Poverty dynamics in Palestine: Evidence using synthetic panels based on cross-sectional surveys

Sameera Awawda

Department of Economics and the Institute of Community and Public Health, Birzeit University, Birzeit, West Bank 627, Palestine

* Corresponding author: sawawda@birzeit.edu

Abstract: This paper aims at measuring transitions between poverty states (poor vs. nonpoor) of households in Palestine during the period 2005-2011. Particularly, the paper seeks to answer the following two questions: To what extent the probability of chronic poverty and escaping poverty as well as the risk of falling into poverty have changed during the period 2005-2011 in Palestine? And how the patterns of these probabilities vary across different groups across regions (the West Bank vs. the Gaza Strip) and Localities (urban, rural vs. refugee camps)? The results show that about 7-16% of Palestinians had escaped poverty while about 5-16% had fallen into poverty during the period 2005-2011. Results also show that the rates of chronic poverty and falling into poverty were higher in the Gaza Strip as compared to the West Bank in 2005-2011. Moreover, Palestinians living in the Gaza Strip are more exposed to changes in their poverty status as compared to those living in the West Bank. Finally, the likelihood of escaping poverty was higher for households living in refugee camps during 2005-2009.

Keywords: Synthetic panels; poverty dynamics; Palestine; upward mobility, downward mobility.

1. Introduction

Poverty is argued to be a static phenomenon when the goal is to measure the incidence of poverty at a single point of time or to trace poverty rates overtime (Baiyegunhi and Fraser 2010; Gordon 1998). However, not all those who are poor in a specific point of time remain poor during their whole lifecycle. The change in the economic status of households (e.g., poor vs. nonpoor) is rather a dynamic phenomenon. Understanding poverty as a dynamic condition is very crucial to identify how likely households are chronically poor, and how likely they are to move into and out of poverty. Moreover, understanding the characteristics of households who are vulnerable to changes in their economic status due to certain economic or political

shocks is also of great importance. Investigating poverty dynamic issues ideally requires panel data, which follows the same households for at least two years. Panel data has been widely used in the literature to measure poverty transitions and to assess the different factors that may be associated with these transitions in developed and some developing countries (e.g., Odozi and Oyelere (2019); Baiyegunhi and Fraser (2010); Justino and Verwimp (2008); Headey, Marks, and Wooden (2005); Baulch and McCulloch (2002)).

The availability of panel data allows to determine the poverty states of a given household for different years. However, panel data are not easily available in many developing countries. Nevertheless, empirical evidence shows that poverty dynamics, as well as other dynamic phenomena, can be analyzed using repeated cross-sectional data, particularly in the absence of panel data or if panel data are of poor quality (e.g., Cruces et al. (2015); Ribas and Machado (2007); Litchfield, McCulloch, and Winters (2003); Gibson and Scobie (2001)). Most pseudo-panel approaches require at least three survey rounds of cross-sectional data to analyze poverty dynamics at the cohort level (Dang and Lanjouw 2013). Recently, Dang and Lanjouw (2016, 2013)proposed a methodology to measure poverty dynamics using only two household survey rounds. Particularly, this approach is used to construct synthetic panel data using repeated cross-sectional surveys to provide point estimates of poverty dynamic statistics between two years.[1] This method relies on the basic assumption that the distribution of error terms corresponding to the variable of interest (i.e., income or consumption (expenditure)) in two years is a bi-normal distribution. The method of Dang and Lanjouw has been applied to measure poverty dynamics in many countries such as Colombia and some Arab countries (Balcazar et al. 2018; Dang and Ianchovichina 2015).

