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MEASURING PRO-POOR GROWTH
IN EGYPT, JORDAN, AND PALESTINE

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Abstract

This paper examines the pro-poorness of economic growth in Egypt, Jordan, and Palestine in the first decade of the twenty-first century. Based on Ravallion and Chen (2003)'s *poverty reducing* definition of pro-poorness which only requires reduction in poverty and ignores the distributional impact of growth, we characterize economic growth in all three countries throughout the decade as pro-poor, with the exception of Palestine during the first half of the decade. On the other hand, using Kakwani and Pernia (2000)'s definition which includes both poverty reduction and distributional aspects and characterizes a growth pattern as pro-poor only if it favors the poor, we find that only Egypt's growth can be characterized as pro-poor for most combinations of poverty measures and poverty lines. Jordan's growth, although remained high throughout the decade, can only be characterized as pro-poor in the second half of this period. Finally, neither Palestine's economic downturn in the first half of the decade nor its following economic recovery in the second half can be characterized as pro-poor.

JEL Classification: I3

Keywords: Poverty Reduction; Distribution; Growth; Egypt; Jordan

ملخص

تبحث هذه الورقة المالية للفقير من النمو الاقتصادي في مصر، والأردن، وفلسطين في العقد الأول من القرن الحادي والعشرين. وبناء على رافاليون وتشن (2003) تعريف الحد من ظاهرة الفقر يتطلب تقليل الفقر ويتجاهل التأثير التوزيعي للنمو، نقوم بتمييز النمو الاقتصادي في البلدان الثلاثة طوال العقد الماضي، مع استثناء فلسطين خلال النصف الأول من هذا العقد. من ناحية أخرى، وباستخدام كاكواني وبيرنيا (2000) تعريف الحد من ظاهرة الفقر يشمل كلا من الحد من الفقر وجوانب التوزيع ويميز نمط النمو، لصالح الفقراء إلا إذا كان يخدم الفقراء، نجد أن النمو في مصر فقط يمكن أن توصف بأنها موالية للفقراء لمعظم المجموعات من مقاييس الفقر وخطوط الفقر. النمو في الأردن، على الرغم من أنها ظلت مرتفعة طوال العقد، لا يمكن وصفها بأنها لصالح الفقراء في النصف الثاني من هذه الفترة. وأخيراً، الانكماش الاقتصادي لفلسطين في النصف الأول من العقد والانتعاش الاقتصادي التالي في النصف الثاني يمكن وصفه بأنها لصالح الفقراء.

1. Introduction

Economic growth has been at the center of development policies for achieving the poverty reduction targeted by the Millennium Development Goals (MDGs) in 2000. Research (Datt and Ravallion, 1992) has shown that economic growth affects poverty by changing both a country's mean income and the distribution of income. This means that countries with the same rate of growth can achieve different results in poverty reduction. Thus, the pro-poor assessments of economic growth, which consider the extent to which such growth favors the poor has gained attention in the last decade (Bourguignon, 2003; Dollar and Kraay, 2002; Ravallion, 2001).

Studies aimed at measuring the pro-pooriness of growth patterns in different regions have looked at Africa (Bibi et al., 2012; Duclos and Verdier-chouchane, 2010), Australia (Azpitarte, 2014), the OECD countries (Klasen, 2005), Brazil (Menezes-Filho and Vasconcellos, 2004), and India (Besley et al., 2005). Recently, both cross-country analyses (Ali and Fan, 2007; Bibi et al., 2010) as well as country-specific cases, such as Syria (Khalid Abu-Ismaïl et al., 2011) and Egypt (Marotta et al., 2011), have been undertaken in the MENA region.

Using the harmonized Household Income and Expenditure Surveys datasets developed by the Economic Research Forum (ERF), this paper investigates the pro-pooriness of growth in Egypt, Jordan, and Palestine in the first decade of 2000s. The surveys are nationally representative datasets that provide cross-sectional information on household incomes and expenditures. We study each half of the decade separately and use the closest survey years to these two periods for which data are available in each country: Egypt 1999–2004 and 2004–2010; Jordan 2002–2006 and 2006–2010; and Palestine 1998–2004 and 2004–2010.

The remainder of this paper is organized as follows. Section 2 discusses the concept of pro-poor growth and commonly used methods for its measurement. Section 3 describes the data sources used in this analysis. Section 4 explains the results. Section 5 concludes.

