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Breadwinner's Education and Household's Income in India

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ABSTRACT

I examine the relationship between the level of education of a household breadwinner and the relative position on a ten-digit scale of household total income. The dataset allows for avoiding usual sample selection biases. Using data from India, I show that the education of the breadwinner is a good predictor of the income of the household. The contribution of secondary and tertiary education is positive, and this result is strong especially for the self-employed. The data suggest also that an increase in inequality among self-employed appears more likely than among part time and full time employees.

Keywords: India, income, education, breadwinner

JEL Classification: D31, I21, R20

Mathematics Subject Classification: 62P10

1. INTRODUCTION

The relationship between individual education and income in developing countries has been widely studied. The extant works cover Asian countries (see Behrman, 1999; Glewwe and Jacoby, 2004; Hawley, 2004; Selim, 2016), and, to a lesser extent, Africa (Söderbom et al., 2006; Oliveira-Martins and Moniz-Fernandes, 2008; Kuepie et al., 2009;). Among Asian countries, particular attention has been paid to China, India and Vietnam (van de Walle and Gunewardena, 2001; Duraisamy, 2002; Li, 2003; Wu and Xie, 2003; Yang, 2005; Fleisher et al., 2005; Korinek, 2006; Kaushik et al., 2006; Chen and Hamori, 2009). All these works aim at estimating the rate of return to education in a specific country, or at providing intra-country comparisons with respect to this variable.

The main findings of this extensive literature are: 1) in developing countries returns to primary education tend to be higher than returns to higher education (but the evidence is not conclusive); 2) the returns are increasing over time; 3) experience correlates positively with the rate of return to education[1] (this is to say that experience represent a sort of informal[2] education). The lack of demand for specialized and skilled labour in these countries may explain the first result The cited literature highlights also at least two main problems at the empirical level: 1) a sample selection bias arising from the use of databases of firm databases and 2) the correlation between the error term of OLS estimates and (some of) the independent variables (namely the individual wage, or the individual total income)[3].

The extant literature, however, does not study whether a relationship between the education level of the breadwinner of a household and its total income exists. The issue is both interesting and problematic, because entails positive externalities. It is indeed highly probable that the spouse of a highly educated person has a high level of education as well. In addition, it is likely that both come from rich families, especially when considering developing countries. The positive externality is represented by the ability of attracting (and marry) people of the own socio-economic status. However, it is not so straightforward that a positive and strong correlation between the level of education of the breadwinner and the total income of a household exists. Unfortunately, the presence of the mentioned externality has some important consequence in terms of econometrics. In particular, when the income of the household is the dependent variable and the level of education of the breadwinner is a control, the latter is likely positively correlated with the error term. Hence, this renders the magnitude of the estimated effect questionable. Consequently, a precise estimate of the effect is not possible; however it is possible to provide evidence in favour of or against a positive effect of the education level of the breadwinner on the income of his/her household. This is precisely the aim of this paper. This topic is interesting to study, as, for example, several health-related behaviours and conditions depend on the income of the household (Violato et al., 2009). It must also be noted that very often the education level of the breadwinner is easier to be known than the income of the household.

The presence of the mentioned positive externality is not a major problem in the context of this paper, as the externality is part of the total return to education. However, in order to isolate the effect of the education of the breadwinner the presence of a second working person (namely the spouse/mate of the breadwinner) in the household is accounted for. This does not rule out the externality, but simply makes explicit one of its components. Since the focus of the present work is on the return to the education of the breadwinner in terms of household (and not individual) income, the production of this externality can be considered as a part of the return, and hence its inclusion in the analysis is the right choice.

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[1] However this is a general finding: it is not strictly related to developing countries.

[2] I.e. not acquired attending school.

[3] This is a problem of omitted relevant variable(s) rather than a matter of endogeneity, as claimed by a large part of the cited literature. It is not possible that income is endogenous to education, when cross sectional data are considered. Indeed the level of education may depend on income, but it is extremely unlikely that education in year t depends on income in the same year.

The topic is worthy to be examined particularly in India, where the society is evolving, but is still permeated by traditional cultural traits, especially for what relates inter-familial relationships (see for instance Sen, 2005). Therefore, in such a context the education of the breadwinner seems a major factor in determining the income of the household. Moreover, not only India is one of the most important developing countries nowadays, but it also has the second largest population in the world. Finally, the paper uses data that suitable to solve the problem of selection bias, and uses an econometric model that preserves the standard controls, and opens the door to an interpretation of the results wider than the usual.

In what follows I will discuss deeper the point mentioned before. The dataset used in this paper allows for solving the sample selection bias, since they are representative of the whole Indian population and are not restricted to the workers of some firms only; indeed, they also include self-employed workers[4]. All the occupational statuses for which the total income is available are considered: workers (full-time, part-time, and self-employed), housewives, retired, students and unemployed. Second, the dataset divides the income of the responders' households in deciles. To assess the impact of education on the probability of belonging to a specific decile of income I will estimate maximum likelihood models through ordered probit. This goes beyond the traditional study of the rate of return to education, and shows the premium of education in relative terms with respect to the national scales of income. This analysis is different from that obtainable from absolute rates of return to education. However, this approach provides information about the return to education in terms of the change in the probability of attaining a specific decile of income rather than the lower one. Moreover, this analysis allows for evaluating the contribution of education in determining the relative position of the individual in the scale of incomes.

