The Adult Goods Approach To Child Gender Bias: Evidence From Iran

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ABSTRACT

This paper provides non-parametric evidence, from an Iranian budget survey, of the child gender effects on adults' consumption. The outcome is contrary to the commonly-held opinion that the adults goods approach is not effective in revealing the presence of such effects. The evidence of pro-boy bias obtained in this study appears almost unchanged when examined against a variety of controls.

Keywords: consumption; adult goods; child gender; intrahousehold inequality

INTRODUCTION

There have been many attempts by the Rothbarth method to detect gender effects in consumption patterns since its first application, but none has found a statistically significant instance of bias against girls.[1] This paper aims to demonstrate that child gender bias is detectable in expenditure behaviour, provided one takes into account the effects of non-nuclear families, and the influence that number of children have on child gender, see also Koohi-Kamali (2008). Section 1 discusses some of the problems with the commonly employed approach and the alternative method they suggest. Section 2 deals with the non-parametric method employed in this paper, and the practical steps taken in applying it; section 3 with the data and expenditure groups; and section 4 with the test results; and section 5 contains the conclusion of this study. The data on which this paper is based comes from a 1984-85 household budget survey of the Central Bank of the Islamic Republic of Iran (CBIHBS), containing 4264 urban households, see Koohi-Kamali (2005) for details on its sampling features.

1. ISSUES FOR ANALYSIS

This section discusses the influences that are likely to be decisive for the test outcome of child gender effect. First, on the existing model of adult goods, the identification of the Rothbarth allocation rule, of inferring child welfare from variation in the level of adults' consumption, will face problems when applied to samples of nuclear *and* non-nuclear households. The average non-nuclear household size is likely to have significantly larger number of adults. Non-nuclear households are quite prevalent in developing countries, and, in many, the extended family is the dominant type, for example, Lanjouw and Ravallion (1993, table 1) for rural Pakistan.. The parents are also unlikely to be the sole decision-makers within the extended families, which typically contain additional employed adults with own incomes. It appears that all previous studies of the child gender effect on adults goods consumption are based on samples of all types of households, not just the nuclear type, a requirement for a valid application of the Rothbarth model, Deaton and Muellbauer (1986, p. 724).

[1] See Deaton (1987) for the first application. Deaton (1997) contains references on the countries studied to that date, and China is examined in Burgess and Zhuang (2003); the latest attempt, on Indian data, seems to be Deaton and Case (2002). More recent studies include Bhalotra and Attfield (1998) for Pakistan, Gong et. al.(2005) for China, and Kebede (2008) for Ethiopia. Deaton (1997, p.238) maintains that the evidence obtained for a pro-boy bias for small children in North India is a "chance" result since it fails to reappear for the combined age group of 0-15.

Second, there is the issue of choosing an effective index of child gender. All previous studies employ the proportions of boys and girls to household size, usually by age, for this purpose. However, no hypothesis has ever been proposed linking child age to parental gender discrimination. I propose to remedy this by testing a particular hypothesis: those parents with a pro-boy bias who fail to have a boy early on in their fertility cycle, are more likely to go beyond their desired number of children in order to achieve their target sex composition of children. Evidence about the presence of such a gender selectivity mechanism has so far come from demographers, usually in the form of correlations between children's proportions of boys and girls, see Simmons et al. (1982), also Muhuri and Preston (1991). However, pro-boy adult preferences do not always result in additional births[2]; see Clark (2000). Note, however, that such an outcome is also consistent with daughter preference. Therefore, as pointed out by Leung (1991), the correlations evidence can indicate the presence of child gender bias, but *not* its direction. This provides the motivation for the test of the gender selectivity hypothesis by consumption of adults goods *conditional* on gender of children; the gender indicator based on the number of children, not their age.

2. METHOD EMPLOYED

I employ a non-parametric approach to the application of the Rothbarth method. Such an approach would have the great advantage of permitting the data to decide the shape of the adult goods consumption curves without the imposition of *a priori* functional form. In order to apply the above method, the data is organized into several demographic groups where the demographic composition within each group, defined simply by the *number of children* in two-adult (husband and wife) nuclear families, is homogeneous. Within each demographic group, households are then arranged in increasing order of their total expenditure, and divided into a number of expenditure groups, depending on the size of the demographic groups. Each demographic/total expenditure group is further divided into two groups, depending on the sex dominance of male and female children. In what follows, the child gender balanced households are *excluded* from the samples employed, though the outcomes are similar to those reported below (and available from the author on request).

The mean values of expenditure on adult goods are obtained for each female and male child dominant groups and the former are subtracted from the latter. If the female child dominant group is discriminated against, one would expect less willingness on behalf of adults to cut down on their standard of living, including consumption of adult goods, compared to the male child dominant group. Thus, the difference of mean expenditure on adult goods of the female dominant group from those of the corresponding male dominant households should be *positive* if there is sex bias against *female* children. The mean differences on adult goods expenditures are divided by their relevant mean total expenditure to keep the resulting ratio constant. I have aggregated such differences, to begin with, over all the total expenditure classes of a given demographic group, and finally, over all demographic groups. The aggregate value should also be positive if there is overall discrimination in allocation of goods against female children.

In order to deal with the 'curse of dimensionality' of this method, i.e. the limit on the number of co-variates employed, I apply a similar non-parametric regression to the same sample, but with a different dependent variable each time. An extensive list of such variables are also tested for the success of my method in controlling for factors that should remain relatively constant between the two groups, such as income, ownership of durables, mother's age, and education, etc.

