

CREB Working Paper No. 03-14

**The Impact of Parents'
Subjective Aspirations on
Schooling Investment in
Rural Punjab**

Anam Ashraf



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Preface

The Centre for Research in Economics and Business (CREB) was established in 2007 to conduct policy-oriented research with a rigorous academic perspective on key development issues facing Pakistan. In addition, CREB (i) facilitates and coordinates research by faculty at the Lahore School of Economics, (ii) hosts visiting international scholars undertaking research on Pakistan, and (iii) administers the Lahore School's postgraduate program leading to the MPhil and PhD degrees.

An important goal of CREB is to promote public debate on policy issues through conferences, seminars, and publications. In this connection, CREB organizes the Lahore School's Annual Conference on the Management of the Pakistan Economy, the proceedings of which are published in a special issue of the *Lahore Journal of Economics*.

The CREB Working Paper Series was initiated in 2008 to bring to a wider audience the research being carried out at the Centre. It is hoped that these papers will promote discussion on the subject and contribute to a better understanding of economic and business processes and development issues in Pakistan. Comments and feedback on these papers are welcome.

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Abstract

Human capital accumulation is a key indicator of the development process and is closely related to other development indicators such as socioeconomic status and occupational productivity. This study examines the human capital investment decisions that parents make in relation to their children's schooling. By conducting a cross-sectional empirical analysis, it aims to determine how parents' subjective aspirations drive their investment decisions regarding children's schooling. The study uses the 2010/11 Privatization in Education Research Initiative (PERI) dataset, which comprises a sample of children aged 5–14 who are currently enrolled in school.

The study's aim is to assess (i) the impact of differences in subjective aspirations between communities on schooling investment, (instrumented by the arrival of a factory) and (ii) how the different capabilities of siblings can influence their parents' investment decisions. We apply exogenous variations (the arrival of a new factory in a community) and household fixed effects to determine how parents' desire for their children to attain a certain level of education shapes their investment behavior. We find that aspirations motivated by external factors (such as the arrival of a new factory) have a more pronounced impact on investment in schooling than the different level of aspirations associated with siblings with differing capabilities. Moreover, this impact on investment is channeled into expenditure rather than private school enrolment.

The Impact of Parents' Subjective Aspirations on Schooling Investment in Rural Punjab

1. Introduction

Human capital accumulation is a key indicator in the development process and is closely related to other development indicators such as socioeconomic status and occupational productivity (Filmer & Pritchett, 2001; Becker, 1993). This study examines the human capital investment decisions that parents make in relation to their children's schooling. By conducting a cross-sectional empirical analysis of data for 2010/11, we attempt to determine how parents' subjective aspirations drive their investment decisions regarding children's schooling.

The growth of human capital in Pakistan has been comparatively slow. The country's gross enrolment rates in 2009 at the primary, secondary, and tertiary levels were 85, 33, and 6 percent, respectively—the lowest among South Asian countries with a comparable per capita income (World Bank, 2014). One reason for such low enrolment rates is the shrinking public expenditure on education. Expenditure on education has declined from 2.2 percent of the gross domestic product (GDP) in 2005/06 to 2 percent in 2009/10 (Pakistan, Ministry of Finance, 2010).

Another explanation for Pakistan's bleak state of education is the persistent pro-male bias in gross enrolment rates, which stood at 64.1 percent for males and 42.8 percent for females in 2008/09 (Pakistan Bureau of Statistics, 2010b). This bias in human capital investment is supplemented by the earnings differential across gender. Women's share of wage employment in the nonagriculture sector is a meager 10.6 percent (2008/09), which tends to perpetuate the pro-male bias (Pakistan Bureau of Statistics, 2010a).

This implies that the pro-male bias in education reflects the earning potential of males, which, in turn, plays a vital role in shaping schooling investment decisions. Based on this earning potential, parents form aspirations for their children's educational outcomes and optimize their level of investment according to these outcomes.

Recent studies have substantiated this theory (see Attanasio & Kaufmann, 2009, 2010; Jensen, 2012; Heath & Mobarak, 2011). Given the existing and newly available employment opportunities, parents will invest in their children's education with a view to reaping future returns on these opportunities.

The aim of this study is to assess (i) the impact of newly available employment opportunities (in this case, the arrival of a factory) on parents' investment behavior (through their subjective aspirations); and (ii) how siblings' different capabilities can influence their parents' investment decisions and, hence, intra-household dynamics. We employ two types of econometric specifications: (i) the instrumental variable (IV) probit or two-stage least squares (TSLS) approach and (ii) household fixed effects (HFE), respectively. Our empirical analysis of child, household, and school characteristics in rural Punjab draws on the Privatization in Education Research Initiative (PERI) dataset.¹

Applying exogenous variations (the arrival of a new factory in a community) as an instrument along with HFE, we find that parents' desire for their child to attain a certain level of education plays a major role in shaping their investment behavior. Thus, parental aspirations that are motivated by external factors, such as the arrival of a new factory, have a more pronounced impact on investment in schooling than the dissimilarity between siblings' capabilities.

Moreover, this impact on investment is channeled into expenditure rather than the choice of school. This may be either because the household's children attend the same type of school or because they have switched between the same types of school, i.e., private schools versus other private schools or government schools versus other government schools. Regardless, parents spend more on their children's schooling or at least on schooling inputs.

The study also proves that a gender bias exists in intra-household resource allocation. We find a positive and significant relationship between parental aspirations and total expenditure on schooling for boys, i.e., parents with higher aspirations for their sons invest more per

¹ One of the reasons for the limited research on this subject in Pakistan is the lack of data on parental aspirations. The PERI dataset helps address this gap.

month whereas there is no such relationship for girls. It is important to note that the arrival of new factories increases parental aspirations for both girls as well as boys, but this does not translate into an increase in investment for the former.

Section 2 provides an overview of the literature on parental aspirations and investment decisions. Section 3 outlines our econometric methodology. Section 4 describes the data used. Section 5 presents the study's results. Sections 6 and 7 identify some limitations and conclude the study.

2. Literature Review

The intra-household allocation of human capital among children is a key variable that induces households to invest a substantial amount in providing their children with a good-quality education. The literature identifying the causal mechanisms that drive human capital investment can be classified as (i) studies that consider supply-side factors such as the availability of schools and teachers in the area, and (ii) studies examining demand-side factors (such as labor market opportunities) that determine human capital investment decisions.

Parental aspirations are found to drive human capital investment decisions in several ways. According to the investment motive hypothesis, resources are allocated among household members according to their expected returns in the labor market. This is because households in developing countries face a budget constraint and credit market issues, which make allocations to human capital more difficult (Becker, 1993). If a household chooses to invest in a child's education, this reflects its expectations concerning the child's future labor market returns. These expectations then shape parents' aspirations such as the level of education they want for their child. They also lead to further classifications by gender because boys are perceived as having different (and better) labor market opportunities later in life.²

Often, human capital investment decisions are a consequence of a localized economic shock, such as the establishment of a new factory in

² Emerson and Souza (2007), Aslam and Kingdon (2008) and Chaudhuri and Roy (2006) add to the idea that parental investment decisions reflect the differential labor market returns for boys. They will optimize the level of schooling and subsequently investment in schooling on the basis of the expected returns to each gender.

the locality. This leads parents to anticipate better future employment opportunities for their children (including their daughters) and acts as a catalyst on schooling investment decisions (see Foster & Rosenzweig, 1996; Heath & Mobarak, 2011; Jensen, 2012; Munshi & Rosenzweig, 2003; Shastry, 2010; Oster & Millett, 2010).

Heath and Mobarak (2011) examine the impact of exogenous economic changes on a sample of villages in Bangladesh. They compare those villages within proximity of a garments factory with villages that are not; this comparison was carried out for before and after the arrival of economic opportunities (the double-difference method). The results suggest that better employment opportunities became available for those with better understanding and writing skills. Since the garments industry required educated females, parents were more inclined to enroll their daughters in school. The study thus observes positive effects on the enrolment of younger girls. Unlike most other studies, Heath and Mobarak examine the explicit impact of aspirations on schooling investment.

