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Operationalizing Inclusive Growth:
Per-Percentile Diagnostics to Inform Redistribution Policies

by Alexei Kireyev and Andrei Leonidov

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I N T E R N A T I O N A L M O N E T A R Y F U N D

IMF Working Paper

Middle East and Central Asia Department

**Operationalizing Inclusive Growth:
Per-Percentile Diagnostics to Inform Redistribution Policies**

Prepared by Alexei Kireyev and Andrei Leonidov¹

Authorized for distribution by Jean-François Dauphin

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Abstract

Inclusive growth, narrowly defined in this paper as growth that helps reduce inequality, is achieved if consumption of the poor increases faster than consumption of the rich. The paper presents a simple accounting framework for a per-percentile consumption diagnostics that could inform redistribution policies. The proposed framework is illustrated in application to Iraq and Tunisia.

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ABSTRACT	1
I. INTRODUCTION	3
II. INCLUSIVE GROWTH TOPOLOGY	4
A. Definition	4
B. Growth Incidence Curve	5
C. Growth Distribution Accounting	9
III. APPLICATIONS	12
A. Comparative Growth Regimes	12
B. Iraq: Achieving Inclusive Growth	14
C. Tunisia: Strengthening Growth Inclusiveness	16
IV. TOWARD PER-PERCENTILE POLICIES	19
V. REFERENCES	21
FIGURES	
1. Inclusive Growth Topology	5
2. Stylized Growth Incidence Curve	6
3. Growth and Inclusiveness	8
4. Growth Regimes	13
5. Iraq: From Contraction to Inclusive Growth	16
6. Tunisia: Protecting the Middle Class	19
ANNEXES	
I. Change in Growth Inclusiveness	24

I. INTRODUCTION

1. Inclusive growth is an important policy priority in most countries. Most emerging market and developing economies and many advanced economies have adopted an explicit inclusive growth strategy that recognizes limitations of unequal growth. For example, in the Middle East after the turbulent 2010-11 period, most country authorities have placed job creation and inclusive growth at the heart of their reform agendas. Since then, some progress in improving growth inclusiveness has been achieved, but clearly not enough. In early 2018, a regional conference “Opportunity for All: Promoting Growth, Jobs, and Inclusiveness in the Arab World” launched several policy priorities summarized as ACT NOW—Accountability, Competition, Trade and Technology, No one left behind, Opportunity and Work (IMF, 2018), which are important for growth inclusiveness.

2. The purpose of this paper is to develop a tool for inclusive growth diagnostics. The issues related to inclusive growth have been well documented at national and international levels by national authorities and international institutions. However, analytical tools that could help evaluate the degree of growth inclusiveness in any country are still not well developed. This paper suggests one such tool, the per-percentile accounting framework. It may be useful for improving the targeting of public policies aimed at reducing inequalities. The tool is illustrated in application to Iraq and Tunisia.

3. The paper builds on earlier research on inclusive growth. A broad context of inclusive growth is provided by Acemoglu and Robinson (2012), and Rodrik (2014). Important insights on growth inclusiveness are contained in Berg and Ostry (2011), and Berg, Buffie and Zanna (2016). The calculations of key growth effects are included Datt and Ravallion (1992), and Ravallion and Chen (2003), with some additional inputs from Kraay (2004). Milanovic (2016) has plotted percentage gain in income against the original income for each percentile of the global income distribution for 1988-2008 to get a growth incidence curve for the world. The idea of inclusiveness as the common thread of all the new issues tackled by the Fund has been articulated in Loungani (2017). Our earlier paper (Kireyev and Chen, 2017) suggests an operationally usable framework for the evaluation of growth inclusiveness—the inclusive growth framework (IGF). The framework has been applied to the cases of Senegal (Kireyev, 2013 and Kireyev and Mansoor, 2014), the West African Economic and Monetary Union (Kireyev, editor, 2016), Djibouti (Kireyev, 2017a and Kireyev, 2017b), and in the Asian context (Kireyev, 2017c). However, these papers did not address the issue of targeted redistribution policies needed to reduce inequality in consumption and therefore improve growth inclusiveness.

4. This paper contributes to the literature along several dimensions. First, the paper presents a simple accounting framework of inclusive growth in its narrow definition, where growth is defined as inclusive if it helps reduce inequality in consumption. Second, the paper illustrates parameter shifts needed to turn non-inclusive growth into inclusive growth. Third,

the paper proposes per-percentile policies needed to rebalance consumption growth at a very granular level of consumption expenditure distribution. Finally, to illustrate the framework, the paper applies the proposed per-percentile approach to Iraq (the case of turning non-inclusive growth into inclusive growth) and Tunisia (the case of strengthening growth inclusiveness by reducing middle-class erosion).

5. The rest of the paper is organized as follows. Section 1 presents inclusive growth topology, including its definition, components, and literature review. Section 2 proposes an accounting framework to assess growth inclusiveness and its macroeconomic outcomes. Section 3 applies the framework to the cases of Iraq and Tunisia. Section 4 concludes and outlines the steps toward per-percentile growth analysis and policy implementation.

II. INCLUSIVE GROWTH TOPOLOGY

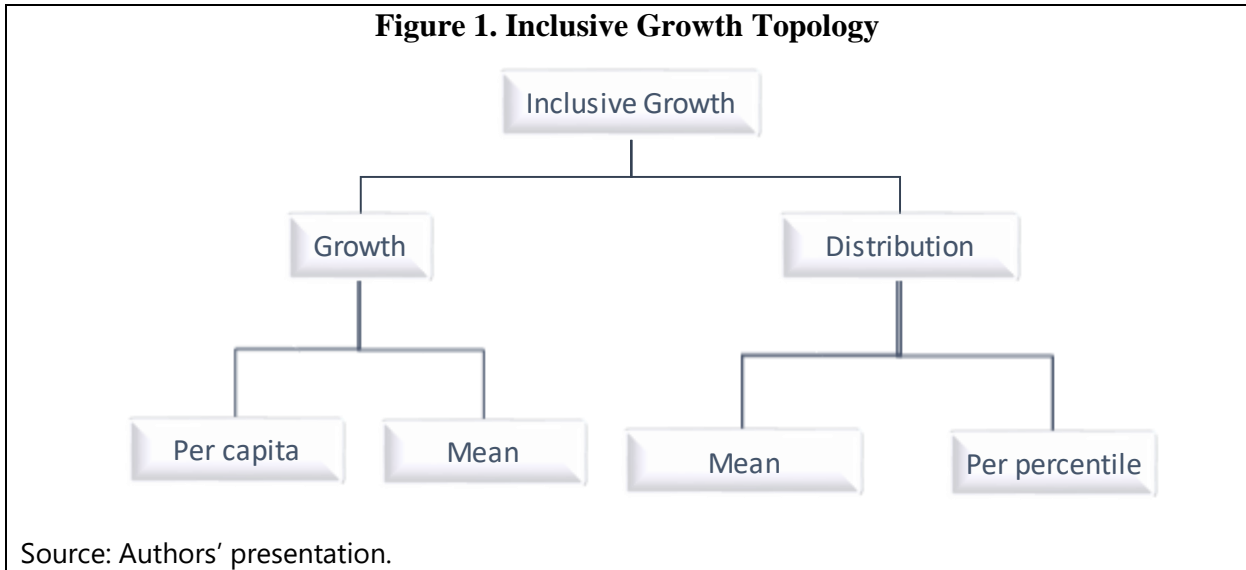
A. Definition

6. Growth is usually considered inclusive if its benefits are shared across the population. Although there is no commonly accepted definition, inclusive growth usually refers to growth that provides equal opportunities, with social policies redressing inequalities, so that all segments of society can share in the benefits of growth (see IMF, 2013, for an overview). This paper focuses only on the distributional characteristics of growth.

