State Planning Organization of the Republic of Turkey
and
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Welfare and Social Policy Analytical Work Program

Working Paper Number 3:

Inequality of Economic Opportunity in Turkey: An assessment using asset indicators and women's background variables

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Inequality of Economic Opportunity in Turkey

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Abstract

Using information on asset ownership, housing quality, and access to services to construct an indicator of household wealth, we estimate the share of inequality among prime-age Turkish women that can be attributed to unequal opportunities. Both parametric and non-parametric estimation methods are used, and robustness to some sample re-definitions is verified. We find that at least one-third (one-fourth) of overall wealth (imputed consumption) inequality in Turkey is associated with morally irrelevant, pre-determined circumstances. The circumstances that account for the largest share of the variance are rural/urban birth area and father's education. Controlling for rural birth, parents' education, language spoken at home, and number of siblings, a three-way regional breakdown of birthplace is not an important predictor of wealth. An opportunity deprivation profile reveals that more than two thirds of the most deprived group in Turkey consists of women born in the rural areas of the Eastern region, from mothers with no formal education.

1. Introduction

1. At first glance, economic inequality in Turkey does not appear to be particularly high. According to Aran et al. (2008), the Gini coefficient for the distribution of consumption per equivalent adult was 0.31 at the time of the latest household budget survey, in 2006. This is in the same broad range as Greece (0.36, consumption) and the United Kingdom (0.34, income). It is considerably higher than in the more egalitarian countries of northern Europe, such as Sweden (0.25, income), and much lower than in neighboring Iran (0.43, consumption), or in the vast majority of countries in Africa and Latin America.[2]

2. Nevertheless, more than 85% of Turks either agree or strongly agree with the statement that "The gap between the rich and poor should be reduced" in their country, and 92% feel that the State ought to be "strongly involved" in reducing that gap.[3] As a benchmark for comparison, only about 50% of World Value Survey respondents in 69 countries (in the year 2000) felt closer to the statement "Incomes should be made more equal in my country" than to "We need larger income differences as incentives for individual efforts".

3. Are Turks particularly inequality averse? Why does inequality, albeit moderate in level, appear to be so unpopular in Turkey? A possible clue is offered by their answers to a third question in the same opinion survey: when asked what is the "main reason why there are some people in need in our country today?", 63% choose "injustice in society" as their answer. Do Turks object more strenuously to inequality which they see as reflecting differences in circumstances over which individuals have no control than to inequality which they perceive as arising from an individual's own efforts?

4. There is an established tradition in moral philosophy that distinguishes inequality of opportunity from other sources of inequality (Dworkin, 1981, Arneson, 1989, Cohen, 1989), and which regards only the former as morally objectionable. An influential strand of this literature actually defines "equal opportunity" as a hypothetical situation in which there is no inequality between groups that differ only in terms of pre-determined, exogenous and morally irrelevant circumstances, such as race, gender, family background, place of birth, and so on (Roemer, 1998). Inequality in any particular outcome of interest (income, education, wealth) might be ethically acceptable, but only insofar as the outcome is independent of those circumstances.[4]

5. It is quite possible that it is high levels of perceived inequality of opportunity – rather than other sources of outcome inequality, such as luck or effort – which Turks find objectionable. There is certainly some evidence that people are more resentful of inequality when it is accompanied by less mobility. Alesina, Di Tella and McCulloch (2004) compared the effect of local inequality on "happiness" in the United States and Europe, and found that the evidence was supportive of what Bénabou and Ok (2001) call the "Prospect of Upward Mobility" (POUM) hypothesis: the notion that inequality is less objectionable in societies that are perceived to be more mobile. In societies with limited mobility, inequality is seen as more permanent, and thus associated with greater unhappiness.[5] Greater inequality of opportunity is closely related to an intergenerational version of the POUM hypothesis: people object to inequality when they feel that children's prospects in their society are heavily pre-determined by their background, so that there is little intergenerational mobility.

6. This paper investigates the degree and nature of inequality of economic opportunity in Turkey. Following Roemer (1998), Bourguignon et al. (2007) and Ferreira and Gignoux (2008), we associate inequality of opportunity with the between-group share of inequality that is estimated when the population is partitioned exclusively on the basis of morally irrelevant, pre-determined circumstances. In the case

[2] Inequality measures for other countries reported in this paragraph are Gini coefficients for per capita distributions, taken from World Bank (2005). These comparisons are merely suggestive of broad ranges, since there are important methodological differences in how the figures are calculated across countries. In particular, the figure for Turkey incorporates equivalence scale adjustments that are absent from the other numbers.

[3] These numbers summarize answers to opinion questions in the Life in Transition Survey (LITS-Turkey, 2006), which are discussed in more detailed in Section 3.

[4] Slightly different versions of this idea have been applied in practice to the empirical measurement of inequality of opportunity in Europe (e.g. Checchi and Peragine, 2005; Lefranc, Pistolesi and Trannoy, 2008) and Latin America (e.g. Bourguignon, Ferreira and Menéndez, 2007; and Cogneau and Gignoux, 2009).

[5] See also Hirschman and Rothschild (1973) for a pioneering discussion.

of Turkey, these circumstance variables include place of birth (both rural-urban status and region), as well as family background (mother's and father's education, language spoken at home, and number of siblings).

7. As in many other countries, there is a non-trivial data challenge associated with this approach to measuring inequality of opportunity in Turkey: There is no single survey that contains satisfactory information both on household income or consumption, on the one hand, and on key pre-determined circumstances on the other. In particular, Turkey's Household Budget Survey (HBS), which contains reliable data on household consumption, does not report information on the family background of working-age individuals. Conversely, surveys such as Turkey's Demographic and Health Survey (TDHS), which do report family background variables for a large subset of the population, do not contain sufficiently detailed income or consumption information.

8. We employ two alternative approaches to circumvent these data limitations. First we use household wealth (measured by a principal-components-based index of assets and access to amenities constructed from information available in the TDHS) as an alternative indicator of economic status. Second, we combine information from the two key datasets, the HBS and TDHS, by imputing consumption from the former into the latter, on the basis of the covariance between consumption and other variables which are observed in both surveys. To avoid underestimating consumption variance in the TDHS because of the imperfect nature of that covariance, a bootstrap prediction method developed by McKenzie (2005) is used. Parametric and non-parametric estimation methods are used for both wealth and imputed consumption, to test the sensitivity of the estimates to small cell-sizes and functional form assumptions.

9. The resulting measures of the opportunity share of economic inequality are lower-bound estimates, since the inclusion of other circumstance variables, which are not observed in our combined datasets, would further refine the population partition (Ferreira and Gignoux, 2008). We also use the population partition into types (groups of individuals with identical observed circumstances) to construct opportunity profiles, which rank types by the first moment of the frequency distribution defined over their opportunity sets. As lower bounds, we find that approximately one third of the observed wealth inequality among women in Turkey is due to unequal opportunities. The corresponding figure for household consumption is just over a quarter. The opportunity profile suggests that opportunity deprivation is particularly pronounced in rural areas of the Eastern provinces, and among families headed by people with mothers with no formal schooling.

10. The paper is organized as follows. Section 2 briefly describes the datasets used in the analysis. Section 3 provides a brief assessment of public opinion about inequality in Turkey, largely as a motivation for what follows. This discussion is based on data from the Life in Transition Survey (2006). Section 4 describes the method for and the results of the analysis of opportunity for wealth acquisition. Section 5 introduces the concept of opportunity profiles, and presents the wealth opportunity profile for Turkey. Section 6 discusses our assessment of inequality of opportunity for consumption, and Section 7 concludes.

2. The Data

11. The paper uses data from three separate household surveys recently conducted in Turkey. The study of perceptions of inequality briefly summarized in Section 3 rests on data from the Life in Transition Survey (LiTS), conducted in 2006. The measurement of inequality of opportunity for wealth in Section 4 is based on data from Turkey's Demographic and Health Survey (TDHS), fielded in 2003. The discussion of inequality of opportunity for consumption, in Section 5, is based on imputing consumption from the Household Budget Survey (HBS), fielded in 2006, into the TDHS.

12. The Life in Transition Survey was carried out by the European Bank for Reconstruction and Development in 28 post-communist transition countries in Europe and Central Asia and in Turkey. The data were collected between August and October 2006. As in the other countries surveyed, a nationally representative sample of 1,000 Turkish households was interviewed. One adult was selected at random in each household to answer a set of detailed questions on living standards, poverty and inequality, trust in state institutions, and attitudes to market economy and democracy. Information on socio-economic characteristics was also collected. We focus on a set of questions regarding perceptions of inequality and economic mobility,

and on how they relate to individual and household characteristics such as educational attainment, native language, consumption expenditures, and residence in an urban or rural area. Unfortunately, the region of residence of the interviewees was not provided in the data.

13. The paper uses data from the Turkey Demographic and Health Survey (TDHS) fielded between December 2003 and March 2004 by the Hacettepe Institute. The data were collected from a sample of 10,836 households, representative at the national level but also at the level of the five major regions of the country (the West, South, Central, North and East regions). Information on basic socio-economic characteristics of the population was collected for all household members, and all ever-married women between 15 and 49 years old answered a detailed questionnaire on demography and health. 8075 women provided information.

14. Although very limited information is provided on earnings and consumption, the TDHS, as other DHS surveys, collected reasonably detailed information on certain durables owned by households, on housing conditions, and on access to amenities. This information is used to construct a measure of household wealth, and to study its distribution. The DHS survey also contains information on a set of circumstance variables for the sample of ever-married women, namely the birth region, the type of area of the place of birth, the levels of education of both the mother and father, the respondent's mother tongue, and the number of siblings.[6] In the remainder of the paper, the information on these pre-determined circumstances is used to measure inequality of opportunity for wealth acquisition, for the sample of ever-married women.

15. The 2006 Household Budget Survey (HBS) collected information among a nationally representative sample of about 8,500 households and their members, including gender, area type, parental education and father's occupation. It is the staple survey for assessing the distribution of household consumption expenditures, and thus contains a reasonably detailed questionnaire on that topic, which provides the most reliable estimates of current living conditions for Turkish households. Although the LiTS, for example, also contains a consumption expenditure module, it is much less detailed than that in the HBS, and covers a much smaller sample.