2. Pro-Poor Growth

Growth can change poverty through changing the mean income and changing the distribution of income. Currently, there is no consensus in the literature on how to meld these two aspects of growth into a universal definition of pro-poor growth (Duclos, 2009; Kakwani and Pernia, 2000; Kakwani and Son, 2008; Klasen, 2008; Ravallion and Chen, 2003; Son, 2004). Three definitions, however, are commonly used: poverty reducing pro-poor growth; relative pro-poor growth; and absolute pro-poor growth. Introduced by Ravallion and Chen (2003), the first definition identifies growth as pro-poor if it simply reduces poverty. The definition ignores poverty's distributional impacts. Kakwani and Pernia (2000) include both aspects in their relative and absolute definitions of pro-poor. They consider growth as relative pro-poor whenever it increases the share of total income accumulated by the poor and absolute pro-poor whenever the income gain of the poor exceeds that of the non-poor. The poverty reducing definition is the weakest of the three definitions, because it only requires a positive growth in the mean income, whereas the relative and absolute definitions require a bias in favor of the poor. The absolute definition imposes the strongest conditions since it requires that the poor benefit more in the absolute sense. Comparing the relative and absolute definitions, there are more consensuses on the relative definition as inequality is mostly seemed to be a relative concept (Kakwani and Son, 2008). For that reason, we focus on the relative definition in this paper.

Osmani (2005) has argued that relative and absolute measures should be defined by comparing the actual poverty reduction with the reduction that could be achieved in a benchmark case. Kakwani

and Son (2008) have proposed a measure known as poverty equivalent growth rate (PEGR) in which the benchmark case is a distributional neutral growth pattern. PEGR applies to a class of additive and separable poverty indices and provides a unifying framework to determine the three alternative definitions of pro-poor growth. This paper uses the PEGR framework to assess the pro-poorness of growth based on the poverty reducing and the relative definitions.

2.1 Measuring pro-poor growth

The approaches in measurement of pro-poorness of economic growth can be classified as partial or complete. The partial approaches don't require a specific poverty line or poverty measure and focus on the conditions under which growth can be pro-poor. If those conditions are not met, the *partial* approach cannot determine the pro-poorness. Ravallion and Chen (2003) and Son (2003) are examples of partial measurement of pro-poorness. On the contrary, the complete (full) approaches do require a specific poverty line and measure and can always determine the extent of pro-poorness for that given poverty line and poverty measure. Studies such as McCulloch and Baulch (2000), Kakwani and Pernia (2000), and Ravallion and Chen (2003) use complete approach. In this study, we use both approaches. We start by Ravallion and Chen (2003)'s Growth Incidence Curve (GIC) which is considered a partial approach. We then compare the results with a commonly used complete measure, the PEGR. Both approaches are explained next.

Let y be the relevant income variable whose mean value is shown by μ . Let $F_{t-1}(y)$ and $F_t(y)$ be the cumulative income distributions at time $t - 1$ and t . One of the most widely used measures of pro-poorness is the growth incidence curve (GIC) proposed by Ravallion and Chen (2003), which looks at the growth rate at different positions (e.g., percentiles) of the distribution. Denote the p th quintile of the income distribution by $y_t(p) = F_t^{-1}(p)$. The growth rate of this quintile can be written as:

$$g(p) = \frac{y_t(p)}{y_{t-1}(p)} - 1.$$

The growth incidence curve shows the above growth rate from the lowest quintile to the highest. For the general class of additively decomposable poverty measures, including Foster et al. (1984) measure used in this paper, GIC can be used to show the dominance results on pro-poorness. Any poverty measure in this class can be written as

$$P = \int_0^z \theta(y, z) f(y) dx,$$

where $\theta(y, z)$ is an individual poverty function, $f(y)$ is the density function of income, and P is the class of poverty measure. Now, let $H(z)$ denote the headcount ratio, i.e., the proportion of the poor. For any poverty measure in this class, growth is considered poverty reducing when it increases the income of the poor:

$$g(p) > 0 \quad \forall p < H(z).$$

Furthermore, a growth pattern is considered pro-poor when it increases the income of the poor by more than the growth in the average income. Essama-Nssah and Lambert (2009) have shown that for every poverty measure in P , the sufficient condition for growth to be (relative)¹ pro-poor is