This paper aims at measuring poverty dynamics in one developing country setting, namely in Palestine using the approach proposed by Dang and Lanjouw (2016, 2013). Poverty rates are relatively high in Palestine. In 2011, about 12.9% were living below the deep poverty line – which equals to $2.5 per day (PCBS 2012)[2]. Indeed, the poverty rates have sharply increased after the second Palestinian uprising (intifada) in September 2000. Available data shows that deep poverty has considerably increased, compared to 1998, reaching 24.3% in 2003 (PCBS 2004; 2000). The long-term effects of the second intifada, including closure, movement restrictions, the construction of the Separation Wall, etc. have had negative consequences on employment and living conditions (Adnan 2015; Ajluni 2003). This, inter alia, has resulted in persisting high poverty rates during the period 2005-2017, with deep poverty being equal to 18.1% in 2005 and 16.8% in 2017. According to the Central Bureau of Statistics (PCBS), deep poverty has increased by about 45% in Palestine in 2005 as compared to 1998 (PCBS 2006). Remarkably, poverty rates have increased in both the West Bank and the Gaza Strip from 8.4% to 13.1% and from 21.6% to 27.9%, respectively, during the period 1998-2005 (PCBS 2006). In general, poverty rates were higher and increasing in Gaza Strip as compared to the West Bank during the period 2007-2017.

The increase of poverty in the Gaza Strip can be attributed to unexpected (external) shocks rather than to the economic dynamics *per se*. Indeed, the increase in poverty rates in 2007 (by 8.1%) may be related to the adverse consequences following the victory of the Islamic resistance movement (known as Hamas) in the latest Palestinian parliamentary elections in January 2006. The new Palestinian government has been boycotted by the international community where most of the international aid and tax clearance from Israel

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[1]Dang et al. (2014) propose an upper bound and a lower bound estimates of poverty. The upper bound is estimated assuming no correlation between error terms of consumption expenditure across two years, while the lower bound assumes perfect positive correlation.

[2] This rate is calculated using the PCBS annual poverty lines which are measured for a typical Palestinian household of two adults and four children (before 2008) or three children (after 2008).

have been partially or fully terminated for political reasons (Qarmout and Béland 2012). The unstable political situation since 2006, including the persisting geopolitical division between the West Bank and the Gaza Strip, had a drastic impact on the Palestinian economy resulting in a significant decrease in the main source of general government revenues. This division has restricted the government's ability to meet its basic commitments, including paying salaries to its employees (Tartir 2015)and sustaining financial aid to the vulnerable groups of the population.[3] These unstable changes raise important questions about the dynamics of poverty in Palestine in general and in the West Bank and the Gaza Strip in particular. Using this endeavor, our main objective is to measure the extent to which the probabilities of transitions across poverty states (poor *vs.* nonpoor) has changed after the second intifada in Palestine. The second objective is to measure how the patterns of these probabilities vary across different groups in Palestine, including regions (the West Bank and the Gaza Strip) and locality type (urban, rural, and refugee camps).

The Palestinian Expenditure and Consumption Surveys (PECS) are the main nationally representative cross-sectional surveys that provide detailed information on the patterns of consumption and expenditures for Palestinian households. These surveys are conducted by the PCBS and are available from 2004 to 2011 in an annual base[4]. We restrict our analysis to the period 2005-2011 where poverty dynamics are measured for each two years. Particularly, this paper constructs synthetic-panels for the following periods: 2005-2007, 2007-2009, and 2009-2011. The PCBS defines a poverty and deep poverty lines for each year based on the consumption expenditure of a typical Palestinian household. The nominal values of these lines appear to increase over time to reflect the basic needs of the typical Palestinian household at each year. Thus, to avoid any increase in poverty rates or changes in poverty states resulted from the increase in poverty lines, we use the international poverty line for lower-middle income countries of $3.2. This line is higher than the $2 poverty line used in Dang and Ianchovichina (2015)for the purpose of comparing poverty dynamics in different Arab countries. This paper also differs in terms of the dependent variable used to classify households into two poverty states (poor and nonpoor). Particularly, we calculate equivalent poverty lines and hence equivalent consumption expenditures for each survey round to adjust for the size of the household.