7. Inclusive growth is defined here as growth that reduces inequality in consumption. From this narrow definition adopted in this paper it follows there are two components to inclusive growth – average growth and its distribution by percentiles of consumption across the population. The growth component suggests that growth on average across the all consumption percentiles should be just positive. At the same time, even if there is growth, worsening inequality in consumption may lead to greater social polarization, political and social instability—factors that would ultimately undermine growth. It would not make sense neither to promote growth without improving distribution, nor to seek better distribution without growth.

8. Therefore, an inclusive growth topology should reflect both consumption expenditure distribution and growth (Figure 1). On the distribution side, the per capita consumption expenditure, which reflects both current income, accumulated wealth, and saving rates, is the most relevant inclusive growth indicator. The position of a person's consumption relative to mean consumption across the whole distribution would measure relative inequality. On the growth side, changes in consumption expenditure between two household surveys would be an indirect indicator of how growth affects income at each percentile over time. In this case, average per capita growth in consumption is the relevant indicator for the growth inclusiveness analysis, contrary to just growth of real GDP. Average per capita growth in consumption should be at least positive to contribute to improving consumption expenditure distribution. If the average per capita growth across the distribution

is negative, the country is facing contraction. In principle, distribution can also improve during contraction if, for example, consumption of the rich is dropping faster than of the poor. But contraction cannot be inclusive, as the whole distribution becomes poorer.



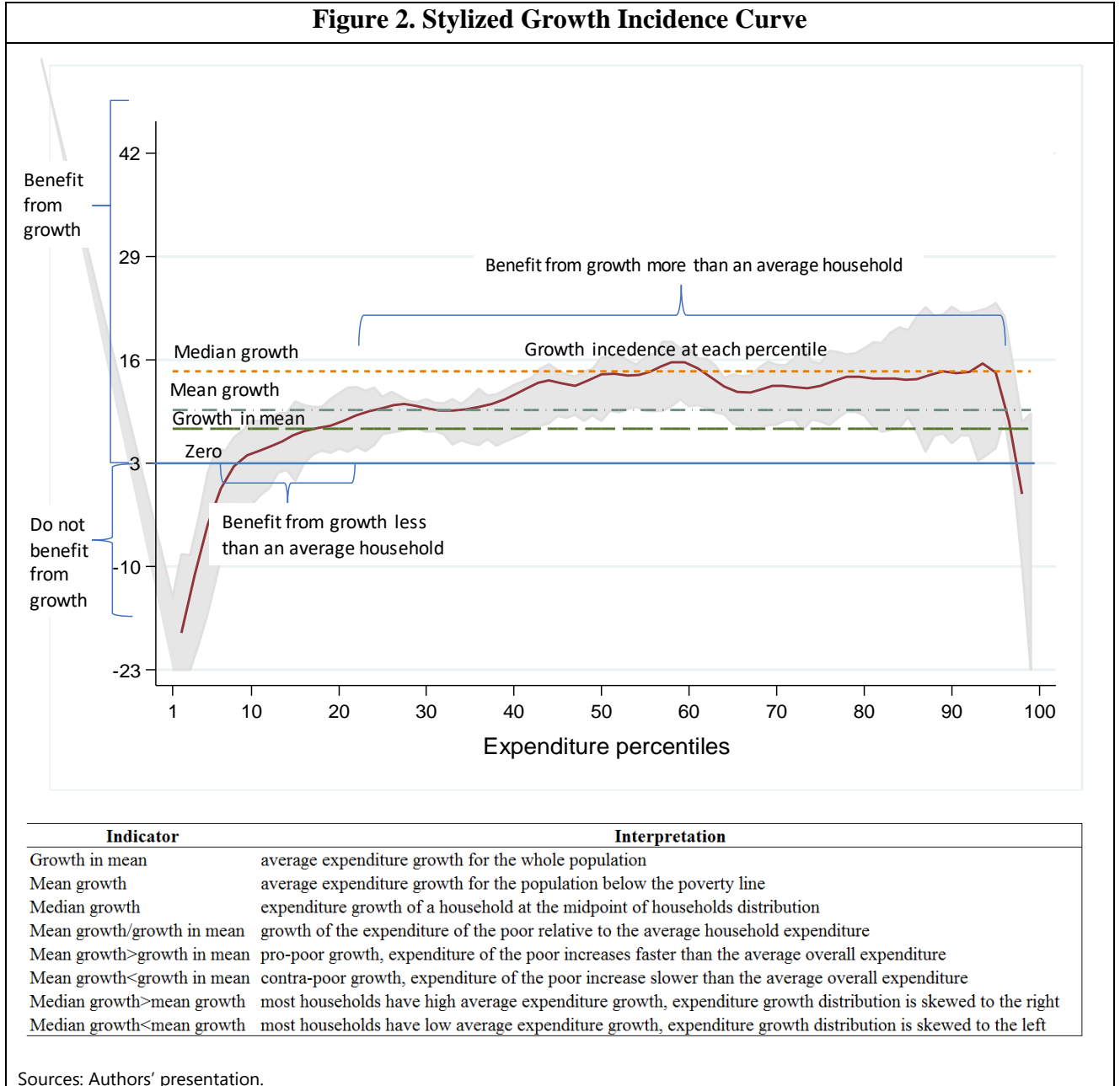
B. Growth Incidence Curve

9. A growth incidence curve (GIC) is a tool for the analysis of growth inclusiveness². It allows identifying some characteristics of real consumption expenditure changes at each percentile (Figure 2). The parts of the curve above the X-axis are the percentiles of the population that benefit from growth, and the parts below the X-axis are the percentiles, whose consumption expenditure declines, suggesting that they lose in relative terms because of growth. If the whole GIC is above the X-axis, growth clearly leads to the reduction of poverty. However, if the GIC crosses the X-axis, the impact of growth on poverty is ambiguous. The part of the curve that are above the overall mean points at the percentile of the population that benefit from growth relatively more than an average household. The parts of the GIC below the mean, but still above zero, point at the percentiles that also benefit from growth, but less than an average household. The parts of the GIC

