	10.4
Large (some or all)	22.7	9.7
Total	31.1	10.2
Crop land area		
Below median		10.8
Median or above		3.7
Total		6.7

Source: Authors' calculations based on TLMPS 2014, ELMPS 2018
Notes: Restricted to participants in the project type.

Market livestock work tends to be particularly underreported (55% of additional market employment was not reported as 3-month market employment in Tunisia and 39% in Egypt). There were meaningful differences only in Egypt in detecting market employment by livestock size, with those with only small/medium livestock particularly under-reported (48% of additional market employment was not reported as 3-month market employment, compared to 26% for large livestock).

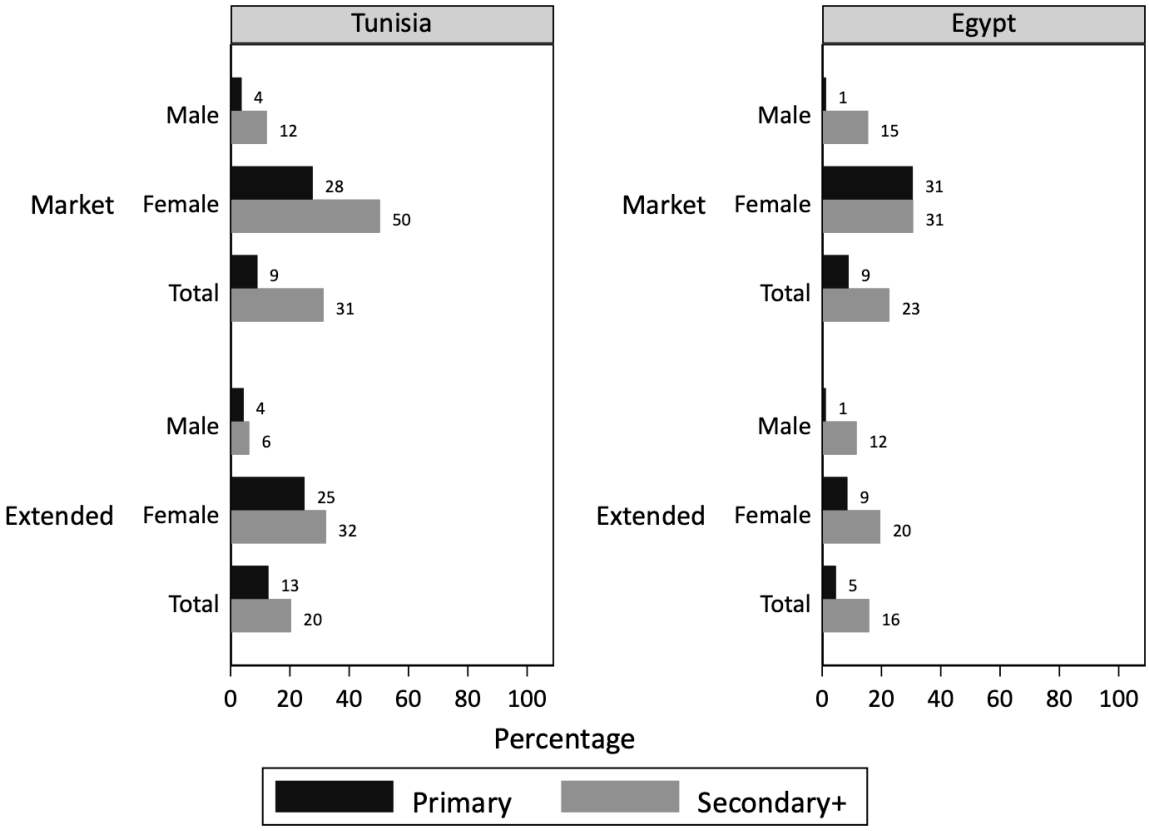
Differences by crop land area are only available in Egypt. While 17% of additional market employment was not reported as 3-month market employment for those participating in market

crop production, this was slightly higher when the area of land was below the median (19%) than at or above the median (16%).

Turning to the additional work, extended definition, a relatively smaller share of extended work (with the additional definition) was undetected with the 3-month extended individual questions. For livestock, this was 31% in Tunisia and 10% in Egypt, with little difference by livestock size in Egypt but a larger difference in Tunisia (35% undetected in the 3-month extended definition in Tunisia for all small/medium livestock; 23% undetected in for large livestock). Likewise for crops in Egypt, only 7% of added extended work went undetected in the 3-month extended work definition. This was higher for smaller plots (11%) than larger ones (4%). Overall, the results suggest that women's employment and work tends to be particularly under-detected for market livestock work, and especially for working with smaller livestock as well as smaller crop areas. This implies, in part, that the work and employment of poorer women and those with lower earnings will go particularly under-detected.

Another important dynamic that may contribute to the under-detection of women's work and employment is whether they are a secondary or tertiary participant, working relatively fewer hours on a project in a support role. Figure 6 displays the share of employment/work rates with the added definition not detected in the 3-month definition, for those in projects, by the highest rank they had across projects. Respondents are asked to provide participation in the project for the person who works the most first, the second most next, etc. Given that there are relatively few third and later ranked participants, we distinguish between primary and secondary (which includes tertiary and higher) participants. In most cases, being a secondary worker leads to more under-detection of employment. Overall and for men in Egypt, under-detection is higher for secondary workers, while for women it is consistently 31% for market employment for both primary and secondary participants, but 9% for primary and 20% for secondary with extended work for women. In Tunisia, the under-detection of women is particularly stark for market employment for secondary workers (50% secondary vs. 28% for primary workers), but less so for extended work (32% secondary vs. 25% for primary workers).