2. Method

In what follows, we provide a brief description of Dang and Lanjouw (2013, 2016) approach used to provide an estimate of poverty dynamics in the absence of panel data. Assume that household consumption expenditure can be modeled as

$$y_{ij} = \beta_j' x_{ij} + \varepsilon_{ij} \tag{1}$$

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[3]Indeed, a significant proportion of Palestinian households relyheavily on financial assistance as their main source of income. Financial assistance can take the form of public transfers from either the Ministry of Social Affairs or other Palestinian governmental institutions, humanitarian assistance from the UNRWA or other international institutions, charity contributions, or donations from relatives or friends.

[4] Recently, the PCBS has conducted a survey for the year 2017. We restrict our analysis to 2011 given that there was no PECS between 2011 and 2017.

where y_{ij} is the corresponding consumption expenditure for household $i = \{1, \dots, n\}$ in survey $j = \{1,2\}$ and x_{ij} is a vector of household time-invariant covariates. We are interested in studying the probability of changes in "poverty states" of households across the two years, e.g.,

$$P(y_{ij} > z_j, y_{ik} > z_k) \qquad (2)$$

where z_j, $j = 1,2$ is the poverty line for year j.[5] The quantity in Eq. 2 represents the size of non-poor households in year j who remain non-poor in year k. Let d_j be an $n \times 1$ vector such that

$$d_{ij} = \begin{cases} 1, & y_{ij} \leq z_j \\ -1, & y_{ij} > z_j \end{cases} \qquad (3)$$

Then the quantity $P(y_{ij} \sim z_j, y_{ik} \sim z_k)$, where $j \neq k$, can be estimated as follows

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\begin{aligned}
P(y_{ij} \sim z_j, y_{ik} \sim z_k) &= P(\varepsilon_{ij} \sim z_j - \beta_j' x_{ij}, \varepsilon_{ik} \sim z_k - \beta_k' x_{ik}) \qquad (4) \\
&= \Phi_k \left(d_{ij} \frac{z_j - \beta_j' x_{ik}}{\sigma_{\varepsilon_j}}, d_{ik} \frac{z_k - \beta_j' x_{ik}}{\sigma_{\varepsilon_k}}, d_{ij} d_{ik} \rho \right)
\end{aligned}
$$

where Φ is the cumulative bivariate normal distribution function, and σ_{ε_j} and σ_{ε_k} are the standard deviations of errors in Eq. 1. This quantity represents the size of the population who are below (above) the poverty line in year j and remain (become) below (above) the poverty line in year k. The characteristics of the households are assumed to be similar in both years, j and k. Thus, either x_{ik} or x_{ij} can be used in the analysis. The correlation coefficient, ρ, can be estimated using an approximation of the cohorts constructed from surveys of both years. Since panel data are not available, and in cross-sectional data, the sets of households are different, then synthetic panel is constructed at the cohort level. First, cohorts (cells) are constructed using time-invariant household's covariates which are available in both survey rounds under consideration. Second, consumption expenditure for each cohort is calculated for each year such that the average consumption expenditure within each cohort is treated as a single observation. Then, we combine data in both surveys by cohorts to estimate the correlation coefficient. Dang and Lanjouw (2016) argue that the cohort consumption expenditure in year j is considered to be a valid instrument for the exact household consumption expenditure that would be observed in year k if the cohort dummy variables are (1) relevant: if household characteristics are significant in the regression of y_{ij}, (2) strong: if cohort dummies are highly correlated with y_{ij}, (3) exogenous, and (4) that the size of each cohort is big enough. The model is unidentified in case the error term includes a cohort effect, a case in which the exogeneity assumption will be violated.

To estimate the quantities of poverty dynamics, we calculate absolute quantities of poverty states for each household in survey round k, Φ_k, given all the estimates of $\beta_j, \beta_k, \sigma_{\varepsilon_j}, \sigma_{\varepsilon_k}$ and ρ. Then, the sample average quantity of poverty is calculated, $\overline{\Phi_k}$. Then, the proportion of households who had poverty state s' in year k and poverty state s in year j is

$$P_{ss'} = \overline{\Phi_k} \qquad (5)$$

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[5] In general, if international poverty lines are used, then $z_1 = z_2$ but the poverty line shall be adjusted to national currency.

where s and $s' \in$ {poor,non-poor} are the poverty states in the first and second year, respectively. To achieve the second objective of this study, we measure $P_{ss'}$ for different groups.