¹ They also report that the sufficient condition for absolute pro-poor growth is $g(p) > \frac{\Delta}{y_t(p)} \quad \forall p < H(z)$

$$g(p) > \gamma \quad \forall p < H(z).$$

where γ is the growth in the average income. Since the above definitions are

If none of the above conditions are satisfied, *complete* pro-poor measures, such as Poverty Equivalent Growth Rate (PEGR), should be used which draw conclusion about pro-poorness using a *particular* poverty measure. PEGR is the growth rate that would create the same level of poverty reduction as the current growth (γ), provided that growth increases all incomes by the same proportions. This can be written as:

$$PEGR * \eta = \delta\gamma$$

where δ is the growth elasticity of poverty ($\frac{dLn(P)}{\gamma}$), and η is the neutral growth elasticity of poverty which shows the percentage change in poverty caused by 1% growth in the mean income when all the benefits of growth are distributed equally leaving inequality unchanged. η was first derived by Kakwani (1993) as $\frac{1}{P} \int_0^H \frac{\partial P}{\partial y} y_t(p) dp$. The PEGR measure of pro-poorness can then be calculated as:

$$PEGR = \left(\frac{\delta}{\eta}\right)\gamma = \varphi\gamma$$

By definition, η is negative since a distribution-neutral growth in income would certainly reduce poverty. Thus, positive values of PEGR imply a poverty reducing growth pattern. Also, a value of $PEGR > \gamma$ indicates that the actual growth pattern has been able to achieve the same level of poverty reduction as the equiproportional growth pattern with a lower growth rate than the PEGR, which implies that the growth pattern must have been relative² pro-poor.

3. Data

This paper uses the harmonized Household Income and Expenditure Surveys for Egypt, Jordan, and Palestine developed by the Economic Research Forum (OAMDI, 2014). The survey years are 1999, 2004, and 2010 for Egypt, 2002, 2006, and 2010 for Jordan, and 1998, 2004, and 2010 for Palestine. The surveys are all nationally representative. Table 1 reports the total number of individuals by country and year.

We choose the per capita expenditure as the welfare indicator, because it is more reliable than per capita income. People have less hesitation to reveal their expenditures than their income. To adjust the expenditure data for inflation we use the consumer price indices (reported by the World Bank for Egypt and Jordan and by the Palestinian Central Bureau of Statistics³).

The unit of analysis in this study is individuals. We calculate the total expenditure per individual by dividing each household's total expenditure by its number of adult equivalent members, where the number of equivalent persons is calculated by the following specification suggested by Buhmann et al. (1988).

$$e = N^\theta,$$

² Growth is considered absolute pro-poor when the $PEGR > \bar{\gamma} > \gamma$, where $\bar{\gamma} = \gamma(1 + \delta(\frac{1}{\eta} - \frac{1}{\eta^*}))$ and η^* is the neutral absolute growth elasticity of poverty.

³ <http://www.pcbs.gov.ps/>

where N is the household size and θ is the measure of economics of scale within the household (and assumed 0.5 in this study).

The growth rate of per capita expenditure over the two time periods are reported in Table 2 for each country. In Egypt, economic growth significantly slowed down in early 2000's in the aftermath of 9/11 terrorist attacks and consequent fall in tourism, a major source of income for Egyptian economy. In the following years, Egypt experienced a high rate of growth accompanied and strong poverty reduction accompanied by high rate of inflation. Unfortunately the recovery period was short-lived and ended with the fuel and food crisis in the late years of the second period (El-laithy, 2011). Jordan's economy has been growing at annual rate of 7 percent since the introduction of liberal economic policies in early 2000s. Since 2005, Jordan's economy has shown even stronger growth mainly due to renewed liberalization policies as well as the structural reforms in education and healthcare systems. Comparing to the other two cases, Palestinian economy has been volatile due to its ongoing conflict with Israel. The first period in our sample is coincided with the second Intifada and massive number of job losses of Palestinian workers in Israel which resulted in a significant economic downturn. The conflicts only intensified in the second period with Hamas winning the 2006 election, intensification of Israel's border closure policies, the war on Gaza in 2009, continued expansion of settlements, and the construction of the separation barrier. The positive growth reported in the table for the Palestine's economy can be misleading since it does not reflect the erosion of productive capacity in the economy which occurred in this period as it is more an evidence of the increase in foreign aid poured into the Palestinian economy (Kanafani and Taghdisi-Rad, 2012).