² Several statistical metrics allow to evaluate different aspects of inclusiveness in this narrow definition. The squared poverty gap assesses inequality as it captures differences in the severity of poverty among the poor. The Watts index is a distribution-sensitive poverty measure because it reflects the fact that an increase in income of a poor household reduces poverty more than a comparable increase in income of a rich household. The Gini coefficient shows a deviation of income per decile from the perfect equality line. The mean log deviation (MLD) index is more sensitive to changes at the lower end of the income distribution. The decile ratio is the ratio of the average consumption of income of the richest 10 percent of the population divided by the average income of the poorest 10 percent. Finally, in dynamic terms the increase of income of the bottom deciles can be compared to the average income increase or the income increase in the highest deciles of the population. If the income of the bottom decile in the distribution tends to rise proportionately or faster than the average income, growth would be considered inclusive. Although the squared poverty gap and the Watts index take into account the distributional characteristics of growth indirectly, all other methods measure equality directly (See Kireyev, 2016).

below zero, point at the percentiles that lose from growth. While GICs provide useful information, poverty indicators remain a useful complement of distributional analysis. In many cases, growth may not be inclusive but could shift (large) portions of the population out of poverty.

Figure 2. Stylized Growth Incidence Curve



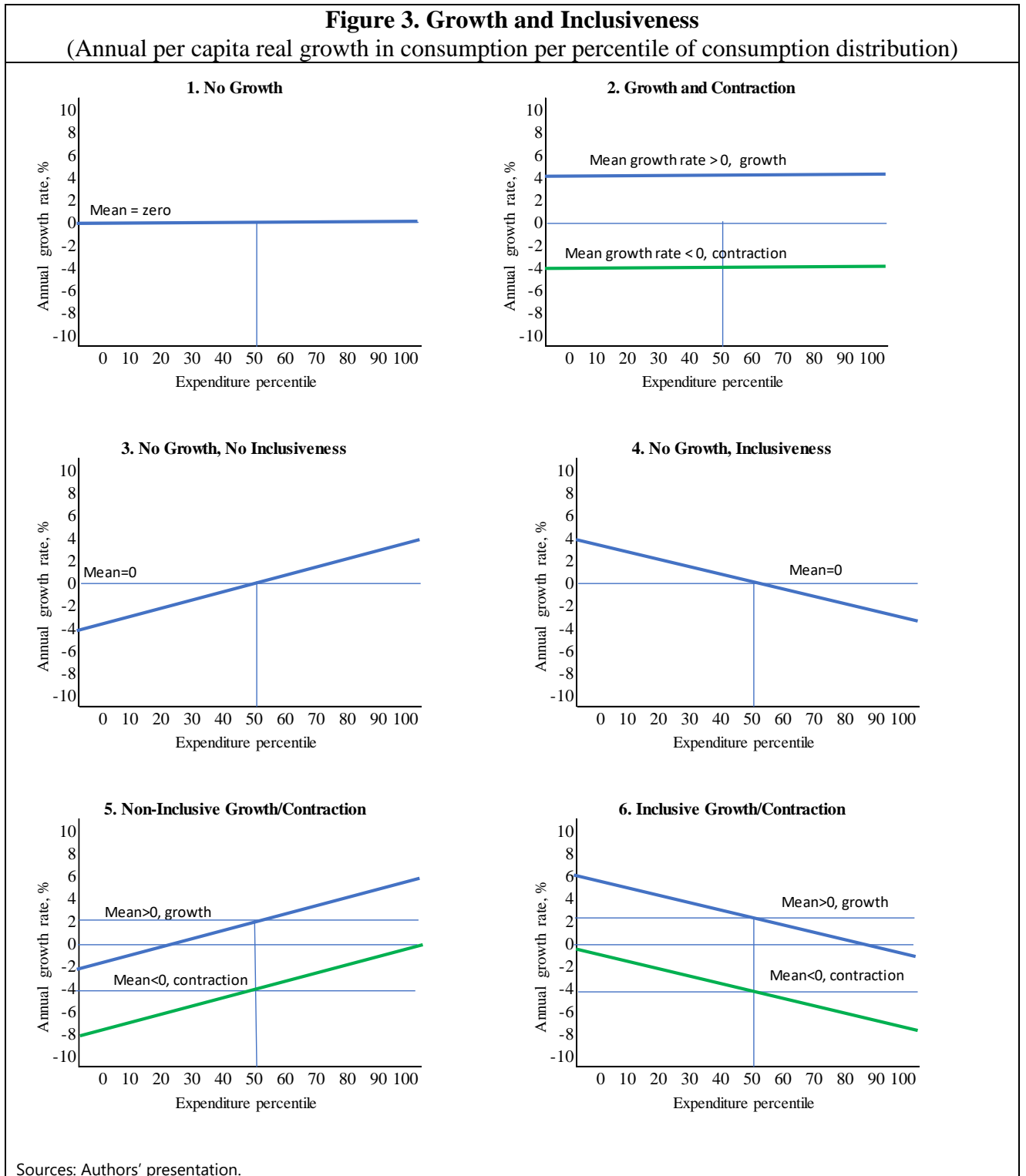
10. GICs allow calculating measures useful for the growth inclusiveness analysis.

For example, median income growth is the change in consumption expenditure of the household at the midpoint of a frequency distribution. Growth in mean consumption is the change in the consumption expenditure of an average household in the whole distribution. The mean growth rate is the average consumption growth of the poor, i.e., only of those

households that are below the poverty line. Therefore, the quotient of mean growth to growth in mean measures shifts in the distribution. Obviously, growth in mean virtually always will be different from mean growth. When mean growth is higher than growth in mean, growth can be considered generally pro-poor, but not necessarily inclusive, as the comparisons of means say nothing about growth at different percentiles.

11. Analysis of growth inclusiveness depends on data availability and quality. Such analysis requires at least two household surveys based on a comparable methodology. These surveys should include data on consumption expenditure by households, which is difficult to collect in most low-income countries because a large share of the population is employed in the informal sector (Foster and others, 2013). The data may include outliers and lead to negative growth rates of the incidence curve for both tails of the distribution in some years. In particular, the data may not be reliable at the lowest and highest percentiles of the distribution, as the very poor and the very rich often do not participate in household surveys. Also, some parameters, such as the size of households and other sociodemographic variables (household head, education level, marital status, employment sector, place of residence, regional distribution, etc.) can vary from survey to survey, which affects their comparability. Finally, using consumption expenditure as a proxy for income has its own shortcoming. Consumption can approximate income only under a strong assumption that the saving rates are constant (across time and across income levels), which may be the case on most low-income economies. Also, income data are not usually widely available, as household surveys usually collect the data on consumption expenditure.