The recent shift of the Indian economy from manufacturing to services has not only led to economic growth but also stimulated a widespread increase in the demand for education, particularly at the primary level. Oster and Millett (2010) estimate the impact of information technology-enabled services (ITES) by using a school, year, and state fixed-effects estimator. The shift toward ITES has led to an increase in primary schooling, driven by the effect that English-medium schools have had on the returns to schooling. The authors find that the information technology (IT) sector grew more rapidly in areas where English was more widely spoken and, in turn, these areas experienced increased school enrolment.

Shastry (2010) has studied the impact of globalization on IT services across various Indian districts along with the different costs of skill acquisition. Based on intra-state variations in the relative cost of learning English, she uses state and year fixed effects to determine which districts have a more elastic supply of English language human capital, given that this type of human capital is particularly relevant to IT service exports.

Parents tend to expect that better social networks will give their children a greater chance of obtaining better-paid jobs in the future. Thus, their desire to maximize future returns through social networks also explains their schooling decisions for children. Munshi and Rosenzweig (2003) explore the channel between employment opportunities and education

by incorporating the dimension of traditional institutions, specifically the caste system, in formulating career choices. They find that fathers from lower castes tend to expect that their child will secure a job similar to theirs—usually, one associated with low future returns.

Munshi and Rosenzweig (2003) find that social networks not only inculcate career choices, but they also lead to specific educational choices. Employing sub-caste (*jati*) fixed effects, the study shows that, while boys already have access to traditional low-return jobs through social networks, girls have begun to enter the labor force through nontraditional jobs. Such jobs require better-educated workers and, consequently, lead to different schooling decisions for girls. For their part, girls have taken full advantage of this globalization because they have few social network ties on which to rely.

Parents' aspirations also depend on their awareness of future job opportunities. Exploring this idea, Jensen (2012) has conducted a randomized controlled trial in which a government intervention aimed at providing business process outsourcing recruiting services to teenage girls from randomly selected rural villages in India. The intervention was designed in a way to create awareness of new employment opportunities as well as access to those opportunities. It acted as an exogenous variation, which helped exclude other explanations for the link between employment opportunities and investment in girls' education. As a result of the intervention, the study found that girls were more likely to be enrolled in school so they could exploit the future benefits of education.

Subjective aspirations can be used to assess human capital investment behavior. Attanasio and Kaufmann's (2009) study, for instance, examines parental aspirations and employment risk perceptions based on data from the Oportunidades³ program in Mexico (a conditional cash transfer program that provides grants to randomly selected young people during the last three years of their high school education). The authors attempt to determine whether parents or children have greater control over the latter's education. Carrying out probit regressions, they find that expected monetary returns and parental risk perceptions of employment are potential determinants of schooling for junior and high school

³ Mexico's main anti-poverty program.

students. Schooling decisions are motivated by parental aspirations, but the decision to attend college depends on adolescents' own aspirations.

Attanasio and Kaufmann (2010) argue that parents' expected returns and the perceived probability of employment are very important to their schooling decisions for boys but not necessarily for girls. This is because boys are seen as future breadwinners of the household while girls are perceived as more likely to marry and leave. This association between gender and future returns (see also Attanasio & Kaufmann, 2011) explains the gender bias in household resource allocation.

Galab et al. (2013) extend the idea of aspirations and investment in education in a study based on quantitative and qualitative data (collected by Young Lives) on children in India. They find that parental aspirations have a profound impact on investment outcomes for children in Andhra Pradesh: parents' aspirations for their child may induce them to send her or him to a private school because education is seen as a key to success in the future.

Atkin's (2012) study, however, provides contrary evidence on the arrival of economic opportunities. Using Mexican census data (collected by the National Institute of Statistics, Geography, and Informatics), the author has found that the arrival of export manufacturing jobs in the sample municipalities resulted in higher dropout rates among children in secondary school. This is because export manufacturing firms attract low-skill workers at high wages, which, rather than inducing investment in schooling, leads to children dropping out from school.

Another strand of the literature shows that parents tend to expect higher future returns for children whom they perceive as being more competent. Parents may value academic achievement as the most important facet of their child's development as a result of which, his or her performance in school acts as a proxy for capability. Various studies have shown that parents had higher expectations of future earnings from children who had done well at school—the child's performance was associated with his or her capabilities and potential (Chi & Rao, 2003; Singh et al., 1995). Natale, Aunola, and Nurmi (2009) also conclude that parents associate their child's capabilities with academic success, while failure is seen as a result of lack of effort on the child's part.

Other studies have determined that parents' aspirations for their child may be formed as early as the first grade (see Englund, Luckner, Whaley, & Egeland, 2004) and that these aspirations are linked increasingly to the child's achievement as he or she proceeds through elementary school (see Goldenberg, Gallimore, Reese, & Garnier, 2001). Such perceptions can, in turn, bring about a change in the child's performance, which substantiates the idea that positive parental expectations and beliefs, when communicated to a child, can influence his or her prospects in a positive way.

These studies show that parents' aspirations for their child's earning potential is determined by two factors: (i) the availability of new economic opportunities and (ii) the child's capability. When parents learn of the existence of future economic opportunities or discover their child's potential for academic success, they are likely to form aspirations for the child's employment prospects. This, in turn, motivates parents to enroll their children in a school that will provide a good-quality education and help them secure a better job in the future.

Although some studies have directly estimated the impact of parental aspirations on investment for certain countries (Bangladesh, India, and Mexico), very few empirical studies have focused on Pakistan. This study addresses the gap between human capital investment behavior and higher returns to education by incorporating the parental aspirations factor.

3. Methodology

This section describes the methodology used to determine the relationship between investment in schooling and subjective parental aspirations in the presence of new employment opportunities as an exogenous factor.

3.1. Investment in Schooling and Subjective Aspirations

Under the theory of rational choice, we assume that parents are rational agents who tend to maximize their utility. They will rationally invest in a particular school that can help their child secure better employment opportunities in the future and maximize future returns. In this maximization problem, parental aspirations play a significant role in bridging the gap between employment prospects and investment in schooling. Aspirations are defined as a function of expectations

concerning potential returns and other factors, which include the value parents place on education and the social norms governing the education of boys and girls.

Parental aspirations are motivated by (i) the availability of new economic opportunities and (ii) the child's potential and capabilities. These aspirations translate into schooling investment when parents perceive that a child who is enrolled in a relatively good school has a better chance of getting a well-paid job.

Additionally, parents are more likely to have higher educational aspirations for a child who is more intelligent or gifted than his or her siblings. This difference in capabilities is reflected in the household's investment patterns. Consequently, aspirations function as an intermediary channel. While most other studies have considered a reduced form of the impact of aspirations (i.e., insofar as economic opportunities affect investment in schooling), we incorporate parents' aspirations directly in our model.

We begin with a simple model of the impact of parental aspirations on investment in schooling:

$$InvS_{cij} = \beta_0 + \beta_1 Parasp_{cij} + \beta_2 C_{cij} + \beta_3 H_{ij} + \beta_3 S_j + \varepsilon_{cij} \quad (1)$$

$InvS_c$ is the investment decision that parents make concerning child c 's schooling. In order to estimate the causal mechanism, $InvS_c$ is expressed in two forms: (i) private school enrolment and (ii) total expenditure incurred on the child's schooling.

The first form of $InvS_{cij}$ indicates whether parents choose to enroll their child in a government or private school. This distinction is used as a proxy for educational investment (see Alderman, Orazem, & Paterno, 2001) because, compared to government schools, private schools are perceived to provide a better education. Parents who invest in a private school are likely to value good-quality education, which they associate with better economic prospects for their child. This variable is a good proxy because it is objective and explains investment behavior precisely. For estimation purposes, it takes the form of a dichotomous variable with a value of 1 if the child is currently enrolled in a private school and 0 otherwise.