3. Perceptions of Inequality

16. The Life in Transition Survey (LiTS), which was briefly described above, asked a number of subjective questions to a representative sample of the Turkish population in 2006. Among these questions, four are particularly informative of Turkish attitudes towards economic inequality. The first asks for people's views on the statement "The gap between the rich and poor today in this country should be reduced". The second asks "Should the state be involved in reducing the gap between the poor and the rich?" The distribution of responses is presented in Table 1, both for the whole sample and by four different characteristics of the respondent: type of area (rural, urban or metropolitan), native language, level of education, and consumption expenditures.

17. The results suggest that Turks are highly averse to the inequality they observe in their society: 85.4% of the people either agree or strongly agree that the gap between rich and poor in Turkey should be reduced. This is the single highest proportion for all 29 countries where LiTS surveys were conducted, and compares with a mean proportion of 47% in those countries. This is particularly remarkable since the LiTS countries include some with much higher observed levels of income inequality than Turkey (e.g. Russia, with an income Gini of 49.6).[7]

18. Not only does a large majority of Turks feel that inequality is too high, but there is almost a consensus that there is a clear role for state-led redistribution: 92% of respondents argue that the State should be "strongly involved" in reducing the gap between rich and poor. This compares with a 68% average across the 29 LiTS countries. Like the proportion who agree that the gap is too great, the share favoring state-led redistribution is actually somewhat higher among the rich and the more educated (although both shares are also markedly higher among ethnic minorities).[8] This

[6] Region was classified into three broad regions: West, Center, and East; the type of area of birth place into rural or urban according to whether the respondent considered it as a village or sub-district or not; parental education into four categories: no education or unknown level, primary, secondary, and higher education; mother tongue into Turkish or another language; and number of siblings into: less than 3, 4 to 5, 6 to 8, 9 or more.

[7] Source: World Bank www.worldbank.org/depweb/beyond/wren/wnrbw_05.pdf

[8] Ethnic minorities are those who do not speak Turkish at home.

(slightly) larger degree of inequality aversion among richer households is reminiscent of the pattern found for the United States using happiness data: in the US (unlike in Europe), the negative effect of inequality on subjective well-being is only statistically significant among the better-off. (Alesina et al., 2004).

19. The remaining two LiTS questions on inequality may help shed some light on what is behind Turkey's marked aversion to (its apparently moderate levels of) income inequality. When asked what would be the "main reason why there are some people in need in our country today?", 63% of respondents choose "injustice in society". If one considers that "luck" and "inevitable part of modern life" also refer to factors beyond the control of the individual, then a full three-quarters of the Turkish population feel that the poor should not be held responsible for their condition. Only 24.4% of respondents attribute poverty to "laziness and lack of will power" of the poor themselves.

20. Interestingly, however, perceptions about the relative roles of circumstances and efforts in determining economic outcomes appear to be asymmetric in Turkey. The fourth LiTS question we examine asks what "factors are most important to succeed in life in this country". Whereas three quarters of the sample attributed poverty to factors other than a person's "laziness" and "will power", only 22.2% attribute economic success to "political connections" or "criminal or corrupt ties". Just over 75% feel, instead, that success is due to effort and hard work (48.4%) or intelligence and skills (27.2%). It would appear that Turks see economic failure and deprivation as the result of an unjust system, or bad luck, but are prepared to view the rich predominantly as deserving of their position. In terms of the Alesina et al. (2004) contrast between American and European views – with the former attributing economic status predominantly to personal desert and the latter largely to social circumstances – Turkish attitudes would appear to be "American upwards", but "European downwards".

21. Table 1 also reveals that "American-style" optimism about the role of effort and hard work in determining economic success declines (slightly) with actual economic and educational achievement: whereas 50% of the poor (and 55% of those with no educational degree) favor hard work, only 45% of the rich (and 43% of those with completed higher education) agree. Conversely, whereas only 8% of the uneducated feel that political connections are key in determining economic success, 26% of college graduates agree.[9]

22. But what is the objective evidence on the relative importance of "effort and hard work", vis-à-vis predetermined circumstances, in accounting for economic status in Turkey? What share of the inequality observed in Turkey is due to unequal opportunities, and what share to personal responsibility and effort? This is the question to which we turn in the next section.

4. Inequality of Opportunity for Wealth

23. "Consequential" approaches to inequality of opportunity measure it in terms of its contribution to, or share of, inequality in some observed outcome of interest, y.[10] Suppose all determinants of this outcome variable can be divided into three groups: those over which the individual has no control (represented by a vector of circumstances, C); those which can be affected by individual decisions (denoted efforts, E); and purely idiosyncratic factors (such as luck) grouped under a zero-mean random variable, u. Then, at a very general level, one can write:

$$y = f(C, E, u) \tag{1}$$

24. Because they are, by definition, variables over which individuals have no control, circumstances can be treated as economically exogenous. Efforts, on the other hand, may clearly be affected by circumstances, as well as by other factors grouped under v. A person's own educational attainment, for instance, is an outcome over which individuals can exercise a measure of control. It is therefore an "effort" variable. But it is affected both by unobservable factors

[9] This pattern would appear to be consistent with Bénabou and Tirole's (2006) argument that people may be prepared to process information selectively, so as to reinforce the weight of evidence consistent with the belief that the world they live in is fair, and that they have a chance to succeed. This may be particularly relevant if they need the encouragement in order to overcome current predicaments.

[10] Most empirical measures of inequality of opportunity in the literature are "consequential" in this sense. See. e.g. Checchi and Peragine (2005), Lefranc et al. (2008), etc. See, however, Barros et al. (2008) for an attempt to measure inequality in access to individual opportunities, without recourse to a relevant concept of (consequential) "advantage".

(such as the individual's ability) and by observable circumstances, such as the educational level of one's parents. Following Bourguignon et al. (2007), we can then rewrite (1) as:

$$y = f\left[C, E(C, v), u\right] \tag{2}$$

25. This formulation captures the idea that circumstances potentially affect final outcomes through two different pathways: a direct effect of the circumstance on the outcome (controlling for efforts), and an indirect effect, through efforts. In this framework, Roemer's (1998) definition of equality of opportunity can be stated in very simple terms: opportunities are equally distributed in a society if (and only if) the outcome of interest is distributed independently of pre-determined, morally irrelevant circumstances: $F(y|C) = F(y), \forall C$. This, in turn, implies three conditions: (i) that circumstances must have no direct impact on outcome y; (ii) that efforts must also be distributed independently of circumstances; and (iii) that the random term u be orthogonal to circumstances.[11]

26. To fix ideas, think of wages as the outcome (y); ethnicity as a circumstance (C); and of education as an effort (E). Ethnicity might affect wages directly, controlling for education, because, for instance, of discrimination in the labor market. It might also affect wages indirectly, if different ethnic groups have differential access to education, for any reason. Roemer's definition of equal opportunities, $F(y|C) = F(y)$ requires that neither of these two channels operate: there should be no differences in the conditional wage distributions across ethnic groups at all, whether driven by ethnicity directly (controlling for education), or indirectly, driven by differences in education levels across ethnicities.

27. As noted by Ferreira and Gignoux (2008), to measure inequality of opportunity is then to try to quantify the extent to which $F(y|C) \neq F(y)$. If the ideal of equal opportunities attains when the distribution of advantage y is independent of all morally-irrelevant predetermined circumstances then, conversely, the degree of inequality of opportunity empirically observed in a given society must be related to the degree to which, in practice, y is correlated with C.

28. In most empirical applications, each element of C is a discrete variable, such as race (black or white), gender (male or female), region of birth, and so on. For a given vector of (such discrete) circumstances C, define $\{y_i^k\}$ as the partition of the population such that $C_i^k = C^k \Leftrightarrow i \in k, k = 1,...,K$. Ferreira and Gignoux (2008) propose a relative measure of inequality of opportunity given by the simple mapping, $\theta : \{y_i^k\} \rightarrow [0,1]$, given by[12]:

$$\theta\left(\{y_i^k\}\right) = \frac{IB\left(\{y_i^k\}\right)}{I\left(F(y)\right)} \tag{3}$$

29. Equation (3) defines a measure of inequality of opportunity as the between-group share of overall inequality in y, where the groups are given by a full partition of the population such that members of each group have identical circumstances for all elements of C. Ferreira and Gignoux (2008) also note that, for a given partition $\{y_i^k\}$, $\theta\left(\{y_i^k\}\right)$ depends on the specific (decomposable) inequality index I() and, for some measures, it may also depend on the path of decomposition. Additionally, given sample size limitations, they note that parametric estimates may have certain advantages over the fully non-parametric decomposition.[13]

30. Given that not all relevant circumstances C are observed, the partition $\{y_i^k\}$ is an incomplete partition by the full set of circumstances. Our data does not contain information on how good the schools to which one's parents went were, for instance. Or on the quality of care women received as infants. These are relevant circumstances that lie beyond an individual's own control, but may affect their lifetime wealth or well-being. If we did observe them, and were able to further partition the population into groups defined by those variables, the between-group share of inequality might rise, and could certainly not fall. $\theta\left(\{y_i^k\}\right)$ is

[11] See Bourguignon et al. (2007) and Ferreira and Gignoux (2008) for more detailed discussions of this Roemer-based approach to the measurement of inequality of opportunity.

[12] The same authors also define an absolute measure of inequality of opportunity, $:\theta : \{y_i^k\} \rightarrow \Re^+ : \theta\left(\{y_i^k\}\right) = IB\left(\{y_i^k\}\right)$

[13] The between-group share defined by (3) corresponds to a standard decomposition of inequality by population subgroups, which uses overall inequality among individuals as the denominator. An alternative decomposition, proposed by Elbers et al. (2008), adjusts the reference inequality (the denominator) to take into account the number and relative sizes of groups in the partition. This alternative approach is specially well-suited to identifying the most salient cleavages in a particular society. While we find it less satisfactory as a lower-bound measure of inequality of opportunity – precisely because both the numerator and the denominator are sensitive to the design of the partition – future research should investigate its uses in describing the profile of opportunity.

therefore a lower-bound on the actual share of between-group across all possible circumstances. This is also true of the parametric estimation approach, which we discuss in more detail below: if additional circumstance variables were to be added to a regression specification, the R2 might rise, but would not fall.