12. An assumption that GIC is linear can help illustrate its properties. In this linear GIC case (Figure 3), growth in mean consumption per-percentile can be: zero, where consumption in per capita terms does not grow at all—in this case, GIC overlaps with the X-axis; positive, with the GIC above the X-axis (growth), or negative in the opposite case (contraction); zero and distribution worsening; the GIC with a zero mean is positively sloped suggesting an absence of growth on average, as negative growth at lower deciles is completely offset by higher growth in higher deciles of consumption distribution; this shows increased inequality, and, therefore, a lack of inclusiveness; zero but distribution improving, which is the opposite case with a negatively sloped GIC; it still points at no growth, but suggests some inclusiveness, as consumption of lower percentiles of the distribution grows while that of the higher percentiles declines, therefore reducing the gap between the rich and the poor; positive and distribution worsening, as the mean consumption increases and GIC is positively sloped; or negative and distribution worsening, suggesting contraction; or positive and distribution improving, where the mean consumption increases and the GIC is negatively sloped; or negative and distribution improving pointing at a theoretically possible case of an inclusive contraction.



13. Changes either in consumption growth or distribution would displace the GIC.

There can be multiple combinations in the shifts of mean growth and GIC with just a few most typical presented as an illustration (Annex 1): an increase in growth with unchanged distribution would shift the GIC up; an improvement in distribution, but not in growth, would

just tilt the GIC and make its slope more negative; an increase growth and improved distribution would simultaneously shift the GIC up and make its slope more negative; and an increase in growth leading to worsened distribution would be manifested by an upward shift of the GIC in parallel with the decline of its negative slope, or even making it positively sloped.

C. Growth Distribution Accounting

14. Growth distribution accounting allows unveiling per-percentile properties of growth. Disentangling average consumption growth into its per-percentile structure would allow identifying the percentiles of population that are excluded from the benefits of growth or benefit from growth relatively less than other percentiles. On this basis, governments can develop per-percentile targeted measures designed to address the most pronounced inequalities and therefore make growth distribution improving and thus more inclusive.

15. The growth distribution accounting starts from the definition of a GIC. For this exercise, a GIC be defined as a per-percentile change in real per capita consumption expenditure. Let $y_t(p)$ be the real per capita (p) consumption expenditure distribution. A growth incidence curve (GIC), $g_t(p)$, measures the per-percentile change in real consumption expenditure from year $t - 1$ to year t across the whole consumption expenditure distribution. Therefore, a GIC is defined as

$$g_t(p) = \frac{y_t(p)}{y_{t-1}(p)} - 1 \quad (1)$$

Using (1), real consumption expenditure distribution is

$$y_t(p) = y_{t-1}(p) + g_t(p)y_{t-1}(p) \quad (2)$$

Average consumption expenditure μ_t corresponding to the distribution $y_t(p)$ is

$$\mu_t = \int_0^1 dp y_t(p) \quad (3)$$

Combining (2) and (3), the change in the average real consumption expenditure is

$$\mu_t = \mu_{t-1} + \int_0^1 dp g_t(p)y_{t-1}(p) \quad (4)$$

16. To achieve inclusive growth, a GIC should have two properties. First, there should be positive average growth and, second, consumption of lower percentiles of the distribution should grow faster than consumption of higher percentiles. The minimum precondition for this is that the observed per-capita consumption expenditure distribution should be transformed in such a way that on average growth across all percentiles becomes positive.

17. For positive inclusive growth, the GIC has to have a number of properties.

$$y_{t-1}(p) \xrightarrow{g_t(p)} y_t(p) \quad (5)$$

Formally, the targeted properties of $g_t(p)$ are

- positive mean, i.e., growth should be positive on average: $\int_0^1 dp g_t(p) > 0$ (6)

- the GIC should be negatively sloped, i.e., growth should be distribution improving:

$$g'_t(p) < 0 \quad (7)$$

For a simple case of a linear GIC

$$g(p) = g(0) - (g(0) - g(1))p \quad (8)$$

these properties would be

- growth: $\int_0^1 dp g_t(p) > 0 \rightarrow \frac{1}{2}(g(0) - g(1)) > 0$ (9)

- and distribution improvement: $g'_t(p) < 0 \rightarrow g(0) > g(1)$ (10)

18. The targeted distribution and the required per-percentile changes in consumption expenditure are as follows.

The targeted distribution is

$$y_t(p), y_t(p) = (1 + g(0) - (g(0) - g(1))p)y_{t-1}(p) \quad (11)$$

and the required per-percentile changes in real consumption expenditure is

$$\delta y(p) = (g(0) - (g(0) - g(1))p)y_{t-1}(p) \quad (12)$$

19. Assume that there are three groups of population classified by their real consumption. These groups are the poor, middle class, and the rich. Based on their expenditure distribution, the consumption expenditure range for each group is

- Poor $p < 20\%$
- Middle class $20\% < p < 80\%$
- Rich $80\% < p < 100\%$

Assume also that the initial consumption expenditures in each range take values (y_1, y_2, y_3)

$$y_{t-1}(p) = \begin{cases} y_1, & p < 20\% \\ y_2, & 20\% < p < 80\% \\ y_3, & 80\% < p < 100\% \end{cases} \quad (13)$$

and these expenditures grow by (g_1, g_2, g_3) in each of the groups

$$g(p) = \begin{cases} g_1, & p < 20\% \\ g_2, & 20\% < p < 80\% \\ g_3, & 80\% < p < 100\% \end{cases} \quad (14)$$

In this simplified setting, the resulting consumption expenditure would be

$$y_t(p) = \begin{cases} y_1(1 + g_1) \\ y_2(1 + g_2) \\ y_3(1 + g_3) \end{cases} \quad (15)$$

or, for the per-percentile consumption change, $\delta y(p) \equiv y_t(p) - y_{t-1}(p)$

$$\delta y(p) = \begin{cases} g_1 y_1 \\ g_2 y_2 \\ g_3 y_3 \end{cases} \quad (16)$$

In this case, average consumption expenditure is

$$\mu_{t-1} = \frac{1}{5}(y_1 + 3y_2 + y_3) \quad (17)$$

and the change in average consumption is simply

$$\mu_t - \mu_{t-1} = \frac{1}{5}(g_1 y_1 + 3g_2 y_2 + g_3 y_3) \quad (18)$$

20. The sign of the GIC distinguishes growth from contraction. If $g_t(p) > 0$, there is growth. If $g_t(p) < 0$, there is contraction. Both growth and contraction can be distribution-improving, distribution-neutral and distribution-worsening.