This paper does not solve the problem of correlation between the education of the individual and the error term, but shifts the goal of the analysis so to decrease the relevance of this problem. In other words: although the problem persists, it is not a major concern for the scope of the present work. The paper contributes to the extant literature under two aspects. First, it presents India as case study. India is not only one of the biggest developing countries, but it is also characterised by strong gender inequality. This entails that households strongly depend on the breadwinner's income and, therefore, understanding the role of his education on the household income is particularly relevant. The other contribution is to show that in a developing country as India, the education of the breadwinner is a good proxy for the total income of a household.

The main results of the paper are: 1) the level of education of the breadwinner and the decile in which the household income falls are positively correlated overall; 2) tertiary education actually allows for reaching the highest deciles of the distribution; 3) no gender effect is detectable: the sex of the chief wage earner does not affect the position of the household on the income scale.

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[4] Nevertheless some restriction is needed, as the chief wage earner of a household must have some source of earnings by definition, and this source is a job very often.

2. DATA AND METHODOLOGY

This paper is based on three waves of the *World Value Survey* (precisely the second, third and fourth[5]). The WVS records the decile in which the total annual income of the interviewee's household falls. The choice of the controls is based primary on Mincer (1974) and on the cited references; therefore gender, age, experience, occupational status (full-time/part-time contract, self-employed, housewife, retired, student), and the highest educational level attained are used.

The model to be estimated is:

$$d_i = \mathbf{X}_i \boldsymbol{\beta} + \gamma s_i + \lambda r_i + u_i$$

where *d* is the decile of income of individual *i*, **X** is a matrix containing demographic and other variables deemed to affect *d*, *s* is the individual experience, *r* is the highest level of education attained by person *i* measured as a discrete variable ranging from 1 (uncompleted primary school) to 8 (completed university degree) and *u* is the usual error term. Then eight dummy variables, one for each educational level included in the previous measure, are constructed. This modifies the previous model as follows:

$$d_i = \mathbf{X}_i \boldsymbol{\beta} + \gamma s_i + \mathbf{R}_i \boldsymbol{\lambda} + u_i$$

where **R** is the matrix (vector) of dummies.

Experience is not calculated as usual (see for example Funkhouser, 1998), but is computed as the difference between the age of the respondent and the age at which s/he completed the last educational level. This procedure is very suitable: consider a person who had been working before or while completing his/her education. It is likely that, after completion, this person changed job and/or position, and in developing countries this phenomenon is very common. Often the experience matured before attaining the highest educational level is of poor or no utility for the individual's next job, but in the labour market of poor countries may be anyway relevant. The usual system to assess experience may thus be source of bias. More precisely, if the described phenomenon involves a relatively large share of the population, then the experience calculated following the traditional system should fail to be significant when no selection bias affects the data[6], while the alternative measure should be significant. This is exactly what we can observe in the results of the analysis[7]. Furthermore, we should notice that considering the years of experience *tout court* means value all the year of experience equally. The measure proposed in this paper contributes to solve also this problem, as it is more homogeneous than the traditional one.

A discrete variable represents the highest educational level attained by the responder. A set of dummies represents the occupational status: in the regressions, I introduced a dummy for each mentioned category but full-time employment, which is use as reference. Unfortunately, the data do not allow for distinguishing between private sector employees on the one side and civil servants and employees of government-owned companies on the other side. I also control for the size of town where the interviewee lives for two reasons. First, it is fundamental to account for the effect that people with high educational levels concentrate in big town and cities, where the demand for qualified and skill labour is high. Second, in urban agglomerations living costs and living standards are generally higher than in the countryside or in small towns; therefore also wages paid to workers in urban areas may be higher than those paid elsewhere.

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[5] The fifth wave has recently ended, but only some data are already available.

[6] Econometrically this is due to 1) the heterogeneity of the measure and 2) to the loss of significance of the indicator itself.