31. In this paper, we apply this decomposition to a household wealth index, constructed on the basis of information contained in the TDHS 2006. This choice of outcome variable y takes the following factors into consideration. First, Turkey's household budget survey (HBS), from which a reliable consumption aggregate can be constructed, does not contain information on some of the most important candidate circumstance variables, such as the education of the father and mother of present-day workers. Second, the consumption aggregate available from the LiTS suffers from two serious shortcomings: it is compiled from a highly aggregated consumption questionnaire, and is available for a relatively small sample. Third, wealth indices constructed from DHS information on the ownership of durable goods (such as fridges, TV sets, cars, computers, etc.), on housing characteristics (such as the type of roof materials and floor cover), and on access to utilities (such as water and sanitation) have been widely used in estimating household welfare and in ranking households for targeting purposes.[14]

32. Following Filmer and Pritchett (2001), we define our wealth index as the first principal component of a vector of assets x (including durables, housing characteristics and utility access indicators) owned by households in the TDHS sample.[15] For each household i, the index is therefore given by:

$$y_i = \sum_p a_p \left(\frac{x_{pi} - \bar{x}_p}{s_p} \right) \qquad (4)$$

where the p-dimensional vector **a** is chosen so as to maximize the sample variance of y, subject to $\sum_p a_p^2 = 1$.s denotes a standard deviation, and the overbar denotes a mean.

33. Table 2 describes the elements underpinning Turkey's household wealth index, by listing each element of the vector x, as well as its mean and standard deviation. The last column presents the scoring factor for each element of x in the TDHS sample (the vector a), divided by the standard deviation. The standard interpretation is that a yields the set of weights providing the maximum discrimination between households in the sample, in terms of their ownership of these particular assets (x).[16]

34. McKenzie (2005) lists a number of reasons why an asset index such as this might in fact be preferable to consumption or income as a basis for inequality measurement, including the likelihood that recall bias might be smaller for asset ownership questions than for some income or expenditure questions. But McKenzie (2005) also highlights two potential pitfalls in using asset indices, namely the possibilities of truncation and clumping. Whereas truncation would most likely arise from not observing assets capable of distinguishing either the very poor from those just above them, or the very rich from those just below them, clumping might be caused by using too few assets, leading to "false modes" in the distribution, arising from insufficient discriminating power in the index. Figure 1 plots the superimposed histogram and kernel density estimate of our asset index for Turkey, revealing the absence of either clumping or truncation.

35. Once we are satisfied that the distribution of y constitutes an appropriate basis from which to estimate inequality of opportunity, the next problem is to choose a suitable inequality index, I(), for computing $\theta\left(\{y_i^k\}\right)$ through equation (3). By construction, y is distributed with mean zero and a variance equal to the largest eigenvalue in the correlation matrix of x. As noted by McKenzie (2005), these properties mean that most standard inequality measures routinely used for income or consumption are unsuitable for the wealth index y. A zero mean impedes computation of most relative inequality measures

[14] See Filmer and Scott (2008) for a recent (and sanguine) assessment of the robustness of household rankings based on asset indices originating from DHS information, when compared, inter alia, to detailed consumption expenditure data.

[15] Like Filmer and Pritchett (2001), we have treated each and every category of our housing characteristic and utility access variables as an independent dummy variable. In some cases, such as access to sanitation or water sources, there is arguably an ordinal nature to the alternative categories, and it may be statistically preferable to treat those variables explicitly as ordinal in the analysis. See Kolenikov and Angeles (2009). This alternative treatment is left for future work.

[16] The TDHS data files contain a pre-constructed asset index, supposedly also given by (4). As the survey documentation does not describe the details of how that index is constructed, best research practice generally involves computing the index from the underlying data, as we have done here. The correlation coefficient between our index and the TDHS index is 0.94, and the kernel density functions for both indices are very similar, although the kernel for our index is considerably smoother.

(which generally divide by the mean), including the Gini coefficient and all members of the Generalized Entropy class. Negative values are problematic for logarithm-based measures (such as the Theil indices, the variance of logarithms, and many others.)

36. For our purposes, the simplest solution is to revert to the variance, which is straightforwardly decomposable and is also translation invariant.[17] Our proposed measure of the opportunity share of inequality in wealth is thus given by:

$$\Psi^N\left(\left\{y_i^k\right\}\right)=\frac{\sum_k \frac{n_k}{n}\left(\bar{y}_k-\mu\right)^2}{Var\left(y\right)} \tag{5}$$

which is a specific version of (3), when $I(F(y))=Var(y)$

37. Since $Var(y)=\sum_k \frac{n_k}{n} \underset{i\in k}{Var}(y_i)+\sum_k \frac{n_k}{n}(\bar{y}_k-\mu)^2$, it is clear that (5) corresponds to the between-group share in a standard variance decomposition. Furthermore, since the weights in both the within-group and the between-group terms are simple population shares, and do not include income levels or shares, (5) describes a path-independent decomposition in the Foster-Shneyerov (2000) sense.[18]

38. Equation (5) can be computed non-parametrically from partition $\left\{y_i^k\right\}$. All that is required is the population share and mean wealth index for each cell of the partition, as well as the overall mean and variance for the complete sample. However, as the dimension of the circumstance vector C, and the number of discrete values that each element Cj can take (#Cj), rise, the number of cells in the partition increases geometrically. If the dimension of C is J, the number of cells in $\left\{y_i^k\right\}$ is given by $K=\prod_{j=1}^{J}\#C_j$ Naturally, for a given sample size, the precision of the estimates of group means will fall as J and #Cj rise.

39. If the number of cells with fewer than 10 observations or so is non-trivial, it becomes worth while to estimate (5) parametrically. This is done by imposing a functional form assumption on equation (2), such as:

$$\begin{aligned} y &= C\alpha + E\beta + u \\ E &= BC + v \end{aligned} \tag{6}$$

The reduced form of (6) is $y=C(\alpha+\beta B)+v\beta+u$ which can be estimated by OLS as

$$y = C\psi + \varepsilon \tag{7}$$

40. Under the maintained functional form assumptions in (6), a parametric estimate of the opportunity share of inequality is given simply by the R2 of (7). Once again, $\Psi^P\left(\left\{y_i^k\right\}\right)$ is the lower-bound estimate on the set of possible estimates of the share of circumstances. If an additional element of C, which is presently omitted, were to become observable, the R2 of (7) might rise, but it would not fall. That is all that is needed to define this measure as a lower-bound, since (7) is a reduced-form regression that is intended to capture the effect of circumstances both directly and through any effort variable whatsoever.

41. To qualify as a "circumstance" in Roemer's sense, variables must (i) be likely determinants of advantage y, either directly or through their effect on efforts; and (ii) be impossible for the individual himself to affect by choice. Given the information available in the TDHS, our vector of circumstances consists of information on the type of area in which the woman was born, the region where she was born, her mother's and father's levels of education, the reported mother tongue, and the number of siblings the individual had at birth. The discrete categories for each variable, as well as the distribution of the population across them, are reported in Table 3.

42. Table 4 reports the results of regression (7) of the wealth index on circumstances. Since this is a reduced-form regression, coefficients should not be interpreted causally. They reflect partial correlations between individual circumstance variables and the household's

[17] McKenzie (2005) also effectively reverts to the variance, although he is interested in the inequality of different sub-regions relative to total inequality, and therefore defines a ratio of standard deviations to the overall standard deviation. Since our measure of inequality of opportunity (in equation 3) is by construction a ratio of inequality measures, we define the inequality index in outcome space as the unadjusted variance. The problem of scale dependence will vanish for the opportunity index, and the (related) issue of mean dependence would seem to be of no import for a variable that has mean zero by construction.

[18] In other words, if one were to define a "smoothed" distribution $\left\{\mu_i^k\right\}$, corresponding to a particular partition $\left\{y_i^k\right\}$ as the distribution that arises from replacing y_i^k with the group-specific mean μ^k , and a "standardized" distribution $\left\{\nu_i^k\right\}$ as the distribution that would arise from replacing y_i^k with $y_i^k \frac{\mu}{\mu^k}$ (where μ is the overall mean), then $\frac{Var(\{\mu_i^k\})}{Var(y)}=1-\frac{Var(\{\nu_i^k\})}{Var(y)}=\Psi^N(\{y_i^k\})$

wealth index, conflating both direct and indirect effects. Nevertheless, the regression is informative. The share of explained variance, $\Psi^{P}(\{y_i^k\})$, is 31%. Being born in an urban area, and having Turkish as mother tongue, are significantly associated with subsequent wealth. So is having educated parents and, in contrast to results for Latin America, father's education appears to be a stronger predictor of wealth than the mother's.[19] Being one of many children in the family is associated with lower wealth. Perhaps most interestingly, once these other circumstances are controlled for, there is no significant association between birth region (at the three-region level) and future wealth.

43. Our estimates of the opportunity share of inequality in household wealth among women in Turkey are presented in Table 5. The first column reports results for the full TDHS sample of ever-married women aged 15-49. The second column restricts the sample to ever-married women aged 30-49, so as to eliminate some of the life-cycle inequality, which is arguably purely transitory in nature. The third column repeats the analysis for the pre-constructed TDHS wealth index, discussed in footnote 15.

44. The first line simply reports the total variance in the wealth index, $\mathrm{var}(y)$. The second line reports the non-parametric estimate of between-group inequality, given by equation (5), while the third line gives its parametric analogue, the R2 of (7), or:

$$\Psi^{P}(\{y_i^k\}) = (\mathrm{var}\, y)^{-1}\left[\sum_k \psi_k^2\, \mathrm{var}\, C_k + \frac{1}{2}\sum_k\sum_j \psi_k \psi_j\, \mathrm{cov}(C_k, C_j)\right] \quad (8)$$

45. The non-parametric estimates are consistently higher than the parametric ones. For our own asset index, the non-parametric estimate of the opportunity share of inequality is 35% for the full sample, and 37% for the sample of ever-married women aged 30-49. The parametric estimates are roughly four percentage points lower in each case. As discussed earlier, these differences are consistent with the expectation of large sampling variances around the estimated cell means in (5), owing to the fine partition of a finite sample. Since the exercise aims to estimate lower bound measures of inequality of opportunity as a share of observed wealth inequality, we choose the parametric estimates in line 3 as our benchmark result. This yields a tight range of 31% - 32%, robust to considering only the adult women.