Figure 6. Share (percentage) of employment/work rates with added definition not detected in 3-month definition, conditional on employment in a project, aged 15-64, by sex, highest rank in a project, definition, and country



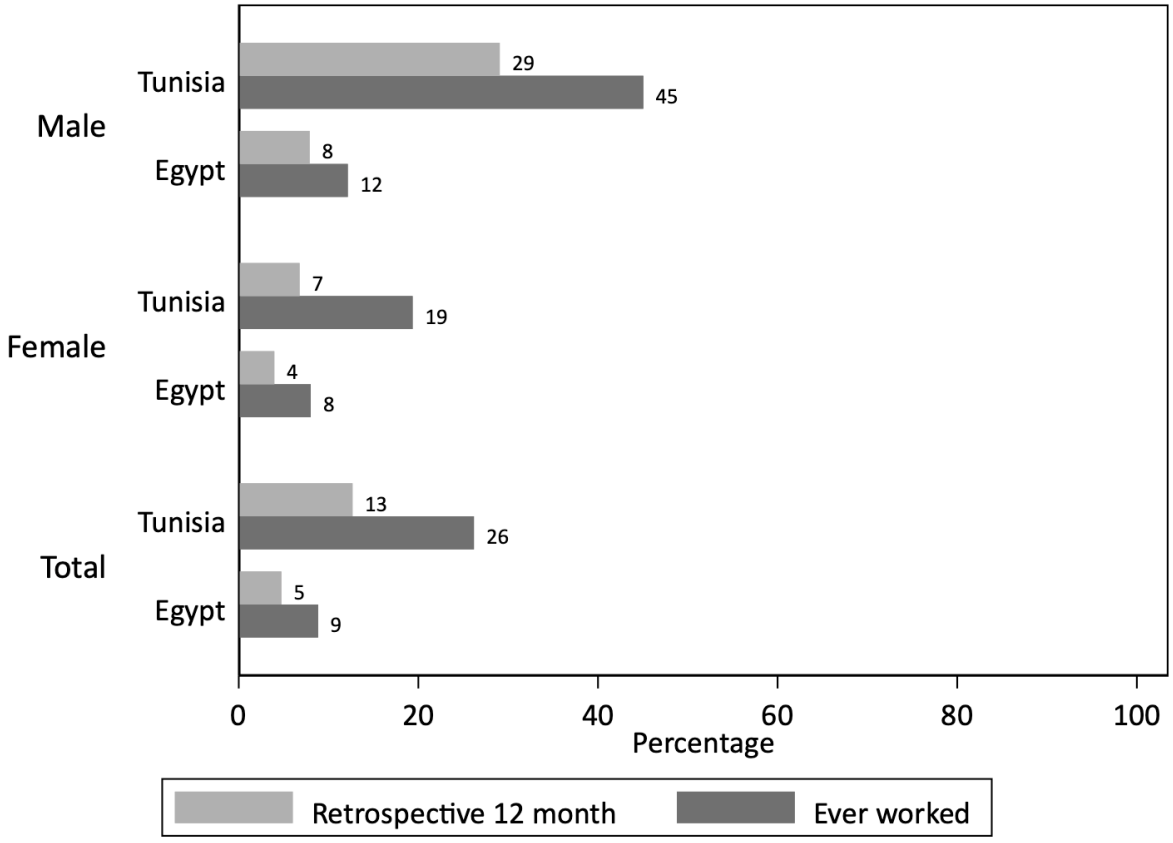
Source: Authors' calculations based on TLMPS 2014, ELMPS 2018

One reason that the added definition detects additional employment compared to the individual 3-month definition may be that respondents undertake work within the past 12 months but not 3 months. Figure 7 explores this possibility, showing, for those whose market employment is detected in the enterprise-based (12-month) definition but *not* the 3-month market definition, what percentage are working in the past 12 months per the retrospective data or report ever working.[13] Overall, in Tunisia, only 13% of those who were only detected with the additional, project-based method report working in the past 12 months in the retrospective data and only 5% of the same group in Egypt. Slightly more report having ever worked, 26% in Tunisia and 9% in Egypt. These shares are, however, all lower for women. Only 7% of women in Tunisia who were only detected with the additional, project-based method, reported working in the past 12 months in the retrospective data and likewise only 4% in Egypt. The share who ever worked among women only detected with the added method is 19% in Tunisia and 8% in Egypt. Therefore, the

[13] The market definition is used because the retrospective and ever worked questions are only asked for market employment.

time frame does not seem to be the main driver of differences in detection; indeed, perceiving such work as market employment seems to be the key barrier.

Figure 7. Worked in the past 12 months (retrospective data), or ever worked (percentages), individuals employed in the added definition but not market 3-month employed, aged 15-64, by sex and country



Notes: Retrospective data and ever worked are both per the market definition
Source: Authors' calculations based on TLMPS 2014, ELMPS 2018

5.2 Changes in employment rates by individual characteristics

The question we address in this section is: who gets missed in the typical, individual questionnaire approach to detecting employment? We explore which individuals have their market employment or subsistence work under-detected by traditional approaches to measuring employment, as compared to approaches that also incorporate enterprise participation. We specifically estimate logit models and present marginal effects for the probability of being reclassified from not 3-month market employed to added market employed (compared to either remaining non-employed or already being detected as 3-month market employed) and likewise for subsistence work. We further estimate the probability of being reclassified from 3-month

subsistence work to added market employed (compared to any of remaining in 3-month subsistence work, remaining in 3-month market work, or not working). We refer to this last outcome as "switch" for short.

Table 2 presents the results of our first model, testing H1, comparing reclassification for women to that of men. This essentially is a statistical test of the differences observed in Figure 8. The base probabilities for reclassification for men are less than a percentage point. The marginal effects for being female are consistent with H1; women's employment/work rates increase more than men's when adding enterprise-based detection methods to individual-level questions. Women's employment rates increase by 0.9 percentage points more than men (base change 0.5 percentage points for men) for market employment in Tunisia and 1.6 percentage points more than men for market employment in Egypt (base change for men 0.6 percentage points). In Tunisia, women's extended work rates increase by 1.9 percentage points more than men (men have a base probability of reclassification of 0.7 percentage points). Likewise, in Egypt, women's extended work rates increase by 1.4 percentage points more than men (who have a base rate of 0.6 percentage points for reclassification). Being reclassified from subsistence work in the 3-month definition to market work in the definition adding enterprise questions is by far more common for women; only 0.2% of men in both Tunisia and Egypt are reclassified in this way, but women's rate of reclassification is 0.6 percentage points higher in Tunisia and 1.3 percentage points higher in Egypt.

