Revisiting the Insuring Child

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April 2007

Abstract

It is now common knowledge that part of the explanation to high fertility rates in developing countries lies with their institutional features. This paper develops a game theoretical framework to highlight the comparative advantage of a child-bearing strategy over more conventional saving schemes, when facing weak institutions as captured by the rule of law. In sake for secured old-age consumption, individuals are shown to trade-off between the risks of saving / investing under conventional forms - which they cannot alter, and unemployment risks - which they can affect through a child quality - quantity strategy. The paper derives clear and testable results, and model's quantitative implications track China's and India's recent fertility rates and population sex ratios well. Sound institutions are shown to foster private saving and old-age consumption, as well as more gender-balanced practices at the household level. Yet, the paper advocates for active gender promoting policies while implementing the rule of law, as the latter fails to overturn parental gender preference to match the demographic sex ratio norm.

Keywords: Fertility; Gender Bias; Institutions.

JEL Classification: J13, J16, 012.

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1 Introduction

This paper rationalizes the role of institutions' quality as captured by the rule of law in parental arbitrage between child bearing and saving under more conventional forms in developing countries. The paper simultaneously tackles the issue of parental gender preference in the light of the society's institutional features. More specifically, I ask if weak institutions can combine with the contest over modern sector employment to explain the yet-to-fall fertility rates as observed again in many of today's developing countries, while accounting for a general preference for sons economy-wide. In spite of unemployment risks, I shall show that large families is one of the many consequences of poor institutions, as the higher risk facing investors makes saving through child-bearing more appealing an option. I shall also show that better institutions *per se* cannot bring gender-based discrimination to an end, calling upon for gender promoting policies while implementing the rule of law. The paper derives clear and testable results, and carries important policy implications.

Along the demographic transition line of development analysis, it is often pointed out that low levels of living and missing institutions are part of the explanation to high fertility rates in developing countries, as both are said to induce a preference for child-bearing as a saving device for old-age consumption. The implementation of social security and pension systems is hence perceived as the way out of a secular tendency for families to grow oversize. Yet, I shall show that even if the relevant institutions were in place, individuals might still rely on child-bearing to secure old-age consumption, should the system as a whole not be trustworthy.

1.1 This paper and the theory of household fertility

Drawing from the conventional theory of household and consumer behavior, the recent microeconomic theory of fertility uses the principles of economy and optimization to explain family size decisions. In application of this approach to fertility analysis, children are considered as a special kind of good and child-bearing is a rational economic response to the family's demand for children relative to other goods - Schultz (1974), Becker and Lewis

(1973), Becker and Nigel (1976), De Tray (1973), Gronau (1973), Willis (1973). The usual income and substitution effects are assumed to apply, so that all things equal, the desired number of children is expected to vary with household's income, tastes for other goods relative to children, and costs of children.

In application of this theory to developing countries, it is often emphasized that children are partly economic investment goods in that there is an expected return in the form of both child labour, and the provision of financial support for parents in old-age - Schultz (1997), Dasgupta (1995). Child overbearing is therefore said to stem from the fact that individuals face problems in finding a reliable outlet for saving, reasons for which include primitive financial institutions, insecure property rights, inflationary pressures, non existent government social security schemes, private pensions and health insurance. With alternative forms of asset accumulation foreclosed, individuals are hypothesized to rely on their children for old-age security, although themselves are risky investment. Lilard and Willis (1997) empirically document significant children-to-parents old-age transfers in Malaysia, while emphasizing the difficulty to apply the traditional old-age security model to such a country, since there is no evidence that it has inadequate outlet for savings. In fact, I shall show that people's perception of their legal environment shapes private fertility choices in that absence the rule of law, individuals may not rely on the relevant institutions for saving (shall they exist), nor will they engage much in the acquisition of other conventionally excludable and rival (investment) goods'.[1]

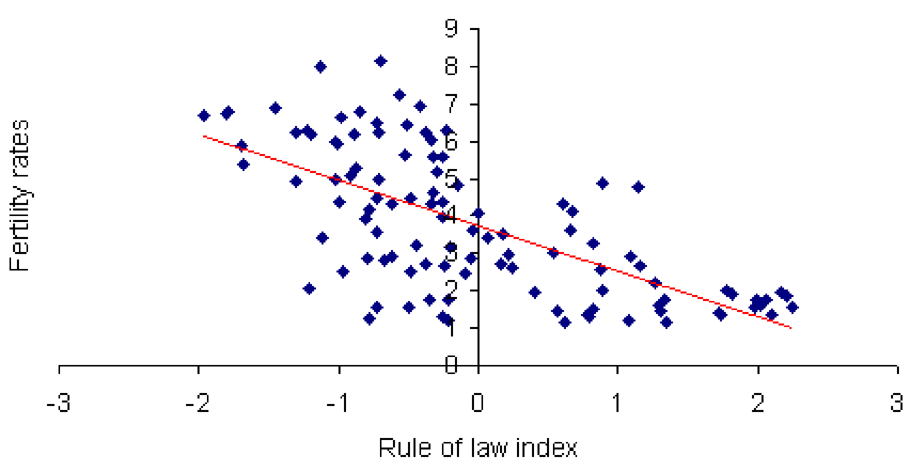
In a first attempt to rationalize the risk-insuring motive of fertility choices in less developed countries, Portner (2001) develops a model in which children serve as an incomplete insurance good allowing parents to shift resources from a period with certain income, to future periods with uncertain income. However, as surviving children are hypothesized to always be in position to provide the expected insurance, Portner's framework clearly overlooks the uncertainty surrounding the return to human capital investment, even for those children. The strategic motive of fertility choices in developing countries is also missing, and

[1]For instance, absence of property rights enforcement, individuals may be reluctant to invest in land or livestock acquisition.

the channel whereby current investments may translate into a reverse flow of income in the future is absent. Other analysis of children as security assets, including Appelbaum and Katz (1991), and Eswaran (1996) share these shortcomings. Yet, in many developing countries, child-bearing entails a high social and cultural value, which one can hardly disentangle from the economic motive. Hence private fertility certainly involves a part of social rivalry which fits best in a game framework.

Overall, the model in this paper rests on the idea that absence sound institutions, the standard reduction in fertility rates arising from an increased opportunity cost for mother's time, may not obtain simply because current earnings cannot safely be converted into old-age consumption. This argument is supported by recent observations of countries' fertility rates and rule of law indexes worldwide. Based on a sample of 108 countries, Chart 1 below points to a strong and negative correlation (to the order of -0.67), which arguably suggests a strong connection between both features.

Chart 1: Rule of law index and world-wide fertility figures



Notwithstanding the above, as far as developing countries are concerned, and aside from survival uncertainty, endemic unemployment clearly points to another risk pertaining to human capital investments: Even well-educated children might fail to provide income for their elderly parents. Yet in this paper, I shall argue that weak institutions make saving through child-bearing more appealing an option, as people weigh the risks of using conventional devices for saving against the unemployment risks facing their children. While the typical household can design a child quality and quantity strategy to alter the probability for its offspring to secure well-paid positions, institutions' quality stands out of their control. In clear, unlike unemployment risks, a typical parent cannot affect the risk of spoliation, misappropriation or mismanagement pertaining to weak institutions.