The size of the surveyed population for each year is reported in Table 1. The OECD equivalent scaling is used to derive adjusted poverty lines and consumption expenditures for each household for all survey rounds. The head of the household is given a scale of 1, any other adult with age greater than or equal to 15 is given a scale of 0.7, while children less than 15 years are given a scale of 0.5 regardless of the gender of each member (OECD 1982). Table 1 reports the main characteristics of the sampled population for each year. As shown in Table 1, the equivalent consumption expenditure has increased (in real terms) from $6.8 in 2005 to $9.3 in 2011. Most of the Palestinian households are male-headed with average age of 44 years in 2005 and 47 years in 2011. The average size of the household has decreased from 6.5 to 6.0 during the period 2005-2011. This is associated with a decrease in the number of children from an average of 2.8 in 2005 to 2.4 in 2011. Nevertheless, the number of elderly per household has slightly increased from 0.2 to 0.3 during the same period. About 65-67% of the population are living in the West Bank with about 19-29% and 12-21% living in rural areas and refugee camps during the period 2005-2011. Moreover, about 56-60% of households' heads have only primary school education, about 15-16% are with secondary school education, and about 16-20% have high education (high diploma, bachelor, master, PhD). Overall, the average values of the main time-invariant variables (gender, region, locality type and level of education) are similar for each two successive years. Accordingly, following Dang and Lanjouw (2013), these results suggest that cross-sectional surveys can well be used as a potential alternative for panel data.

Table 1: Household's characteristics

Variable	2005	2007	2009	2011
Nominal value				
Household consumption expenditure ($/day)	26.9	32.1	36.2	43.5
Per capita consumption expenditure ($/day)	4.8	6.1	7.1	8.6
Head consumption expenditure ($/day)	6.8	8.5	9.9	11.9
Real values				
Household consumption expenditure ($/day)	26.9	30.3	30.3	34.1
Per capita consumption expenditure ($/day)	4.8	5.8	5.9	6.7
Head consumption expenditure ($/day)	6.8	8.1	8.3	9.3
Male-head household (%)	93.5	91.2	89.9	88.3
Age	44.2	45.6	45.4	46.9
Household size	6.5	6.4	6.0	6.0
Number of children	2.8	2.7	2.5	2.4
Number of elderly	0.2	0.3	0.2	0.3
West Bank (%)	65.1	67.8	69.0	67.4
Rural (%)	29.4	28.7	18.8	26.7
Refugee camp (%)	16.6	16.4	11.6	20.9
Primary school	57.7	59.5	56.1	56.6
Secondary school	14.9	15.0	15.7	16.4
High education	18.3	16.5	19.7	19.4
Sample size	2152	1231	3848	4317

* Source: Author's findings
* Consumption expenditures in real values are calculated using the consumer price indices (CPI) for each year relative to 2005. The CPI, which are calculated relative to the reference year 2004, for the years 2005, 2007, 2009 and 2011 are 104.1, 110.12, 124.34 and 132.71, respectively.

Table 2 reports changes in overall poverty rates in Palestine using the adjusted international and national poverty lines, respectively. Overall, the poverty rate has decreased during the period 2005-2011. In general, poverty rates calculated based on the international poverty lines are slightly less than half the rates calculated based on the national poverty lines. When rates are split across regions, poverty rates are higher in the Gaza Strip. For instance, Table 2 shows that while about 19.0% of the Palestinians living in the Gaza Strip were below the poverty line of $3.2 in 2007, only 4.3% of the Palestinians living in the West Bank were below the poverty line of $3.2. Unlike international poverty lines, when national poverty lines are used, poverty rates are shown to be higher in the Gaza Strip in 2007 as compared to 2005 as shown in Table 2. The following section represents the results on the evolution of poverty dynamics across different groups during the period 2005-2011 using the adjusted $3.2 poverty line.