Table 2. Marginal effects from logit models of changes in employment/work status by detection approach for individuals aged 15-64

	Tunisia - Market	Tunisia - Extended	Tunisia - Switch	Egypt, Arab Rep. - Market	Egypt, Arab Rep. - Extended	Egypt, Arab Rep. - Switch
Female (male omit.)						
Female	0.009***	0.019***	0.006***	0.016***	0.014***	0.013***
	(0.002)	(0.003)	(0.001)	(0.002)	(0.002)	(0.001)
Base (male) probability	0.005***	0.007***	0.002*	0.006***	0.006***	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N (Obs.)	9468	9334	9330	35404	35406	35404

Source: Authors' calculations based on TLMPS 2014, ELMPS 2018

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. "Market" denotes an outcome of being reclassified from not 3-month market employed to added market employed (compared to either remaining non-employed or already being detected as 3-month market employed). "Extended" denotes an outcome of being reclassified from not 3-month extended work to added extended work (compared to either remaining non-working or already being detected as 3-month extended working). "Switch" refers to an outcome of being reclassified from 3-month subsistence work to added market employed (compared to any of remaining in 3-month subsistence work, remaining in 3-month market work, or not working).

Comparing the magnitude of results on additional market work detected and switching suggests a sizeable portion of those women who are detected in market work only in the enterprise questions were in fact classified as subsistence workers in the 3-month individual question approach (consistent with H2). We test this question (H2) directly in Table 3, which is restricted to women not in 3-month market employment. We include a covariate for engaging in subsistence work in the 3-month period to test H2. While the baseline probability of being reclassified is only 0.9 (Tunisia) to 1.0 (Egypt) percentage points, there are large differences for women who were classified as subsistence workers. In Tunisia, the probability of being reclassified into market work in the enterprise approach is 13.9 percentage points higher for those who were engaged in subsistence work and in Egypt the change is 8.7 percentage points. Differences are all statistically significant (confirming H2). The magnitude of differences also underscores how market work is often misclassified as subsistence work only; the enterprise-based approach, asking about sales in the past 12 months, may be particularly important for improving detection along this margin.

Table 3. Marginal effects from logit models of changes in market employment status adding enterprise questions for women aged 15-64, not in 3-month market employment

	Tunisia - Market	**Egypt, Arab Rep. - Market**
Subsistence work (no work omit.)		
Subsistence work	0.139***	0.087***
	(0.020)	(0.007)
Baseline probability	0.009***	0.010***
	(0.001)	(0.001)
N (Obs.)	4131	14981

Source: Authors' calculations based on TLMPS 2014, ELMPS 2018
Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. "Market" denotes an outcome of being reclassified from not 3-month market employed to added market employed (compared to either remaining non-employed or already being detected as 3-month market employed). "Subsistence" is a covariate for having been classified as in subsistence work only in the 3-month period.

We now focus on which individual characteristics predict under-detection; which women are we missing in traditional approaches to employment detection? We present marginal effects for the outcomes of being reclassified into market employment and extended work going from the 3-month to enterprise-added definitions in Table 4. These analyses test H3. In the appendix, Table 5 presents employment rates for women by individual characteristics and Table 6 presents these same outcomes descriptively by individual characteristics, as well as separately for urban and rural areas.

The reference, baseline probability for an urban, 15–19-year-old, single, higher educated woman is quite low (less than 0.1% to 0.3%). However, the marginal effect for rural is large and significant, ranging from 1.8 percentage points to 3.3 percentage points increase across countries and market employment/extended work. Compared to the reference 15–19-year-old, older age

groups are often significantly more likely to be reclassified and have been under-detected with traditional approaches, up through ages 50-54 (at that age, the differences are 1.6 to 2.6 percentage points across the models).

There are significant differences by education, with less educated (and particularly the least educated) women significantly more likely to be under-detected and reclassified compared to higher educated women. There are significant differences at the basic level as well for both outcomes in both countries, and even at the secondary level (significant in Egypt). For instance, illiterate women are 1.4 to 3.7 percentage points more likely to be employed/working with the enterprise approach. There are not, however, significant differences by marital status. Thus, our results confirm H3 in terms of the women less likely to be detected as employed with traditional approaches being more likely to get reclassified for education and location, but not marital status. It is also important to keep in mind that, although we are estimating the effects of each characteristic separately, they are often interrelated, and so groups such as older, illiterate, rural women are particularly likely to be reclassified and have their employment under-detected with traditional measurement approaches.

Table 4. Marginal effects from logit models of changes in employment/work status by detection approach and covariates for women aged 15-64

	Tunisia - Market	**Tunisia - Extended**	**Egypt, Arab Rep. - Market**	**Egypt, Arab Rep. - Extended**
Rural (urban omit.)				
Rural	0.028***	0.033***	0.024***	0.018***
	(0.004)	(0.006)	(0.002)	(0.003)
Age group (15-19 omit.)				
20-24	0.013*	0.012	0.010*	0.011*
	(0.006)	(0.008)	(0.004)	(0.004)
25-29	0.004	-0.002	0.014**	0.007
	(0.003)	(0.007)	(0.004)	(0.004)
30-34	0.008*	0.010	0.015**	0.015**
	(0.004)	(0.008)	(0.005)	(0.005)
35-39	0.019**	0.018*	0.026***	0.012*
	(0.007)	(0.009)	(0.007)	(0.005)
40-44	0.005	0.027*	0.019**	0.022*
	(0.004)	(0.012)	(0.006)	(0.009)
45-49	0.020***	0.013	0.024***	0.014*
	(0.006)	(0.010)	(0.007)	(0.007)
50-54	0.022**	0.026*	0.020**	0.016*
	(0.008)	(0.012)	(0.007)	(0.008)
55-59	0.009	0.006	0.010	0.010