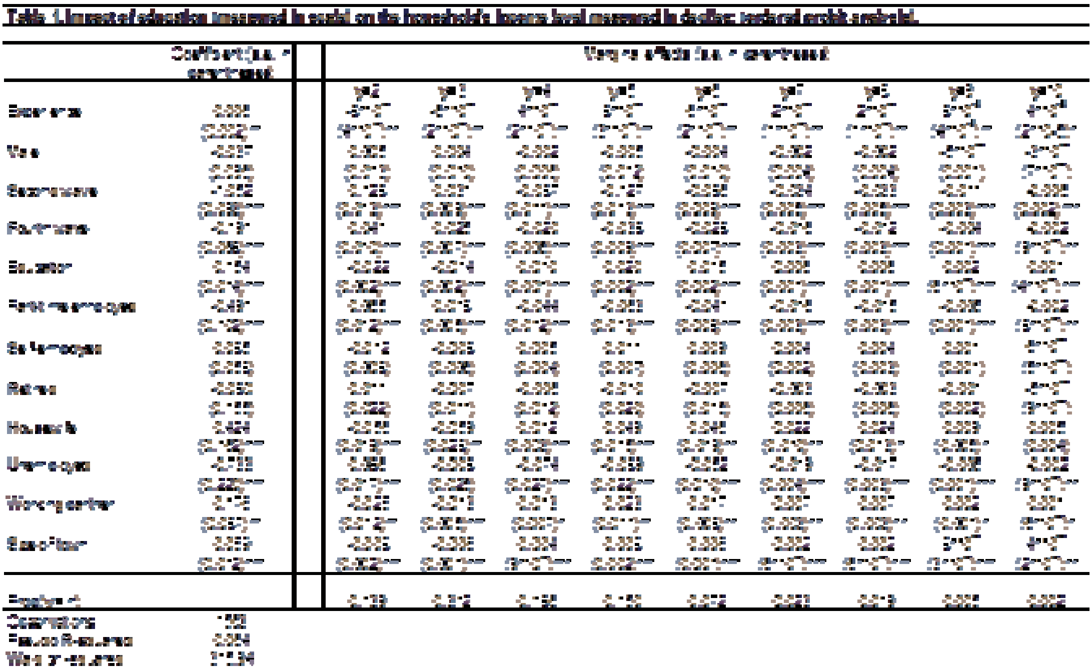
[7] For sake of concision, the paper shows the results based on the alternative measure only. The other results are available upon request to the author.

Eventually two dummies capturing the second-to-last and the last waves of the survey are used as controls, to capture any trend or time effect (due, for example, to some economic crisis). As already mentioned, the estimation procedure is a standard ordered probit with robust standard errors. The literature suggests alternative methods: the most applied are OLS and IV (see for example Uusitalo, 1999; Trostel et al., 2002; Wu and Xie, 2003; Yang, 2005 who claims that OLS is the best strategy because of comparability and despite its shortcomings; Andrén et al., 2005, Fleisher et al., 2005; Pastore and Verashchagina, 2006; Flabbi et al., 2008, Arrazola and de Hevia, 2008, Chen and Hamori, 2009), EGIV (García-Mainar and Montuenga-Gómez, 2005), quantile regression (Anderson and Pomfret, 2000 and Flabbi et al., 2008). With the data used in this paper, these methodologies would be less appropriate than ordered probit (Andrén et al., 2005). The IV methodology is very appealing and solves several problems (see Card, 1999) with respect to pure OLS; however, both OLS and IV, as the other methods, do not allow for reaching the results of this paper, i.e. an analysis of the payoff of education in terms of relative positioning in the scale of incomes. Maximum likelihood estimation is rarely used, but appropriate (Duraisamy, 2002). However, in this case, the dependent variable is the absolute value of income and the aim is the estimation of the absolute return to income, rather than the relative return in terms of position on the income scale.

Before commenting the results, I would like to stress a point. Here I am considering the effect of the education level of the chief wage earner on the household's overall income. This involves a positive correlation between this variable and the error term of the model, as it is highly probable that the level of education of the other members of the household is positively correlated with that of the breadwinner. This would be a problem if I focused on estimating the rate of return to education of the interviewee. However, what I am estimating is the overall contribution of the chief wage earner's education to the household income. The fact that a highly educated person tends to marry to a highly educated individual and the fact that their offspring are likely to receive a high level of education is included in the effect I am estimating. Of course, this is very different than assessing a precise return to education. Moreover, the results of this paper are not necessary conclusive; however, they are robust and provide the extant literature with some hints, that can open the path to new investigations. In spite of the modernization process, India is still a traditional society, in which breadwinners play a crucial role within the domestic walls. Hence, the study of the relation between his/her level of education and the income of the household is worthy and interesting.

3. RESULTS

Tables 1 and 2 present the results. It is possible to notice that the education level of the breadwinner contributes to explain the level of the household income, and that this contribution is overall positive, and highly significant. In particular, Table 1 highlights that the higher the level of education, the lower the probability for the household of falling in the second or in the third decile of the distribution. The working experience of the chief wage earner contributes positively to the household income, although the magnitude of the effect is much smaller than the contribution of education. However, it is noteworthy that there is a high probability that the education level of the breadwinner is positively associated to the education level of the spouse and/or of other members of the household. The consequence of this in terms of econometrics is that while the sign of both the coefficient and the marginal effects of the chief wage earner's education are correct as their level of significance is, their magnitude includes also the positive externalities generated.



No gender effect is detected. This result is both surprising and extremely interesting. It is surprising because, in general, in developing countries women tend to be discriminated, and thus they earn lower wages. The result is interesting because it suggests that, controlling for education and for the other variables, the gender of the breadwinner (but not gender in general) does not influence the income of the whole household.