- Distribution-improving (inclusive) growth/contraction is

$$g_t(p) = \begin{cases} g_1 = g \\ g_2 = g - \delta g \\ g_3 = g - 2\delta g \end{cases} \quad (19)$$

where the change in average consumption expenditure equals

$$\mu_t - \mu_{t-1} = \frac{g}{5}(y_1 + 3y_2 + y_3) + \frac{1}{5}(-3\delta g y_2 - 2\delta g y_3) \quad (20)$$

- Distribution-neutral (inclusiveness neutral) growth/contraction is

$$g_t(p) = \begin{cases} g_1 = g \\ g_2 = g \\ g_3 = g \end{cases} \quad (21)$$

$$\mu_t - \mu_{t-1} = \frac{g}{5}(y_1 + 3y_2 + y_3) \quad (22)$$

- Distribution-worsening (non-inclusive) growth/contraction is

$$g_t(p) = \begin{cases} g_1 = g - 2\delta g \\ g_2 = g - \delta g \\ g_3 = g \end{cases} \quad (23)$$

$$\mu_t - \mu_{t-1} = \frac{g}{5}(y_1 + 3y_2 + y_3) + \frac{1}{5}(-2\delta g y_2 - 3\delta g y_3) \quad (24)$$

III. APPLICATIONS

A. Comparative Growth Regimes

21. Six different combinations of average growth and GIC slopes can be identified.

Using the IG topology discussed above, household surveys for several Middle East countries allow illustrating all six combinations. These combinations are: distribution improving growth (Tunisia), distribution neutral growth (Egypt), distribution worsening growth (Djibouti, Iraq), distribution improving contraction (Iran), distribution neutral contraction (WBG), and distribution contraction. Distribution improving growth can be viewed as inclusive, while distribution worsening growth can be considered non-inclusive.

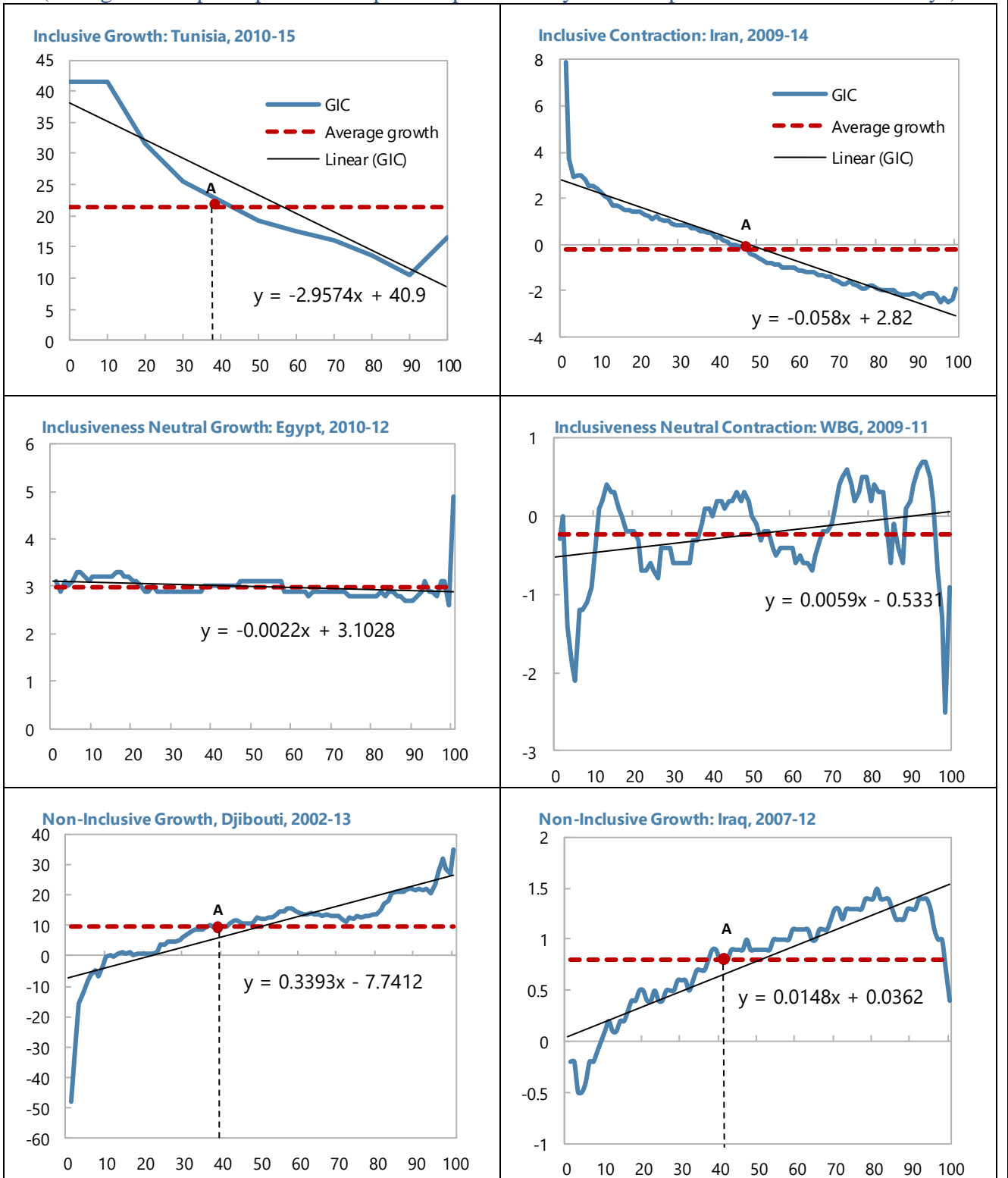
Theoretically, contraction can also be inclusive, if it helps reduce inequality, even though the average standards of living worsen.

22. Average growth and the slope of the GIC can be established graphically, even in nonlinear cases.

In real life, GICs usually have complex shapes, reflecting growth in consumption at each decile of the population (Figure 4). Tunisia, Egypt, Djibouti, and Iraq are the cases when growth between the two dates of household surveys was positive on average for the whole distributions. Iran and West Bank Gaza (WBG) are the examples of contraction, i.e., growth on average was negative across the whole consumption distribution. The slope of GICs defined by simple linear trends are negative for Tunisia and Iran, close to zero for Egypt and WBG, and positive for Djibouti and Iraq.

Figure 4. Growth Regimes

(Change in real per capita consumption expenditure by decile in percent between two surveys)



Sources: National household surveys.

23. From an operational perspective, growth inclusiveness can be assessed in several steps:

- (i) establish the slope of the GIC based on the information of at least two sequential household surveys;
- (ii) if the slope is positive, suggesting that growth has not been inclusive, identify measures that could increase income and presumably consumption expenditure of the lowest deciles, while increasing the mean growth rate, that is, not at the expense of higher deciles;
- (iii) if the slope of the GIC is negative, suggesting growth has been inclusive, identify measures to increase the absolute value of the slope by making the growth of consumption of lower deciles even faster, without hampering any other deciles;
- (iv) and, alternatively or in addition, find a measure to reduce inequality in the next period that would shift the entire GIC up (See Kireyev, 2013 for details).

24. Public policy actions to improve growth inclusiveness would depend on the diagnostics. Such analysis should be performed on carefully constructed GICs based on the two most recent household surveys. For example, in the two cases below, those of Iraq and Tunisia, used as illustration, public policies should differ.