	Tunisia - Market	Tunisia - Extended	Egypt, Arab Rep. - Market	Egypt, Arab Rep. - Extended
	(0.006)	(0.009)	(0.005)	(0.005)
60-64	0.003	0.004	0.012*	0.029**
	(0.003)	(0.009)	(0.005)	(0.010)
Education (higher ed. omit.)				
Illiterate	0.018***	0.037***	0.025***	0.014***
	(0.004)	(0.008)	(0.004)	(0.003)
Read & Write	0.013**	0.019***	0.012*	0.010
	(0.004)	(0.005)	(0.006)	(0.010)
Basic Education	0.007**	0.019***	0.019***	0.017***
	(0.003)	(0.004)	(0.005)	(0.005)
Secondary Education	0.007	0.008	0.011***	0.008**
	(0.004)	(0.005)	(0.003)	(0.003)
Marital status (single omit.)				
Ever married	0.003	0.001	0.003	-0.011
	(0.004)	(0.007)	(0.005)	(0.006)
Baseline probability (reference group)	0.000	0.001	0.001*	0.003**
	(0.000)	(0.001)	(0.000)	(0.001)
N (Obs.)	4903	4860	17910	17912

Source: Authors' calculations based on TLMPS 2014, ELMPS 2018
Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. "Market" denotes an outcome of being reclassified from not 3-month market employed to added market employed (compared to either remaining non-employed or already being detected as 3-month market employed). "Extended" denotes an outcome of being reclassified from not 3-month extended work to added extended work (compared to either remaining non-working or already being detected as 3-month extended working).

6 Discussion and conclusions

Women's employment in LMICs is often under-detected, and disproportionately so, compared to measures for men (Anker 1983; Anker and Anker 1989; Desiere and Costa 2019; Discenza et al. 2021; Durazo et al. 2021; Franck and Olsson 2014; Langsten and Salem 2008; Muller and Sousa 2020). Past innovations in improving the measurement of women's employment include using activities lists or recovery questions, which can substantially increase estimates of women's employment (Langsten and Salem 2008; Anker and Anker 1989; Discenza et al. 2021; Durazo et al. 2021). In Egypt, perceptions of women's employment are certainly higher than standard statistics. For instance, in Egypt, 63% of women and 46% of men expect most or all of the women in their community are employed (National Council for Women, Baseera, and World Bank 2023).

6.1 Summary

We set out, in this paper, to determine the extent to which work, in particular women's work, is under-detected in approaches that rely exclusively on questions to individuals about their activity status. We investigated the additional work detected by questions that inquire about household agricultural and non-agricultural activities and ask who in the household engages in these activities. We distinguished between employment (market work) and extended work that also includes participation in subsistence production.[14] Our first hypothesis, that women's different kinds of work are more likely to be under-detected than men's by an exclusively individual question approach has been strongly confirmed. Women's overall employment rates increased by 0.9 percentage points more than men in Tunisia. In Egypt, the increase was even larger, with women's employment rates rising by 1.6 percentage points more than men. Rates of engagement in extended work also increased substantially more for women than men in both Tunisia and Egypt. In Tunisia, they increased by 1.9 percentage points more and in Egypt by 1.4 percentage points more.

Our second hypothesis was that women who reported being exclusively engaged in subsistence production using the individual approach would be more likely to have their status switch to market work when the enterprise-based approach is used than women who are reported as not engaged in any kind of work using the individual approach. This hypothesis is strongly confirmed. In fact, women who are initially detected to be in subsistence work only see their employment rates rise by 13.9 percentage points in Tunisia and by 8.7 percentage points in Egypt when the enterprise approach is used.

Our third hypothesis was that women with characteristics that tend to be associated with lower employment rates in standard individual detection questions will see their employment rates rise more with an enterprise-based approach. These also tend to be the women who are typically more engaged in home-based work in agriculture and animal husbandry rather than in wage employment. We hypothesized that less-educated, rural, older, and married women would see a greater bump in employment rates. We in fact find that under-detection rates are indeed greatest for less-educated women, rural women, and older women, but not significantly different for ever-married and never-married women. In fact, by our estimate, the employment rate of a rural, illiterate, fifty-year-old woman in Tunisia is under-detected by 6.8 percentage points compared to an urban 15–19-year-old, higher educated woman (whose rate is not under-detected at all). In Egypt, this same difference in under-detection of employment amounts to 6.9 percentage points. Similar rates of under-detection can be observed for extended work across these two categories of women (9.6 percentage points in Tunisia, and 4.8 percentage points in Egypt). Differences between rural and urban areas account for about 34% to 40% of these differences depending on the country and the type of work.

Descriptive statistics confirm that market work is most likely to remain undetected for women in households that rear livestock. More than half (55%) of women's employment in Tunisia and

[14] We limited our definition of subsistence production to the production that falls within the SNA boundary, that is the production and processing of primary commodities for purposes of household consumption. We exclude participation in unpaid care work, which also counts as a form of work in the ICLS-19's broadest definition of work.

39% in Egypt is not detected in households rearing livestock when the individual approach to work detection is used. In Tunisia, the under-detection rate does not depend on the size of livestock being reared, but in Egypt, women's employment is more likely to be undetected for households raising small and medium livestock compared to those with at least some large livestock. There are also substantial rates of under-detection of women's employment for households that engage in crop production. While we do not have data on individual involvement in such work in Tunisia, the rate of non-detection of this work for women in such households in Egypt is 17%, with slightly higher non-detection rates in households with below median land sizes compared to those with above median sizes.