Table 2: Poverty rates in Palestine during the period 2005-2011

Year	Palestine	West Bank	Gaza Strip	Urban	Rural	Camps
Results based on using the international poverty line of $3.2 (%)						
2005	14.50	10.47	20.79	14.01	15.86	13.91
2007	9.72	4.26	19.00	11.02	5.85	12.11
2009	8.18	4.05	15.46	8.36	7.79	7.53
2011	7.59	3.73	13.87	8.51	3.89	7.34
Results based on the national poverty lines (%)						
2005	26.19	20.30	37.80	22.31	29.86	32.96
2007	24.40	14.39	43.77	24.49	18.53	35.37
2009	20.00	13.72	32.18	20.00	19.98	20.44
2011	18.02	10.11	32.77	18.38	12.69	24.98

* Source: Author's findings
* These values are the author calculations and are different from those reported by the PCBS because we use the adjusted international poverty line of $3.2, and the equivalent consumption expenditure instead of the national poverty lines and household total consumption expenditure.

3. Findings and Discussions

In what follows, we summarize results using the adjusted $3.2 international poverty line for lower-middle income countries and the point estimate of the correlation coefficient. Table 3 shows joint probabilities of changes in poverty status for the total population as well as probabilities across different groups over the period 2005-2011. For each pair of years, j and k, the joint probability indicates the probability of having (or the share of the population with) poverty status s in year j and poverty status s' in year k. There are four possible poverty dynamics over a period of time, and hence four categories of

households: (i) chronic poverty (poor-poor),[6] which corresponds to the share (probability) of households who are always poor; (ii) escaping poverty (poor-nonpoor), which corresponds to the share (probability) of households who move out of poverty; (iii) falling into poverty (nonpoor-poor), which corresponds to the share (probability) of households who move into poverty, and (iv) nonpoor-nonpoor, which corresponds to the share (probability) of households who were never poor. These probabilities and the corresponding standard errors are calculated using 100 bootstraps.

Overall, results, which are summarized in Table 3, show that the share of the poor who remained poor in the following year is decreasing overtime (from 5.5% in 2005-2007 to 3.2% in 2009-2011). Such a result is associated with the overall decrease in poverty rates in Palestine as shown in Table 2. This result is significantly different from results reported in Dang and Ianchovichina (2015). In their paper, Dang and Ianchovichina found that 1.5% and 0.7% of the Palestinians were poor in 2005 and 2009, respectively. Using the same method that is proposed by Dang and Lanjouw (2013), their results show that only 0.1% of Palestinians had experienced chronic poverty during the period 2005-2009 which is lower than our estimates for the three periods. Such differences are mainly attributed to the use of a lower poverty line of $2 per capita (as opposed to $3.2 per equivalent household).

In general, Table 3 shows that the share of all households who experienced changes in their poverty states (inward or outward of poverty) has decreased from 24.6% in 2005-2007 to 19.1% in 2009-2011. This may indicate that about fifth of the Palestinian population is exposed to changes in their poverty status overtime. This value is much higher than the 1.9% found in Dang and Ianchovichina (2015)for the period 2005-2009 of which 1.3% had escaped poverty. In our analysis, however, the share of Palestinians who had escaped poverty has decreased to slightly more than the half in 2009-2011 as compared to 2007-2009 (15.5% *vs.* 7.2%) as shown in Table 3. Nevertheless, the share of those who fall into poverty has increased from 5.4% in 2007-2009 to 11.9% in 2009-2011. Such a result may be attributed to the negative economic consequences followed the Palestinian legislative election in 2006 such as the reduction in salaries to government employees as well as financial aid to vulnerable groups. These results may also be attributed to the dynamics in the employment status of the households due to the unstable political situation, particularly changes in the rates of underemployment and employment in Israel. Based on the Palestinian labor force surveys, the underemployment rate has decreased from 8% to 6% during the period 2007-2009, it has, then, increased to about 8% in 2011. Empirical evidence shows that the underemployed are more likely to be pushed into poverty as compared to regular full-time employees (e.g., Pratomo (2015)). Moreover, there was an increase in the share of Palestinians who work in Israel by about 15% in 2009 compared to 2007. This share has slightly decreased by about 2% in 2011. It is worth highlighting that salaries are higher for Palestinians in the Israeli labor market compared to the Palestinian labor market.