A part of the income of the self-employed comes from their capital rather than from their education. To obtain more accurate estimates, I divided the sample into two sub-samples: self-employed and employees. Moreover, education enters the regressions either as a categorical variable or as a series of dummies, each representing a completed level. Namely I individuate the following levels: non literate or uncompleted primary school, completed primary school, uncompleted vocational school, completed vocational school, uncompleted university preparatory school, completed university preparatory school[8], uncompleted university, completed university and/or higher.

Tables 2 and 3 refer to sub-sample of full-time and part-time employees. The breadwinner's education has a positive and highly significant impact on the income of the household, as expected. In particular,

Table 2. Impact of education (measured in scale) on the household's income level measured in deciles: (ordered probit analysis).

	Coefficient (s.e. in parentheses)	Marginal effects (s.e. in parentheses)								
		y=2	y=3	y=4	y=5	y=6	y=7	y=8	y=9	y=10
Experience	0.004	$-5*10^{-4}$	$-3*10^{-4}$	$3*10^{-4}$	$5*10^{-4}$	$4*10^{-4}$	$2*10^{-4}$	$2*10^{-4}$	$5*10^{-5}$	$2*10^{-5}$
	(0.002)*	$(3*10^{-4})$*	$(2*10^{-4})$*	$(2*10^{-4})$	$(3*10^{-4})$*	$(2*10^{-4})$*	$(1*10^{-4})$*	$(1*10^{-4})$*	$(3*10^{-5})$	(2*10-5)
Male	-0.011	0.002	0.001	$-7*10^{-4}$	-0.002	-0.001	$-5*10^{-4}$	$-5*10^{-4}$	$-2*10^{-4}$	$-8*10^{-5}$
	(0.095)	(0.013)	(0.010)	(0.006)	(0.012)	(0.010)	(0.004)	(0.004)	(0.001)	$(6*10^{-4})$
Second wave	-0.964	0.120	0.033	-0.079	-0.118	-0.081	-0.032	-0.031	-0.010	-0.005
	(0.098)***	(0.013)***	(0.008)***	(0.011)***	(0.013)***	(0.009)***	(0.005)***	(0.004)***	(0.003)***	(0.002)***
Fourth wave	-0.235	0.033	0.020	-0.016	-0.031	-0.023	-0.010	-0.009	-0.003	-0.002
	(0.072)***	(0.010)***	(0.007)***	(0.005)***	(0.010)***	(0.007)***	(0.003)***	(0.003)***	(0.001)***	$(7*10^{-4})$**
Completed elementary	-0.330	0.046	0.021	-0.026	-0.043	-0.031	-0.012	-0.011	-0.003	-0.002
	(0.074)***	(0.010)***	(0.004)***	(0.007)***	(0.010)***	(0.006)***	(0.003)***	(0.003)***	(0.001)***	$(7*10^{-4})$**
Completed vocational	0.006	$-8*10^{-4}$	$-6*10^{-4}$	$4*10^{-4}$	$8*10^{-4}$	$6*10^{-4}$	$3*10^{-4}$	$2*10^{-4}$	$8*10^{-5}$	$4*10^{-5}$
	(0.156)	(0.022)	(0.015)	(0.010)	(0.020)	(0.016)	(0.007)	(0.006)	(0.002)	(0.001)
Completed preparatory	0.332	-0.046	-0.039	0.015	0.041	0.035	0.016	0.016	0.006	0.003
	(0.072)***	(0.010)***	(0.011)***	(0.003)***	(0.009)***	(0.009)***	(0.004)***	(0.005)***	(0.002)***	(0.001)**
University degree	0.704	-0.091	-0.095	0.018	0.078	0.076	0.036	0.041	0.015	0.009
	(0.084)***	(0.011)***	(0.016)***	(0.004)***	(0.009)***	(0.011)***	(0.007)***	(0.008)***	(0.005)***	(0.003)***
Part-time employed	-0.505	0.067	0.018	-0.045	-0.065	-0.043	-0.016	-0.015	-0.004	-0.002
	(0.101)***	(0.013)***	(0.005)***	(0.012)***	(0.013)***	(0.008)***	(0.003)***	(0.003)***	(0.001)***	$(8*10^{-4})$**
Self-employed	0.081	-0.011	-0.008	0.005	0.011	0.008	0.003	0.003	0.001	$6*10^{-4}$
	(0.058)	(0.008)	(0.006)	(0.003)	(0.008)	(0.006)	(0.003)	(0.003)	$(9*10^{-4})$	$(5*10^{-4})$
Retired	-0.068	0.009	-0.006	-0.005	-0.009	-0.007	-0.003	-0.003	$-8*10^{-4}$	$-4*10^{-4}$
	(0.157)	(0.022)	(0.012)	(0.012)	(0.021)	(0.015)	(0.006)	(0.006)	(0.002)	$(9*10^{-4})$
Housewife	0.412	-0.055	-0.056	0.012	0.048	0.045	0.021	0.023	0.009	0.005
	(0.155)***	(0.019)***	(0.027)**	(0.003)***	(0.015)***	(0.018)**	(0.010)**	(0.012)**	(0.005)*	(0.003)
Unemployed	-0.675	0.081	-0.002	-0.067	-0.084	-0.051	-0.018	-0.016	-0.004	-0.002
	(0.225)***	(0.019)***	(0.023)	(0.027)***	(0.024)***	(0.011)***	(0.004)***	(0.003)***	(0.001)***	$(8*10^{-4})$**
Working partner	0.166	-0.023	-0.013	0.012	0.022	0.016	0.006	0.006	0.002	$9*10^{-4}$
	(0.086)**	(0.012)**	(0.005)**	(0.007)*	(0.011)**	(0.008)**	(0.003)**	(0.003)**	(0.001)*	$(5*10^{-4})$*
Size of town	0.064	-0.009	-0.006	0.004	0.008	0.006	0.003	0.003	$8*10^{-4}$	$4*10^{-4}$
	(0.012)***	(0.002)***	(0.001)***	$(9*10^{-4})$***	(0.002)***	(0.001)***	$(6*10^{-4})$***	$(6*10^{-4})$***	$(3*10^{-4})$***	$(2*10^{-4})$**
Prob(y = n)		0.139	0.310	0.185	0.151	0.073	0.023	0.019	0.005	0.002
Observations	1563									
Pseudo R-squared	0.065									
Wald chi-squared	316.87									