Substantial rates of non-detection of women's employment are also found for women in households with non-agricultural enterprises (around 15%), but no systematic differences were found between enterprises operating inside fixed establishments and those that did not. We also found that, in Tunisia, women's employment is more likely to be undetected when the woman's role in the household activity is a secondary or support role rather than if she runs or manages the activity. However, such a difference in detection between primary and secondary workers was not found for women in market work in Egypt, although it was found for men and for women in extended work.

6.2 Limitations

There are a number of limitations in this research that we wish to acknowledge. First, our data for Egypt and Tunisia are not completely comparable. In Tunisia, we do not have data on individual involvement in some household activities, such as crop production, and other agricultural projects. We can therefore only detect added employment using the enterprise approach in livestock production and in non-agricultural enterprises. Had we been able to measure individual involvement in all activities, the rates of non-detection in Tunisia would have likely been higher.

We have different reference periods for different kinds of work and for the individual and enterprise approach to detecting employment. In the individual modules, market work is measured for a short 7-day reference period and a long 3-months reference period, whereas subsistence work is only measured in the short 7-day reference period. In the household enterprise modules (crops, livestock, non-agriculture enterprises, and other agricultural products), the reference period is often one year. These differences can cause a number of issues. First, individuals could be involved in these household activities during the year, but not during the three-month reference period. Second, the household may sell some products during the year, but not in the reference week, when production could be exclusively for household consumption. This could confound the identification of whether a person is engaged exclusively in subsistence work or in market work.

We try to overcome this limitation, at least for the measurement of market work, in two ways. First, we use the retrospective information on prior involvement in market employment for those who ever worked to see if the individual was engaged in market work at any time during the previous year. Second, we are also able to check whether individuals not employed during the reference three months were ever employed. We find that only a small fraction of the added

employment we detect in the household enterprise modules (4%-19%) can be explained by the use of a longer reference period rather than a different way of detecting employment.

Our results highlight some issues of under-detection of employment that are common in LMICs, but employment detection issues may vary across contexts. Our results may be more applicable to situations where women's economic activities are carried out within the context of the home or the family farm and where a clear separation between domestic roles (in unpaid care work) and economic roles does not exist. Countries with a larger share of the population in non-wage work, living in rural areas, or engaged in agriculture may be particularly at risk for under-detection of employment. For instance, in Sudan, a country with a primarily rural population, disproportionately engaged in informal, non-wage, and agricultural work, the employment rate rises from 12% to 25% for women when moving from standard individual questions to measures that incorporate participation in household enterprises (Krafft et al. 2023).

6.3 Implications for data collection and research

As noted in Section 2, efforts to improve the measurement of female participation in economic activity have a long history in LMICs such as Egypt. These efforts were often difficult to sustain and resulted in considerable instability in the measured rates. The 19th ICLS made substantial progress in distinguishing between the concept of employment (or work for pay or profit) and other kinds of work. Given the informality of much employment in LMICs (La Porta and Shleifer 2014), administrative data are not sufficient to assess employment rates, requiring reliance on household surveys. However, operationalizing these definitions in Labor Force Surveys has been fairly difficult and has been applied inconsistently across countries and even in the same country over time.

The main difficulty with measuring women's employment has been with self-employment and unpaid family work that women undertake in the context of household enterprises and farms. Our work suggests that information about such work can best be obtained by asking about the household's involvement in specific activities such as crop production, livestock rearing, other agricultural processes, and non-agricultural activities and then inquiring in detail about who among household members is involved in either running or managing these activities or in support roles. Distinguishing between employment and other forms of work would then depend on whether these activities are carried out at least in part for purposes of market exchange.

Clearly, an individual approach to inquiring about employment is also necessary, but that approach should be supplemented by this enterprise-based methodology to obtain a fuller picture of women's and potentially children's involvement in economic activity in LMICs. Accurate data on women's employment is critically important for informing policies and programs to support women's employment and economic development. For instance, common surveys in Sub-Saharan Africa that differentially sample and survey women-owned businesses yield different policy implications for supporting such businesses (Hardy, Kagy, and Jimi 2022).

Future research should revisit the relationship between women's employment and other outcomes with better measures of employment. For instance, the additional employment captured with different measures could have a differential relationship with women's

empowerment than the type of employment captured with standard, individual questions. Disaggregation of employment and understanding the relationships between types of employment and women's outcomes has been shown to be important in other research (Assaad, Krafft, and Salemi 2023; Assaad, Krafft, and Selwaness 2022; Selwaness and Krafft 2021), and should be pursued with better measures of employment as well.

Additional research is needed to continue to improve the detection of women's employment. The same types of employment that are under-detected contemporaneously tend to be left out of retrospective recall (Assaad, Krafft, and Yassin 2018). Piloting and testing project-based detection in retrospective questions is an important area for future research. Similar project-based measures of earnings are also available with the LMPSs (Krafft and Davis 2021) and research on what additional earnings are detected, and gender gaps in earnings, merits future research.

Additional qualitative and quantitative work to understand reasons for underreporting women's employment could be helpful. It could, for example, be that women disproportionately engage in informal businesses and are concerned about reporting a business to a government official for fear of legal or tax implications. It could also be that strong female homemaker/male breadwinner norms lead to the underreporting of employment (Muller and Sousa 2020; Franck and Olsson 2014; El-Feki, Heilman, and Barker 2017; Hoodfar 1997). Potentially, similar problems could arise due to perceptions of norms (Bursztyn, Gonzalez, and Yanagizawa-Drott 2020; Bursztyn et al. 2023; Barnett 2023). These problems may occur particularly for certain types of employment, such as home-based businesses (Muller and Sousa 2020).