The following graph (Figure 1) shows the GDP per capita in the last two decades for these countries. The slowdown of Egypt and Jordan in early 2000's and the long term stagnation of Palestine's economy are evident from the graph. Table 3 reports the changes in income distribution of these countries for selected years in our sample. Jordan is the only country that has succeeded in reducing its poverty rate and income inequality throughout this period. Egypt has the most equal distribution of income out the three cases. This can be related to the fact that poverty in Egypt is relatively shallow with a big cluster of the poor around the poverty line (El-laithy, 2011).

4. Results

Figure 2 shows the GIC estimates for Egypt, Jordan, and Palestine in the first and second halves of 2000s. Egypt's curves suggest that economic growth in Egypt was more concentrated at the lower end of the distribution, with most of the middle and bottom positions growing more than the average. The growth pattern in Jordan was similar to that of Egypt, i.e., growth was more concentrated at the lower end of the distribution. However, there are some major differences between the two. Compared to Egypt's case in which only the income of small fraction of population (people in the top 20 percentiles) grew slower than the average income, in Jordan more than half of the population experienced slower-than-average income growth. Another difference between the two growth patterns is related to the income growth among the rich. While in Jordan growth rate in the upper end of income distribution increases with the level of income the reverse occurs in Egypt, i.e., the wealthier an Egyptian gets the lower income growth he/she experiences. The growth pattern in Palestine seems to be quite different than the pattern in the other two countries. Comparing to previous cases, growth in Palestine was more concentrated on the upper end of distribution, with the incomes of most people in the middle and lower positions growing less than the average. In the first period, the growth in the average income in Palestine is negative which reflects the economic downturn caused by the second Intifada. In the second period,

however, the growth in the mean income is positive in Palestine as well as in Jordan and Egypt. In fact, the growth in the second period is positive over the whole distribution which can be seen from the fact that all GIC curves in the second period lie above the zero line. Following the poverty reducing definition of pro-poorness, one can conclude that the economic growth in all three countries in the second period was pro-poor. However, the same cannot be said about the growth in the first period since GICs cross the zero line.

As discussed in previous section, the sufficient condition for relative pro-poorness is that income at every percentile up to the poverty line grows faster than mean income ($g(p) > \gamma \forall p < H(z)$) which in terms of graph it means that GIC should be above the dotted line (growth in the average income) for the poor in the lower end of the distribution. This condition is not satisfied in most cases in our sample which means this partial approach cannot determine the relative pro-poorness of economic growth in these cases and a complete approach with specific poverty line and poverty measures should be used instead.

We use Poverty Equivalent Growth Rate method which aims at finding an equivalent growth rate that has same poverty reduction effect as the actual growth rate but it is inequality-neutral, i.e., it only shifts the entire distribution and does not influence the inequality. The reasoning behind this method is related to our earlier discussion about two channels by which growth can reduce poverty, namely: increasing the mean income and improving the distribution. PEGR deals with the first channel and shows how much growth would be needed to achieve the current level of poverty reduction had the poverty been reduced only through shifting the mean and not through changing the distribution. If the actual growth rate is less than PEGR then it means that the observed rate of growth has not been high enough to have been the sole factor behind the level of poverty reduction that has occurred. In other words, part of the poverty reduction must have been caused by improvement in distribution and the growth must have benefited the poor proportionally more than the rest of distribution. Thus, growth must have been pro-poor. Alternatively, if the actual growth is higher than PEGR, it shows that the observed level of poverty reduction could have been achieved with a lower rate of growth. This means that the distributional aspect of the growth pattern must have negatively impacted the effectiveness of increase in average income and for that reason, growth cannot be considered pro-poor.

In case of negative growth, if the absolute value of actual growth is higher than the absolute value of PEGR then the negative growth pattern can be considered pro-poor. This is due to the fact that the actual pattern in this case requires a higher drop in the average income to reach the same welfare change as distribution-neutral pattern. So the distributional impact of the pattern must have been positive to have reduced the negative impact of decline in the average income. In other words, the poor must have suffered less from the negative growth relative to other part of the distribution.

Measurement of PEGR requires specifying a particular poverty index and poverty line. We use three well-known poverty indexes within FGT_α class of poverty measures: headcount ratio ($\alpha = 0$), poverty gap ratio ($\alpha = 1$), and severity of poverty ($\alpha = 2$), where α is the weight that these measures consider for the poorer of the poor. We define the poverty lines using the 5, 10, 15, 20, and 50 percentiles of the initial distribution.