B. Iraq: Achieving Inclusive Growth

25. The phenomenon of non-inclusive growth was observed in Iraq. A World Bank study of the 2007 and 2012 household surveys has shown a secular improvement in consumption expenditure (World Bank, 2012). Poverty in Iraq has also declined³. However, irrespective of the positive overall trend, consumption expenditure of the very poor (below the 10th percentile) declined, and that of the lower-middle class (between 20th and 40th percentiles) was below average (Figure 5a). At the same time, consumption of the upper-middle class (between the 40th and 80th percentiles) and the rich, except for the very rich (above the 90th percentile), increased. Therefore, growth in consumption has led to worsening inequality, i.e., it was non-inclusive in the definition of this paper.

26. In principle, public policies should aim at making growth faster and inclusive. In practice, this means that the authorities should simultaneously increase average growth and ensure a substantially faster growth of consumption expenditure of the poor relative to the rich. This would shift the GIC and its average up, increase its positive mean, and change the slope of the GIC from positive to negative. The authorities can achieve inclusive growth by

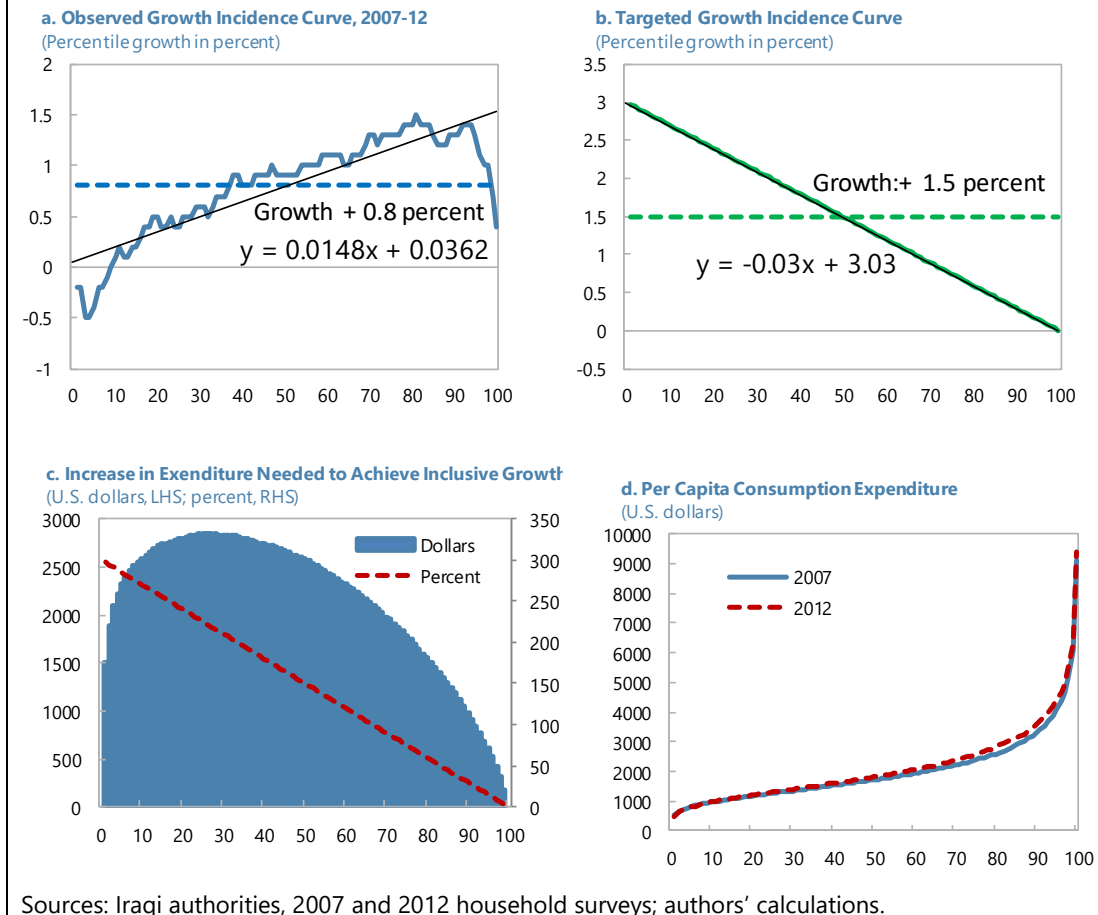
³ The consumption distribution in 2012 stochastically dominates that in 2007. This implies that irrespective of where the poverty line is set (barring an extreme shift in the poverty line), the proportion of people below that line in 2012 is lower than in 2007 (World Bank, 2012).

redistributing income by way of fiscal policies. For example, as a policy scenario, the authorities could have targeted an increase of the income of the poor to improve their consumption, while the situation of the rich at least should not worsen.

27. In Iraq, to achieve inclusive growth redistribution policies could have been as follows. Using 2007 as a base year for the application of the redistribution policies, the authorities could have targeted an increase in consumption expenditure of the 1st percentile of the poor by 300 percent and a zero consumption increase of the 100th percentile of the rich. The targeted increase in the consumption expenditure for all other percentiles could be equally distributed between 300 percent and 0 percent given the initial distribution (Figure 5b). This approach would have doubled average consumption growth to about +1.5 percent and would change the slope of the GIC from positive to negative. As a result, the poor would have benefited from growth more than the rich, and inequality would decline. Growth would have become inclusive.

28. The needed change in consumption can be calculated in dollars and in percent (Equation 12). Suppose the authorities' target is to double average consumption expenditure and improve distribution. In this case, if all additional income is consumed, annual income of the 20th percentile should become by US\$ 2,898 or 240 percent higher relative to its 2007 level, while income of the 80th percentile should be US\$ 1,600 or 60 percent higher. The exact level of additional income needed to achieve the goal of faster and inclusive growth is calculated also for each percentile and presented in dollars and percent increase relative to the base 2007 level in Figure 5.c. Therefore, fiscal policies can target an increase of transfers or reduction of taxes for each percentile of the population, with the view to achieve growth that reduces inequality, i.e., inclusive growth. Unfortunately, the 2012 survey suggests that, while growth in consumption was achieved in Iraq between 2007 and 2012, inclusiveness was not, as the consumption expenditure profile has not changed much between the two household surveys (Figure 5d).

Figure 5. Iraq: From Contraction to Inclusive Growth
(Per-percentile change in real per capita consumption expenditure)



C. Tunisia: Strengthening Growth Inclusiveness

29. Household surveys are conducted in Tunisia every five years. Such periodicity allows to calculate GICs for three periods 2000-05, 2005-10, 2010-15 (Figure 6a). Although there is no official definition of the poor, the middle class, and the rich in Tunisia in terms of deciles, the poverty threshold was at 15.2 percent in 2015, 20.5 percent in 2010 and 23.1 percent in 2005. Therefore, as a first approximation, 0-20th percentiles can be considered to include the poor segment of the population, the 20-80th percentiles can be viewed as the middle class, and the 80-100th percentiles as rich.

30. Average consumption expenditure in Tunisia has increased in the past two decades. If during the 2000-05 period, real per capita consumption expenditure increased by 7.0 percent annually, in 2005-10 the increase reached 7.7 percent annually, and further in the 2010-15 period to 10.7 percent annually.