The second form of $InvS_{cij}$ is the total expenditure incurred on the child's education. Total schooling costs are important in this study because they categorize investment decisions in monetary terms. In developing countries, investment decisions are subject to a budget constraint. Thus, investing a substantial amount of money in their child's schooling reflects how parents make decisions subject to a budget constraint. Assuming they value a high-quality school, using a variable in monetary terms helps us understand the tradeoff between the quality and cost of schooling. This variable is the sum of monthly expenditures on tuition fees, admission fees, examination fees, uniforms, shoes, books, funds and donations, private tuition, and transport. For missing observations, we assume the expenditure is 0 for purposes of simplicity.

$Parasp_{cij}$ represents parents' aspirations for child c 's education. This variable is quantified by asking parents which class or grade they would like to see their child complete. This ranges from 0 to 16, where 0 represents preschool and 16 a postgraduate degree. For estimation purposes, it is a continuous variable. C_c is a vector of child characteristics where c denotes the child, H_i is a vector of household characteristics where i is the household, and S_j is a vector of the characteristics of a government school j .

We have run regressions for seven districts in rural Punjab: Bahawalpur, Chakwal, Hafizabad, Faisalabad, Nankana Sahib, Khanewal, and Jhang. Separate regressions are run for male and female children. The results are adjusted for heteroskedasticity of unknown form by using robust standard errors at the cluster level.

3.2. Subjective Aspirations and New Economic Opportunities

The first approach attempts to bridge the gap between the availability of new economic opportunities and human capital investment behavior using parental aspirations as an intermediary channel.

3.2.1. Aspirations as a Potentially Endogenous Variable

A potential problem associated with equation (1) is that aspirations can be endogenous. There may be reverse causality between parental aspirations and investment in schooling. Choosing a high-quality school will lead parents to formulate aspirations as far as their child's earning

potential is concerned because they associate academic success with success in the labor market. Thus, this channel introduces reverse causality, leading to simultaneity bias. Moreover, aspirations may also be endogenous if correlated with other unobserved factors related to educational investments.

To correct these problems, we use the IV approach. Ideally, the instrument should contain covariates that have strong explanatory power for the specific endogenous variable but no correlation with ε , i.e., $cov(X_i, Z_i) \neq 0$ and $cov(\varepsilon, Z_i) = 0$.

This study uses the change in the number of factories located within a five-kilometer radius as an instrument for parents' aspirations. In order to create the instrument, we have used Google Maps and data from the Directory of Industries (2006–10) to obtain GPS coordinates for factories in proximity to the sample households. Since the PERI survey data includes the GPS coordinates of all households, it was possible to generate a variable representing the distance between households and all factories within a five-kilometer radius for 2006 and 2010. This, in turn, was used to create the instrument in question. Intuitively, the arrival of new factories in a region indicates higher chances of better economic opportunities being available.

The International Labour Organization's (2014) study sets the minimum age of employment at 15 years, which implies that firms can hire workers who have attained at least a primary level of schooling in countries such as Pakistan "where the economy and educational facilities are insufficiently developed." It also implies that children who acquire some level of education are more likely to find employment in a factory. Hence, the presence of a nearby factory will be strongly correlated with parents' aspirations for their child. This instrument does not affect human capital investment through any channel other than aspirations because the presence of a factory in the region will influence the decision to invest only when parents have formed aspirations for their child's education.

Districts across rural Punjab are largely heterogenous in terms of observable factors (such as economic opportunities and infrastructure including road networks, health facilities, and schools) as well as unobservable factors (such as cultural background, norms, and values). Including district dummies in the model will help capture the impact of

any observed and unobserved heterogeneity across districts. Moreover, with the arrival of fresh economic opportunities, price levels may change, increasing the cost of schooling inputs and, in turn, causing education expenditure to decline. Accordingly, we include district dummies in all our specifications to improve the validity of the instrument (for example, there may be districts with better infrastructure and better schools and, hence, more factories).

To further ensure the validity of the instrument, we add controls for household income, mother's income, and household wealth. Not doing so would confound the relationship between parental aspirations and investment, subjecting the specifications to omitted variable bias.

It may be that the arrival of new factories provides better economic opportunities for parents too. This could translate into higher household incomes and, therefore, into more income being available to invest in children's education. Including household income resolves the problem of omitted variable bias and ensures that the arrival of new factories affects investment in schooling only through the channel of parents' aspirations rather than their income stream. We include the mother's income to address the issue of her bargaining power in making investment decisions concerning her children's schooling. Taking all these factors into account, we are able to create a valid, informative instrument.

3.2.2. Estimation Strategy

The variable $InvS_c$ is both dichotomous and continuous, so in order to estimate the equation with these variable forms, we use the IV probit and TSLS techniques, respectively. Having dealt with the endogeneity issues discussed above, we re-estimate equation (1) using the number of factories located within a five-kilometer radius as a variable to instrument for parental aspirations.

In the first stage, this yields

$$Parasp_{cij} = \beta_0 + \beta_1 Factories_j + \beta_2 C_{cij} + \beta_3 H_{ij} + \beta_4 S_j + \varepsilon_{cij} \quad (2)$$

The second stage yields

$$InvS_{cij} = \beta_0 + \beta_1 \hat{Par}asp_{cij} + \beta_2 C_{cij} + \beta_3 H_{ij} + \beta_4 S_j + \varepsilon_{cij} \quad (3)$$

$\hat{Par}asp_{cij}$ represents the fitted values of parental aspirations from the first-stage regression. $Factories_j$ is the instrument representing the change in the number of factories located within a five-kilometer radius.

3.3. Subjective Aspirations and Capability

When choosing to invest in their children's schooling, parents make decisions based on a comparative analysis of each child's academic aptitude or hard work and drive. If a particular child is more driven to succeed academically than the other, his or her parents may choose a school they feel matches the child's capabilities.

Such comparisons influence both parental aspirations and investment decisions because they differ from child to child. Thus, our second approach focuses on how differences in children's capabilities can generate different investment decisions through the intermediary channel of parental aspirations.

3.3.1. Specification Issues

Unobservable household-specific factors such as culture and family background can confound the relationship between schooling investment and parental aspirations by influencing parents' beliefs about education and their child's prospects. For instance, parents from a particular caste or with strong notions of clan may expect their child to follow in their footsteps rather than seek employment elsewhere. Similarly, parents' decision to invest in a particular kind of school (for instance, a government school) may be driven by their own experience of attending that school. Hence, the direction of bias in relation to the aspirations coefficient will be positive.

We use HFE to rectify this bias, thus eliminating all unobservable household-specific factors from the regression. The HFE model also eliminates all characteristics that are exactly the same across siblings, which, in turn, helps analyze the cross-sibling dynamics of investment behavior.

3.3.2. Estimation Strategy

Since the dependent variable $InvS_c$ is both dichotomous and continuous, we estimate HFE using a linear probability model (LPM) for

the binary dependent variable and ordinary least squares (OLS) for the continuous dependent variable. The LPM estimates a linear least-squares regression where the dependent variable takes a value of 1 or 0. As with OLS, it minimizes the sum of the squared residuals but presents two problems. In the case of the binary dependent variable, OLS imposes heteroskedasticity and the LPM estimates exceed the interval limit of 1 and 0. However, these problems can be resolved by using heteroskedasticity-robust standard errors at the cluster level (see Greene, 2003). This produces consistent, unbiased estimates that are fairly similar to the marginal effects of the probit regression.

As mentioned earlier, using HFE helps purge our results of bias:

$$InvS_{cij} = \beta_0 + \beta_1 Parasp_{cij} + \beta_2 C_{cij} + \beta_3 S_j + \alpha_i + \varepsilon_{cij} \quad (4)$$

α_i includes those household factors that do not vary across children in household i . Household-invariant factors include wealth, total income, parents' level of education, residence, and unobservable factors such as cultural values. The HFE model ensures that all household-invariant characteristics are eliminated to enable a comparison among siblings based solely on variant factors.