From a child survival perspective as stressed in other models, this paper uses four main features to shift the source of uncertainty pertaining to old-age support to the labour market: (1) Parents allocate household's resources between current consumption, savings for old-age consumption, and child rearing costs. However, depending on the rule of law, investors may loose their saving, case in which transfers from grown up children become the only source of old-age consumption. I use an index of rule of law ranging between 0 and 1 as a proxy for institutions' quality.[2] The higher this index, the better and trustworthy the institutions, and the higher the probability that investors can get their saving back. This is because the rule of law induces not only more thoughtful a management, but brings about contracts enforcement and rights protection as well.

In addition, as chronic unemployment is commonplace in developing countries, the model allows for a contest over modern sector employment among grown up children and postulates an endogenous probability to secure well-paid positions. This probability depends on: (2) The relative number, *i.e.* quantity of children, and (3) average human capital levels, *i.e.* quality of children, as well as (4): the extent of job rationing in the modern sector as captured by an exogenous index ranging between 0 and 1.

These features allow me to show that for a given demand for labor in the modern sector, *i.e.* rationing index, the better the institutions, (1) the lower household fertility, (2) the

[2] The Rule of Law indicator is a measure of the extent to which agents have confidence in, and abide by the rules of society. Its index, which originally ranges between -2.25 and +2.25 is comprised of indicators that measure perceptions of the incidence of crime, judicial quality and honesty, and the enforceability of contracts. Kaufmann, Kraay and Mastruzzi (2003) offer an in-depth discussion of the methodology underlying its calculation.

higher savings, and (3) the higher old-age consumption. The fact that the model's quantitative implications almost match the recent fertility experiences of China and India clearly illustrates the relevance of the channel highlighted in this paper.[3]

Furthermore, because the probability to secure a modern sector position depends both on the quality and the quantity of children, I can afford investigating the issue of parental gender preference when allocating educational resources within the household.

1.2 This paper and sons preference

Parental preference for sons has now been widely documented. The PROBE survey, a study that covered five Indian states accounting for almost half of India's population in 1996, recently again adds to this empirical evidence. The PROBE survey reveals that: (1) Parents picture that returns to human capital investments are higher for boys, whereas an analysis of National Sample Survey data finds that each year of extra schooling raises men's productivity by 8 per cent, and women's productivity by 10 per cent.[4] (2) As Chart 2 in appendix points out, regardless of their socioeconomic background and location (states, gender, literacy status, occupation and cast), parents consider boys as assets in whose education it is sensitive to invest, while girls for their part are expected to leave their natal homes after marriage, hence the reason why the education of boys should be given priority. (3) The next chart in appendix documents that improved employment and income opportunities tops the list of motives for parental investment into sons' education.[5]

Such findings clearly point to the origin of gender educational gaps against young females,

[3]Recent experiences, including those of China (rule of law index for 1998 of -.22), Indonesia (-.97), and Russia (-.78), suggest that modernization does not necessarily come with the rule of law, which makes it unlikely that the latter might just be acting as a proxy for conventional modernization variables affecting fertility (e.g. female education). - Data source: United Nations Population Division http://www.esa.un.org/unppg/ and World Bank Institute, Governance and Anti-Corruption Resource Center.

[4]Center for Development Economics, *The Schools Environment: Public Report on Basic Education in India*, Oxford University Press, 1999, p 22.

[5]Other studies have found discrimination of girls to increase with education level of mothers in India - Miller (1981), and Das Gupta (1987).

another common feature among developing countries. In 2004, in 66 out of 108 countries, women's enrollment in primary and secondary education was lower than that of men by at least 10 percentage points. For all developing countries taken together, the female literacy rate was 29% lower than male literacy, women's mean years of schooling were 45% lower than men's, and females' enrollment rates in primary, secondary and postsecondary schools were 9%, 28%, and 49% lower, respectively, than the corresponding male rates - Todaro and Smith (2007) p 376. This picture, one can then argue, stems from parental selective provision to their progeny when allocating educational resources within the household, an argument also supported by the PROBE survey, as girls are found to be more easily withdrawn from school for economic motives.

Moreover, gender bias favorable to boys is often emphasized in explaining the "*missing women mystery*" along the health dimension of human capital. In Asia, the United Nations has found that there are far fewer females as a share of the population than would be predicted by demographic norms. Unlike developed countries where there are about 1.05 girls for every boy, in Asia in general there are 1.10 boys for every girl. Nobel laureate Amertya Sen (1992) points out that death of women is not just a matter of poverty *per se* because in Africa where poverty is more severe, the pro-male bias is lower than in Asia, which has higher income on average. Sen then emphasizes that a larger part of the explanation seems to lie with the poorer treatment of girls. However, it should be noted that the evidence on gender bias in Africa is mixed as some studies find a small pro-female bias, and others a small, and possibly, rising pro-male bias - Klasen (1996), and Svedberg (1996).

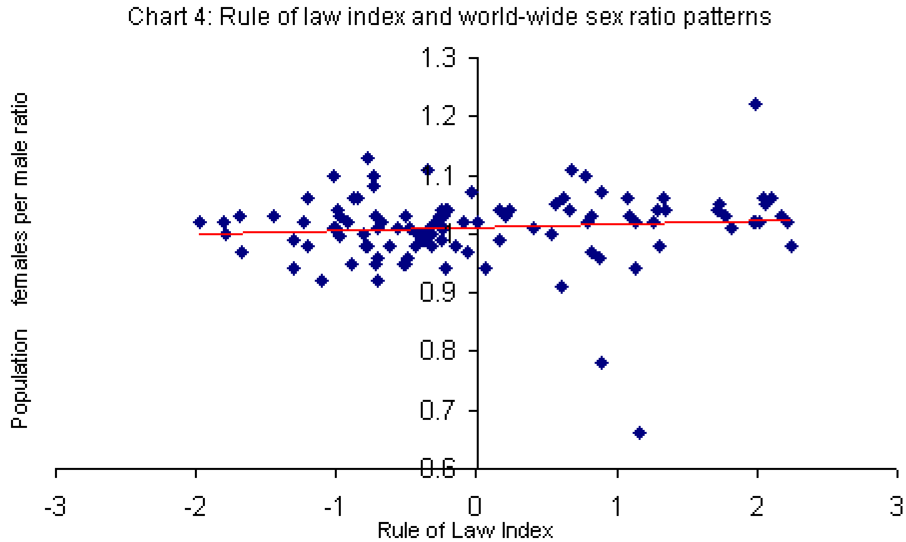
Using both cross-country analysis and natural experiment based on some recent vaccination campaigns, Oster (2005) also finds that discrimination is responsible for half of the 100 millions missing women as estimated by Amertya Sen (1992).

Overall, the evidence shows that increased family income does not necessarily mean improved health and / or education for girls, due to the gender bias in parental allocation of household's resources with regard to human capital investments. Drawing on Becker (1981), and Becker and Nigel (1976), a number of contributions have been made to provide a rational motivation for sex-selective mistreatment, including Rosenzweig and Schultz (1982), Klasen (1996), Agnihotri (1999), Edlund (1999), and Kojima (2005). Other recent contributions focus either on female bargaining power as in Qian (2005), or on constraints on resources facing families as in Garg and Morduch (1997).