31. Overall, growth since 2000 has broadly led to reduced inequality in Tunisia. In 2000-05, Tunisia's GIC was flat, suggesting that although consumption expenditure was increasing, growth was inclusiveness neutral, with the overall level of inequality remaining broadly unchanged (Figure 6a). In 2005-10, an increasing part of national income was redistributed from the rich to the poor; growth became more inclusive, as shown by the negatively sloped GIC. In 2010-15, and in particular after the 2011 Revolution, in addition to providing social support, the authorities hired about 70 thousand low-income people into public administration and several thousand more into public enterprises⁴. As a result, consumption of the poor and lower-middle class increased substantially and the negative slope of the GIC tripled. This suggests tripling of growth inclusiveness based on this metric on average for the whole territory of Tunisia, although substantial regional disparities remained⁵.

32. However, trends in consumption distribution differed during the three periods. For example, in 2000-05, there was no clear indication as to who benefitted from growth, as the GIC crosses the average growth line at multiple points (Figure 6b). However, it is obvious that the poor (0-20th percentiles) benefitted less from growth than the average person in Tunisia. Within the middle class (20-80th percentiles), the lower-middle class (20-40th percentiles) benefitted from growth more than an average Tunisian. The middle-middle class (40-60th percentiles) benefitted as much as an average person. And the upper-middle class (60-80th percentiles) benefitted slightly less. The rich (80-100th percentiles) have gained the most, except for the very top, which may be a statistical error, as the richest segments of the population typically do not participate in household surveys. During the next period, 2005-10, most poor and virtually the entire middle class benefitted from growth. Only the very rich, beyond the 90th percentile of consumption distribution, lost in relative terms. Finally, in 2010-15, the situation has changed dramatically. Growth became strongly inclusive, as consumption of the poor and low-middle income groups increased substantially faster than consumption of the upper-middle class and the rich.

33. Focusing on the middle class, the analysis suggests that its position has changed. After 2010, the poor and the rich have benefitted from growth more than the middle class (Figure 6c). In 2000-05, consumption expenditure growth reflected the growth in consumption expenditure of the middle class. In the 2005-10 period, the middle class even benefitted somewhat more from growth than an average Tunisian. But during the 2010-15 period, the situation of the middle class changed. Its consumption increase was substantially lower than the average for the economy. The poor benefitted the most, as a result of targeted

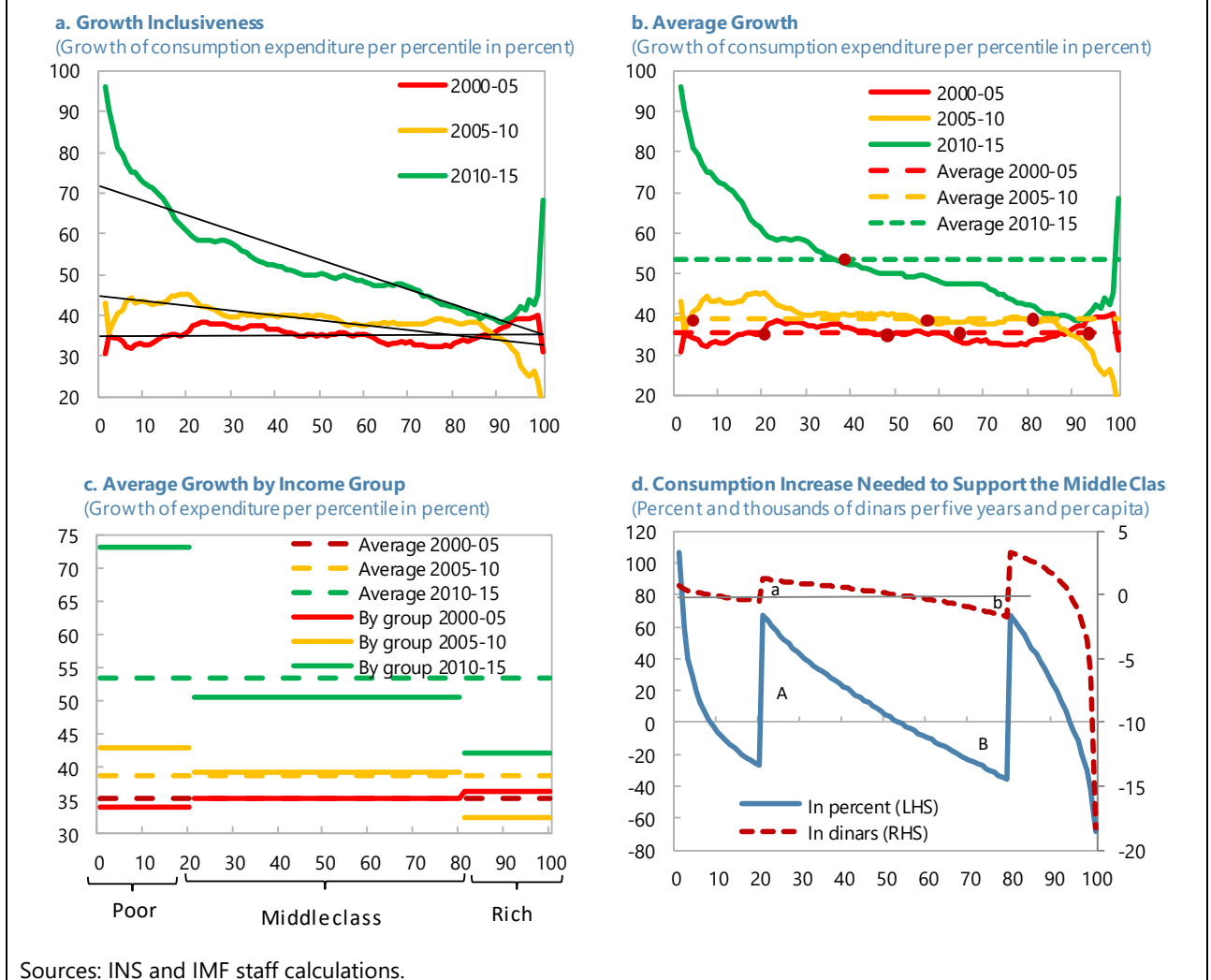
⁴ These were one-off measures to address immediate social needs. Such massive recruitment measures, salary increases, and social assistance programs cannot be reproduced in the coming period on the same scale.

⁵ Information on real consumption growth by region is also available from Tunisia's household surveys.

fiscal policies (hiring and wage increases in the public sector, increases in social transfers), as well as the unintended large extension of the informal activities.