Table 3 reports the PEGR estimates for every combination of poverty lines and poverty measures. The first observation that we can make is about the sign of PEGR estimates. Regardless of the choice of poverty index and poverty line, the equivalent growth rates are all positive in Egypt and Jordan in both periods and in Palestine in the second period. This is consistent with the results of

GICs shown in Figure 2 and indicates poverty reducing growth in all countries throughout the decade with the exception of Palestine during the downturn in the first period.

The second general observation is with regard to the decrease in the magnitude of PEGR as the weight parameter of the poverty index (α) changes from 0 (i.e. headcount ratio) to 1 (i.e. poverty gap), and to 2 (i.e. severity of poverty). This is because as α increases the poverty index becomes more sensitive to the poorer of the poor and as a result, the amount of poverty reduction achieved by the actual growth declines. Therefore, the magnitude of equivalent growth needed to generate the same level of poverty reduction drops as well. For a similar reason, one can see why PEGR increases with increase in poverty line. Achieving a particular level of poverty reduction becomes more difficult as the poverty line increases and requires a higher equivalent growth rate.

We now turn to a country-specific discussion of PEGR estimates. In Egypt during the first period (1999-2004), PEGR is always greater than the actual growth rate (1.45%). This shows that despite the very low rate of growth in this period which was caused by the fall in tourism after 9/11 attacks, the pattern of growth was pro-poor and the average income of the poor increased more relative to others. The pro-poor nature of economic growth in Egypt continued for the most part in the second period when the economy was recovering. However, the pro-poorness of growth in the second period depends on the sensitivity of the poverty measure to the poorer groups. PEGR estimates based on the severity of poverty which is our most sensitive measure do not support the pro-poorness of economic growth in Egypt in the second period (2004-2010).

In Jordan, the results show that pattern of growth has changed from the first period to the second. While the growth seems to become pro-poor in the second period, the pro-poorness in the first period is not that clear and depends on the measure of poverty and also the poverty line used. In the first period (2002-2006), PEGR is less than the actual growth rate only when it is measured using the headcount ratio or the poverty gap ratio. The more sensitive measure of poverty, i.e. severity of poverty, does not support the pro-poorness of growth in the first period. In the second period, the actual growth is less than PEGR for the most part except when the poverty line is set at a very high and unlikely threshold (50th percentile).

Palestine's pattern of economic growth is different than Egypt and Jordan since it involves a period of economic decline. All of PEGR estimates in 1998-2004 are negative reflecting the poverty-increasing impact of the downturn. As mentioned earlier, in the case of negative growth the absolute values are used for comparison with PEGR. The absolute value of Palestine's PEGR estimates are greater than the actual 4.85% reduction in the mean income which is a sign that the pattern was not pro-poor since it caused the same level of poverty increment as PEGR with a lower rate. In the second period, even though the growth rate was positive but the growth pattern still was not pro-poor. For the most part, PEGR is less than the actual growth rate except when the poverty line is assumed very low (5th percentile) which is unlikely considering the harsh realities of Palestinian economy.

5. Conclusions

In the first decade of the twenty-first century, Egypt, Jordan, and Palestine experienced sharply different growth patterns. Following the terrorist attacks of 9/11 and consequent instability in the region, Egypt's tourism suffered a major blow causing the economy to start the decade with a modest rate of growth. A series of reforms helped the Egypt's economy recover in the in the second period. Our results show that for the most part the pattern of growth in Egypt in both periods was pro-poor.

Since the introduction of its liberal economic policies in the early 2000s, Jordan has maintained a high rate of growth (above 6%) throughout the entire decade with a relatively higher rate in the second half. However, the pattern of growth has changed throughout this period. While the evidence of pro-poorness of growth in Jordan in the first half is not supported by poverty measures that are more sensitive to the wellbeing of the poorer groups, our results strongly suggest that economic growth was pro-poor in the second half regardless of what poverty measures used.

Following a significant economic downturn after the second Intifada in the early 2000s, Palestinian economy grew in the second period mainly due to the increase in foreign aid that poured into the economy. However, evidence presented in this paper shows that the pattern of economic growth in Palestine has never been pro-poor. During the downturn, poorer Palestinians suffered more and in the following recovery period, they benefited less than the other income groups.