Qian (2005) provides estimates of the effect of economic incentives on the sex ratios of surviving children in China, and shows that increases in the value of female labour increase the share of girls who survive, which suggests behavioral responses to economic incentives. On the other hand, Garg and Morduch (1997)'s study reveals that Ghanian children with three siblings are over 50% more likely to attend middle or secondary schools when all three of their siblings are sisters than when the three are brothers, with similar results for health outcomes. As pointed out by Ray (1998) p. 285, "*the study illustrates the importance of considering issues of gender within the context of markets and institutions available to households*," hence the avenue I shall pursue in this paper.

In my attempt to connect parental gender preference with the rule of law I also draw on Cain's (1986) analysis that "*deterrence is, indeed, one form of insurance and in the case of depredation - an important source of risk in rural Bangladesh - it is the function of mature sons to serve in preserving family property rights*." Hence one should expect the rule of law to crowd out gender-based, parental discrimination against females, especially as through better institutions people uncover more of their first period' saving, affording a higher share of self-financed old-age consumption. In clear, one expects the rule of law to make parents indifferent as whether to emphasize boys' or girls' education. In fact, to the extent that parental gender preference filters through a population sex ratio as suggested by Edlund (1999), Chart 4 point to the positive association between institutions' quality and more balanced gender practices.[6]

[6]The coefficient of correlation is to the order of 0.1 based on the same sample of countries as for chart 1. Sex ratio data are also from the United Nations Population Division.



In rationalizing the above-mentioned feature I first characterize gender preference as a Nash equilibrium outcome of a game involving the aggregate all families, completion upon which I evaluate parental bias using survey data for India and China. The model's quantitative implications tracks the sex ratio of both countries well, while pointing to a limited gender preference response to institutional improvements. I interpret these results as suggesting an important role for gender promoting policies while implementing the rule of law.

The remainder of this paper is structured as follows. Section 2 presents the model, which is solved and quantitatively assessed in section 3. Finally section 4 contains concluding remarks.

2 The model

Consider a two-period economy populated by M households, each of which bears up to n_j children at the beginning of the first period, with $j = 1, 2, ...M$, $(M \geq 2)$. Abstracting away from child mortality so as to focus on the two other sources of uncertainty, n_j also captures the number of a household's surviving children. Henceforth, all second-period variables are superscripted with a prime ($'$).

Households initially differ only in their asset or wealth endowments A_j, and at the end of the first period, adult members have one period left to live. Children in this environment do nothing apart from accumulating human capital, when offered. As adults, they compete with grown up children from other households for modern sector employment on the basis of their average human capital (quality), and number (quantity). As long as there is excess labour supply to the modern sector as common to many developing countries, there is no guaranty of employment even upon acquiring human capital. I capture labour market conditions with an index of job rationing, $\delta \in [0, 1]$, prevailing on this market. All things equal, the fewer job openings, the higher the value of δ, and the lower the probability, $\rho_j'(.)$, that the labour market contest can be successful to household $j's$ children.

However, prior to facing the labour market contest, household $j's$ offspring must acquire human capital through education, hence the child rearing burden lying with the household. In return for their provision, and depending on the earning profile of their offspring as adults, parents benefit from some old-age financial support. Yet, due to parental perception of relative returns to human capital investments as evidenced by the PROBE survey, it is assumed that parents might put less emphasis on females' education, hence the potential (endogenous) bias $\gamma_j \in (0, 1]$, unfavorable to girls. The stronger the bias, the lower the value of γ_j.

Clearly, the sequence of events is as follows: For a given social norm of gender preference, individuals first make their fertility decision, n_j, and choose their level of saving, s_j, realization upon which they choose a human capital investment strategy. I shall make the simplifying assumption that all households face the same equi-probability to give birth to either boys or girls. At equilibrium, parental choice of γ_j turns out to be consistent with the starting social norm of gender preference, hence my consistency check.

In addition to choosing their fertility (quantity of children), and a human capital investment strategy (quality of children), parents must decide on the level of their current consumption, c_j. Adults are also assumed to have access to a costless storage technology whereby current resources can be converted into old-age consumption. However, depending on institutions' quality, there is a non trivial probability, $1 - \pi(\zeta) > 0$, to loose one's saving, either because of spoliation, mismanagement by the receiving institution, misappropriation or else, hence the risk facing investors. The better the institutions, *i.e.* the higher the rule of law index $\zeta \in (0,1]$, the higher the probability, $\pi(\zeta)$, to get one's saving back. For simplicity, I shall let $\pi(\zeta) = \zeta$.

On the other hand, although saving is an option, there is no loss of generality in assuming that due to capital markets imperfections, a typical parent cannot use his offspring's earnings as collateral for a loan. To keep things simple I shall also assume that transfers to parents claim a fraction, α, of offspring's earnings as adults, with $\alpha \in (0,1)$.

Following Tertilt (2005), and Becker and Lewis (1973), I shall capture child rearing costs as implied by the socioeconomic environment and expressed in terms of the economy's numeraire, as a function, $\Gamma(n_j)$, properties of which follow:

Assumption A1: (*i*) $d\Gamma(n_j)/dn_j > 0$; (*ii*) $d^2\Gamma(n_j)/dn_j^2 \geqslant 0$; (*iii*) $\Gamma(0) = 0$.

Letting females and males face the same wage rate on the labour market, parental perception of relative returns to human capital investments implies that from the household's standpoint, devoting one unit of resource to a girl's (respectively, a boy's) education yields a human capital level of h'_f (h'_m) in the second period, with $h'_m > h'_f > 0$.[7] With n_{jm} sons and n_{jf} daughters to raise, and letting x_j (respectively, y_j) stand for the amount of resources allocated to a boy's (a girl's) human capital formation, household educational expenses in their distributional form amount to $x_j n_{jm} + y_j n_{jf}$, which yields an average human capital level of $\bar{h}'_j$ for household $j's$ offspring, with

$$\bar{h}'_j = \frac{x_j n_{jm} h'_m + y_j n_{jf} h'_f}{n_j}. \tag{1}$$

Equation (1) aligns with Becker and Lewis (1973) assumption of same quality for household $j's$ offspring and implies that the distribution of educational resources among siblings

[7]Human capital levels h'_m and h'_f need not be household, nor time specific because perceptions regarding their relative values matter only in orienting the bias. Otherwise they are by no means important to my results.

should not matter. Yet, I shall show that parental gender preference lowers the average human capital of their offspring.