3.4. Individual and Household Characteristics⁴

This section describes the variable C_c , which includes child-specific characteristics such as age, gender, birth order, and capability; and the variable H_i , which includes household wealth and income, mother's income, and parents' level of education.

3.4.1. Age

Since the sample is restricted to children aged between 5 and 14 years, the age variable considers children only within this age bracket. Age is an important determinant of schooling investment: parents may be more particular about which school their child attends (and the quality of schooling) while he or she is of primary school-going age. As children grow older (reaching middle school-going or high school-going age), parents may become relatively indifferent to such considerations

⁴ See Table A.1 in the Appendix for a detailed description of all the variables used.

because other factors, such as the decision to earn or study, come into play. In order to capture this U-shaped impact, we incorporate age and age-squared in the model.

3.4.2. *Gender*

Parents also tend to become gender-selective when making schooling decisions; in some cases, this selective decision-making can bridge the gap between boys and girls by increasing the educational and employment opportunities available to the latter. The gender variable reflects the extent of bias in schooling investment decisions. It takes the form of a dummy variable equal to 1 if the child is male and 0 otherwise. This is because, in rural Punjab, parents are more likely to invest in boys' schooling over that of girls. We expect the gender variable to have a positive sign because boys are perceived as eventually staying with and providing for their parents in old age.

3.4.3. *Birth Order*

A large body of literature suggests that parents favor either firstborn or lastborn children. In the first case, parents may choose to invest more in older children's schooling because they perceive that (i) it is associated with earlier returns to education, (ii) older children enrolled in a good school can help tutor their younger siblings (thus saving on schooling expenses), and (iii) older children are more likely to provide financial security in their parents' old age. In the second case, parents may choose to invest in their younger children's schooling, keeping older siblings at home to look after the former. The literature thus implies that birth order can have either a negative or positive relationship with schooling investment decisions.

The evidence on birth order effects is mixed. Behrman and Taubman (1986) and Kantarevic and Mechoulan (2006) find that parents are more likely to allocate their time and resources to firstborn children than to those born later. Powell and Steelman (1995), however, conclude that children born later are more likely to receive financial assistance from their parents. Taking into account theory and empirical evidence, we include the number of child c 's older siblings in household i as a control. This allows us to test the possible mechanisms through which birth order can affect parents' choice of school for their child and to capture information on any schooling biases parents may have.

3.4.4. *Capability*

As discussed earlier, capability is a key determinant of parents' decision to invest in schooling: the more intelligent or hardworking a child, the more likely his or her parents are to invest in what they perceive to be a good school that will engage their child's potential.

This variable is continuous and is based on parents' perception of their child's capability (in response to the question "How intelligent is your child in general?"). It takes a value of 1 if the child is considered below average, 2 if the child is average, and 3 if the child is above average. However, keeping in mind that capability can affect investment in schooling through parental aspirations, thus causing endogeneity, we calculate the variance inflation factor (VIF) and tolerance to establish that there is no collinearity between aspirations and capability (see Table A.2 in the Appendix).

3.4.5. *Household Income and Wealth*

Given that a household's budget constraint shapes its human capital investment decisions, our model takes into account the household's resources as well as income. First, household wealth is used as a proxy for resources and estimated using a wealth index of its assets.⁵ Employing principal component analysis (PCA), we apply a multivariate statistical technique to reduce the number of variables in the dataset into fewer "dimensions" (see Filmer & Pritchett, 2001). In mathematical terms, from an initial set of n correlated variables, PCA creates uncorrelated indices or components where each component is a linear weighted combination of the initial variables.

Next, total household income is calculated as the sum of its basic income and any additional income per year. Finally, we add the mother's income as a control variable to account for her bargaining power in investment decisions' regarding the child's education.

⁵ The wealth index is created using the same assets as in the Multiple Indicators Cluster Survey for 2007/08, i.e., refrigerator, air conditioner, cooking range/microwave oven, motorcycle/scooter, sewing/knitting machine, personal computer, bicycle, car/vehicle, electricity, gas, telephone connection, type of dwelling, and number of rooms.

3.4.6. Parents' Level of Education

Parents' level of education is important because we assume that better-educated parents will make relatively informed decisions about their child's schooling. They will be more inclined to enroll their children in schools they perceive as facilitating access to better employment opportunities. This variable takes the form of a continuous variable that lies between 0 and 16, where 0 years of education refers to preschool and 16 years of education refers to a Master's degree. The specification includes both parents' level of education.

3.5. School Characteristics

Schooling investment decisions are also driven by the quality of the school. Parents are more likely to opt for schools that offer relatively high-quality education, implying that there is a positive relationship between investment in schooling and the quality of education provided.

We add an index of characteristics of government schools and private schools S_j to control for their respective quality. The vector S_j includes both types of schools because, unlike private schools, government schools respond to factors other than market forces (e.g., political pressure and policy perspectives) and attempt to cater to the area's education needs. They are not completely independent of the demand for schools, but are less so than private schools.

S_j consists of four characteristics: (i) teachers' qualifications, (ii) the medium of instruction, (iii) infrastructure, and (iv) child safety. Teachers' qualifications are calculated as the proportion of teachers with a postgraduate degree in a particular cluster. The medium of instruction is measured as the proportion of government or private schools within a particular cluster that teach largely in Urdu. Infrastructure and child safety are assessed in terms of whether the school building is constructed of *pakka* bricks and whether it has a boundary wall or fence. This generates variables for the proportion of government or private schools in a particular cluster that are constructed of brick and do have a boundary wall. PCA is then used to generate indexes of school characteristics.

4. Data

The PERI dataset we employ in this study was generated by a survey conducted by the Lahore School of Economics in collaboration with the Punjab Bureau of Statistics in April 2011. The survey spanned seven rural districts in Punjab (one in northern Punjab, four in central Punjab, and two in southern Punjab). A total of 1,024 households were surveyed in 64 clusters spread across eight *tehsils* (administrative sub-units) in these districts. The dataset includes information on household characteristics (location, age, gender, employment status, education level attained, and earnings), community characteristics, parental perceptions of schooling, and individual characteristics.

The rationale for selecting this dataset is that it provides comprehensive, recent information with data on parental aspirations and investment in schooling presented separately. The dataset includes both child and household-level characteristics necessary for our analysis. The parental aspirations module provides detailed information on parents' perceptions corresponding to each child in the household aged between 3 and 18 years.

The total sample of children is 1,870 (3 to 18 years old), of whom 1,190 were currently enrolled in school and 680 were not. For our purposes, however, the study's working sample comprises 931 children aged 5–14 years (inclusive) currently enrolled in school. The reason for choosing this particular age bracket is that the standard age for starting primary school is five years old.

As Table 1 shows, investment in human capital is categorized as (i) private school enrolment and (ii) total expenditure on schooling. For estimation purposes, private school enrolment takes the form of a dichotomous variable equal to 1 if a child is currently enrolled in a private school and 0 otherwise. Total expenditure on schooling is the sum of monthly expenditures on different schooling inputs (see Section 3.1).