A closer look at the disaggregation of the population across regions (West Bank vs. Gaza Strip) reveals some important variations in poverty dynamics between the two regions. Table 3 shows that the probability of chronic poverty and the risk of falling into poverty were always higher in the Gaza Strip as compared to the West Bank. This is mainly due to the closure of the Gaza Strip and its geopolitical separation from the West Bank since 2007. The share of the population who had experienced chronic poverty has decreased from 1.5% to less than 1% in the West Bank and from 8.4% to 4.7% in the Gaza Strip from 2005-2007 to 2009-2011, respectively. However, while the risk of falling into poverty has decreased in the West Bank from 5.7% in 2007-2009 to 3.9% in 2009-2011, it has increased in the Gaza Strip from by 2.2 percentage point for the same period as shown in Table 3. This may be attributed to the long-term consequences of the 2008-2009 war in the Gaza Strip, including the drastic deterioration of the most basic services in the region. Another

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[6] In general, the minimum duration of chronic poverty is five years. Nonetheless, we use the term "chronic" to describe those who were poor in year j and remained poor in year k.

potential reason is the significant differences of the value of financial assistance received by the deprived households in the West Bank and the Gaza Strip after the significant cut in 2007. According to the PECS (2009 and 2011), although the share of households receiving financial aid is higher in the Gaza Strip as compared to the West Bank, the average amount received by a household living in the West Bank is about 25% and 61% higher than that received by a household living in the Gaza Strip in 2009 and 2011, respectively. Moreover, the average amount of financial aid received by a household living in the Gaza Strip has decreased by about 17% during the period 2009-2011.

Table 3: Poverty dynamics in Palestine by region and locality type (joint probabilities)

			Region		Locality type	
	Palestine	West Bank	Gaza Strip	Urban	Rural	Refugee camps
Poverty status			2005-2007			
Poor-poor	0.055	0.015	0.084	0.050	0.056	0.067
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Poor-nonpoor	0.091	0.094	0.160	0.065	0.101	0.116
	(0.002)	(0.001)	(0.004)	(0.003)	(0.002)	(0.005)
Nonpoor-poor	0.156	0.047	0.162	0.145	0.154	0.176
	(0.002)	(0.006)	(0.002)	(0.002)	(0.005)	(0.002)
Nonpoor-nonpoor	0.699	0.844	0.594	0.740	0.689	0.641
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Mobility	0.247	0.141	0.322	0.210	0.255	0.292
N (2005)	2146	1398	748	1157	632	357
			2007-2009			
Poor-poor	0.047	0.012	0.073	0.042	0.055	0.060
	(0.001)	(0.000)	(0.001)	(0.001)	(0.002)	(0.001)
Poor-nonpoor	0.155	0.073	0.170	0.151	0.153	0.169
	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)
Nonpoor-poor	0.054	0.057	0.115	0.038	0.071	0.058
	(0.002)	(0.002)	(0.020)	(0.001)	(0.001)	(0.004)
Nonpoor-nonpoor	0.744	0.858	0.642	0.768	0.721	0.712
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Mobility	0.209	0.130	0.285	0.189	0.224	0.227
N (2007)	1231	835	396	676	353	202
			2009-2011			
Poor-poor	0.032	0.007	0.047	0.033	0.039	0.024
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)
Poor-nonpoor	0.072	0.061	0.122	0.061	0.082	0.074
	(0.002)	(0.001)	(0.003)	(0.002)	(0.002)	(0.010)
Nonpoor-poor	0.119	0.039	0.137	0.118	0.123	0.123
	(0.003)	(0.003)	(0.003)	(0.004)	(0.023)	(0.004)
Nonpoor-nonpoor	0.777	0.893	0.693	0.788	0.757	0.778
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)