Furthermore, as there is no guaranty that human capital investments will result into modern sector employment given the degree of job rationing, δ, for well-paid positions, I shall attach the following endogenous probability of success to household $j's$ offspring:

$$\rho_j'\left(\delta, n_j, \bar{h}_j'\right) = \frac{\left(N_j'\right)^{\delta}}{N'}, \tag{2}$$

with

$$N_j' = n_j \bar{h}_j', \tag{3}$$

and

$$N' = \sum_{l=1}^{M} \left(N_l'\right)^{\delta} = \sum_{l=1}^{M} \left(n_l \bar{h}_l'\right)^{\delta}. \tag{4}$$

This formulation states that for household $j's$ offspring, the probability to secure a modern sector position also depends on both their number (quantity), and average human capital (quality), relative to the economy's aggregate.[8]

The production side of this model economy consists of a modern sector on one hand, and a subsistence/traditional sector on the other hand. Both sectors produce the economy's consumption good, which I also take as the numeraire. When hired, an adult inelastically supplies labour to either sector. However, as disguised unemployment is widespread among developing countries, I shall assume a perfectly elastic demand for labour in the traditional sector, but hypothesized a highly inelastic demand in the modern sector, partly because of labour market regulations. The latter is also assumed to pay a higher wage rate, ω', relative to the traditional sector's wage rate, ω_I', *i.e.* $\omega_I' < \omega'$, both measured in natural log terms. I shall normalize $\omega_I' = 0$, so that ω' can be viewed as the wage premium for the skill-intensive, modern sector's workers. I also postulates individual price-takers, so that wage rates are exogenous from the standpoint of a typical household.

[8]Using household survey data from Bangladesh, Basu, Narayan and Ravallion (2002) find strong evidence of external effects of education on individual earnings within households. Gibson (2001) find similar results using Papua New Guinea data.

2.1 The problem of a typical household

A typical parent derives utility from consumption, c_j, and child-bearing, n_j. Through financial support she also derives some utility from having raised children whose earning profile as adults is W_j'. As most developing countries traditionally experience significant inflation, I shall assume a negligible real return on saving, *i.e.* $r \approx 0$, which implies that discounting, $\beta = 1/(1+r)$, can be ignored without further consequence as in Baland and Robinson (2000), and Rosenzweig and Schultz (1982). For simplicity, I shall also rule out parental bequest to their progeny, so that old-age financial assistance never arises from some patrimony preservation rationale based on investment-like motives. Hence, a typical household seeks to:

$$\max_{\gamma_j} \left(\max_{c_j, n_j, s_j} \{ u(c_j) + v(n_j) + u(c_j') \} \right),$$

$$s.\ t.\ c_j + s_j + \Gamma(n_j) \leq A_j \tag{5}$$

$$c_j' \leq \zeta s_j + \alpha W_j' \tag{6}$$

$$W_j' = \omega' \rho_j', \tag{7}$$

with

$$n_j = n_{jm} + \gamma_j n_{jf},\ c_j > 0,\ c_j' > 0,\ s_j \geqslant 0,\ n_j > 0,\ \gamma_j > 0,$$

where c_j (respectively, c_j') stands for current (next) period consumption, and n_{jm} (respectively, n_{jf}) captures the number of male (female) offspring. The functions u and v are assumed to be strictly increasing, strictly concave, and to satisfy Inada conditions.

Combining (7) and (6), and substituting budget constraints back into the objective function for an interior solution yield the following maximization program facing a typical household:

$$\max_{\gamma_j} \left\{ \max_{n_j, s_j} V(n_j, \gamma_j, s_j) \equiv u[A_j - s_j - \Gamma(n_j)] + v(n_j) + u\left(\zeta s_j + \omega' \alpha \rho_j'\right) \right\}. \tag{8}$$

It is worth noting that although the typical parent derives utility from both her sons and her daughters, she might prefer the former provided that $\gamma_j < 1$, hence the potential bias against females. Accounting for parental gender preference, and assuming that both genders share the same probability to show up at birth, so that $n_{jm} = n_{jf}$, the male-equivalent to any realized fertility can be written as follows:

$$n_j^p(\gamma_j) = (1 + \gamma_j)\, n_{jm}. \tag{9}$$

That is, assuming $\gamma_j = 1/2$ for instance, a four-child family including two girls is equivalent from a parental view-point to a family whose all three offspring are boys. However, as detailed below, parental preference for sons, if any, carries important implications for old-age support.

2.2 Gender bias inefficiency at a glance

From equation (7) let define the following expected old-age support from household j's offspring:

$$T_j' = \alpha\omega'\rho_j'. \tag{10}$$

Equation (10) suggests that children to parents transfers in the second period are higher, the higher the probability for the former to secure modern sector positions. However, this global picture hides some adverse effects pertaining to parental preference for sons.

To see this, suppose there is parental preference for sons. Then regardless of parental provision to their progeny, a typical household spends $\gamma_j < 1$ units on a girl for every unit spent on a boy. Hence provided that household j allocates x_j units to a boy's education, $y_j = \gamma_j x_j$ units will be allocated to a girl's human capital formation. Thus under the maintained assumption that boys and girls share the same probability to show up at birth and using equation (9), the total child-rearing burden lying with household j, $\Gamma(.) = x_j n_{jm} + y_j n_{jf}$, can be written as follows:

$$\Gamma(.) = (1 + \gamma_j)\, x_j n_{jm}, \tag{11}$$

where the left-hand side captures total child-rearing resources, say as implied by the socioeconomic environment, and the right-hand side stands for the allocation strategy implemented within the household. Equation (11) carries the implication that through gender selective practices, a household might curtail child-rearing costs, since $\Gamma\left(n_j^p\right) < \Gamma(n_j)$ whenever $\gamma_j \neq 1$.

Furthermore, absence any parental gender preference, *i.e.* $\gamma_j = 1$, it is easy to see from equation (11) that for a given provision of educational resources, $\Gamma(n_j)$, each child enjoys the same level of parental investment, no matter her gender:

$$x_j = \frac{\Gamma(n_j)}{n_j}. \tag{12}$$

Equations (9) and (12) clearly map parental gender preference, if any, into a specific distribution of child rearing resources. To see this, assume the cost function is linear in the number of children under assumption A1, then it is apparent that parental gender preference leaves a boy's educational resources, x_j, unchanged, while reducing educational expenses on females , since $y_j = \gamma_j x_j$.[9] Hence reductions in child rearing costs are clearly implemented at the expense of female offspring. This analysis suggests a double counting if one were to investigate both parental gender preference and the household's human capital investment strategy in the same framework. This is because the former maps into the latter. Therefore, from now on, I shall focus only on the gender preference aspect.

From equation (1), substituting in $y_j = \gamma_j x_j$ along with equations (12) and (9), the average human capital of household $j\prime s$ offspring collapses to

$$\bar{h}_j'\left(n_j, \gamma_j; h_m', h_f',\right) = \frac{\left(h_m' + \gamma_j h_f'\right)}{(1+\gamma_j)} \frac{\Gamma(n_j)}{n_j}. \tag{13}$$

Equation (13) illustrates the crucial role of beliefs in this model economy. Letting the cost function be linear for instance, gender selection stands as a human capital improving device from a parental view-point, *i.e.* $\left(\partial \bar{h}_j'/\partial \gamma_j\right) < 0$. Notice that this result obtain because of the parental perception of relative returns to human capital investments, *i.e.* $h_m' > h_f' > 0$.