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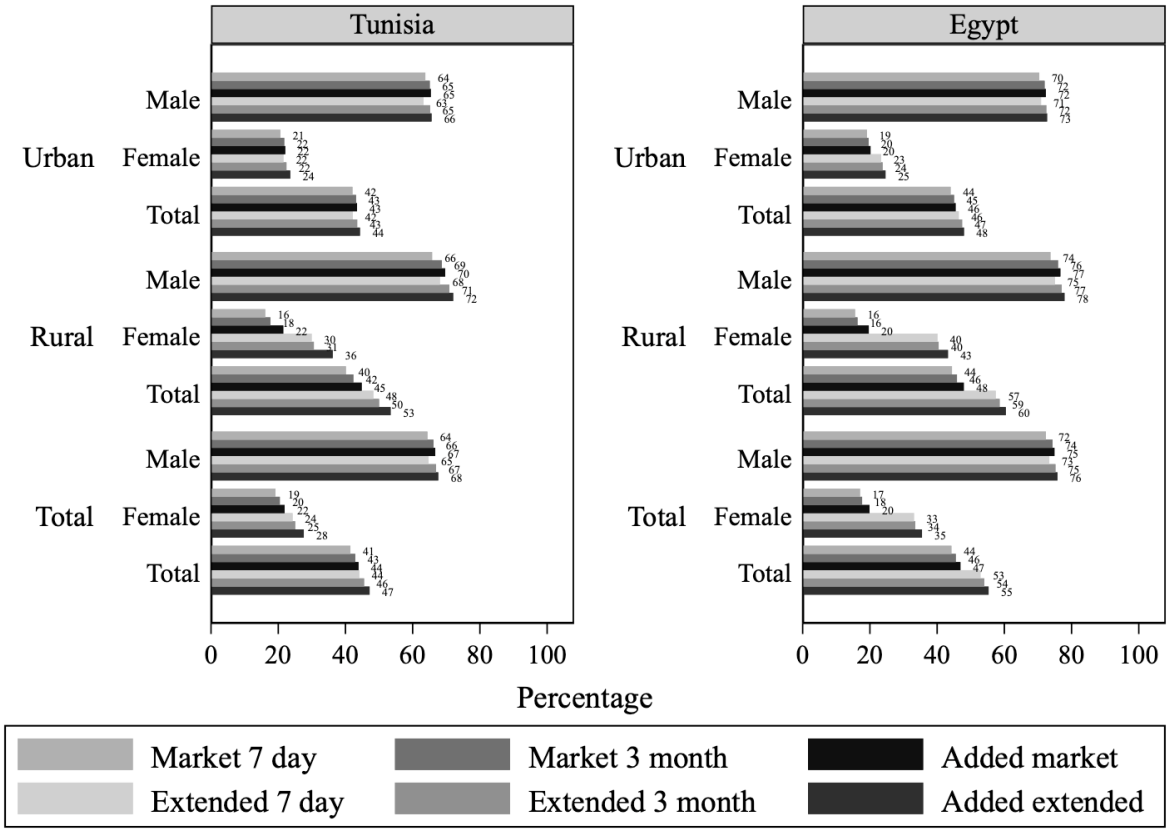
Appendix: Additional Figures

Figure 8. Rates of engagement (percentages) in various kinds of work by definition, by sex, location, and country, ages 15-64



Source: Authors' calculations based on TLMPS 2014, ELMPS 2018

Appendix: Additional Tables

Table 5. Employment rates by definition and individual and household characteristics, women aged 15-64

	Tunisia						Egypt, Arab Rep.					
	Market 7 day	**Market 3 month**	**Added market**	**Subs. 7 day**	**Subs. 3 month**	**Added subs.**	**Market 7 day**	**Market 3 month**	**Added market**	**Subs. 7 day**	**Subs. 3 month**	**Added subs.**
					Rural							
Age group												
15-19	4.6	5.2	5.8	8.8	9.4	12.4	4.5	4.7	5.8	17.3	17.5	19.7
20-24	16.3	16.8	20.0	24.7	25.1	29.9	6.9	7.2	9.3	24.3	24.5	27.2
25-29	20.1	21.0	22.5	29.4	30.6	33.4	14.3	15.3	18.0	39.7	40.2	42.0
30-34	17.8	19.1	22.2	29.8	29.9	35.7	18.5	19.5	22.6	45.9	46.2	49.2
35-39	17.5	19.5	26.4	36.8	36.9	44.1	22.7	23.0	28.2	49.4	49.5	52.1
40-44	18.9	20.7	24.0	35.4	35.8	43.2	23.3	24.9	29.2	54.0	54.7	58.4
45-49	17.5	18.3	25.2	36.7	36.6	44.1	25.6	27.4	33.0	57.8	58.9	62.2
50-54	20.3	24.6	31.6	38.8	41.0	50.7	23.0	23.5	28.8	57.1	57.5	60.4
55-59	14.8	17.5	22.9	39.0	39.4	43.3	19.9	20.6	24.2	48.8	48.9	51.8
60-64	13.2	15.1	17.6	30.8	32.3	37.9	7.4	7.7	11.4	30.9	31.2	36.3
Education Levels (1-digit)												
Illiterate	15.0	16.7	22.2	34.1	34.9	41.3	15.7	16.5	21.6	44.9	45.2	48.7
Read & Write	16.8	19.9	24.4	34.3	35.4	42.5	16.3	17.6	20.5	45.5	45.5	46.9
Basic Education	17.7	18.6	20.4	27.5	27.8	33.0	8.0	8.4	11.0	29.4	29.6	32.4
Secondary Educ	12.8	13.4	15.7	15.7	16.3	19.2	14.1	14.8	17.4	38.4	38.7	41.4
Post-Secondary	11.6	13.0	14.5	14.6	16.0	18.2	31.3	32.1	34.4	49.9	50.1	50.8
University	27.8	28.4	28.4	28.7	29.3	30.6	34.9	35.8	36.7	47.7	48.7	50.2
Post-Graduate	26.6	34.7	34.7	26.6	26.6	26.6	60.4	63.7	63.7	71.7	73.4	73.4