46. The bottom panel of Table 5 reports the partial shares of each individual circumstance (J) included in the partition, defined as:

$$\Psi^{PJ}(\{y_i^k\}) = (\mathrm{var}\, y)^{-1}\left[\psi_J^2\, \mathrm{var}\, C_J + \frac{1}{2}\sum_k \psi_k \psi_J\, \mathrm{cov}(C_k, C_J)\right] \quad (9)$$

47. Inspection of (9) immediately reveals that, for any given partition, these partial shares sum up to the overall parametric estimate of between-group inequality, given by (8). Besides this attractive additive decomposability property, this definition of circumstance-specific shares also satisfies the Foster-Shneyerov path-independence property. Although we have already noted that the overall non-parametric decomposition (5) is path-independent by construction, parametric estimation of the partial shares – based respectively on the smoothed and standardized distributions – are not the same. However, as we show in the Appendix, equation (9) is the simple average between the direct and residual estimates of the partial shares, which correspond to those smoothed and standardized distributions, respectively. (9) is therefore a simple example of a Shapley-value based decomposition, where averaging across alternative paths eliminates path-dependence. See Shorrocks (1999).

48. Unsurprisingly, the partial shares echo some of the preliminary findings from Table 4. Whether a Turkish woman is born in an urban or rural area appears to be a powerful predictor of her likely household wealth as an adult. More than a third of the overall (lower- bound) opportunity share of inequality is accounted for by this circumstance alone. Father's education and mother's education follow, in that order. Taken together, they are roughly of the same magnitude as rurality in accounting for the overall share: just over a third. Mother tongue and number of siblings follow. The number of siblings results, with roughly 10% of the share of overall variance accounted for by circumstances, is not trivial, particularly when considering that this is after controlling for the education of both parents, as well as the geography of birth.

49. As before, and despite the salience of regional differences in the literature on Turkey, the three-way (East, Center, West) partition of the country has no importance in accounting for differences in opportunity for wealth, once the other determinants have been controlled for.

[19] Although this may be because the Latin American regression contained information on the father's occupation as well. See Ferreira and Gignoux (2008).

5. Opportunity Profiles for Household Wealth

50. The partition of the population into circumstance-homogeneous groups (called types by Roemer, 1998), which was used above to compute a lower-bound measure of inequality of opportunity for wealth, can also be used to shed light on the distribution of opportunities among Turkish women in a more direct and disaggregated manner. As noted by Ferreira and Gignoux (2008), each cell in the partition of the population implemented in Section 4 (such that $C_i^k = C^k \Leftrightarrow i \in k, k = 1,...,K$), corresponds to a Roemerian type $T_k : \{i | i \in k\}$. We have seen that equal opportunities attain when $F_k(y) = F_l(y), \forall k \neq l$, which is a different way of writing $F(y|C) = F(y)$ for a discrete partition. Differences in the outcome distributions among types, therefore, are taken to reveal (or arise from) inequality of opportunity.

51. It follows that to plot the conditional wealth distributions, $F_k(y)$, for each type should be an informative way to graphically depict inequality of opportunity. The cardinal measures presented in Section 4 rely fundamentally on differences across conditional means. A complementary exercise is to visually inspect differences across the entire distributions. Because of sample size restrictions, it is impossible to estimate density or distribution functions for all 768 types used in our decomposition. But it is still informative to look at more aggregated conditional distributions, where the population is decomposed into groups by one specific circumstance at a time. The results, in the shape of kernel estimates of the conditional density functions, are presented in Figure 2.[20]

52. Figure 2 reveals that the conditional wealth distributions differ across social groups not only in means, but in other moments and in general shape as well. The distributions for women born in rural areas (and in the East) have visibly larger dispersion than the distributions of those born in urban areas (and in the Central and Western regions). Similarly, there is greater dispersion in the distribution of those who grew up in non Turkish-speaking households than in that for native Turkish-speakers. There are also substantial differences in skewness and kurtosis, particularly in the urban/ rural, regional, and native language partitions.[21]

53. Looking at the overall shape and position of these conditional distributions, some other differences across social groups are also clearly apparent. There are large wealth gaps between women with uneducated mothers and those whose mothers have completed either primary or higher levels of schooling, although there is little positional difference across the latter two distributions. In contrast, there are clear positional differences across all three distributions conditional on father's education. The distribution for native Turkish speakers lies well to the right of that for non-Turkish speaking minorities. As expected from the results in Table 5, those who were born in urban areas are considerably wealthier than those born in rural areas. Women who grew up in large families (with six or more children) tend to fare less well than those who grew up in smaller households. By each of these circumstance-specific cuts, it is clear that the conditional distributions are not identical: social background – as measured by predetermined circumstances that individuals themselves can not be held responsible for – does powerfully affect the distribution of opportunities faced by individual Turkish women.

54. At least conceptually, it is not unreasonable to see the support of such a conditional distribution as an individual i's ($i \in k$) opportunity set for outcome y, and $F_k(y)$ as the probability distribution associated with the opportunity set. After all, given i's circumstances C_i^k, only i's own choices, effort and luck will determine his final position, $p_i = F_k(y_i)$. If it were possible, therefore, to rank $F_k(y)$ across k in a meaningful way, we would obtain a ranking of opportunity sets across types, which Ferreira and Gignoux (2008) call an opportunity profile.

55. At the level of disaggregation implicit in Figure 2, one can look for robust rankings across conditional distributions by means of stochastic dominance relationships (see Lefranc et al., 2008). However, such broad groupings may be less useful for policy

[20] Diagnoses of inequality of opportunity by means of stochastic dominance test across such conditional distributions have been used in the literature. See Lefranc et al. (2008).

[21] Throughout this subsection, the sample is restricted to households containing ever-married women between ages 30-49. This is so as to minimize possible selections biases arising from more frequent early marriages among rural women in the Eastern part of the country.

makers interested in identifying pockets of exclusion than a distributions cannot be plotted and stochastic dominance relationships cannot be established, because of data insufficiency, the types can still be ranked by a particular moment of their conditional distributions. While this is certainly less robust than a dominance-based ranking, there are offsetting gains in terms of the ability to generate a complete ranking of types by their opportunity sets, and in terms of a much sharper description of the disadvantaged groups.

56. To explore this option, we follow Ferreira and Gignoux (2008) and rank each type in our fine partition by the mean of its conditional wealth distribution. Once types are so ordered, the circumstances which define them constitute an opportunity profile. Table 6 lists the circumstances that define those types that make up the bottom tenth of the opportunity distribution. In other words, it lists the individual types with the lowest mean levels of wealth (by asset index) in the population, until the cumulative population share reaches 10%. A full 66% of the people in this group live in households whose ever-married woman was born in the rural areas of the eastern provinces, to an uneducated mother, and in a non-Turkish speaking household. These women almost always had more than three siblings, and a father with either none or primary schooling only.

57. This is a heavy concentration of deprivation among a fairly specific social group, which is defined by a few observable characteristics over which they have no control. It may present analysts and policymakers in Turkey with a reasonably clear picture of which groups enjoy the least opportunity for acquiring wealth, based on exogenous circumstances of their birth.

58. Table 7 compares characteristics for the bottom and top tenths of the opportunity profile defined over the population in our TDHS sample (of households containing 30-49 year old ever-married women). In other words, the table reports the circumstance composition of the top and bottom deciles of the distribution when households are ranked by the mean wealth level of their types (as in Table 6). According to Table 7, 99% of those women in the most advantaged group were born in urban areas, and 62% were born in the western provinces. 85% of them had fewer than 3 siblings, and 98% had Turkish as their mother tongue at home. It is interesting to note that mother's education level is fairly low even among the most advantaged groups, as a result of the overall low educational attainment of women: more than 70% of the top decile in terms of opportunities had mothers who had no schooling or had only primary schooling.

59. The contrast with those in the bottom opportunity decile could not be starker: 97% of the women in this group were born in rural areas, and 89% of them were born in the East of the country. 97% had uneducated mothers (as compared to 7% among their advantaged counterparts), and 81% had illiterate fathers as well. 91% hailed from non-Turkish speaking households, and only 4% came from relatively small families (with fewer than three siblings). Clearly, when Turkish households are ranked by the mean wealth indices of the types they belong to, there are very stark differences in the degree of their access to opportunity for wealth acquisition.

6. Inequality of Opportunity for Consumption

60. Although the distribution of wealth, as measured by an asset index, is of intrinsic interest, it is unlikely to be the best description of the distribution of current economic well-being. Among other concerns, the asset index contains no information on liabilities, and is thus a better indicator of gross than of net wealth. The distribution of consumption expenditures is likely to be a better guide to the distribution of well-being, and it thus provides an alternative angle on economic opportunity in Turkey. However, as noted in the introduction, the Household Budget Survey, which contains a good measure of consumption, does not report information on a number of important circumstance variables. In this final section, we follow a simple statistical procedure to combine information on circumstances from the TDHS survey with information on consumption from the HBS. Ultimately, since the link between the two surveys is provided largely by components of the asset index (and a few additional covariates), the exercise can also be seen as an alternative way of using information on assets to measure inequality of opportunity in Turkey. Our approach here closely follows McKenzie (2005) in imputing consumption from the HBS into the TDHS, using a bootstrap prediction method.[22]

[22] This approach is a simplified version of the consumption imputation procedures proposed by Elbers, Lanjouw and Lanjouw (2003).