Substituting (13) back into equation (2) shows that household $j's$ offspring face the following probability to secure modern sector positions:

$$\rho_j'\left(n_j, n_{-j}, \delta, \gamma_j, \gamma_{-j}, h_m', h_f'\right) = \frac{\left[\kappa_j'\left(\gamma_j; h_m', h_f'\right)\Gamma(n_j)\right]^{\delta}}{\sum_{l=1}^{M}\left[\kappa_l'\left(\gamma_l; h_m', h_f'\right)\Gamma(n_l)\right]^{\delta}}, \tag{14}$$

[9]On the other hand, if rearing costs increase at an increasing pace, then gender preference also reduces boys' educational resources, yet less than what a female will be experiencing.

where the adjusting factor for parental gender preference, κ_j, is as defined below:

$$\kappa_j' \left(\gamma_j; h_m', h_f'\right) = \frac{h_m' + \gamma_j h_f'}{1+\gamma_j}, \qquad j = 1, ...M. \tag{15}$$

Equation (14) suggests that the labour market outcome for household $j's$ offspring mainly depends on the relative importance of their educational resources after controlling for parental gender preference. The latter is shown to have important implications for old-age support as formally stated in the following lemma:

Lemma 1 *Let* $\xi = [n_j/\Gamma(n_j)]\, d\Gamma(n_j)/dn_j$ *capture the child number elasticity of the cost function,* $\xi \geq 1$. *Then for a given quality of institutions,* ζ *:*

(Part one) In the absence of any competition for modern sector positions, i.e. $\delta = 0$, *parental gender preference has no incidence on old-age support .*

(Part two) Whenever there is some job rationing in the modern sector, i.e. $\delta > 0$, *old-age financial support tends to be lower the stronger parental bias.*

Proof. Part one obtains by letting $\delta = 0$ in equation (14).To prove part two, first substitute equation (14) back into equation (10) using equation (9). The result then follows by way of differentiation with respect to γ_j, letting $\delta > 0$.

This ends the proof. ■

Lemma one arises as gender preference brings about parental under provision to their progeny in household j, leading to a lower human capital on average, and ultimately to a smaller probability to secure a well-paid position.

The next section solves the model for parental optimal choices.

3 Solving the model

Parents may clearly have a gender preference even prior to procreating. However, prenatal sex selection is out of the scope of this paper. Hence I use a two-stage game approach in solving the model outlined in the previous section. More specifically, for a given social norm of gender preference $\widehat{\gamma}$, a typical household first makes a joint fertility - saving decision, realization upon which parents choose a gender preference. The latter eventually turns out to reproduce the social norm of gender preference $\widehat{\gamma}$, hence my consistency check.

In characterizing fertility decisions as a Nash-equilibrium of a non-cooperative game, let denote each household as player j, (with $j = 1, ...M$). For a given social norm $\gamma_j = \gamma_{-j} = \widehat{\gamma}$, all j, let also $B_j \subset \mathbb{N}^*$ denote the strategy set of player j, with generic element n_j, whereas $B \equiv B_1 \times B_2 \times ..... \times B_M$ denotes the space of all feasible strategy profiles, with generic element n. I can define a real-valued function $V^j : B \rightarrow \Re$ by $w_j = V^j\left(n_j, s_j; n_{-j}, \gamma\right)$, where w_j denotes the payoff to player j when the strategy profile $n = (n_j, n_{-j})$ is played, and n_{-j} denotes the strategy profile chosen by the aggregate all players other than player j.

From equation (8), substituting in equation (14) and rearranging terms yield player $j\prime s$ payoff function as follows:

$$w_j = u\left[A_j - s_j - \Gamma(n_j)\right] + v\left(n_j\right) + u\left(\zeta s_j + \alpha\omega'\rho_j'\right), \tag{16}$$

all j.

In sake for tractability, from now on I shall consider the following functional specifications: $u\left(c\right) = \ln\left(c\right)$, $v(n) = \ln\left(n\right)$, and $\Gamma(n) = n$.[10] I shall also assume strong competition for modern sector employment, *i.e.* $\delta = 1$, which is done without any loss of generality as the focus of the paper isn't on labour market imperfections.

Given n_{-j}, player $j's$ best response satisfies the following first order conditions for the optimal levels of saving and fertility respectively:

$$\left(A_j - s_j - n_j\right)^{-1} = \left(\zeta s_j + \alpha\omega'\rho_j'\right)^{-1}\zeta, \tag{17}$$

and

$$\frac{n_j}{A_j - s_j - n_j} = 1 + \frac{\left(1 - \rho_j'\right)\alpha\omega'\rho_j'}{\zeta s_j + \alpha\omega'\rho_j'} \tag{18}$$

The left hand-side in equation (17) gives the marginal opportunity cost of saving through conventional channels (less consumption), whereas the right hand-side gives the associated marginal benefit in the subsequent period (self-financed old-age consumption). Equation (17)

[10] Following Dessy and Pallage (2005) I assume that there exists a positive factor τ, which I normalize to 1, and which converts a unit of the household's endowment into human capital.

suggests a role for institutions' quality in driving the arbitrage between current and next period consumption. Clearly, based on equation (17), household $j's$ saving under conventional forms can be expressed as follows:

$$s_j\left(n_j,\rho_j';\zeta,A_j,\omega'\right)=\frac{1}{2}\left(A_j-n_j\right)-\frac{\alpha\omega'}{2\zeta}\rho_j', \tag{19}$$

hence the lemma:

Lemma 2 *(Part one) Saving through conventional channels tends to be higher the better the institutions.*

(Part two) Parental saving tends to be lower the larger the family.

Proof. The results follow from equation (19) by way of differentiation with respect to ζ and n_j respectively. ■

Since children are often viewed partly as economic investment goods in developing countries, part two in lemma 1 suggests an additional trade-off between saving through conventional channels and procreation. This is because financial support from grown up children is a perfect substitute for parental saving with regard to old-age consumption, especially in the presence of weak institutions. Clearly, equation (18) shows that when making their fertility choice, households typically weigh the marginal opportunity cost of child-bearing in terms of forgone consumption (left-hand side), with the associated marginal benefits (right-hand side), where the latter derives from a direct benefit, $(v\left(n_j\right))$, and an expected gain stemming from old-age financial assistance. The next lemma rationalizes the importance of institutions' quality in driving parental preference of a saving scheme.

Combining the right-hand sides in equations (17) and (18) respectively, one arrives an arbitrage condition between saving through child-bearing and saving under more formal channels. Hence I can define a net marginal gain of saving through conventional channels as:

$$\Pi\left(\zeta\right)\equiv\frac{\zeta-\left(1-\rho_j'\right)\alpha\omega'\rho_j'}{\zeta s_j+\alpha\omega'\rho_j'}-1, \tag{20}$$

from which the result follows:

Lemma 3 *The net marginal gain from saving under conventional forms tends to be higher, the better the institutions.*

Proof. The proof follows by differentiating (20) with respect to ζ. ■

As Kaufmann, Kraay and Mastruzzi (2003) find weak institutions to be commonplace in developing countries, lemma 3 suggests that this feature may have something to do with the overall fertility rates of those nations. The next section investigates this issue in more details.

3.1 Institutions, fertility, and old-age consumption

In rationalizing the connection between institutions' quality and household fertility in developing countries, as well as the implications for old-age consumption, I shall simplify the exposition by focussing on a two-household economy, which clearly entails no loss of generality.