Table 3 shows interesting differences across the different levels of education: the households, whose breadwinners are poorly educated (i.e. have completed the primary school at most) do not enjoy an income higher than those headed by a person who is either illetterate or has not completed the elementary school. However, as the level of education increases, so do its benefits: completing the preparatory level reflects in an economic benefit, which is higher than completing a vocational school. A possible explanation for this is that it is likely that those who attend a preparatory school are from wealthier families than those whose offspring attend a vocational school. Moreover, we can notice a positive trend over the time: income has significantly increased between the second and the fourth wave of the survey and this indicates a generalized increase for each level of education. The positive influence of being full-employed is due also to the larger amount of worked (and thus paid) hours.

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[8] In the following of the paper, I will refer to the university preparatory school as to preparatory simply, for brevity's sake.

Notice also that the contribution of full-time vs part-time employement is lower than the contribution of any “jump” in the scale of education levels. Looking at Tables 4 and 5 (in which the results for the sub-sample of self-employed are presented), we observe that, differently than before, the low and medium levels of education have no (or weakly significant) impact on the income of the household. Only completed preparatory and university education exert a significant positive effect on the household income. The most likely explanation for this result is that people who have no or poor education and are self-employed tend to be low-skilled crafstmen, or farmers, or retail sellers, etc. Instead, the self-employed with high educational levels are likely to be either entrepreneurs, or professionals such as lawyers, medical doctors, etc. For this reason, in this sub-sample we identify two macro-levels of education and a neat border between them, whereas in the previous sub-sample no such phenomenon existed. In these tables also a town-size effect is present, though its statistical significance is low. This outcome may have the same causes discussed before: professionals tend to work in large urban centres, while farmers and craftsmen are (relatively) concentrated in the countryside.

Table 3. Impact of education on the household's income level measured in deciles: full time and part-time employees (ordered probit analysis).