61. We are interested in examining the relationship between the distribution of consumption c and a vector of circumstances C. The TDHS contains information on circumstances, but no comprehensive information on consumption. However, the HBS contains detailed information on consumption, and both surveys collected a common set of information on ownership of durable goods, housing characteristics, and access to utilities. The HBS may then be used as an auxiliary survey to impute consumption into the main survey, the TDHS, from the common information on wealth indicators and a set of demographic and other controls. The imputation may be implemented in different ways, but the bootstrap prediction method appears to be most reliable for studies of inequality (McKenzie, 2005). This procedure consists in combining a direct prediction based on a regression model, with a repeated draw of residuals comparable to a bootstrap. The relationship between wealth indicators $\boldsymbol{X}$ and per capita consumption c is estimated, on sample S_a (from the auxiliary HBS survey), using a log-linear regression model:

$$\ln(c) = X\beta + w\gamma + \varepsilon \qquad (10)$$

where w are demographic controls. The estimation of (10) provides the fitted coefficients $\hat{\beta}$ and $\hat{\gamma}$ as well as estimated residuals $\hat{\varepsilon}$. In order to reproduce the observed levels of inequality, the prediction of per capita consumption in sample S_m (from the "main" DHS survey) is constructed by adding the linear prediction of per capita consumption, $X\hat{\beta} + w\hat{\gamma}$ and a prediction of the residual $\tilde{\varepsilon}$. (A traditional direct prediction, consisting exclusively of the linear prediction, would underestimate actual inequality.) The predicted residual $\tilde{\varepsilon}$ is drawn, for the sample S_m of the main survey, from the empirical distribution of residuals obtained in fitting (10) to the auxiliary sample S_a. Following McKenzie (2005), the procedure allows for heteroskedasticity by drawing $\tilde{\varepsilon}$ from the distribution of residuals for households with similar assets.[23] This is done through six steps:

(1) The regression in (10) is carried out using the common set of wealth indicators, and the parameters $\hat{\beta}$ and residuals $\hat{\varepsilon}$ are obtained.

(2) The sample S_a of the HBS survey is divided into G = 10 groups, defined according to the deciles of the distribution of the first principal component (the wealth index) y for the set of wealth indicators common to the two surveys.[24] Separate distributions of the predicted residuals are identified for each of the 10 groups.

(3) The sample S_m of the DHS survey is then divided into the same 10 groups, using the same cut-off values for y as in the auxiliary sample.

(4) For each household *i* in group *g* in S_m , a residual $\tilde{\varepsilon}_i$ is drawn from the empirical distribution of residuals for households in group *g* in S_a , The predicted value of per capita consumption is given by:

$$c_i = \exp\left(\hat{\beta}' x_i + \hat{\gamma}' w_i + \tilde{\varepsilon}_i\right) \qquad (11)$$

(5) Measures of inequality of opportunity are computed using the predicted distribution of per capita consumption.

(6) Following the bootstrap principle, steps (4) and (5) are repeated for a number *R* of drawn replicate distributions of the residuals, and the measures of inequality of opportunity are computed as the mean over the measures obtained for each replication. In our analysis, we use *R*=20 replications. This replication process allows averaging out the bootstrap sampling error.

62. The opportunity share of consumption inequality may be obtained through the same equation (3), as for wealth inequality. However, the choice of a suitable inequality index, I(), for computing $\theta\left(\{c_i^k\}\right)$ might differ. Imputed consumption ci takes only positive values, so that members of the generalized entropy class (GE) can be computed. Their main advantage over the variance, in this case, is that the distributions of imputed consumption do not have mean zero by construction, so that mean- or scale-independence becomes, once again, a desirable property for I(). All GE indices also satisfy the additive decomposability property required to identify the share of between-circumstance groups inequality. However, in this class, only the mean log deviation allows for a path-independent decomposition in the Foster-Shneyerov sense because of the income weights in the decomposition.[25] Using this index,

[23] Heteroskedasticity might stem from a non-linear relationship between log consumption $\ln(c)$ and wealth assets $\boldsymbol{X}$ and also from the higher noise in this relationship for richer households than for poorer and middle-class ones.

[24] We partition the sample into 10 groups in order to allow a sufficiently high degree of heteroskedasticity and keep group sizes of the order of a few hundreds observations.

[25] See Foster and Shneyerov (2000) and Ferreira and Gignoux (2008) for discussions of this point.

our measure of the opportunity share of inequality in consumption is given by:

$$\Psi^{N}\left(\left\{c_i^k\right\}\right) = \frac{\sum_k \frac{n_k}{n} E^0\left(c_i^k\right)}{E^0\left(c\right)} \qquad (12)$$

As in Section 4, we compute this share non-parametrically (using equation 12), as well as parametrically. The parametric estimate uses a log linear specification of the relationship between circumstances and per capita consumption:

$$\ln c = C\psi + \varepsilon \qquad (13)$$

63. Under these functional form assumptions, a parametrically-standardized distribution is estimated by $\tilde{c} = \exp\left(\overline{C}\hat{\psi} + \hat{\varepsilon}\right)$, and a parametric alternative to $\Psi^{N}\left(\left\{c_i^k\right\}\right)$ is given by:[26]

$$\Psi^{P}\left(\left\{c_i^k\right\}\right) = 1 - \frac{I\left(\tilde{c}\right)}{I\left(c\right)} \qquad (14)$$

64. The set of wealth indicators common to the DHS and HBS surveys contains 14 variables for ownership of durable goods, and four variables for housing characteristics and access to utilities. We also use a variable indicating the ownership of agricultural land, and nine variables for demographic controls. Table 8 presents descriptive statistics for those variables in the two samples. The results for the regression of total consumption on assets using the HBS data are then presented in Table 9. We use a log linear specification because of the likely nonlinear relationship between the ownership of assets and consumption. The R-squared for the regression is 0.53. The coefficients for the asset variables are all highly significant and have the expected signs: ownership of any durable is positively correlated with consumption, as are access to piped water, the number of rooms, and ownership of land. As for the demographic controls, household size is positively and the number of children negatively correlated with consumption. An inverted U-shaped relationship is observed between the age of household head and consumption, and a convex positive relationship attains for education. As in many other countries, the coefficient on the gender of the head is insignificant (which is generally thought to reflect the endogeneity of headship status). Levels of consumption are also higher in urban areas.

65. In order to identify the G = 10 groups with comparable levels of wealth, the first principal component for the set of wealth indicators is computed using both samples for the HBS and DHS data. The deciles of this wealth indicator in the HBS auxiliary sample are used to identify the groups in the DHS main sample.

66. Per capita consumption is then imputed using the fitted coefficients $\hat{\beta}$ and $\hat{\gamma}$ presented in Table 8 and the draws of the residuals. The descriptive statistics in Table 8 suggest that the set of regressors used for the imputation have similar distributions in the two samples.[27] Figure 3 depicts kernel density estimates of the distributions of total household consumption observed in the auxiliary HBS sample and imputed in the main TDHS sample.[28] The two distributions have reasonably similar shapes, and the levels of inequality in actual consumption in the HBS and in imputed consumption in the TDHS are also close: for the sample of 30-49 year-old women, the E(0)s are 0.337 and 0.360 respectively.

67. For each of the 20 draws, a set of parametric and nonparametric indexes of inequality of opportunity are computed. These measures are computed for both samples of 15 to 49 and 30 to 49 ever-married women. Table 10 presents the regression estimates of imputed per capita consumption on the same set of circumstance variables used for the analysis of opportunities in wealth. The R-squared for this regression is 0.26. The coefficients on the circumstance variables are all significant and have the expected signs: per capita consumption is higher for individuals born in a urban area, those living in the West and Center regions, Turkish native-speakers; it increases with parental education and decreases with number of siblings.

68. Table 11 gives the opportunity shares of consumption inequality for the two samples: ever-

[26] A parametrically smoothed distribution can also be computed.

[27] Significant differences are found only for the share of urban residence because of the difference in the definitions of urban areas in the two surveys (agglomerations with 20,000 inhabitants for the HBS survey and 15,000 for the TDHS one), and access to piped water (the definition is more restrictive in the DHS).

[28] The distribution of imputed consumption in the TDHS that is shown corresponds to the first one of the R=20 draws.

married women aged 15-49; and ever-married women aged 30-49. Reassuringly, the overall levels of inequality in per capita consumption (measured by the mean log deviation), are 0.35 and 0.36 in the two samples. Parametric and non-parametric estimates for the total share of inequality of opportunity, presented in the second and third lines, indicate that lower bounds for the opportunity shares of inequality in consumption are comprised between 25% and 29% for the broader sample (with life-cycle variations potentially introducing a downward bias for this sample) and between 27% and 32% for the sample of women aged 30 to 49. These results suggest that the opportunity shares of consumption inequality are about five percentage points lower than the corresponding shares for wealth inequality.

69. The next lines give estimates for the partial shares of inequality associated with each circumstance variable. As in the case of wealth, birth in an urban or rural area and parental education are the circumstances associated with the largest shares, between 9 and 11%, of inequality of opportunity in consumption. Mother tongue and number of siblings also capture significant shares, at about 5%, of consumption inequality. These results are very close to those obtained for wealth.

7. Conclusions

70. Inequality may be found more objectionable when it originates from exogenous differences in people's initial circumstances, rather than from differences in their relative levels of effort or responsibility, or in the wisdom of their choices. Using both non-parametric and regression-based techniques, this paper has sought to estimate a lower bound for the share of overall economic inequality among women in Turkey that is due to those exogenous circumstances. Following Roemer (1998) and Bourguignon et al. (2007), this share is interpreted as a measure of inequality of economic opportunity in Turkey.

71. Our lower bound estimate relies on a small set of observed personal characteristics which can be confidently interpreted as completely independent of individual choices: region and area of birth, the educational attainment of both parents, mother tongue, and the number of siblings a person grew up with. It is precisely because this is an incomplete set of circumstances that the inequality shares we estimate must be interpreted as a lower bound. Even with such a limited set of circumstances, however, there is no single household survey dataset in Turkey that contains reliable information on both these variables and on consumption expenditures. Consequently, we have used information on household asset ownership, housing characteristics, and access to amenities to construct a composite asset indicator that has frequently been used as a measure of household wealth.