34. The proposed accounting framework allows to assess redistribution measures needed for each percentile of the population to preserve the overall growth inclusiveness. Equations 19 and 20 can be used in tandem to address the policy relevant question: given the fixed budget envelope, by how much and at whose expense should consumption expenditure of each percentile of the population change to smooth out undesirable social shifts? The calculations show that relative to its own 2015 average, consumption expenditure of the middle class should increase, but in different proportions depending on the position of each household along the 20-80th percentiles of consumption expenditure distribution (Figure 6d). Moreover, this consumption expenditure increase is really needed only for the household roughly in the 20-50th percentiles and is not really needed in the 50-80th percentiles, as their consumption is already higher the average for the middle class. Such an increase for the 20-50th percentiles in dinars per capita per-percentile is shown by area *A* and in percent by the corresponding area *a*. In principle, such an increase can be financed, at least in part, by additional taxes on the individuals in the 50-80th percentiles, leading to savings of area *B* in dinars or the corresponding area *b* in percent. The share of additional expenditure that can be financed by this redistribution would depend of the share of households in the 20-50th percentiles relative to 50-80th percentiles. Moreover, depending on the number of people in the 20-50th percentiles relative to the 50-80th percentiles, savings in *B* can be equal or even outweigh additional expenditure needed in *A*.

35. Thus, the position of the middle class could be stabilized, at the expense of the redistribution inside the middle class itself. This may be achieved with fiscal policies while preserving consumption expenditure of the poor growing much faster than those of the middle class and the rich. At the same time, the position of the rich would not worsen either. Also, there is no need to increase the fiscal deficit, as the whole redistribution would take place within the given budget envelope and between the subgroups of the middle class. Finally, this transfer mechanism would also depend on the efforts of monetary and fiscal policies to increase growth, so that the poor could preserve a positive growth rate of real expenditure, without further eroding the purchasing power of the middle class.

Figure 6. Tunisia: Protecting the Middle Class

IV. TOWARD PER-PERCENTILE POLICIES

36. The proposed accounting framework calls for the development of targeted redistribution policies. The GICs give clear policy guidance on how to replace generalized redistribution policies with well-targeted policies to make consumption expenditure more equal and therefore achieve inclusive growth in consumption. In principle, such policies can be developed for at least three income groups. They can target not only the poor in their national definition but also address the needs of the middle class, while not hampering the rich. At the next level of granularity, such policies could be customized to each decile of the population based on an analysis of their relative consumption expenditure patterns. Such a decile-based approach would allow monitoring the relative position of relatively large, yet homogeneous, groups of population. It would ensure that growth of their consumption expenditure contributes to reducing inequality, and therefore growth remains inclusive.

Finally, at the highest level of granularity, per-percentile policies can be developed. Such policies would target people in each percentile of the consumption expenditure distribution. The objective would be to eliminate obvious troughs in consumption growth patterns, which may indicate that specific percentiles of the populations are left behind in the distribution of growth dividends.

37. Fiscal policy can help achieve inclusive growth by per-percentile targeting. As fiscal instruments are standard and numerous, their application could become more granular based on the first-hand knowledge of consumption patterns from household surveys. *First*, progressive direct taxes and transfers are already used to reduce inequality. The per-percentile analysis of the taxable income and consumption, before and after taxes and transfers, can point to the percentiles of the population that do not benefit from growth equally with the others and inform, for instance, the setting of tax brackets for the personal income tax. *Second*, fiscal policy can reduce inequality by percentile design of income taxes rates. Third, through in-kind transfers targeted to specific percentiles, fiscal policy can reduce inequality in consumption. *Finally*, per-percentile targeting of transfers, such as on education and health, also affect inequality by changing the distribution of human capital and by promoting social mobility.

38. The suggested granular design of fiscal policy would face limitations. First, many low-income and emerging-market economies do not have the targeting mechanisms in place to design fiscal policy at a very granular level. For instance, the government may not be able to identify the group of households at the bottom of the distribution. Even if the government can identify those households, these groups may be commonly part of the informal sector, the government may not have a transfer system (cash or in kind) capable of delivering benefits to these groups. Also, fiscal policy should—among other things—balance equity and efficiency considerations. As a result, per percentile design of tax brackets for the personal income tax may not be efficient and difficult to implement and enforce. In addition, only a positive change in aggregate consumption would be beneficial to growth.

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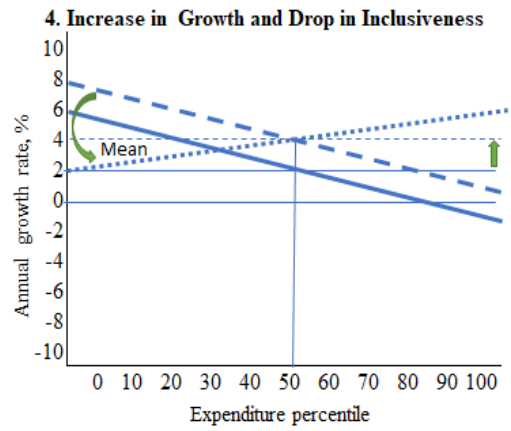
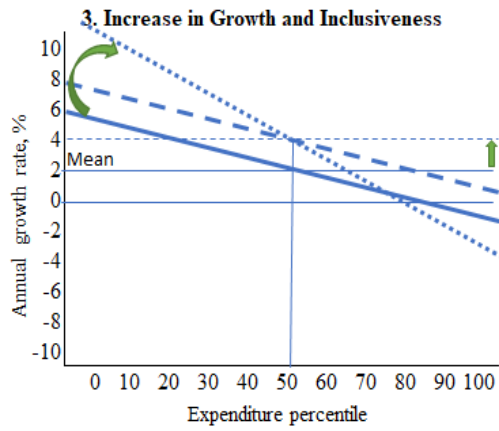
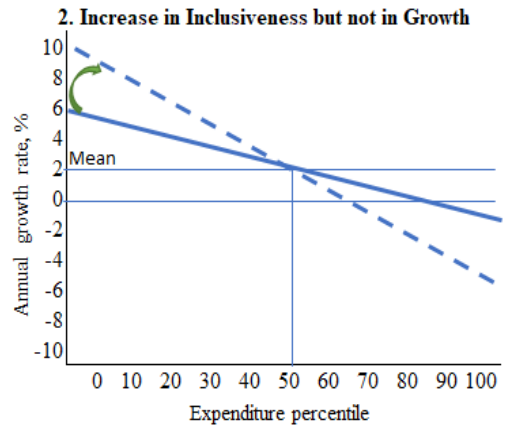
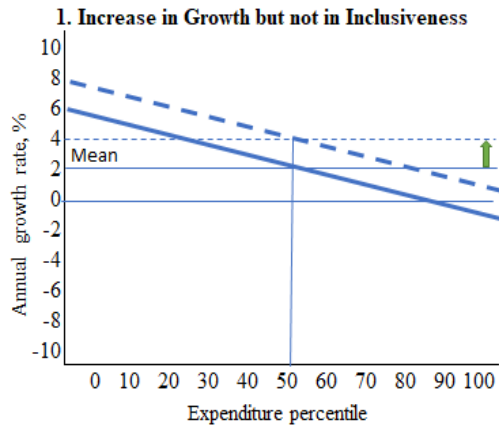
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Annex I. Change in Growth Inclusiveness



Source: Authors' presentation.