Table 1: Descriptive statistics

Variable	Total sample	Male	Female
Outcome variable			
Private school enrolment*	0.26 (0.44)	0.25 (0.43)	0.28 (0.45)
Total expenditure on schooling	228.71 (441.24)	236.97 (502.99)	218.84 (353.89)
Explanatory variables			
<i>Individual characteristics</i>			
Parental aspirations	12.73 (3.80)	13.40 (3.77)	11.93 (3.68)
Age	9.38 (2.73)	9.41 (2.71)	9.34 (2.76)
Gender*	0.54 (0.50)		
Number of older siblings	1.92 (1.91)	1.97 (1.90)	1.85 (1.91)
Capability	2.25 (0.53)	2.23 (0.52)	2.26 (0.54)
<i>Household characteristics</i>			
Father's education	4.24 (4.53)	4.04 (4.49)	4.49 (4.56)
Mother's education	1.66 (3.20)	1.71 (3.24)	1.59 (3.16)
Wealth index			
Low	-3.29 (0.94)	-3.29 (0.91)	-3.30 (0.99)
Medium-low	-1.44 (0.46)	-1.49 (0.47)	-1.36 (0.44)
Medium	0.08 (0.46)	0.09 (0.47)	0.07 (0.46)
Medium-high	1.57 (0.44)	1.61 (0.45)	1.52 (0.43)
High	3.23 (0.79)	3.21 (0.82)	3.25 (0.76)
Household income	33.03 (139.86)	33.95 (160.50)	31.92 (110.40)
Mother's income	1.53 (15.60)	1.61 (15.91)	1.43 (15.24)
<i>Community characteristics</i>			
Index for government school characteristics			
Low	-1.67 (0.68)	-1.68 (0.69)	-1.66 (0.69)
Medium-low	-0.53	-0.53	-0.52

Variable	Total sample	Male	Female
	(0.14)	(0.14)	(0.13)
Medium	-0.02 (0.06)	-0.01 (0.05)	-0.02 (0.06)
Medium-high	0.45 (0.30)	0.42 (0.31)	0.48 (0.29)
High	2.55 (1.72)	2.50 (1.72)	2.62 (1.73)
Index for private school characteristics			
Low	-1.22 (0.64)	-1.25 (0.65)	-1.19 (0.63)
Medium-low	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)
Medium			
Medium-high			
High	1.07 (1.71)	0.93 (1.57)	1.27 (1.88)

Notes: Standard deviations are given in parentheses. * = Dummy variable; the mean represents the proportion of the variable.

Source: Author's calculations.

The descriptive statistics show that, on average, parents expect their children to complete high school (12 years of schooling). However, it is worth noting that this desired level of education is higher than one might expect partly because our sample includes only those parents whose children are currently enrolled in school. The average expenditure on schooling is PRs275 per month per child.

Around 25 percent of the sample is enrolled in private schools whereas the rest are enrolled in government or other schools. The data also show that 56 percent of all school-going children are male, implying that investment in human capital in rural Punjab is biased toward boys. This is substantiated by the observation that the fathers of the sampled children tend to be better educated than their mothers.

5. Results and Empirical Findings

In order to examine the relationship between parents' subjective aspirations and their schooling investment decisions, we employ the coefficient of the change in the number of factories within a five-kilometer radius. This instrument has strong explanatory power for the specific

endogenous variable, but is not correlated with the error term (see Section 3.2.1). With the arrival of new factories in a region, parents are likely to want their child to attain a higher level of schooling (and better chance of future employment). This exogenous change can have a profound effect on parents' desired level of education for their child. Applying the Angrist-Pischke test yields an F-statistic of 23.81, which shows that the instrument has sufficient explanatory power and is informative.

The validity of the instrument is determined by applying the Hansen-Sargan test for overidentifying restrictions to the instrument and its square. The null hypothesis that all IVs are uncorrelated with the structural error is not rejected, thus supporting the validity of the IV. As explained in Section 3.2.1, the arrival of new factories can affect investment in schooling through community- and household-specific aspects and confound the aspirations-investment relationship. To ensure the validity of the instrument, we add district dummies, household income, mother's income, and wealth as controls.

The results of the first-stage regression (Table 2) indicate that parents' aspirations are motivated by the arrival of new factories in the region. This exogenous change increases the existing pool of economic opportunities and the likelihood of finding a well-paid job. Parents recalibrate their expectations in line with this and, as our results show, are more likely to desire 0.0678 additional years of schooling for their child. The arrival of new factories thus has a positive and significant impact on parental aspirations.

Table 2: First-stage regression for investment in schooling

Explanatory variables	Parental aspirations
	Change in number of factories within 5-km radius
Change in number of factories within 5-km radius	0.0678*** (0.0139)
<i>Individual characteristics</i>	
Age	-0.0375 (0.2640)
Age squared	0.00411 (0.0141)
Gender	1.6070*** (0.3110)
Number of older siblings	-0.2010**

Explanatory variables	Parental aspirations
	Change in number of factories within 5-km radius
	(0.0867)
Capability	0.2930 (0.4080)
<i>Household characteristics</i>	
Father's education	0.0560 (0.0374)
Mother's education	0.1320*** (0.0493)
Wealth index	0.2900*** (0.0780)
Household income	0.00133* (0.000666)
Mother's income	-0.00819** (0.00341)
<i>Community characteristics</i>	
Index for government school characteristics	-0.3920*** (0.0893)
Index for private school characteristics	0.0476 (0.1440)
Constant	11.1100*** (1.3550)
District dummies	Yes
Number of observations	931
Tests	
First-stage F-test	
F-statistic	23.8100
Prob. > F	0.0000
Hausman test	
Ho: variables are exogenous	
Robust regression F (1,63)	0.14
P-value	0.71
Hansen-Sargan test	
Ho: instruments are jointly valid	
Sargan (score) chi2 (1)	2.62
P-value	0.11
Basmann chi2 (1)	2.57
P-value	0.11

Notes: Clustered standard errors are given in parentheses below estimates.

* Significant at 10 percent, ** significant at 5 percent, *** significant at 1 percent.

Source: Author's calculations.

The second stage uses the predicted values of the endogenous variable (obtained from the first stage) as the regressor, along with other exogenous covariates to determine the impact of parental aspirations on human capital investment in rural Punjab. Table 3 reports the second-stage estimations, which resolve the endogeneity stemming from the reverse causality between parents' aspirations and investment in schooling. The marginal effects for the IV probit estimations are reported in Table A.3 in the Appendix. These probability derivatives highlight the effect of a unit change in independent variables on the dependent variable keeping all other factors constant.

Table 3: Second-stage regression for investment in schooling

Explanatory variables	Private school enrolment			Total expenditure on schooling		
	Probit	IV probit	HFE with LPM	OLS	TSLs	HFE with OLS
<i>Individual characteristics</i>						
Parents' desired number of schooling years for child	0.0430*** (0.0163)	0.0837 (0.1170)	0.000915 (0.00575)	8.1910** (3.1150)	82.810** (37.460)	-5.352* (3.064)
Age	0.1460 (0.1220)	0.1460 (0.1230)	-0.0107 (0.0302)	15.0300 (31.9600)	17.230 (38.370)	-22.600 (18.320)
Age squared	-0.0100 (0.00627)	-0.0101 (0.00629)	0.000105 (0.00156)	-0.0354 (1.6010)	-0.313 (1.997)	2.089** (0.908)
Gender	-0.1010 (0.1000)	-0.1660 (0.2110)	-0.0293 (0.0291)	19.9200 (21.8000)	-99.980 (69.070)	11.470 (15.900)
Number of older siblings	-0.0267 (0.0317)	-0.0179 (0.0423)	-0.0198 (0.0178)	-13.3000 (8.2690)	2.329 (15.330)	-9.746 (11.260)
Capability	0.2260** (0.0902)	0.2120** (0.0974)	0.0562 (0.0375)	49.1800 (40.6900)	27.060 (55.000)	76.090 (60.090)
<i>Household characteristics</i>						
Father's education a	0.02100 (0.0142)	0.0183 (0.0169)	0.00956 (0.00946)	8.0660* (4.3690)	3.657 (5.965)	0.971 (3.341)
Mother's education a	0.0283 (0.0226)	0.0224 (0.0274)	0.00744 (0.0216)	28.3800*** (9.1240)	18.480* (10.560)	8.739 (9.268)
Wealth index	0.1260*** (0.0370)	0.1140** (0.0561)	0.1140** (0.0561)	20.0600*** (7.0420)	1.290 (14.610)	
Household income	0.000561 (0.000461)	0.000500 (0.000476)	0.000500 (0.000476)	0.1930* (0.0993)	0.0940 (0.111)	
Mother's income a	-0.00000909 (0.00341)	0.000338 (0.00351)	0.0483 (0.0317)	1.5670 (1.9070)	2.199 (1.810)	52.520** (24.930)