	Coefficient (s.e. in parentheses)	Marginal effects (s.e. in parentheses)								
		y=1	y=2	y=3	y=4	y=5	y=6	y=7	y=8	y=9
Experience	0.002	$-2*10^{-4}$	$-1*10^{-4}$	$4*10^{-5}$	$2*10^{-4}$	$2*10^{-4}$	$1*10^{-4}$	$7*10^{-5}$	$6*10^{-5}$	$2*10^{-5}$
	(0.003)	$(3*10^{-4})$	$(2*10^{-4})$	$(6*10^{-5})$	$(3*10^{-4})$	$(4*10^{-4})$	$(2*10^{-4})$	$(1*10^{-4})$	$(1*10^{-4})$	$(4*10^{-5})$
Male	-0.068	0.007	0.004	$-9*10^{-4}$	-0.006	-0.008	-0.005	-0.003	-0.002	-0.001
	(0.096)	(0.009)	(0.007)	$(9*10^{-4})$	(0.008)	(0.012)	(0.007)	(0.004)	(0.003)	(0.001)
Second wave	-0.680	0.058	0.030	-0.035	-0.064	-0.078	-0.041	-0.020	-0.017	-0.006
	(0.121)***	(0.011)***	(0.006)***	(0.010)***	(0.013)***	(0.014)***	(0.008)***	(0.005)***	(0.004)***	(0.002)***
Fourth wave	0.314	-0.030	-0.021	0.001	0.026	0.039	0.023	0.012	0.011	0.004
	(0.087)***	(0.009)***	(0.006)***	(0.003)	(0.007)***	(0.011)***	(0.007)***	(0.004)***	(0.004)***	(0.002)**
Completed elementary	0.198	-0.019	-0.014	$2*10^{-4}$	0.017	0.025	0.015	0.008	0.007	0.003
	(0.113)*	(0.011)*	(0.008)*	(0.003)	(0.009)*	(0.014)*	(0.009)*	(0.005)	(0.005)	(0.002)
Uncompleted vocational	0.402	-0.040	-0.031	-0.011	0.028	0.049	0.033	0.018	0.018	0.008
	(0.198)**	(0.019)**	(0.017)*	(0.014)	(0.010)***	(0.023)***	(0.018)*	(0.011)*	(0.012)	(0.006)
Completed vocational	0.333	-0.032	-0.025	-0.007	0.025	0.041	0.026	0.015	0.014	0.006
	(0.202)*	(0.019)*	(0.017)	(0.012)	(0.012)**	(0.025)*	(0.018)	(0.011)	(0.011)	(0.005)
Uncompleted preparatory	0.317	-0.031	-0.023	-0.003	0.025	0.039	0.025	0.013	0.012	0.005
	(0.125)**	(0.012)**	(0.011)**	(0.006)	(0.009)***	(0.016)**	(0.011)**	(0.006)**	(0.006)**	(0.003)*
Completed preparatory	0.681	-0.064	-0.053	-0.026	0.043	0.081	0.056	0.033	0.033	0.016
	(0.131)***	(0.012)***	(0.012)***	(0.013)*	(0.006)***	(0.016)***	(0.014)***	(0.009)***	(0.010)***	(0.007)**
Uncompleted university	0.604	-0.056	-0.049	-0.029	0.035	0.071	0.051	0.030	0.031	0.015
	(0.146)***	(0.013)***	(0.014)***	(0.017)*	(0.005)***	(0.016)***	(0.015)***	(0.011)***	(0.012)***	(0.008)**
University degree	0.969	-0.087	-0.073	-0.040	0.055	0.109	0.079	0.048	0.050	0.026
	(0.142)***	(0.013)***	(0.013)***	(0.016)**	(0.007)***	(0.016)***	(0.015)***	(0.012)***	(0.013)***	(0.010)***
Full-time employed	0.164	-0.015	-0.010	0.005	0.015	0.020	0.011	0.006	0.005	0.002
	(0.074)**	(0.007)**	(0.004)**	(0.003)	(0.007)**	(0.009)**	(0.005)**	(0.003)**	(0.002)**	(0.001)*
Married	0.178	-0.017	-0.010	0.006	0.017	0.022	0.012	0.006	0.005	0.002
	(0.088)**	(0.008)**	(0.005)**	(0.005)	(0.009)*	(0.011)**	(0.006)**	(0.003)**	(0.002)**	(0.001)*
Size of town	0.002	$-1*10^{-4}$	$-9*10^{-5}$	$3*10^{-5}$	$1*10^{-4}$	$2*10^{-4}$	$1*10^{-4}$	$6*10^{-5}$	$5*10^{-5}$	$2*10^{-5}$
	(0.017)	(0.002)	(0.001)	$(3*10^{-4})$	(0.001)	(0.002)	(0.001)	$(6*10^{-4})$	$(5*10^{-4})$	$(2*10^{-4})$
Prob(y = n)		0.112	0.134	0.278	0.141	0.112	0.045	0.019	0.014	0.004
Observations	1104									
Pseudo R-squared	0.053									
Wald chi-squared	278.60									

In both sub-samples there is virtually no gender effect. Although this result may appear striking, I would like to propose three considerations, which may help to explain this result. First, income at household – and not at individual – level is the variable of interest; therefore, although gender discrimination in India exists, this may be not sufficiently strong to affect the income of the whole household. Second, female breadwinners are also more educated than the mean, with a very large share (almost 45%) holding a university degree; the results may suggest also that gender discrimination decreases as the level of education increases. The lack of significance for the male dummy can be (at least partially) explained by the very high proportion of highly educated women in the sample. Third, the share of female breadwinners in the sample is lower than 15%, and this can affect the level of significance of the male dummy. A weak gender effect appears in the second sub-sample (that composed by self-employed responders); here only 9% of the sample is represented by women, and the high levels of education are less over-represented with respect to the national Indian mean: only less than 9% of the female respondents holds a university degree. Therefore, some gender wage discrimination may re-emerge. However within self-employed it is likely that gender discrimination is weaker than among employees, and this partially justifies the low level of statistical significance of the dummy.

Table 4. Impact of education on the household's income level measured in deciles: self-employed workers (ordered probit analysis).