3. DATA: SAMPLES AND EXPENDITURE GROUPS EMPLOYED

I restrict the samples employed to nuclear families, defined here to consist of the household head, his/her spouse, and their immediate children aged 0-16; with the added provision that each family must have at least one child. I examine the evidence for gender bias across rich and poor regions separately; I also check the sensitivity of my results to the precise definition of child age boundary. I employ up to 5 demographic categories, based on the number of children, in Tehran, and up to 6 in both large and small cities.

[2]Suppose a couple with two girls and no boy most prefer to have two boys and one girl. The couple might regard (an approximate) 50% risk of having a third girl sufficiently high to stop at parity two.

Four categories of expenditure appear reasonable candidates for adult goods: a 'pure' category consisting of expenditure on tobacco products, and three other possible candidates. These are: readily prepared food and drink consumed outside, cosmetics and hair dye, and jewellery exclusive of gold sovereigns. The choice of the four groups here is partly an attempt at a more gender balanced list, so that the first two are goods predominantly consumed by men, but the last two mainly by women. The problem, common with applications of this method, is the survey availability of suitable adult goods. A number of studies, discussed in Deaton (1995), indicate that the effect of the presence of children on expenditure on outside meals is not determined by its income effect alone, as children also affect work patterns, resulting in substitution effects as well (assumed absent in the Rothbarth model). As for expenditure on jewellery and cosmetics, given the public dress code in force in 1984-85 in Iran, neither is likely to fully reflect voluntary levels of consumption presupposed by the adults goods approach. This leaves tobacco as the best adult good candidate. However, expenditure data on tobacco or alcohol contain typically a large component of measurement error due to infrequency of purchase. For this reason, testing by the aggregate basket of adult goods can be helpful for supporting evidence on gender effects for tobacco.

In order to check the child gender results on adult goods compared with possible gender effects on goods exclusively consumed by children, several categories of the latter are also included among the list of goods tested for gender effect; finally, tests regarding mean differences of controlled variables are also carried out for a long list of controls, see below

4. RESULTS AND ASSESSMENT

Table 1 shows a portion of the tests results for the selected categories of adult goods, excluding those for child goods, and those for control variables, to save space. $\bar{\theta}$ is the aggregate estimated mean expenditure differences of the girl from boy-dominant groups, and $\boldsymbol{Z}$ is the test-statistic obtained from dividing $\bar{\theta}$ by the square root of its variance. The first point to note is that the three mean tobacco expenditure differences are all *positive*, thus indicating discrimination against *female* children. All three $\boldsymbol{Z}$ values are above the critical 5% significant threshold of 1.64, increasingly as we move from Tehran first, to large, and then, to small cities columns. However, each of the other adult goods categories signs alternate between positive and negative, and all are insignificant. Note, however, that the aggregate expenditure on all 4 categories of adult goods taken together still retain the significant positive sign of the tobacco group, even in relatively rich Tehran, though increasing in significance as we move to small cities.

There is also evidence of statistically significant female child discrimination by child goods, matching those for tobacco, for stationary products in large cities, and for the category of child footwear, for (0-6) age group, in small cities. In addition, I found no statistically significant evidence of differences between the two child gender groups on welfare, and wealth-related influences. Moreover, I have also tested the robustness of the tobacco results with a different (0-15 years) definition of child age, and with differences between the smaller samplers of gender-balanced two-girl and two-boy households. In all cases, the results in table 1 proved robust to these additional checks (full test results are available from the author).

5. CONCLUSION

Summarizing, there is evidence of female child discrimination by tobacco expenditure in all three city groups, all having z values above the significant threshold. Note that this outcome reappears with the aggregate category of adult goods, and the results are insensitive to the child age definition employed. Note also the regional evidence suggests child gender bias is not poverty related. An independent support for the gender bais conclusion comes also from matching evidence on a variety of goods consumed directly by children. An extensive list of expenditure and demographic categories show that the influence of irrelevant factors on the gender results by adult goods are all successfully neutralised. I conclude that sex bias can be detected from expenditure data on adult goods, provided the method is applied to nuclear samples, and gender indicator is based on the number of children.

Table 1: Test Of Gender Bias Among Children Aged 0-16 Years

	Tehran		Large Cities		Small Cities	
Expend. Group	$\bar{\theta}$	**Z**	$\bar{\theta}$	**Z**	$\bar{\theta}$	**Z**
Tobacco	0.00951	2.13594	0.01234	2.58250	0.01682	3.22247
Eating out	-0.00186	-0.52069	0.00116	0.34967	-0.00181	-1.20089
Jewellery	0.00290	1.13404	-0.00230	-1.19716	0.00205	0.66343
Cosmetics	-0.00152	-1.17226	-0.00013	-0.19848	-0.00021	-0.56208
All-adult goods	0.01090	1.84604	0.01007	2.05820	0.01684	3.11437

Source: CBIHBS 1984-5(nuclear household samples)

ACKNOWLEDGEMENTS

I wish to express my debt to John Muellbauer for his encouragement and support. Comments on the earlier drafts of this paper by Frank Cowell and Hashem Pesaran are also gratefully acknowledged. They bear of course no responsibility for remaining errors or shortcomings, which are mine alone.

AUTHOR INFORMATION

Feridoon Koohi-Kamali obtained his doctorate in economics from Oxford University. His research focus is analysis of household surveys of Iran, Ethiopia, and India. He currently teaches Economics at John Jay College, CUNY, U.S.A. He was previously Research Scholar and Editor at Levy Economics Institute, and has been a consultant to the World Bank.

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