Mobility	0.191	0.100	0.259	0.179	0.205	0.197
N (2009)	3847	2653	1194	2676	723	448

* Source: Author's findings
* Standard errors of 100 bootstraps are between parentheses. All results are significant at p-vale of 0.01.
* Standard errors of 0.000 means less than 0.0005.
* The poverty states at period $year_1 - year_2$ can be read as follows. Poor-poor: poor in $year_1$ and poor in $year_2$; poor-nonpoor: poor in $year_1$ and nonpoor in $year_2$; nonpoor-poor: nonpoor in $year_1$ and poor in $year_2$, and nonpoor-nonpoor: nonpoor in $year_1$ and nonpoor in $year_2$.
* Mobility is the sum of the share of households who experienced changes in their poverty states (poor-nonpoor and nonpoor-poor).

Decomposition across locality types is illustrated in Table 3. Similar to poverty trends observed across regions, chronic poverty has also decreased overtime for the three Palestinian localities with a higher decrease being observed for refugee camps (6.7% in 2005-2007 to 2.4 in 2009-2011). Interestingly, the share of those who had escaped poverty was higher in refugee camps in the first two periods as compared to rural and urban areas (11.6% in 2005-2007 and 16.9% in 2007-2009). These differences across those living in refugee camps and others may be attributed to the financial assistance that households receive either from the government, international organizations, relatives, or any other sources. Indeed, the proportion of Palestinians who benefit from financial assistance is higher in refugee camps as compared to urban and rural area. It is worth noting that the proportion of the population who benefits from any kind of social aid was about 34.8%, 33.1% and 58.5% in 2005 and 35.2%, 25.5% and 45.4% in 2011 in urban areas, rural areas and refugee camps, respectively. Empirical evidence shows that social safety net programs are considered as important instruments to reduce poverty in developing countries (e.g., Badhan et al. (2019); Hasan et al. (2018)). Turning to the risk of falling into poverty, Table 3 reveals that the risk of falling into poverty is always the lowest in urban areas. For instance, 11.8% of households living in urban areas has fallen into poverty in 2009-2011 as compared to 12.3% of households living in rural areas or refugee camps. Moreover, the risk of falling into poverty has increased in 2009-2011 as compared to 2007-2009 for the three localities. This indicates that the adverse consequences of the 2006 elections have affected all the groups in Palestine. Expectedly, urban areas have lower poverty mobility (17.9% in urban areas *vs.* 20.5% in rural areas and 19.7% in refugee camps in 2009-2011). This indicates that households living in urban areas are less exposed to changes in their poverty status as compared to those living in rural areas and refugee camps.

Lastly, Table 4 provides some statistical evidence on the differences across groups using the Bootstrap method. This table summarizes the differences of the share of each poverty status across different groups with the standard errors of the difference being presented between parentheses. All differences between the West Bank and the Gaza Strip are statically significant at 5%. However, this is not the case for the differences across localities. Particularly, Table 4 shows that the differences of the shares of poverty states are less statically significant for the period 2009-2011 as compared to the two other periods and for the pair (rural areas and refugee camps) as compared to the two other pairs.

Table 4: Comparisons of poverty dynamics across groups (differences of joint probabilities)

	Regions	Localities		
Poverty state	West Bank *vs.* Gaza Strip	Urban *vs.* rural	Rural *vs.* camps	Urban *vs.* camps
Poor-poor				