Explanatory variables	Private school enrolment			Total expenditure on schooling		
	Probit	IV probit	HFE with LPM	OLS	TOLS	HFE with OLS
<i>Community characteristics</i>						
Index for government school characteristics	0.0283 (0.0702)	0.0398 (0.0659)		14.5700 (19.3600)	35.990* (19.030)	
Index for private school characteristics	0.0246 (0.0964)	0.0242 (0.0971)		-21.8100 (17.7900)	-20.650 (19.540)	
Constant	-2.3740*** (0.6450)	-2.803** (1.340)	0.1420 (0.1820)	-213.900 (179.800)	-1,035.7** (463.5)	51.95 (165.90)
District dummies	Yes	Yes	No	Yes	Yes	No
Number of observations	931	931	931	931	931	931

Notes: Clustered standard errors are given in parentheses below estimates.

* Significant at 10 percent, ** significant at 5 percent, *** significant at 1 percent.

a = variables that are defined in HFE because certain households have a joint family system.

Source: Author's calculations.

The coefficient of parental aspirations for total expenditure on schooling is positive and significant. Parents who want their child to complete a higher level of education are more likely to incur higher expenditure on schooling—even without necessarily enrolling them in a private school. Thus, the sampled parents are generally motivated to educate their children regardless of the type of school attended.

There are several possible explanations for this finding. Parents may consider their child's education to be a worthwhile investment associated with high monetary and nonmonetary returns. Thus, the decision to invest could be driven by factors such as (i) better prospects of the child securing well-paid employment, (ii) the perceived role of the child as a caregiver able to provide financial support in his or her parents' old age, and (iii) the perception that schooling is an important facet of the child's personal development. These factors are then tied to parents' awareness of new economic opportunities as well better schooling opportunities available in the area. Better-informed parents are likely to recalibrate their aspirations in line with exogenous changes such as the arrival of a new factory, and translate these aspirations into higher expenditure on human capital development.

However, when the choice of school is taken into account, our findings contradict the literature and do not show a significant relationship between parental aspirations and private school enrolment. Assuming that parental aspirations affect investment in schooling, then this effect is no larger than a probability of 0.41 for private school enrolment (at a 95 percent confidence level). Children appear to either remain in the same school or switch between schools of the same type (private or government). Regardless, parents incur higher expenditures on their schooling or schooling inputs.

We can account for this by assuming that parental aspirations are associated with different levels of education; since the IV is the arrival of new factories, it will capture only the local average treatment effect of the availability of economic opportunities. Those households affected by the arrival of new factories may not be the same set of households who chose between private or public schools, which is why we find no relationship between parental aspirations and private school enrolment. Investment in schooling could also be motivated by other factors such as the cost of schooling inputs (tuition fees, uniforms, books) or the choice

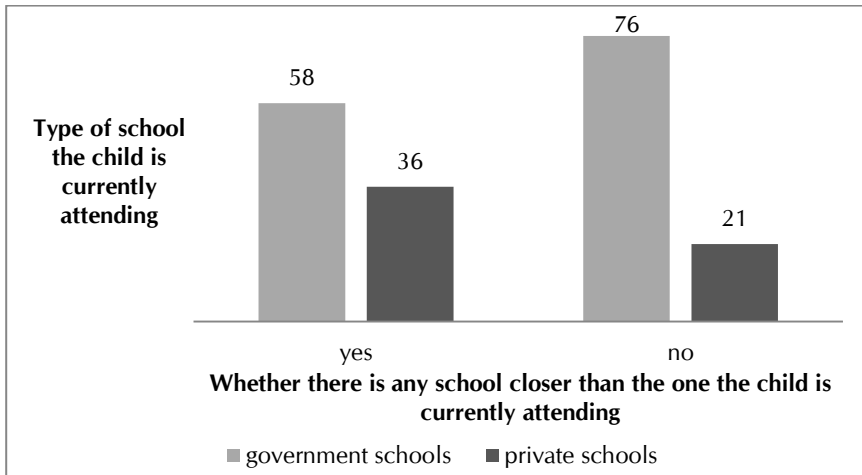
between relatively cheap or expensive schools rather than by the choice of school type.

In this context, there is also a tradeoff between the quality and quantity of education. Parents may prefer that their child complete more years of schooling at an average or low-quality school (public school) than fewer years at a high-quality school (private school). This could explain why a substantial impact is found in the case of total spending on schooling but none for private school enrolment.

An interesting aspect of the quality-quantity relationship is that parents appear to opt for both quantity (for the child to reach a higher grade) as well as quality (incurring more expenditure up front). This could be because they want to expand both margins or have chosen to invest in schooling quality at this stage to ensure that the child progresses to the next grade. Parents may also feel that the private schools in that area are not necessarily as good as the government schools, thus choosing to enroll their child in the former.

Apart from demand-side factors, supply-side factors can also account for this finding. Access to school plays a crucial role in schooling decisions. If the nearest private school is located farther away than the nearest public school, parents are more likely to opt for the latter. Of the parents in our sample, 55 percent reported that their children attended the nearest possible school (Figure 1). Of this proportion of children, 76 percent were enrolled in a government school and 21 percent in a private school. This supports our finding that the relationship between parental aspirations and private school enrolment is influenced by supply-side factors such as the availability of private schools in the area. The existence of fewer private schools may explain why most children are enrolled in government schools.

Figure 1: Percentage of children enrolled in school with respect to proximity to school



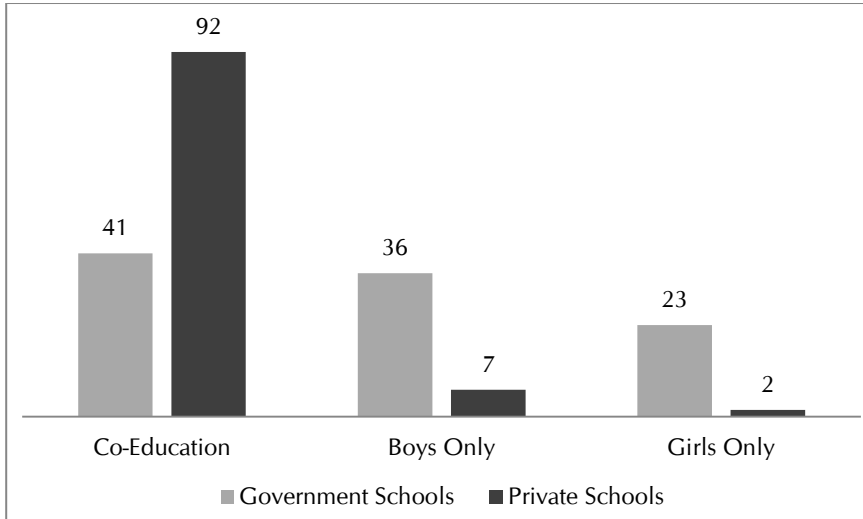
Additionally, it is worth noting that most private schools in Punjab are coeducational. In rural Punjab, cultural norms are likely to result in a preference for single-sex schools. Figure 2 shows that 92 percent of the private schools in the sample area are coeducational compared to 41 percent of the government schools. Thus, even if parents want their child to study at a private school, they may be less inclined to enroll him or her in a coeducational school. Again, this may explain why parental aspirations have an insignificant relationship with private school enrolment.

The results of the HFE model for private school enrolment also show that there is no relationship between parental aspirations and investment in (private) schooling (Table 3). However, the coefficient for total expenditure on schooling indicates a statistically negative relationship. Once we control for heterogeneity across households, parents' desired level of education for their child is associated with a decline in spending. In other words, parents might aspire to a higher level of schooling for their child, but this does not necessarily translate into a higher level of expenditure.