Substituting equation (19) back into equation (18) yields

$$\frac{\left(1-\rho_j'\right)\alpha\omega'\rho_j' - \zeta n_j}{\left(A_j - n_j\right)\zeta + \alpha\omega'\rho_j'} + \frac{1}{2} = 0, \tag{21}$$

where, using $\kappa_j' = \kappa_{-j}'$ (since $\gamma_j = \gamma_{-j} = \gamma$, all j),

$$\rho_j' = \frac{n_j}{\sum_{l=1}^{M} n_l}. \tag{22}$$

Since Lilard and Willis (1997)'s empirical study reveals that $0.01 < \alpha < 0.1$, and because $\rho_j' \in (0,1)$ at interior solutions, there is no loss of information in letting $\alpha * \left(\rho_j'\right)^2 \approx 0$, which implies that the bias inefficiency as highlighted in lemma 1 is only negligible at the margin.[11] Letting the subscript R, (respectively U) stand for a rural (urban) household, equation (21)

[11] Arguably, the assumption that $\alpha\rho_j^2 \approx 0$ could be questioned on a purely mathematical ground, if say, ρ_j is close to 1. However, in the context of developing countries, that would raise the issue as to how empirically plausible is the idea that a modern sector's job seeker has almost 100% chance to secure a position. It is also worth noticing that for $M \geq 2$, $\left(1-\rho_j\right)\rho_j$ hits an upper bound at $\rho_j = 0.5$.

suggests that if the pair (n_R^*, n_U^*) is to be a Nash equilibrium, parental fertility choices must satisfy:

$$3\alpha\omega'\rho_R' + A_R\zeta = 3\zeta n_R, \tag{23}$$

$$3\alpha\omega'\rho_U' + A_U\zeta = 3\zeta n_U. \tag{24}$$

That is, using equation (14), and taking the ratio of (23) to (24), and arranging terms,

$$\frac{n_R}{n_U} = \frac{A_R}{A_U}. \tag{25}$$

Hence the result:

Proposition 1 *For a given quality of institutions as captured by the of rule of law index, ζ, the Nash equilibrium in pure strategy of this game is given by equation (25) and:*

$$n_R^*(\zeta, \omega', A_R, A_U) = \frac{A_R}{3} + \frac{\alpha\omega' A_U}{(A_U + A_R)\zeta} \tag{26}$$

Proof. The proof follows by substituting (25) back into (23) and then arranging terms. ■

Proposition 1 points to an important role for both economic factors and institutions' quality in private fertility choices. The next proposition highlights the properties of the underlying connections.

Proposition 2 *The Nash equilibrium profiles, $n_j^* \equiv \eta(\zeta, \omega', A_j, A_{-j})$, $j = R, U$, of this game satisfy: (i) $\eta_{A_j} \lesseqgtr 0$; (ii) $\eta_\omega > 0$, and (iii) $\eta_\zeta < 0$.*

Proof. The proof proceeds by way of differentiation of (26) with respect to each of the arguments. ■

Although wealth effect seems to be ambiguous based on part one in proposition 2, equation (25) clearly shows that this effect is indeed at play, hence the standard income effect of the conventional theory of household fertility. On the other hand, part 2 in proposition 2 points to a pervasive effect arising from high stakes been placed on human capital investments. Part 2 shows that all things equal, the typical family size is larger, the higher the potential return to child-bearing as captured by the forecasted wage rate.

Part 3 stands as the most important result in proposition 2. Under the maintained assumption of strong competition for modern sector jobs as hypothesized earlier, part 3 states that weak institutions bring about large family sizes. The intuition of this result is as follows: Because weak institutions tend to discourage conventional forms of saving / investments as suggested by part 1 in lemma 2, children-to-parents transfers need to take over parental saving in financing old-age consumption. However, given the competition for well-paid positions, old-age consumption might still be negligible, hence the parental strategy to widen the financial support basis by increasing family size. Part 3 ultimately suggests that in the absence of sound institutions, the standard argument resting on the higher opportunity costs for mother's time may not hold because current earnings cannot safely be converted into old-age consumption. Therefore, in addition to increases in female nonagricultural employment opportunities, better institutions are necessary if one is to expect changes in fertility behaviors in developing countries.

Furthermore, better institutions are shown to foster saving and bring about more of old-age consumption. To see this, first substitute the Nash equilibrium levels of fertility back into equation (19) to arrive the following expression for saving:

$$s_j^*(\zeta, A_j, A_{-j}, \omega') = \frac{1}{2}\left[A_j - \eta(\zeta, \omega', A_j, A_{-j})\right] - \frac{\alpha\omega'}{2\zeta}\frac{A_j}{A_j + A_{-j}}, \qquad j = R, U. \tag{27}$$

Combining equations (6)-(7), along with equation (27) and substituting in the Nash solution levels of fertility then yield old-age consumption as follows:

$$c_j^{*\prime}(\zeta, \omega', A_j, A_{-j}) = \frac{\zeta}{2}\left[A_j - \eta(\zeta, \omega', A_j, A_{-j})\right], \tag{28}$$

from which the following result derives:

Proposition 3 *Both saving and old-age consumption are higher the better the institutions.*

Proof. The proof follows by totally differentiating equations (27) and (28) with respect to ζ, using $\eta_\zeta < 0$, and $\Gamma(n_j^*) = n_j^* < A_j$ (budget constraint).

This ends the proof. ■

The result in proposition 3 arises as the rule of law increases the net marginal gain of saving through conventional channels, especially as this is deemed better an option than procreation, given job rationing in the modern sector. Hence, to the extent that the aggregate of all households bears the responsibility as a society to make institutions better, proposition 3 highlights some of the benefits stemming from such a move. I quantitatively assess these gains in a section to come.

Because better institutions lessen the need for old-age financial support and hence cause fertility to decline, it is worthwhile investigating the extent to which implementing the rule of law might also take care of gender-based discrimination in societies where relative returns to human capital are still subject to some strong subjective valuation. The next section addresses this point.

3.2 On institutions and sons preference

Letting the typical household stand as a player j as before, (with $j = 1, ...M$), I shall first characterize parental gender preference as a Nash-equilibrium outcome of a non-cooperative game between the respective families.

Given the realized fertility and saving levels from the first stage of the game, let $\Omega_j \equiv \left[\underline{\gamma}, 1\right]$ be the strategy set of player j, with generic element γ_j. Let also $\Lambda \equiv \Omega_1 \times \Omega_2 \times ..... \times \Omega_M$ capture the space of all feasible strategy profiles with generic element γ. I can define a new real-valued function, $\vartheta^j : B \rightarrow \Re$ by $\theta_j = \vartheta^j \left(\gamma_j; n_j^*, s_j^*, n_{-j}^*\right)$, where θ_j denotes the payoff to player j when the strategy profile $\gamma = (\gamma_j, \gamma_{-j})$ is played, and γ_{-j} is the strategy profile chosen by the aggregate all players other than player j.