	Tunisia						Egypt, Arab Rep.					
	Market 7 day	**Market 3 month**	**Added market**	**Subs. 7 day**	**Subs. 3 month**	**Added subs.**	**Market 7 day**	**Market 3 month**	**Added market**	**Subs. 7 day**	**Subs. 3 month**	**Added subs.**
Marital status												
Single	17.7	18.5	20.9	25.3	25.9	29.9	7.3	7.6	9.1	19.9	20.1	23.1
Ever married	15.0	17.0	21.9	32.7	33.3	40.0	17.6	18.4	22.2	44.9	45.2	48.0
Total	16.1	17.7	21.5	29.9	30.6	36.2	15.6	16.3	19.7	40.1	40.5	43.2
	Urban											
Age group												
15-19	7.5	8.4	8.4	7.7	8.6	8.6	4.1	4.8	5.0	6.0	6.6	7.1
20-24	16.1	17.1	17.1	17.0	17.8	17.8	9.0	9.2	9.9	11.6	11.7	12.7
25-29	26.3	26.7	26.7	26.8	27.3	27.3	17.7	18.6	19.2	21.0	21.8	22.4
30-34	33.7	34.0	34.0	33.1	32.2	32.5	17.4	18.2	18.7	22.2	22.9	23.5
35-39	25.2	25.9	26.2	27.3	28.4	29.5	25.4	25.6	26.1	31.0	31.3	32.0
40-44	24.1	26.5	26.5	24.4	25.6	29.0	30.5	30.7	31.4	35.3	35.5	36.9
45-49	23.4	25.7	26.9	26.4	29.1	31.0	23.6	24.0	24.9	29.6	29.9	30.6
50-54	18.3	21.2	22.6	20.3	22.7	25.6	35.9	36.1	36.6	41.0	41.1	42.4
55-59	13.3	14.0	14.0	14.4	15.0	17.0	30.7	32.0	32.2	35.4	36.6	37.0
60-64	3.1	3.0	3.2	4.0	4.0	5.2	4.2	4.2	5.0	8.8	8.8	10.5
Education Levels (1-digit)												
Illiterate	8.5	9.3	10.3	11.0	12.4	17.3	10.7	10.9	12.1	19.3	19.3	20.8
Read & Write	15.2	16.3	16.7	15.8	17.1	17.4	10.0	11.2	11.7	16.1	17.1	19.4
Basic Education	22.3	23.3	23.5	23.4	24.2	24.7	7.9	8.3	8.9	11.2	11.6	13.0
Secondary Educ	20.1	20.3	20.3	20.1	20.5	20.8	15.8	16.2	16.8	20.4	20.9	21.3
Post-Secondary	27.3	27.7	27.7	27.6	27.2	27.2	27.3	28.0	28.0	28.6	29.4	30.4
University	37.7	38.7	38.7	37.8	38.7	38.7	38.8	39.6	39.8	40.0	40.9	41.2

	Tunisia						Egypt, Arab Rep.					
	Market 7 day	**Market 3 month**	**Added market**	**Subs. 7 day**	**Subs. 3 month**	**Added subs.**	**Market 7 day**	**Market 3 month**	**Added market**	**Subs. 7 day**	**Subs. 3 month**	**Added subs.**
Post-Graduate	41.4	50.1	50.1	41.4	41.4	41.4	74.4	74.4	75.4	75.8	75.8	76.9
Marital status												
Single	25.5	26.0	26.0	25.8	25.8	26.3	16.6	17.1	17.4	18.1	18.7	19.2
Ever married	18.4	19.8	20.3	19.7	21.0	22.6	19.9	20.4	21.1	25.0	25.4	26.4
Total	20.6	21.8	22.1	21.6	22.4	23.6	19.1	19.6	20.2	23.3	23.8	24.7
					Total							
Age group												
15-19	6.5	7.3	7.5	8.1	8.9	9.9	4.3	4.7	5.5	13.2	13.6	15.1
20-24	16.2	17.0	18.1	19.6	20.2	21.8	7.7	7.9	9.5	19.5	19.7	21.7
25-29	24.3	25.0	25.4	27.6	28.3	29.2	15.7	16.6	18.5	32.3	33.0	34.3
30-34	28.6	29.4	30.4	32.1	31.5	33.5	18.0	19.0	21.1	36.5	36.9	39.0
35-39	22.7	23.8	26.3	30.4	31.2	34.3	23.8	24.1	27.3	41.5	41.7	43.4
40-44	22.4	24.6	25.7	28.0	28.9	33.6	26.4	27.4	30.2	46.0	46.4	49.1
45-49	21.5	23.4	26.4	29.7	31.5	35.3	24.7	25.9	29.5	45.6	46.3	48.5
50-54	18.9	22.2	25.1	25.5	27.8	32.5	29.2	29.5	32.5	49.4	49.7	51.9
55-59	13.8	15.1	16.7	22.1	22.6	25.2	25.1	26.0	28.0	42.4	43.0	44.7
60-64	6.5	7.0	7.9	12.9	13.3	16.0	5.7	5.9	8.1	19.4	19.5	22.9
Education Levels (1-digit)												
Illiterate	12.0	13.2	16.7	23.5	24.5	30.2	14.5	15.1	19.3	38.5	38.8	41.8
Read & Write	15.7	17.4	18.9	21.2	22.5	24.7	13.3	14.6	16.4	31.8	32.3	34.1
Basic Education	21.0	22.0	22.6	24.6	25.2	27.1	7.9	8.3	10.1	22.2	22.5	24.8
Secondary Educ	18.6	18.9	19.4	19.2	19.7	20.5	14.9	15.4	17.1	30.4	30.7	32.4