	Coefficient (s.e. in parentheses)	Marginal effects (s.e. in parentheses)								
		y=1	y=2	y=3	y=4	y=5	y=6	y=7	y=8	y=9
Experience	0.006	$-4*10^{-4}$	$-7*10^{-4}$	$-1*10^{-4}$	$4*10^{-4}$	$8*10^{-4}$	$6*10^{-4}$	$3*10^{-4}$	$2*10^{-4}$	$8*10^{-5}$
	(0.004)*	$(3*10^{-4})$*	$(4*10^{-4})$*	$(1*10^{-4})$	$(3*10^{-4})$*	$(5*10^{-4})$*	$(3*10^{-4})$*	$(3*10^{-4})$*	$(1*10^{-4})$	$(6*10^{-5})$
Male	0.306	-0.021	-0.029	0.005	0.026	0.041	0.025	0.011	0.006	0.003
	(0.187)*	(0.013)*	(0.015)**	(0.010)	(0.018)	(0.024)*	(0.013)*	(0.006)*	(0.004)*	(0.002)*
Second wave	-0.673	0.045	0.059	-0.016	-0.058	-0.087	-0.053	-0.024	-0.013	-0.006
	(0.145)***	(0.012)***	(0.013)***	(0.011)	(0.015)***	(0.020)***	(0.012)***	(0.007)***	(0.005)***	(0.003)**
Fourth wave	0.309	-0.021	-0.034	-0.007	0.022	0.042	0.029	0.014	0.008	0.004
	(0.109)***	(0.008)***	(0.012)***	(0.004)*	(0.008)***	(0.015)***	(0.011)***	(0.005)***	(0.004)**	(0.002)*
Education	0.154	-0.011	-0.017	-0.003	0.011	0.014	0.014	0.007	0.004	0.002
	(0.021)***	(0.002)***	(0.003)***	(0.002)	(0.002)***	(0.003)***	(0.003)***	(0.002)***	(0.001)***	(0.001)**
Married	0.138	-0.010	-0.015	$7*10^{-4}$	0.011	0.012	0.012	0.006	0.003	0.002
	(0.109)	(0.008)	(0.011)	(0.002)	(0.009)	(0.009)	(0.009)	(0.004)	(0.003)	(0.001)
Size of town	0.035	-0.002	-0.004	$-6*10^{-4}$	0.003	0.005	0.003	0.002	$9*10^{-4}$	$4*10^{-4}$
	(0.020)*	(0.001)*	(0.002)*	$(6*10^{-4})$	(0.001)*	(0.003)*	(0.002)*	$(9*10^{-4})$*	$(6*10^{-4})$	$(3*10^{-4})$
Prob(y = n)		0.065	0.169	0.264	0.154	0.140	0.062	0.023	0.011	0.004
Observations	613									
Pseudo R-squared	0.052									
Wald chi-squared	142.68									

Table 5. Impact of education on the household's income level measured in deciles: self-employed workers (ordered probit analysis).

	Coefficient (s.e. in parentheses)	Marginal effects (s.e. in parentheses)								
		y=1	y=2	y=3	y=4	y=5	y=6	y=7	y=8	y=9
Experience	0.006	$-4*10^{-4}$	$-7*10^{-4}$	$-1*10^{-4}$	$5*10^{-4}$	$9*10^{-4}$	$6*10^{-4}$	$3*10^{-4}$	$2*10^{-4}$	$7*10^{-5}$
	(0.004)*	$(3*10^{-4})$*	$(4*10^{-4})$*	$(1*10^{-4})$	$(3*10^{-4})$*	$(5*10^{-4})$*	$(3*10^{-4})$*	$(2*10^{-4})$	$(1*10^{-4})$	$(5*10^{-5})$
Male	0.300	-0.021	-0.029	0.005	0.026	0.040	0.024	0.011	0.006	0.003
	(0.195)	(0.014)	(0.016)*	(0.010)	(0.019)	(0.025)	(0.014)*	(0.006)*	(0.004)*	(0.002)*
Second wave	-0.522	0.036	0.049	-0.008	-0.045	-0.069	-0.042	-0.019	-0.010	-0.005
	(0.171)***	(0.013)***	(0.015)***	(0.009)	(0.017)***	(0.023)***	(0.014)***	(0.007)***	(0.004)**	(0.002)*
Fourth wave	0.368	-0.026	-0.041	-0.008	0.026	0.050	0.034	0.017	0.010	0.005
	(0.0171)***	(0.010)**	(0.015)***	(0.005)*	(0.010)***	(0.019)***	(0.014)***	(0.007)**	(0.005)**	(0.003)*
Completed elementary	-0.114	0.008	0.012	0.001	-0.009	-0.015	-0.010	-0.005	-0.003	-0.001
	(0.152)	(0.011)	(0.016)	(0.001)	(0.012)	(0.021)	(0.013)	(0.006)	(0.003)	(0.002)
Uncompleted vocational	0.327	-0.022	-0.039	-0.017	0.018	0.043	0.033	0.018	0.011	0.006
	(0.255)	(0.017)	(0.032)	(0.021)	(0.009)*	(0.032)	(0.029)	(0.017)	(0.011)	(0.006)
Completed vocational	0.509	-0.033	-0.062	-0.036	0.021	0.064	0.054	0.031	0.020	0.011
	(0.306)*	(0.017)*	(0.039)*	(0.036)	(0.005)***	(0.032)**	(0.037)	(0.023)	(0.018)	(0.012)
Uncompleted preparatory	0.268	-0.019	-0.031	-0.010	0.017	0.036	0.026	0.013	0.008	0.004
	(0.144)*	(0.010)*	(0.018)*	(0.009)	(0.008)**	(0.019)*	(0.016)*	(0.008)	(0.005)	(0.003)
Completed preparatory	0.642	-0.041	-0.077	-0.040	0.030	0.080	0.067	0.037	0.024	0.014
	(0.150)***	(0.010)***	(0.019)***	(0.017)**	(0.006)***	(0.019)***	(0.020)***	(0.013)***	(0.009)***	(0.008)*
Uncompleted university	0.798	-0.047	-0.096	-0.073	0.018	0.088	0.087	0.054	0.038	0.025
	(0.163)***	(0.010)***	(0.021)***	(0.025)***	(0.009)**	(0.016)***	(0.022)***	(0.018)***	(0.015)**	(0.013)*
University degree	1.025	-0.058	-0.119	-0.096	0.016	0.104	0.109	0.071	0.052	0.037
	(0.187)***	(0.011)***	(0.022)***	(0.029)***	(0.012)	(0.016)***	(0.024)***	(0.022)***	(0.019)***	(0.020)*
Married	0.127	-0.009	-0.014	$-7*10^{-4}$	0.010	0-017	0.011	0.005	0.003	0.001
	(0.110)	(0.008)	(0.011)	(0.002)	(0.009)	(0.015)	(0.009)	(0.005)	(0.003)	(0.001)
Size of town	0.029	-0.002	-0.003	$-5*10^{-4}$	0.002	0.004	0.003	0.001	$7*10^{-4}$	$3*10^{-4}$
	(0.019)	(0.002)	(0.002)	$(5*10^{-4})$	(0.002)	(0.003)	(0.002)	$(9*10^{-4})$	$(5*10^{-4})$	$(3*10^{-4})$
Prob(y = n)		0.065	0.170	0.265	0.155	0.140	0.061	0.023	0.010	0.004
Observations	613									
Pseudo R-squared	0.056									
Wald chi-squared	145.79									