This result is in line with our previous finding that private schools are not necessarily perceived as being better than government schools: thus,

parents may prefer to spend on high-quality government schools (which are less expensive) than low-quality private schools.

Figure 2: Percentage of single-sex and coeducational schools with respect to type of school



In order to better understand the aspirations-investment mechanism, we extend the specification to gender (Table 4), running separate regressions for boys and girls. The results indicate a positive and significant relationship between parental aspirations and total expenditure on schooling for boys (i.e., parents with higher aspirations for their sons invest an additional PRs150.8 in their schooling per month) but no such relationship for girls.

Table 4: Second-stage regression for investment in private schooling for boys and girls

Explanatory variables	Private school enrolment		Total expenditure on schooling	
	IV probit (boys)	IV probit (girls)	2SLS (boys)	2SLS (girls)
<i>Individual characteristics</i>				
Parents' desired number of schooling years for child	0.1050 (0.1270)	0.0359 (0.1350)	150.800*** (42.380)	-35.990 (33.610)
Age	0.1060 (0.1620)	0.2610 (0.2250)	26.390 (90.580)	-19.130 (38.340)
Age squared	-0.00926 (0.00850)	-0.0148 (0.0118)	-0.628 (4.624)	1.531 (2.047)
Number of older siblings	0.00176 (0.0546)	-0.0419 (0.0482)	35.550 (25.690)	-25.880** (12.610)
Capability	0.2370* (0.1290)	0.1920 (0.1440)	33.230 (99.770)	41.610 (40.240)
<i>Household characteristics</i>				
Father's education	0.0125 (0.0220)	0.0272 (0.0197)	3.593 (10.060)	3.650 (4.763)
Mother's education	0.0535* (0.0284)	-0.000834 (0.0461)	31.650* (16.380)	26.660* (15.110)
Wealth index	0.1060 (0.0681)	0.1300** (0.0552)	-15.860 (21.970)	33.070** (15.560)
Household income	0.000298 (0.000499)	0.00116** (0.000570)	-0.00462 (0.147)	0.181 (0.161)
Mother's income	0.00174 (0.00306)	-0.00328 (0.00374)	3.730** (1.893)	-0.517 (0.447)
<i>Community characteristics</i>				
Index for government school characteristics	0.0378 (0.0803)	0.0349 (0.0631)	62.590*** (23.370)	3.967 (16.640)
Index for private school characteristics	0.0433 (0.1250)	-0.0276 (0.102)	-9.869 (33.340)	-20.540 (19.650)
Constant	-3.2320** (1.4460)	-2.6610 (2.1640)	-2,252.8*** (693.5)	571.1 (457.5)
District dummies	Yes	Yes	Yes	Yes
Observations	507	424	507	424

Notes: Clustered standard errors are given in parentheses below estimates.

* Significant at 10 percent, ** significant at 5 percent, *** significant at 1 percent.

Source: Author's calculations.

It is important to note here that the first-stage F-test applied to the excluded instrument for girls is still high (12.7091), which shows that the arrival of new factories is still associated with higher parental aspirations for both genders (Table 5). The first-stage regression results show that the arrival of new factories increases the desired number of schooling years by 0.0688 for boys and 0.0685 for girls (Table 5). However, the second-stage regression in Table 4 shows that this increase in parental aspirations translates into greater schooling investment solely for boys.

Table 5: First-stage regression for investment in schooling for boys and girls

Explanatory variables	Parental aspirations	
	Boys	Girls
Change in number of factories within 5-km radius	0.0688*** (0.0135)	0.0685*** (0.0192)
<i>Individual characteristics</i>		
Age	0.1520 (0.4090)	-0.4140 (0.3860)
Age squared	-0.00577 (0.0215)	0.0237 (0.0208)
Number of older siblings	-0.2790** (0.1270)	-0.1130 (0.0802)
Capability	0.3150 (0.5750)	0.2770 (0.4310)
<i>Household characteristics</i>		
Father's education	0.0697* (0.0360)	0.0441 (0.0508)
Mother's education	0.0458 (0.0616)	0.2380*** (0.0653)
Wealth index	0.3000** (0.1200)	0.2800*** (0.1040)
Household income	0.00142** (0.000593)	0.000814 (0.00162)
Mother's income	-0.00773 (0.00695)	-0.00468 (0.00291)
<i>Community characteristics</i>		
Index for government school characteristics	-0.4430*** (0.0906)	-0.3110** (0.1510)
Index for private school characteristics	-0.0336 (0.2010)	0.1550 (0.1570)
Constant	12.21*** (2.155)	12.540*** (1.977)

Explanatory variables	Parental aspirations	
	Boys	Girls
District dummies	Yes	Yes
Number of observations	507	424
Tests		
First-stage F-test on excluded instrument		
F-statistic	25.96560	12.7091
Prob. > F	0.00000	0.0007
Hausman test		
Ho: variables are exogenous		
Robust regression F (1,63)	0.22262	0.002595
P-value	0.63870	0.9595
Hansen-Sargan test		
Ho: instruments are jointly valid		
Sargan (score) chi2 (1)	2.07229	0.591765
P-value	0.15000	0.4417
Basman chi2 (1)	1.99871	0.56464
P-value	0.15740	0.4524

Notes: Clustered standard errors are given in parentheses below estimates.

* Significant at 10 percent, ** significant at 5 percent, *** significant at 1 percent.

Source: Author's calculations.

There are several possible explanations for this finding. First, parents generally perceive boys as having greater earning potential than girls and may, therefore, choose to provide their sons with a better quality of schooling than their daughters (even if they want the latter to attain a certain level of education). Second, sons are seen as future breadwinners: parents may perceive that investing in their education will lead to better employment opportunities in the future and augment the household's income. This is especially the case if new economic opportunities are geared toward males rather than females. This finding is in line with the literature and reflects the perception that sons will provide their parents with financial support in their old age.

Third, a clear distinction exists between the labor market roles assigned to males and females. Parents may feel that boys are better suited to the nature of factory work than girls, and thus prefer to invest more in their sons' schooling. As already mentioned, the first-stage model shows that the arrival of new factories increases parental aspirations for both genders, but the effect does not necessarily translate into higher investment in schooling for girls for the reason given above. The literature also indicates that parents are more likely to allocate resources to their sons.

The fourth explanation relates to social institutions such as marriage and dowry. Daughters are perceived as likely to get married relatively early and become part of their husband's household; parents may, therefore, be less inclined to invest in their schooling because the returns would likely accrue to another household. Sons, on the other hand, often continue to live with their parents even after marriage and are expected to provide for them. Additionally, the custom of providing dowry often imposes a financial burden on parents, who may then opt to save for their daughter's marriage rather than spend on her education.

When differences across gender are taken into account, the results of the HFE model for private school enrolment show that there is no significant relationship between parental aspirations and investment in schooling. The coefficient of total expenditure on schooling, however, indicates a statistically negative relationship similar to that in Table 3. The regression in Table 6 indicates that, when it comes to investment in schooling, there is a substantial gender bias.

Table 6: HFE for investment in schooling across gender

Explanatory variables	Private school enrolment	Total expenditure on schooling
<i>Individual characteristics</i>		
Parents' desired number of schooling years for child	-0.00105 (0.00637)	-7.938** (3.335)
Age	-0.01110 (0.03030)	-23.160 (18.410)
Age squared	0.000144 (0.00156)	2.141** (0.912)
Gender	-0.10600 (0.06790)	-89.750* (53.450)
Gender*aspirations	0.00583 (0.00544)	7.679* (4.462)
Number of older siblings	-0.01840 (0.01700)	-8.019 (11.050)
Capability	0.05710 (0.03780)	77.250 (59.820)
<i>Household characteristics</i>		
Father's education	0.00954 (0.00933)	0.950 (3.317)
Mother's education	0.00782 (0.02130)	9.239 (8.962)
Wealth index		

Explanatory variables	Private school enrolment	Total expenditure on schooling
Household income		
Mother's income	0.04820 (0.03150)	52.500** (24.690)
<i>Community characteristics</i>		
Index for government school characteristics		
Index for private school characteristics		
Constant	0.16100 (0.18500)	77.630 (172.000)
District dummies	No	No
Number of observations	931	931

Notes: Clustered standard errors are given in parentheses below estimates.