72. Given the statistical properties of the composite asset index, we use a path-independent variance decomposition to calculate the opportunity share of inequality. The standard non-parametric estimates of this share for Turkey are 35% for the full sample, and 37% when we focus on a more restricted age range, to eliminate some of the variation due only to the life-cycle. The parametric estimates, based on the R2 of a reduced-form regression of the wealth index on the observed circumstances, are 31% and 32% respectively. Although the non-parametric estimates have the advantage that they impose no arbitrary functional form, they suffer from a potential upward bias arising from imprecision in the estimation of conditional means (as cell sizes fall). We treat our parametric estimates as conservative estimates of the lower-bound share of inequality of opportunity in Turkey.

73. The parametric estimates have the additional advantage that they are additively decomposable into partial shares corresponding to each individual circumstance variable. These shares indicate that the rural or urban status of a woman's birthplace accounts for the largest component of inequality of opportunity in Turkey – a third of the overall opportunity share. Rural status is followed by father's education; mother's education; mother tongue and number of siblings, in that order of importance.

74. Interestingly, once these various characteristics are controlled for, the broad geographical region in which a woman was born (Eastern, Central or Western) accounts for almost no variance. Since wealth distributions do differ substantially across these regions (as do consumption and education levels), this finding suggests that such differences are due to heterogeneity in the composition of the population across regions, in terms of the other circumstances, rather than to any intrinsic regional effects.

75. All of these findings, which are based on an analysis of variance of the composite asset index, are robust to an alternative empirical strategy, in which we imputed household consumption levels from the Household Budget Survey into the Demographic and Health Survey. Although the overall opportunity shares of inequality were somewhat lower for imputed consumption, at 25% - 26% of the mean log deviation, the partial ranking of circumstances was identical: rural or urban birth status; father's education, mother's education, mother tongue, number of siblings and birth region.

76. In addition to providing some sense of qualitative robustness of the results, the consumption-based analysis also permits a limited degree of international comparability. Using the lower-bound parametric estimates of the opportunity share of consumption inequality calculated by Ferreira and Gignoux (2008) for five Latin American countries, we can place the Turkish results into some context. The overall shares for the mean log deviation were 24% for Colombia, 32% for Ecuador, 34% for Peru, 39% for Panama, and 50% for Guatemala. Given methodological differences, comparisons between Turkey and these other countries should not be over-interpreted or emphasized. In particular, the Turkish results are based on imputed, rather than observed consumption. Also, the Latin American study did not include number of siblings as a circumstance, but did use father's occupation. Nevertheless, as an indication of rough relative position, it is clear that Turkey is not as opportunity-unequal as the most unequal countries in Latin America, such as Guatemala and Panama. It ranks alongside the lower end of the inequality of opportunity spectrum in Latin America, with Colombia being a good comparator.

77. The paper also explored the opportunity profile for Turkey, constructed by ranking circumstance-homogeneous types of households by their mean wealth levels. Once households are so ranked, the bottom 10% of the distribution is 97% rural and 88% Eastern (by birth). 91% of them hail from non-Turkish speaking households, and 97% had mothers with no formal education. A full 66% of this opportunity-deprived decile (of woman aged 30-49) has the following combination of characteristics: she was born in a rural area of an Eastern province, to an illiterate mother, and in a non-Turkish speaking household. The contrast with the top decile in the opportunity distribution was striking along every dimension.

78. Such marked differences in economic opportunity across groups defined by morally irrelevant and pre-determined characteristics might explain, at least in part, why Turks appear relatively inequality averse, despite a middling position in the world's ranking of consumption inequality. Perhaps more importantly, the opportunity profile of social groups, constructed on the basis of these pre-determined circumstances, may be useful to Turkish policymakers as they seek to target scarce resources and policy attention with the aim of fostering a more inclusive growth process.

Appendix

1. Table 5 reports partial shares of inequality of opportunity, associated with each individual element Cj of the vector of circumstances C. These partial shares, which are computed through equation (9), using the regression coefficients from (7), have the attractive property that they sum up to the total share of inequality of opportunity computed through equation (8), using the same regression coefficients.

2. This appendix shows that (9) is a simple average of the two alternative paths of the variance decomposition. It therefore corresponds to the Shapley value decomposition proposed by Shorrocks (1999). This explains its additive decomposability.

Recall that $y = C\psi + \varepsilon$ (7)

Therefore $$\operatorname{var}(y) = \sum_j \psi_j^2 \operatorname{var} C_j + \frac{1}{2}\sum_k \sum_j \psi_k \psi_j \operatorname{cov}(C_j, C_k) + \operatorname{var} e \tag{A1}$$

3. The partial contribution of a particular circumstance CJ to var (y) can be calculated in two alternative ways. Both focus on the first two terms in (A1), i.e. set

4. var (e) = 0. The direct estimate holds all $C_j, \forall j \neq J$ constant in (A1), and computes the remaining variance as a share of the total:

$$\theta_d^{PJ} = \frac{\psi_J^2 \operatorname{var} C_J}{\operatorname{var} y} \tag{A2}$$

5. The indirect, or residual, estimate takes holds CJ itself constant, and takes the difference between var (y) and the ensuing variance:

$$\theta_r^{PJ} = \frac{\operatorname{var} y - \operatorname{var} \tilde{y}^J}{\operatorname{var} y} = \frac{\operatorname{var} y - \left[\sum_{j \neq J} \psi_j^2 \operatorname{var} C_j + \frac{1}{2}\sum_{j \neq J}\sum_{k \neq J} \psi_J \psi_k \operatorname{cov}(C_j, C_k) + \operatorname{var} e\right]}{\operatorname{var} y} = \tag{A3}$$

$$= \frac{\psi_J^2 \operatorname{var} C_J + \sum_k \psi_k \psi_J \operatorname{cov}(C_k, C_J)}{\operatorname{var} y}$$

Taking the average between (A2) and (A3) yields (9):

$$\frac{1}{2}\left(\theta_d^{PJ} + \theta_r^{PJ}\right) = \frac{\psi_J^2 \operatorname{var} C_j + \frac{1}{2}\sum_k \psi_k \psi_J \operatorname{cov}(C_k, C_J)}{\operatorname{var} y} = \Psi^{PJ}\left(\{y^k\}\right)$$

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Figure 1: The Household Asset Index for Turkey: density

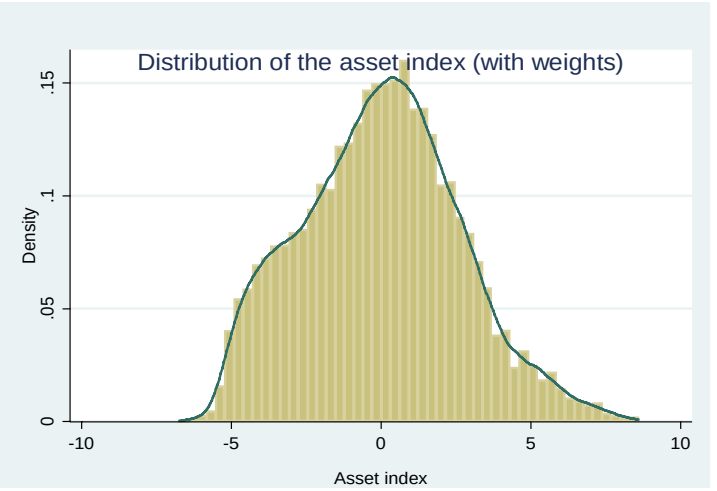
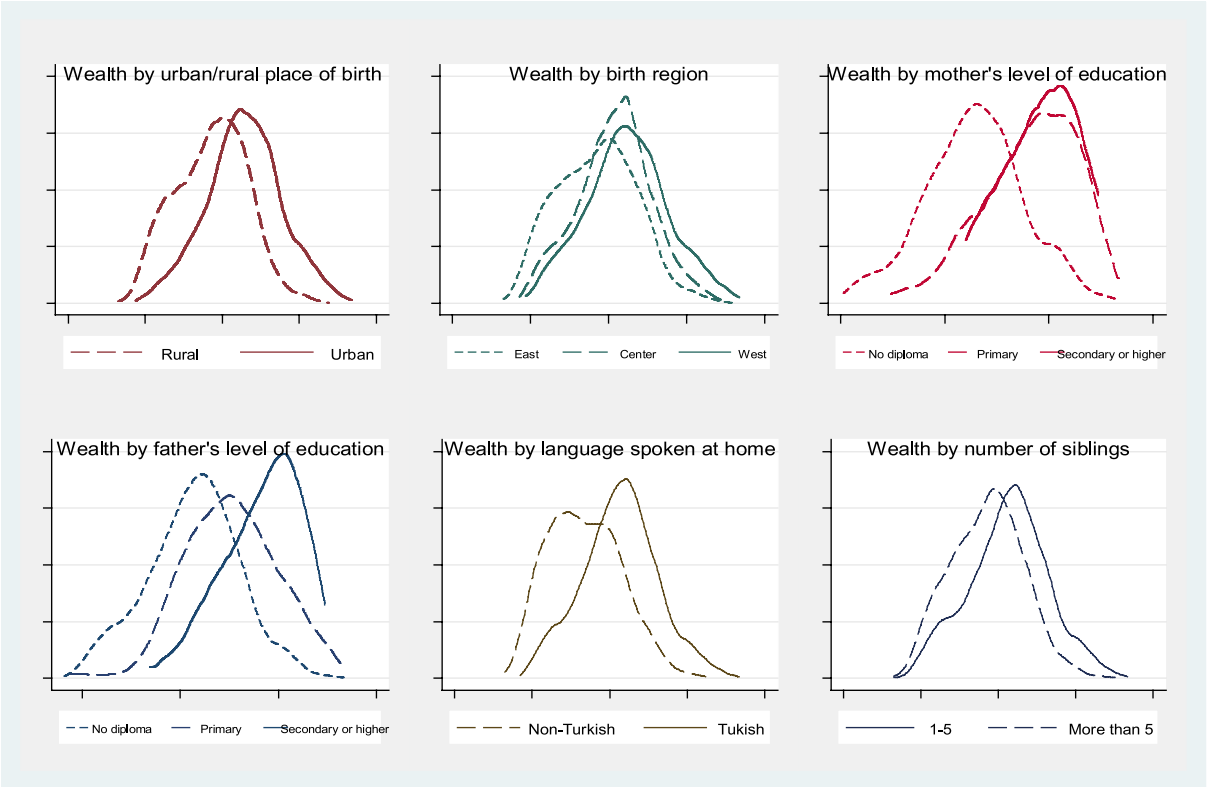


Figure 2: Household Wealth Distributions for Different Circumstance Groups in Turkey: Kernel Density Estimates



Kernel density estimates for the conditional distributions of wealth.
Source data: Turkey TDHS 2003 ever-married women 30 to 49 years old.