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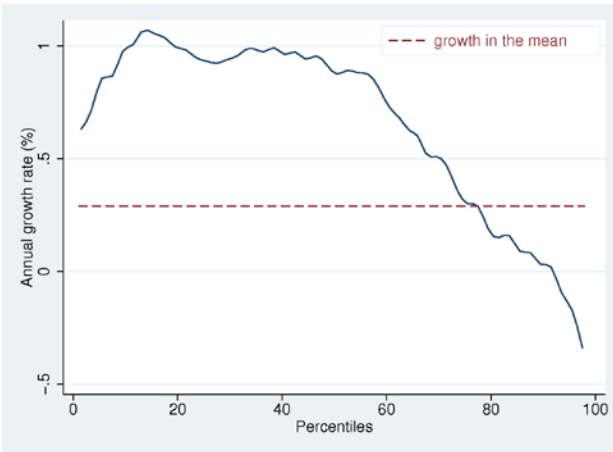
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Figure 1: GDP Per Capita, PPP (Constant 2011 International \$)

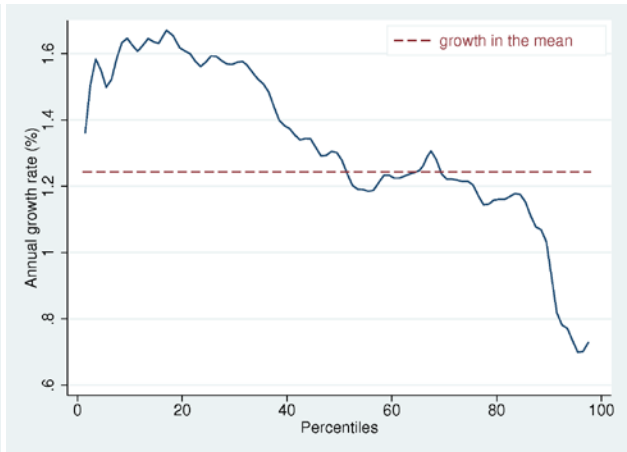


Source: World Bank Development Indicators (WDI 2015);

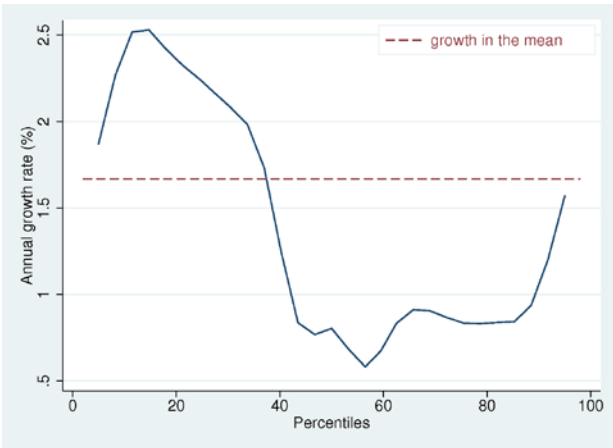
Figure 2: Growth Incidence Curve (GIC) for Egypt, Jordan, and Palestine