	Tunisia						Egypt, Arab Rep.					
	Market 7 day	**Market 3 month**	**Added market**	**Subs. 7 day**	**Subs. 3 month**	**Added subs.**	**Market 7 day**	**Market 3 month**	**Added market**	**Subs. 7 day**	**Subs. 3 month**	**Added subs.**
Post-Secondary	25.0	25.6	25.8	25.6	25.5	25.8	29.0	29.8	30.8	38.0	38.5	39.3
University	36.5	37.5	37.5	36.7	37.6	37.8	37.4	38.3	38.7	42.6	43.5	44.3
Post-Graduate	40.6	49.2	49.2	40.6	40.6	40.6	68.6	70.0	70.6	74.1	74.8	75.4
Marital status												
Single	22.9	23.5	24.3	25.6	25.9	27.5	11.7	12.1	13.0	19.1	19.4	21.2
Ever married	17.3	19.0	20.8	23.8	24.9	28.1	18.5	19.2	21.7	36.9	37.3	39.3
Total	19.2	20.5	21.9	24.3	25.0	27.6	17.1	17.7	19.9	33.1	33.5	35.5

Source: Authors' calculations based on TLMPS 2014, ELMPS 2018

Table 6. Percentage point changes in market employment, extended work, and switching from subsistence to market work with project-based approach as compared to 3-month individual approach, by country and residence, women aged 15-64

	Tunisia			Egypt, Arab Rep.		
	Market - p.p. change	Extended - p.p. change	Switch - p.p. change	Market - p.p. change	Extended - p.p. change	Switch - p.p. change
Rural						
Age group						
15-19	0.6	3.0	0.0	1.1	2.2	0.7
20-24	3.2	4.8	1.4	2.1	2.7	1.3
25-29	1.5	2.8	0.7	2.7	1.8	2.2
30-34	3.1	5.8	1.5	3.1	3.0	2.1
35-39	7.0	7.3	5.6	5.2	2.5	3.8
40-44	3.4	7.4	0.7	4.3	3.7	3.3
45-49	6.9	7.5	3.9	5.6	3.3	4.3
50-54	7.0	9.6	3.8	5.3	2.9	4.0
55-59	5.4	4.0	4.2	3.6	2.9	3.0
60-64	2.5	5.6	1.9	3.7	5.1	2.4
Education Levels (1-digit)						
Illiterate	5.5	6.4	3.4	5.1	3.4	4.0
Read & Write	4.4	7.0	3.0	3.0	1.4	2.4
Basic Education	1.8	5.2	0.6	2.6	2.8	1.7
Secondary Educ	2.3	2.9	0.7	2.6	2.7	1.9
Higher ed.	0.7	1.7	0.0	1.1	1.3	0.6
Marital status						
Single	2.4	4.0	1.2	1.5	3.0	1.0
Ever married	4.8	6.7	2.8	3.8	2.7	2.8
Total	3.8	5.6	2.2	3.3	2.8	2.5
Urban						
Age group						
15-19	0.0	0.0	0.0	0.2	0.5	0.2
20-24	0.0	0.0	0.0	0.7	1.0	0.2
25-29	0.0	0.0	0.0	0.7	0.6	0.2
30-34	0.0	0.3	0.0	0.6	0.6	0.2
35-39	0.3	1.0	0.0	0.5	0.7	0.3
40-44	0.0	3.4	0.0	0.8	1.4	0.2

	Tunisia			Egypt, Arab Rep.		
	Market - p.p. change	**Extended - p.p. change**	**Switch - p.p. change**	**Market - p.p. change**	**Extended - p.p. change**	**Switch - p.p. change**
45-49	1.2	1.9	0.8	1.0	0.6	0.5
50-54	1.4	2.9	0.0	0.5	1.4	0.4
55-59	0.0	2.0	0.0	0.3	0.4	0.2
60-64	0.2	1.3	0.0	0.8	1.8	0.0
Education Levels (1-digit)	0.0	0.0	0.0	0.0	0.0	0.0
Illiterate	1.1	4.9	0.2	1.2	1.5	0.7
Read & Write	0.4	0.2	0.2	0.5	2.3	0.0
Basic Education	0.2	0.6	0.0	0.6	1.4	0.1
Secondary Educ	0.0	0.3	0.0	0.6	0.4	0.3
Higher ed.	0.0	0.0	0.0	0.2	0.5	0.0
Marital status	0.0	0.0	0.0	0.0	0.0	0.0
Single	0.0	0.5	0.0	0.3	0.5	0.2
Ever married	0.5	1.5	0.1	0.7	1.0	0.3
Total	0.3	1.1	0.1	0.6	0.9	0.3
			Total			
Age group						
15-19	0.2	1.0	0.0	0.8	1.6	0.5
20-24	1.1	1.6	0.5	1.6	2.1	0.9
25-29	0.5	0.9	0.2	1.9	1.3	1.4
30-34						
35-39	2.5	3.1	1.8	3.2	1.8	2.3
40-44	1.1	4.7	0.2	2.8	2.7	2.0
45-49	3.0	3.7	1.8	3.6	2.2	2.6
50-54						
55-59	1.7	2.6	1.3	2.0	1.7	1.7
60-64	1.0	2.7	0.6	2.2	3.4	1.1
Education Levels (1-digit)						
Illiterate	3.4	5.7	1.9	4.2	3.0	3.2
Read & Write	1.6	2.2	1.0	1.8	1.8	1.3
Basic Education	0.7	1.9	0.2	1.8	2.2	1.1
Secondary Educ						

	Tunisia			Egypt, Arab Rep.		
	Market - p.p. change	**Extended - p.p. change**	**Switch - p.p. change**	**Market - p.p. change**	**Extended - p.p. change**	**Switch - p.p. change**
Higher ed.	0.1	0.2	0.0	0.5	0.8	0.2
Marital status						
Single						
Ever married	1.8	3.2	1.0	2.5	2.0	1.8
Total	1.4	2.6	0.7	2.2	2.0	1.5