Figure 3: Distribution of household annual expenditure observed in HBS 2003 and imputed in TDHS 2003

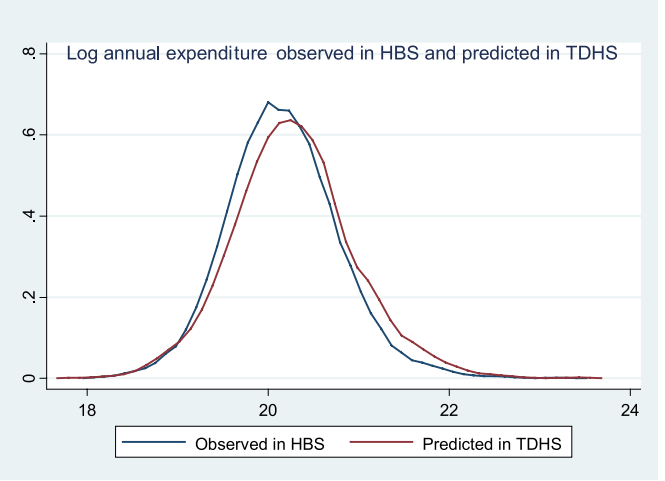


Table 1: Perceptions of the Magnitude and Nature of Inequality in Turkey

		Overall	By type of area			By native language		By level of education				By level of expenditures		
			metropolitan	urban	rural	Turkish	Other	no degree	primary	secondary	professional or higher	Poor	Intermediate	Rich
"The gap between the rich and the poor today in this country should be reduced."	strongly disagree	2.5	3.5	3.1	0.8	3.0	0.6	1.0	2.2	3.6	5.5	2.3	2.9	2.4
	disagree	3.4	3.7	2.4	4.0	3.8	1.7	2.8	4.4	1.2	5.2	2.6	3.0	4.4
	neither disagree not agree	6.3	5.6	4.3	9.3	6.7	4.8	8.7	5.8	5.6	4.9	8.7	3.7	6.7
	agree	18.2	16.3	19.8	18.5	18.1	18.2	24.0	16.2	20.2	7.0	23.9	16.7	14.7
	strongly agree	67.2	69.0	67.8	64.7	66.0	72.8	59.6	69.0	68.3	76.1	58.9	71.5	70.4
"Should the state be involved in reducing the gap between the rich and the poor?"	not involved	1.9	3.5	1.5	0.6	2.2	0.6	1.9	2.2	1.4	1.5	1.2	2.2	2.3
	moderately involved	6.2	4.8	5.3	8.5	7.5	0.3	6.6	7.2	3.2	6.9	8.2	7.0	3.7
	strongly involved	91.9	91.7	93.2	90.9	90.3	99.1	91.5	90.5	95.4	91.6	90.6	90.9	94.1
"In your opinion, what is the main reason why there are some people in need in our country today?"	unlucky	7.5	9.4	5.3	7.6	6.7	10.9	12.7	7.3	3.5	4.3	11.2	7.2	4.6
	laziness and lack of willpower	24.4	21.8	29.1	22.5	26.3	15.9	21.2	28.3	17.8	29.3	22.6	27.2	23.4
	injustice in society	62.9	64.1	60.1	64.5	61.4	69.7	63.9	58.9	70.5	61.9	61.4	60.9	66.0
	inevitable part of modern life	2.6	2.6	3.5	1.5	3.0	0.6	0.3	2.5	4.6	3.7	2.1	0.8	4.5
"Which of the factors in this list is the most important to succeed in life in this country?"	effort and hard work	48.4	46.7	52.1	46.6	50.2	40.9	54.5	49.5	43.2	39.4	50.1	51.2	44.5
	intelligence and skills	27.2	23.2	22.3	36.8	25.7	33.8	30.9	30.2	20.0	20.1	31.9	23.0	27.1
	political connections	11.4	17.0	8.6	8.1	10.4	15.9	8.0	9.4	13.1	27.3	8.2	12.4	13.2
	criminal/corrupt ties	10.8	11.8	12.9	7.7	11.4	8.4	5.4	9.4	19.5	11.3	8.9	10.6	12.7
Distribution of the population			35.2	32.8	32.0	81.4	18.7	23.5	45.9	22.2	8.4	30.5	33.1	36.4

Source: Tabulations from the Life in Transition Survey for Turkey, 2006.

Table 2: The Household wealth index
Principal components and summary statistics for asset indicators

Variable	Mean	Std. Dev.	Scoring factor for 1st principal component (divided by s.d.)
Has gas or electric oven	0.712	0.453	0.213
Has microwave oven	0.072	0.259	0.123
Has dishwasher	0.221	0.415	0.237
Has blender/mixer	0.392	0.488	0.244
Has DVD/VCD player	0.317	0.465	0.197
Has washing machine	0.783	0.412	0.225
Has video camera	0.035	0.184	0.122
Has iron	0.851	0.356	0.201
Has sattelite antenna	0.143	0.350	0.086
Has vacuum cleaner	0.756	0.429	0.245
Has air conditioner	0.047	0.212	0.123
Has television	0.947	0.223	0.114
Has video	0.073	0.259	0.134
Has cable TV	0.062	0.240	0.151
Has camera	0.339	0.473	0.224
Has CD player	0.182	0.386	0.184
Has cellular phone	0.671	0.470	0.200
Has computer	0.116	0.320	0.199
Has internet	0.063	0.242	0.175
Has private car	0.258	0.437	0.169
Has motorcycle	0.045	0.208	-0.017
Has bicycle	0.193	0.394	0.097
Employs a domestic worker	0.000	0.018	0.004
Works own or family's agricultural land	0.137	0.344	-0.140
Uses piped water in residence for drinking	0.501	0.500	0.020
Uses water from public faucet (piped) for drinking	0.004	0.061	-0.004
Uses water from a well in residence for	0.009	0.095	-0.027
Uses water from a public well for drinking	0.024	0.152	-0.051
Uses water from piped surface for drinking	0.196	0.397	-0.171
Uses water from spring/public fountain for drinking	0.064	0.245	-0.032
Uses water from river, canal or surface for drinking	0.001	0.028	-0.005
Uses rain water for drinking	0.000	0.020	-0.010
Uses water from tanker truck for drinking	0.003	0.051	-0.011
Uses bottled water for drinking	0.195	0.396	0.195
Uses water station for drinking	0.002	0.040	0.008
Uses water from other source for drinking	0.002	0.044	-0.005
Uses a private flush toilet inside residence	0.675	0.469	0.244
Uses a shared flush toilet inside residence	0.001	0.033	-0.011
Uses a private flush toilet outside residence	0.068	0.251	-0.090
Uses a shared flush toilet outside residence	0.010	0.097	-0.034
Uses a pit latrine	0.080	0.272	-0.143
Uses a VIP latrine	0.148	0.355	-0.121
Uses bush,field as latrine	0.005	0.068	-0.038
Uses other type of latrine 0	0.012	0.111	-0.047
Has dirt, sand, dung as principal floor material in dwelling	0.041	0.198	-0.108
Has wood, plank as principal floor material in dwelling	0.156	0.363	-0.082
Has parquet or polished wood as principal floor material in dw	0.171	0.376	0.169
Has karo as principal floor material in dwelling	0.086	0.281	0.041
Has cement as principal floor material in dwelling	0.283	0.450	-0.160
Has carpet as principal floor material in dwelling	0.072	0.259	0.071
Has marley as principal floor material in dwelling	0.158	0.365	0.077
Has mozaic/tiles as principal floor material in dwelling	0.023	0.149	0.017
Has other type of flooring in dwelling	0.010	0.100	-0.005
Dwelling is owned by a household member	0.620	0.485	-0.051
Dwelling is rented	0.248	0.432	0.070
Dwelling is is a lodging	0.014	0.118	0.032
No rent paid for dwelling	0.116	0.321	-0.027
Other type of dwelling	0.002	0.040	-0.013
Number of members per sleeping room	2.412	1.223	-0.130

Table 3: Partition of the population by circumstances; wealth analysis

Characteristics	Pop. Share
	Percent
Type of area	
Rural area	54.2
Urban area	45.8
Birth region	
East	24.4
Central	43.9
West	31.7
Mother's education	
no education or unknown	64.0
primary education	32.4
Secondary education	3.1
higher education	0.5
Father's education	
no education or unknown	37.3
primary education	52.1
Secondary education	8.7
higher education	2.0
Mother tongue	
Other language	17.1
Turkish	82.9
Number of siblings	
less than 3	23.6
4 to 5	47.4
6 to 8	24.0
9 or more	5.1

Table 4: Reduced-form regression of household asset index on circumstances

Circumstance variable	Coefficient
Birth in a urban area	1.46***
	[0.06]
Birth in the Central region	0.066
	[0.0742]
Birth in the West region	0.10
	[0.09]
Mother’s primary education	0.51***
	[0.07]
Mother’s secondary education	1.22***
	[0.19]
Mother’s higher education	0.95**
	[0.38]
Father’s primary education	0.47***
	[0.07]
Father’s secondary education	1.32***
	[0.11]
Father’s higher education	2.20***
	[0.21]
Turkish mother tongue	1.02***
	[0.09]
4 to 5 siblings	-0.39***
	[0.08]
6 to 8 siblings	-0.63***
	[0.09]
9 or more siblings	-1.09***
	[0.13]
Constant	-1.68***
	[0.11]
Observations	8074
R-squared	**0.306**

Robust standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1 Sample of 15-49 year-old ever-married women.