From equation (16), substituting in equations (14) and (19), while using (9) for the male-equivalent to the Nash fertility profile $\eta\left(\zeta, \omega', A_j, A_{-j}\right)$, the male-equivalent to the Value function which household j seeks to maximize can be written as follows:

$$\max_{\gamma_j} \theta_j = \ln\left[\zeta A_j - (1+\gamma_j)\,\zeta n_{jm}^* + \alpha\omega'\rho_j'\right] + \frac{1}{2}\ln\left[(1+\gamma_j)\, n_{jm}^*\right] - \frac{1}{2}\ln 4\zeta, \qquad (29)$$

where

$$\rho_j'\left(\zeta,\omega',A_j,A_{-j},h_m',h_f',n_{jm}^*,n_{-jm}^*\right)=\frac{\left(h_m'+\gamma_j h_f'\right)n_{jm}^*}{\sum_{l=1}^{M}\left(h_m'+\gamma_l h_f'\right)n_{lm}^*}. \tag{30}$$

Hence, applying the Envelop theorem and using the two-household framework, if the pair (γ_R^*,γ_U^*) is to be a Nash equilibrium at this stage of the game, parental gender preferences must satisfy the following first order conditions for player R and U respectively:

$$\frac{\zeta n_{R,m}^*-\left(\rho_U'\right)^2\alpha\omega' h_f' n_{R,m}^*/\left(h_m'+\gamma_U h_f'\right)n_{Um}^*}{\zeta A_R-\left(1+\gamma_R\right)\zeta n_{R,m}^*+\alpha\omega'\rho_R'} = \frac{1}{2\left(1+\gamma_R\right)}, \tag{31}$$

$$\frac{\zeta n_{R,m}^*-\left(\rho_R'\right)^2\alpha\omega' h_f' n_{Um}^*/\left(h_m'+\gamma_R h_f'\right)n_{R,m}^*}{\zeta A_U-\left(1+\gamma_U\right)\zeta n_{U,m}^*+\alpha\omega'\rho_U'} = \frac{1}{2\left(1+\gamma_U\right)}. \tag{32}$$

Under the maintained assumption that $\alpha*\left(\rho_j'\right)^2\approx 0$, taking the ratio of equation (31) to equation (32) and then moving terms around while using the male-equivalent to equation(25), *i.e.* $n_{U,m}^*=\left(1+\gamma_R\right)A_U n_{R,m}^*/\left(1+\gamma_U\right)A_R$, one arrives the following equilibrium relation between parental gender preferences:

$$\gamma_U^*=\gamma_R^*. \tag{33}$$

Substituting (33) back into (31) then yields the following result:

Proposition 4 *The Nash equilibrium profile in fertility* $n_j^*\equiv\eta\left(\zeta,\omega',A_j,A_{-j}\right)$, $j=U,R$, *underlies a Nash equilibrium profile in parental gender preference as defined below:*

$$\widehat{\gamma}\equiv\gamma^*\left(\zeta,\omega',A_R,A_U\right)=\frac{A_R}{3n_{R,m}^*}\left[1+\frac{\alpha\omega'}{\left(A_R+A_U\right)\zeta}\right]-1. \tag{34}$$

Proposition 4 rationalizes gender discriminatory social norms as an equilibrium outcome arising endogenously from the interaction of private optimizing agents. Notwithstanding the importance of the result in proposition 4, an important issue is whether such an equilibrium in fact involves any parental gender preference at all, *i.e.* $\widehat{\gamma}<1$. In clear, knowing how the first component in the right-hand side of (34) compares to 1 is essential to the analysis. I shall therefore quantitatively assess the extent of parental bias in the next section.

Prior to the quantitative exercise, it is worth stating the paper's last proposition. To that goal, first substitute (25) and (33) back into (14) to arrive the following equilibrium probability to secure modern sector employment:

$$\rho_j'^* = \frac{A_j}{A_j + A_{-j}}, \qquad j = U, R, \tag{35}$$

Proposition 5 *The wealthy the household, the higher the probability to secure well-paid jobs.*

Proof. The result follows from equation (35) by way of differentiation. ■

Proposition 5 is important in that it shows the ultimate irrelevance of both child-bearing and gender selective strategies as devices to alter the probability that one's offspring can secure modern sector positions. The result shows that relative wealth endowments sort households' probabilities in equilibrium while children from richer families top the distribution. This is because child rearing costs increase with family size, and wealthy households bear more - see equation (25) or the income effect of the conventional theory. Hence, a common gender preference in equilibrium implies that on average, children from richer households benefit from more investment, making their average human capital higher. I consider the model's quantitative implications next.

3.3 A quantitative assessment

In assessing the quantitative relevance of the channel highlighted in this paper I shall use some survey data from India - for consistency with the PROBE survey, and China - as a robustness check. In both cases, I allow financial transfers, *i.e.* α, to account for 9.2%, or 2.4% of children's earnings as estimated by Lilard and Willis (1997) for Malaysia.

Data for India are from the National Sample Survey Organization - NSSO for the 1991-92's round. The survey sample includes 20,606 urban (mean assets 144,000 Rs), and 36,425 rural households (mean assets 107,000 Rs) respectively, with response rates as high as 94.4% in the former area, and 95.7% in the latter.[12] I shall consider these mean values in natural log, and assume a wage premium of 2.07 as estimated by Desjonquiere, Machin and Van

[12]Assets include buildings, land, financial assets, household durables, production assets and debt.

Reenen (1999) for India. To re-scale the rule of law indexes constructed by Kaufmann, Kraay and Mastruzzi (2003) in such a way that all countries' indexes lie between 0 and 1, I have added +2.25 to each observation and then divided the result by 4.5. This exercise then yields an aggregate index of 0.55 for India, and 0.45 for China.

Data for China are from a 1996 household survey conducted by the Chinese Academy of Social Sciences (CASS), which drew from the large sample used by the National Bureau of Statistics (NBS) in its annual household survey. The CASS survey covers 19 provinces and 102 counties in rural China, and 12 provinces and 69 cities in urban China. The survey sample includes 6934 urban (mean assets 13,700 yuan), and 7,998 rural households (mean assets 11,427 yuan) respectively, whose asset values are also considered in natural log.[13] The wage premium is taken to be 1.364 as estimated by Owen and Yu (2003) using a panel of 29 provinces of China over the years 1986 to 2001.

Based on sample weighted means of rural and urban households, Table 1 displays total fertility rates, n_T, saving, s_T, and consumption, c_T, and c'_T, as implied by the model, under various scenario. For each scenario, values for the Nash equilibrium solution in parental gender preference are also computed. In addition, Table 1 reports India's and China's fertility rates, n_{98}, and populations' sex ratios, γ_{98}, *i.e.* females per male, for 1998 as estimated by the United Nations' Population Division. Model-based calculations first use each country's rule of law index for 1998, ξ_{98}, and then considers an hypothetical situation where indexes are twice as high as their true values, ξ^{sim}. Hence, not only can one compare the model's implications with real world values, but simulated results can also be compared with actual solutions, for a conservative scenario - lowest value for α as estimated by Lilard and Willis (1997), and for the benchmark case - highest α.[14]
Interesting enough, model's quantitative implications track actual values quite well, and the results suggest country-specific responses to institutions' improvement, while always aligning

[13]Assets include land, housing property, financial assets, fixed production assets, durable goods and non-housing liability. For further details regarding the CASS survey, see Shi Li and R. Zhao (2007).

[14]In Lilard and Willis (1997), $\alpha = 0.024$ refers to situations where only wife's parents are eligible to financial transfer, whereas $\alpha = 0.092$ refers to cases where both wife's and husband's parents are eligible.