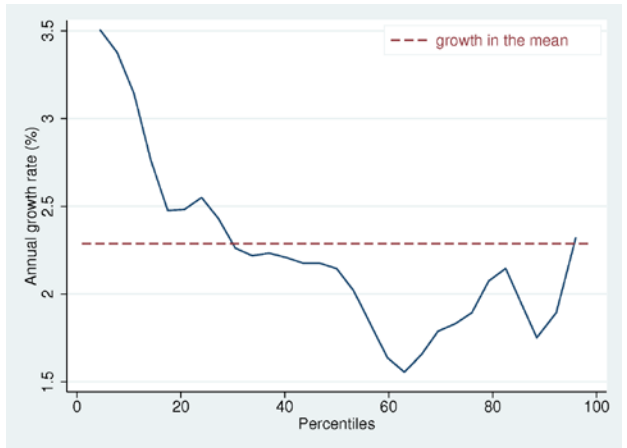
Egypt 1999-2004



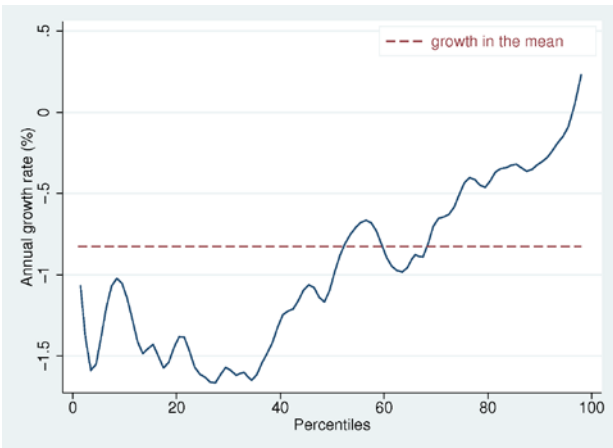
Egypt 2004-2010



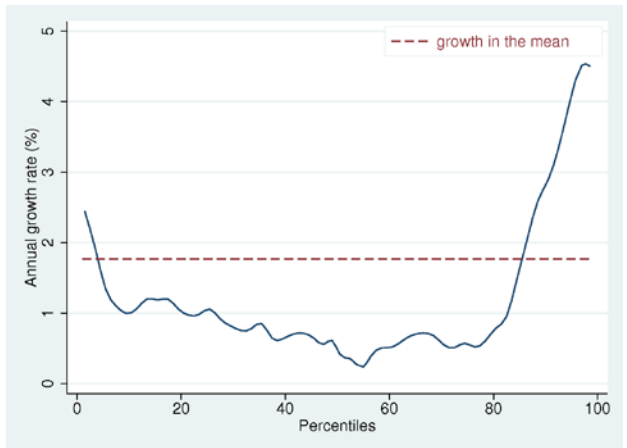
Jordan 2002-2006



Jordan 2006-2010



Palestine 1998-2004



Palestine 2004-2010

Table 1: Number of Observations by Country and Survey Year

	1999	2004	2010
Egypt	23,975	47,095	7,719
	2002	2006	2010
Jordan	2,518	2,897	2,845
	1998	2004	2010
Palestine	2,851	3,098	3,757

Table 2: Annual Per Capita Expenditure Growth Rate

	1999-2004	2004-2010
Egypt	1.45	7.69
	2002-2006	2006-2010
Jordan	6.84	9.47
	1998-2004	2004-2010
Palestine	-4.85	11.68

Table 3: Poverty and Inequality Measures (Selected Years)

		Poverty headcount ratio at \$2 a day (PPP)	GINI index
		(% of population)	
Egypt	2000	19.37	32.76
	2004	20.08	32.14
	2008	15.43	30.75
Jordan	2002	11.04	38.87
	2006	2.88	33.89
	2010	1.17	33.69
Palestine	1998	-	-
	2004	25.9	34
	2010	25.7	35.5

Source: World Bank Development Indicators (WDI 2015);

Table 4: Pro-poor Measures for Egypt (1999–2010), Jordan (2002–2010), and Palestine (1998–2010)

Threshold = <i>p</i> th income percentile	Poverty Equivalent Growth Rate (PEGR)					
	Headcount ratio	Poverty gap ratio	Severity of poverty	Headcount ratio	Poverty gap ratio	Severity of poverty
	1999–2004 (Annual growth in the mean = 1.45%)			2004–2010 (Annual growth in the mean = 7.69%)		
Egypt						
5	3.25	2.97	2.97	9.43	7.36	5.20
10	4.35	3.16	2.81	9.06	7.71	6.33
15	4.77	3.44	2.86	9.90	7.89	6.65
20	5.53	3.67	2.96	9.86	7.97	6.82
50	4.77	3.57	3.01	8.47	7.51	6.74
	2002–2006 (Annual growth in the mean = 6.84%)			2006–2010 (Annual growth in the mean = 9.47%)		
Jordan						
5	7.73	4.21	2.26	11.89	11.57	11.52
10	7.06	5.19	3.53	13.12	11.49	10.54
15	11.67	6.04	4.33	12.52	11.38	10.22
20	8.31	6.51	4.74	10.56	10.69	9.92
50	3.31	5.37	5.09	8.86	7.95	7.69
	1998–2004 (Annual growth in the mean = -4.85%)			2004–2010 (Annual growth in the mean = 11.08%)		
Palestine						
5	-7.58	-6.85	-5.90	12.44	13.75	14.66
10	-9.45	-5.83	-5.27	7.31	9.76	11.22
15	-10.61	-6.15	-5.00	7.83	8.05	9.39
20	-9.85	-6.22	-4.94	7.69	7.30	8.14
50	-4.12	-5.20	-4.51	2.93	4.46	4.80

Note: All variables expressed in percentage.