Table 5: The Opportunity Shares of Wealth Inequality for Women

	Our index		DHS index
	15-49 year-olds	30-49 year-olds	
Overall inequality: variance	6.479	6.953	91.631
Total share of inequality of opportunity			
Non parametric	0.345	0.372	0.286
Parametric	0.306	0.324	0.245
Partial shares associated with circumstances			
Type of area	0.116	0.127	0.072
Birth region	0.004	0.002	0.002
Mother's education	0.041	0.058	0.038
Father's education	0.066	0.075	0.061
Mother tongue	0.045	0.031	0.039
Number of siblings	0.033	0.030	0.034

Note: partial shares are given by the means of smoothed and standardized estimates; sample of ever married women aged 15 to 49, second column restricts the sample to women aged 30 to 49.

Table 6: The (Wealth) Opportunity-Deprivation Profile for Turkey

Birth Area	Birth Region	Mother's Education	Father's Education	Mother Tongue Spoken at home	Number of Siblings	Share of the population	Group mean outcome (in assets index)
Urban area	Central	no education or unknown	secondary education	Turkish	9 or more	0.0079	-4.881
Urban area	West	primary education	no education or unknown	Turkish	6 to 8	0.0309	-3.821
Rural area	East	no education or unknown	secondary education	other language	4 to 5	0.0260	-3.773
Rural area	West	primary education	primary education	Turkish	9 or more	0.0695	-3.092
Rural area	West	no education or unknown	secondary education	Turkish	4 to 5	0.0521	-3.050
Rural area	Central	primary education	primary education	other language	6 to 8	0.0204	-2.917
Urban area	Central	primary education	primary education	other language	9 or more	0.0158	-2.705
Rural area	West	no education or unknown	no education or unknown	Turkish	9 or more	0.0207	-2.652
Urban area	Central	secondary education	secondary education	other language	9 or more	0.0151	-2.604
Rural area	East	primary education	primary education	other language	6 to 8	0.0063	-2.575
Rural area	Central	no education or unknown	no education or unknown	other language	9 or more	0.1373	-2.361
Rural area	East	no education or unknown	no education or unknown	other language	less than 3	0.4403	-2.298
Urban area	East	primary education	no education or unknown	other language	9 or more	0.0063	-2.292
Rural area	East	no education or unknown	primary education	other language	9 or more	0.3602	-2.264
Rural area	East	no education or unknown	no education or unknown	other language	9 or more	1.2089	-2.173
Rural area	East	no education or unknown	no education or unknown	other language	4 to 5	2.2051	-2.108
Rural area	East	primary education	no education or unknown	other language	9 or more	0.0115	-2.088
Rural area	East	primary education	no education or unknown	other language	6 to 8	0.0395	-2.047
Rural area	East	no education or unknown	no education or unknown	other language	6 to 8	3.3125	-2.017
Rural area	East	no education or unknown	primary education	other language	6 to 8	0.6914	-1.881
Urban area	Central	secondary education	higher education	Turkish	4 to 5	0.0191	-1.562
Urban area	West	no education or unknown	primary education	other language	4 to 5	0.1038	-1.479
Rural area	East	primary education	primary education	other language	4 to 5	0.0380	-1.469
Rural area	East	no education or unknown	secondary education	Turkish	4 to 5	0.0275	-1.453
Rural area	East	no education or unknown	primary education	other language	4 to 5	0.4324	-1.452
Rural area	Central	no education or unknown	no education or unknown	Turkish	9 or more	0.5650	-1.442
Urban area	West	no education or unknown	no education or unknown	Turkish	9 or more	0.0881	-1.365

Source: TDHS 2003. Sample includes Ever Married Women between Ages 30-49. The index has an overall mean of 0.283 and a standard deviation of 2.637.

Table 7: The opportunity-Deprived and the Opportunity-Hoarders: characteristics of the bottom and top tenths of the opportunity profile

Percentage of the advantaged and disadvantaged groups of women that fall into each category of circumstances				
		Advantaged 10%	Disadvantaged 10%	Total
Birth Area	Rural	0.7	97.1	57.7
	Urban	99.3	2.9	42.3
Birth Region	East		88.5	25.0
	Central	32.2	7.8	44.7
	West	61.9	3.7	30.2
Mother's Education	No Diploma/Illiterate	6.6	97.3	70.8
	Primary School	66.5	2.4	26.7
	Secondary School	23.9	0.3	2.2
	Higher Education	3.1	0.0	0.3
Father's Education	No Diploma/Illiterate	0.3	81.1	44.4
	Primary School	45.7	17.5	47.7
	Secondary School	38.7	1.3	6.4
	Higher Education	15.3	0.2	1.5
Mother Tongue	Non-Turkish	1.5	91.1	17.6
	Turkish	98.5	8.9	82.4
Number of Siblings	Less than 3	85.0	4.4	20.3
	3 to 5	13.7	29.2	48.5
	6 to 8	1.2	41.2	25.9
	More than 9	0.0	25.2	5.3

Note: Wealth index in this analysis is recalculated from the assets in the DHS data.
Sample includes only ever-married women ages 30-49.

Table 8: Descriptive statistics for the asset indicators and demographic variables common to the HBS and DHS samples

	DHS 2003			HBS 2003		
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Oven	10836	0.072	0.259	25764	0.063	0.242
Dishwasher	10836	0.221	0.415	25764	0.229	0.420
Dvd player	10836	0.317	0.465	25764	0.200	0.400
Washing machine	10836	0.783	0.412	25764	0.801	0.399
Video camera	10836	0.035	0.184	25764	0.022	0.146
Air conditioner	10836	0.047	0.212	25764	0.028	0.166
TV	10836	0.947	0.223	25764	0.971	0.168
Video	10836	0.073	0.259	25764	0.068	0.251
Cable TV	10836	0.062	0.240	25764	0.060	0.237
Cellular	10836	0.671	0.470	25764	0.545	0.498
Computer	10836	0.116	0.320	25764	0.093	0.291
Internet	10836	0.063	0.242	25764	0.036	0.187
Car	10836	0.258	0.437	25764	0.241	0.428
Moto	10836	0.045	0.208	25764	0.026	0.158
Agricultural land	10836	0.137	0.344	25764	0.131	0.338
Piper water	10836	0.742	0.437	25764	0.932	0.251
Toilets inside	10836	0.782	0.413	25764	0.884	0.321
House owned	10836	0.620	0.485	25764	0.719	0.449
House rented	10836	0.248		25764	0.216	0.411
House lodge	10836	0.014	0.118	25764	0.013	0.115
House other	10836	0.118	0.323	25764	0.051	0.221
Household members per room	10836	1.325	0.872	25764	1.271	0.699
Log household size	10836	1.301	0.538	25764	1.308	0.485
Number of children 0 to 4	10836	0.382	0.686	25764	0.344	0.626
Number of children 5 to 14	10836	0.802	1.134	25764	0.845	1.106
Female household head	10836	0.125	0.331	25764	0.096	0.295
Age of head	10836	47.218	15.071	25764	46.841	13.658
Squared age of head (/10)	10836	24.566	15.525	25764	23.806	13.867
Years of education of head	10834	6.952	7.716	25764	6.662	3.474
Squares years of education of head (/10)	10834	10.787	65.521	25764	5.645	5.227
Urban area	10836	0.705	0.456	25764	0.638	0.481

Notes: Statistics given for the full samples of each survey.

Table 9: Regression of household annual consumption on assets in HBS

Coefficient	Log household annual expenditure
Oven	0.08*** [0.02]
Dishwasher	0.21*** [0.01]
Dvd player	0.09*** [0.01]
Washing machine	0.23*** [0.01]
Video camera	0.29*** [0.03]
Air conditioner	0.22*** [0.03]
TV	0.16*** [0.03]
Video	0.05*** [0.02]
Cable TV	0.32*** [0.02]
Cellular	0.21*** [0.01]
Computer	0.12*** [0.02]
Internet	0.16*** [0.03]
Car	0.20*** [0.01]
Moto	0.06*** [0.02]
Agricultural land	0.05*** [0.01]
Piper water	0.08*** [0.02]
Toilets inside	0.11*** [0.01]
House owned	0.05*** [0.01]
House rented	Ref.
House lodge	0.05 [0.03]
House other	0.04** [0.02]
Household members per room	-0.05*** [0.01]
Log household size	0.39*** [0.02]
Number of children 0 to 4	-0.03*** [0.01]
Number of children 5 to 14	-0.05*** [0.00]
Female household head	0.02 [0.01]
Age of head	0.02*** [0.00]
Squared age of head (/10)	-0.01*** [0.00]
Years of education of head	0.02*** [0.00]
Squares years of education of head (/10)	0.01** [0.00]
Urban area	0.10*** [0.01]
Constant	18.23*** [0.06]
Observations	25764
R-squared	0.525

Robust standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1

Table 10: Reduced-form regression of imputed per capita consumption on circumstances

Circumstance variable	Coefficient
Birth in a urban area	0.34*** [0.02]
Birth in the Central region	0.08*** [0.03]
Birth in the West region	0.15*** [0.04]
Mother's primary education	0.16*** [0.03]
Mother's secondary education	0.59*** [0.09]
Mother's higher education	0.75*** [0.17]
Father's primary education	0.10*** [0.03]
Father's secondary education	0.34*** [0.05]
Father's higher education	0.61*** [0.11]
Turkish mother tongue	0.39*** [0.04]
4 to 5 siblings	-0.09*** [0.03]
6 to 8 siblings	-0.19*** [0.04]
9 or more siblings	-0.30*** [0.06]
Constant	18.15*** [0.04]
Observations	5229
R-squared	0.257

Robust standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1
Source: TDHS 2003 with consumption imputated from HBS 2003; sample of ever-married women 30-49

Table 11: The Opportunity Shares of Consumption Inequality for Women

	Sample of 15-49 years old	Sample of 30-49 years old
Overall inequality: E(0)	0.347	0.360
Total share of inequality of opportunity		
Non parametric	0.292	0.322
Parametric	0.248	0.266
Partial shares associated with circumstances		
Type of area	0.097	0.112
Birth region	0.026	0.026
Mother's education	0.071	0.093
Father's education	0.084	0.093
Mother tongue	0.060	0.052
Number of siblings	0.049	0.047

Note: Parametric standardized simulations.
Source: TDHS 2003 with consumption imputed from HBS 2003; sample of ever-married women 30-49