Table 1: Quantitative Implications

Transfer	*A. Conservative estimates:* $\alpha_{\min} = .024$					
	China			India		
	n_{98} : 1.78		γ_{98} : .94	n_{98} : 3.43		γ_{98} : .94
R. of Law	ζ_{98} : .45	ζ^{sim} : .9	$\Delta\zeta$: 100%	ζ_{98} : .55	ζ^{sim} : 1	$\Delta\zeta$: 81.8%
n_T	1.4	1.38	-1.43%	3.94	3.92	-.5%
s_T	1.33	1.35	1.5%	3.85	3.88	.8%
c_T	1.37	1.37	0%	3.89	3.88	-.2%
c'_T	.60	1.22	101.7%	2.13	3.88	82.16%
γ	.96	.98	2.08%	.986	.994	.8%
Transfer	*B. Benchmark estimates:* $\alpha_{\max} = .093$					
n_T	1.51	1.43	-5.3%	4.07	4	-1.72%
s_T	1.225	1.3	5.77%	3.73	3.8	1.87%
c_T	1.365	1.37	.4%	3.88	3.88	0%
c'_T	.58	1.2	106.6%	2.09	3.85	84.2%
γ	.87	.94	8%	.94	.965	2.66%

with the model's theoretical predictions.

Overall, the results in Table 1 call for three major remarks. First, regardless of the rule of law, individuals save less (respectively, more), the higher (the lower) old-age support (α). Yet, first period consumption is robust to both the rule of law, and the extent of financial assistance expected in old-age. This clearly highlights parental arbitrage between child-bearing and saving under conventional forms. The results in Table 1 point to a substitution away from child-bearing as institutions improve, a feature that lemma 3 rationalizes by individuals' willingness to take advantage of the incremental benefit of saving under conventional forms.

Second, owing to the fact that parental bias is lower, the better the institutions, higher levels of saving clearly obtain without further selection against females.

Third, and notwithstanding the above, the rule of law cannot overturn parental gender preference to match the females per male demographic norm of 1.05. For India, the results in Table 1 show that parental bias persistently remains below unity, and this outcome is robust to both the rule of law and the extent of old-age financial assistance.[15] These results clearly warm against the limits of free markets' institutions as a device to eradicate gender discrimination, especially in societies where returns to human capital investments are still perceived to be favorable to men. Hence the paper advocacy for active gender promoting policies while implementing the rule of law, if one is to draw the full benefits stemming from sound institutions.

4 Concluding remarks

This paper formally rationalizes the connection between institutions' quality and fertility choices in developing countries, while shedding light on the endogenous origin of gender discriminatory social norms for which a Nash-equilibrium rationale is provided. As institutions improve, individuals are shown to substitute away from child-bearing, to save more, and to afford more of old-age consumption, while selecting less against females. All the results are derived in a clear and testable manner.

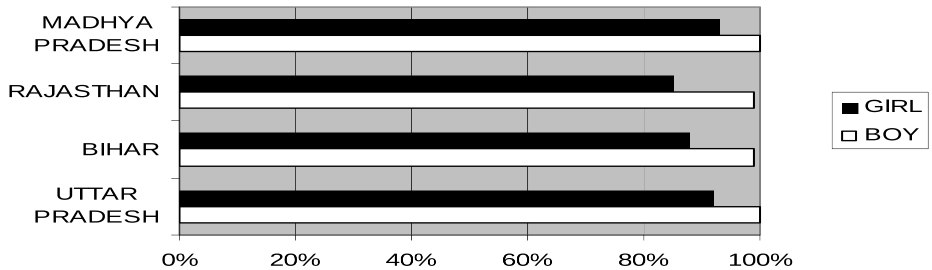
On the quantitative ground, the model's implications closely track the recent fertility figures of India and China, the world's most populated economies. To the extent that parental gender preference filters through a population sex ratio as suggested by Edlund (1999), the model also does well at predicting the recent sex ratios of both countries. Yet, while the rule of law is shown to foster more gender-balanced practices, the results suggest an important role for gender promoting policies in order to make it to the demographic norm of 1.05 females per male.

[15] The same results show for China, *i.e.* assuming $\zeta^s = 1$, $\gamma = .98$ when $\alpha = .024$ and $\gamma = .93$ if $\alpha = .093$

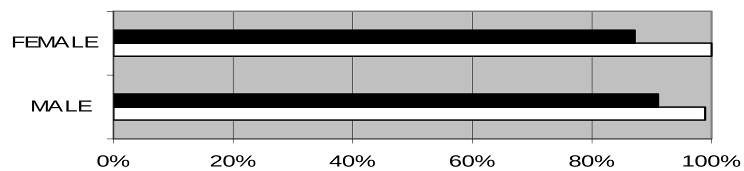
Chart 2: Parental Social Background

Proportion (%) of respondents who consider it important for a boy/girl to be educated.

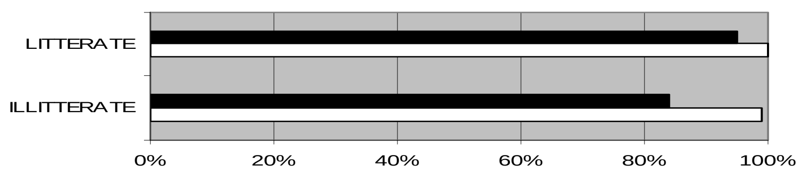
States



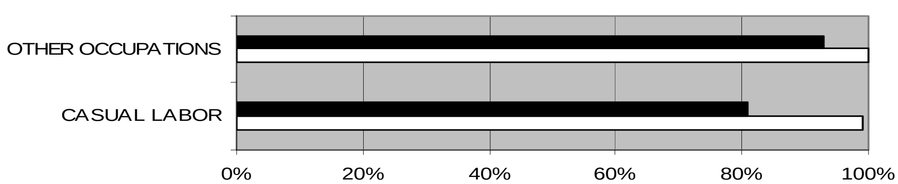
Gender



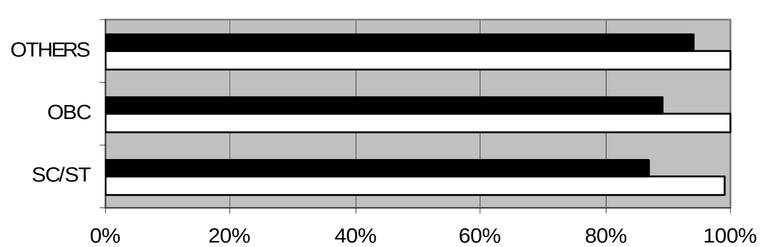
Literacy status



Occupation



Caste



Source : PROBE Survey

Chart 3: Education and parental motivations.

Why Parents Want to Educate Their Children

Is it important for a boy to be educated?		Is it important for a girl to be educated?	
YES	98%	YES	89%

If "YES", why?*
(most frequently-cited reasons)

BOYS		**GIRLS**	
1. Improves employment and income opportunities	87	1. Helps to write letters and keep accounts	50
2. Improves social status	29	2. Improves employement and income opportunities	40
3. Improves self-confidence or self-esteem	24	3. Improves marriage prospects	35

* Percentage of respondents who mentioned the stated reason.
The responses are not mutually exclusive.

Source: *PROBE Survey.*

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