These results are in line with the wide literature on education and income: as the breadwinner's education increases, so does the household's income. However, what is more relevant here is that this relationship is very strong in the middle points of the distribution of income, while the effect remains statistically significant, but small, at the highest levels. This may indicate that, unlikely other cases, the attainment of the highest levels of income in India is facilitated not only by education, but also by other unobserved characteristics such as castes.

Some more comments to the results are important to better understand the message conveyed and to attempt some policy considerations. McLanahan and Percheski (2008) highlight that when the role of the breadwinner in determining the household income is preeminent, social inequalities and social immobility are persistent. Yodanis and Lauer (2007) find that in families where there is a predominant breadwinner, this generally manages the financial resources of the household, with scarce involvement of the partner. These outcomes of previous works are bad news for India, and policies to foster the women's participation to the job market and to improve their emancipation should be implemented. However, it has to be stressed that as the household's income increases, more resources are available to allow also daughters to study.

4. CONCLUSIONS

The results of the analysis highlight a strong, positive and statistically significant correlation between the level of education of the breadwinner and the income of a household. The analysis relies on a database that avoids the usual sample selection bias and allows for analysing also the income of the households with a self-employed breadwinner. Moreover, using relative rather than absolute data about income, the paper offers evidence in favour of a positive link between the education of the chief wage earner of a household and the position of the household on the scale of income distribution. Last, but not least, the inquiry focuses on India, a major developing country.

This study is important also to highlight the contribution of the breadwinner to the positioning of the household on the income scale. Indeed, the extant literature shows that this position is likely to affect the happiness of the members of the household and their behaviour with respect to several decisions taken at the household level. Part of the results of this paper are due to the positive externalities produced by education itself. Finally, the analysis shows that the impact of education depends also on the type of job of the breadwinner. In particular, among low educated self-employed the impact of education is virtually null. This may depend on the fact that the majority of these responders are likely to be craftsmen or shop-keepers, jobs whose remuneration is weakly related to the level of education.

It is also likely that the high contribution of high levels of education to income is due to the relative scarcity of highly educated people in the country, what increases the marginal returns on high levels and depresses those on the low levels of education (as the workers of this type are relatively very abundant). The situation described in this paper is compatible with increasing inequality over the time:

as the market of an emerging country such India will require more and more highly educated workers, and lesser and lesser low educated staffs. In particular, inequality will increase more among self-employed, who appear to be more polarised than others in terms of returns to education. Also for the others inequality is likely to increase, but the distribution of income should remain less unequal than for the self-employed.

The results suggest that the Indian government should pursue two goals. On the one side, the education of the Indian population has to be promoted, to increase the average levels of income and to allow people escaping from poverty. On the other side, the negative effects of a too traditional society (based on one breadwinner per household) should be contrasted. The promotion of female education and of working women as a positive value may help to reach this las goal. While the way seems not too hard, the caste system that is still strong in India may offer a potent obstacle. However, traditional values are often sustained by a lack of education; therefore, policies aimed at reaching equal opportunities of access to education for both genders, and at promoting education besides gender-related traditional values. These policies would help India families to better off their financial situation and women to emancipate.

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