2005-2007	-0.068***	-0.006***	-0.011***	-0.017***
	(0.002)	(0.001)	(0.002)	(0.001)
2007-2009	-0.067***	-0.009**	-0.005	-0.017***
	(0.006)	(0.004)	(0.003)	(0.002)
2009-2011	-0.040***	-0.005	0.008	0.008***
	(0.001)	(0.004)	(0.005)	(0.002)
Poor-nonpoor				
2005-2007	-0.066***	-0.037***	-0.013***	-0.046***
	(0.005)	(0.002)	(0.004)	(0.004)
2007-2009	-0.092***	-0.009*	-0.006	-0.007
	(0.006)	(0.005)	(0.008)	(0.005)
2009-2011	-0.062***	-0.015***	-0.002	-0.023**
	(0.003)	(0.003)	(0.024)	(0.008)
Nonpoor-poor				
2005-2007	-0.120***	-0.006**	-0.028***	-0.029***
	(0.004)	(0.003)	(0.004)	(0.002)
2007-2009	-0.075**	-0.034***	0.012**	-0.014***
	(0.012)	(0.003)	(0.005)	(0.003)
2009-2011	-0.100***	0.001	-0.039	-0.001
	(0.003)	(0.016)	(0.015)	(0.010)
Nonpoor-nonpoor				
2005-2007	0.254***	0.049***	0.052***	0.093***
	(0.005)	(0.003)	(0.005)	(0.003)
2007-2009	0.233***	0.051***	-0.001	0.038***
	(0.004)	(0.005)	(0.008)	(0.005)
2009-2011	0.202***	0.020	0.033	0.015
	(0.003)	(0.014)	(0.044)	(0.010)

* Source: Author's findings

* Standard errors in parentheses. *p<0.1, **p<0.05, ***p<0.01

4. Conclusion

The key objective of this research was to measure poverty dynamics in Palestine during the period 2005-2011. Particularly, we were interested in measuring the extent to which the probabilities of poverty dynamics have changed across different groups in Palestine. To achieve our objective, we adopted the approach proposed by Dang and Lanjouw (2013, 2016)which is based onconstructing synthetic panels using repeated cross-sectional surveys in the absence of panel data. Different cohorts were constructed based on the Palestinian Expenditure and Consumption Surveys 2005, 2007, 2009 and 2011. Cohorts were created using a set of time-invariant variables such as gender, region, place of residence and the level of education of the head of the household. Poverty status was assessed using an adjusted version of the international poverty line of \$3.2. Descriptive statistics provided a basis for applying the methodology proposed by Dang and Lanjouw (2013, 2016)to measure poverty dynamics in Palestine. We further used the bootstrap method to provide some statistical evidence for the differences in poverty dynamics across a variant of groups.

A number of interesting findings are worth highlighting in the context of the ongoing Israeli restrictions in Palestine. First, in general, about 7-16% Palestinians had escaped poverty during the period 2005-2011. Unfortunately, however, about 5-16% of Palestinians had fallen into poverty during the same period. This generally indicates that a Palestinian is about 20-25% vulnerable to changes in her economic (poverty) status. Secondly, the rates of chronic poverty and falling into poverty were higher in the Gaza Strip as compared to the West Bank in 2005-2011. This demonstrates the high levels of deprivation in the Gaza Strip resulting mainly from the persisting blockade of the region and reduction in financial aid after the 2006 elections. Thirdly, the overall share of mobility of poverty (escaping poverty and falling into poverty) were higher in the Gaza Strip during the period 2005-2011 indicating that the poor (nonpoor) Palestinians living in Gaza Strip are more exposed to changes in their poverty status as compared to those living in the West Bank. Fourthly, the likelihood of escaping poverty was higher for households living in refugee camps during 2005-2009. This result demonstrates the importance of social safety nets in poverty alleviation where the share of households living in refugee camps who benefit from financial aid is higher than those living in urban and rural areas.

Lastly, our results show that there is a clear statistically-based evidence on poverty dynamics in and within Palestine over the period 2005-2011. However, it should be noted that, in addition to the choice of the poverty line, results are dependent on the set of the time-invariant variables used to build the cohorts, hence, the correlation coefficient, ρ (e.g., Nicolas and Jenkins (2018)). In this case, given that panel data are not available in the context of Palestine, a simulation analysis of different sets of time-invariant variables may be used to check the validity of the results.

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