* Significant at 10 percent, ** significant at 5 percent, *** significant at 1 percent.

Source: Author's calculations.

The estimations reveal that, once we control for heterogeneity across households, parents' desired level of education for girls is associated with a decline in spending. Parents with higher aspirations for their sons, however, tend to spend an additional PRs7.679 on their schooling relative to daughters. This finding is in line with Table 5, which indicates that parents might have high aspirations for both boys and girls, but prefer to invest more in boys. This substantiates the previous finding that, for the reasons we have identified, there exists a substantial gender bias in the household's investment decisions.

In sum, our findings show that parents' desire for a high level of schooling for their child is based on their perception of the child's future earning potential (as the return to their investment in his or her education). According to the literature, parents' aspirations are formed on the basis of (i) the employment opportunities available in the area and (ii) the differential capabilities of each child. Our results indicate that the former is more likely to influence schooling investment.

The second aspect of our findings is that higher parental aspirations are associated with higher expenditure on schooling, but not necessarily with a preference for private school enrolment. Supply-side factors, such as the availability of and access to schools and whether a school is single-sex or coeducational, may determine the level of investment in schooling.

Finally, our results show that, although the arrival of new factories does have an impact on parental aspirations for girls, this does not necessarily translate into higher investment in their schooling (unlike in the case of boys). The perceived demand for male labor and the notion that boys are more likely to enter the formal labor market means that parents are likely to consider it more important to provide boys with a high-quality education. For girls, there is a tradeoff between investing in their marriage (in the form of dowry) and their schooling. Households that face a budget constraint will allocate resources accordingly to maximize their future benefits.⁶

Study Limitations

Some limitations of this study should be kept in mind. First, the Directory of Industries dataset does not specify whether factories are labor- or capital-intensive. This limits the analysis because the number of workers that either type of factory will hire will be different, thus affecting the aspirations-investment mechanism.

Second, the analysis is subject to sample selection bias because we take into account only those children who are currently enrolled in school. The aspirations variable for children who are out of school is likely to have a very different impact on schooling investment or may not have an impact at all. The descriptive statistics show that most (76 percent) children aged 5–14 years are currently attending school. This implies that sample selection is less of a problem in this study, but if a bias did exist, its expected direction would be downward.

Third, with the arrival of new economic opportunities, the overall price level in the region also rises because the new factories' demand for inputs increases. This may also increase the cost of schooling inputs and affect the aspirations-investment mechanism. Due to the lack of data on prices, this study does not incorporate this dimension.

⁶ Regressions using data on (i) children whose parents are not employed in the private sector, (ii) children currently enrolled in school and aged 5–10 years, (iii) child labor as the endogenous variable, (iv) the log of expenditure as the dependent variable, and (v) different dependent variables (such as English as the medium of instruction) were run as robustness checks and are available on request.

Conclusion

The results of this study indicate that parental aspirations are influenced by the arrival of new factories in the region: an exogenous change that increases the existing pool of economic opportunities and is likely to drive higher aspirations for children's education.

There is a noteworthy relationship between parents' aspirations and their total expenditure on schooling. Parents with higher aspirations for their child are likely to invest more in his or her schooling whether or not they enroll the child in a private school. This reflects parents' motivation to educate their children regardless of the type of school attended.

However, when the choice of school is taken into account, our findings contradict the literature and show no significant relationship between parental aspirations and private school enrolment. Children either remain in the same school or switch between similar schools (i.e., between one private/government school and the other), regardless of which parents will incur higher expenditures on their schooling or inputs of schooling. Apart from demand-side factors, supply-side factors such as the availability of and access to schools and whether a school is single-sex or coeducational may also determine the level of investment in schooling.

On extending the specification to gender, we have found a positive and significant relationship between aspirations and total expenditure on schooling for boys (i.e., parents with higher aspirations for boys invest more in their schooling per month), but not for girls. What is important to note is that the arrival of new factories increases parental aspirations for girls as well as boys, but does not translate into higher schooling investment for girls. This may be because boys, rather than girls, are perceived as future breadwinners for the household and as more likely to enter the formal labor market. For girls, there is a tradeoff between investing in their marriage (in the form of dowry) and their schooling. Households subject to a budget constraint will allocate their resources accordingly.

When differences across gender are taken into account, the HFE results for private school enrolment shows no relationship between parental aspirations and investment in schooling. The statistically negative relationship for total expenditure on schooling indicates that, once heterogeneity across households is controlled for, parents' desired level

of education for their daughters is associated with a decline in spending. Parents with higher aspirations for their sons, however, will spend more on their schooling than on that of their daughters.

The study could be extended to include university students and determine whether exogenous shocks in the economy are likely to alter parental aspirations and investment allocations. It could also be extended to urban areas to assess if the results are more or less pronounced. Finally, looking at the long run to determine whether girls go to school longer would provide an additional dimension to the study, i.e., by examining the notion of "empty" aspirations where parents are more inclined to invest in the number of years that girls attend school but not in the quality of that schooling.

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Appendix

Table A1: Definition of variables

	Form	Description	Units
Outcome variable			
Private school enrolment	Dichotomous	Type of school the child is attending: private school = 1 and 0 otherwise	-
Total expenditure on schooling	Continuous	Sum of monthly expenditures on tuition fee, admission fee, examination fee, uniform, shoes, books, funds and donations, private tuition, and transport	Rupee
Explanatory variables			
<i>Individual characteristics</i>			
Parental aspirations	Continuous	Till what class do you want your child to study?	Grade/class
Age	Continuous	Age of the child	Years
Gender	Dichotomous	Sex of the child: male = 1 and 0 otherwise	
Number of older siblings	Continuous	Total number of older siblings of the child currently attending school	
Capability	Continuous	How intelligent is the child in general? 1 = below average, 2 = average, 3 = above average	
<i>Household characteristics</i>			
Father's education	Continuous	Level of education attained by father	Years
Mother's education	Continuous	Level of education attained by mother	Years
Wealth index	Continuous	Number of items owned by household during the year: refrigerator, air conditioner, cooker/microwave oven, motorcycle/scooter, sewing/knitting machine, personal computer, bicycle, car/vehicle	Index
		Dwelling type	
		1. Independent house/compound	
		2. Apartment/flat	
		3. Part of a larger unit	
		4. Part of a compound	
		5. Other	
		Number of rooms (including bedrooms and living rooms)	

	Form	Description	Units
		Does the household have (i) an electricity connection, (ii) a gas connection, and (iii) a telephone connection? 1. Yes 2. Yes (extension) 3. No	
		What is the main source of drinking water for the household? 1. Piped water 2. Hand-pump 3. Motorized pump/tubewell 4. Open well 5. Closed well 6. Pond 7. Canal/river/stream 8. Spring 9. Other	
Household income	Continuous	Total monthly household income	Rupees
Mother's income	Continuous	Mother's total monthly income	Rupees
<i>Community characteristics</i>			
Index for govt. school char.	Continuous	How many teachers in this school have the following qualifications? 1. Below matriculation 2. Matriculation 3. FA/FSc 4. BA/BSc 5. MA or above Medium of instruction 1 = Urdu 2 = English School building characteristics 1 = pukka bricks 2 = kachha bricks/mud 3 = other (specify)	Index
Index for private school char.	Continuous	Does the school have the following facilities: 1 = boundary wall/fence 0 = no boundary wall/fence How many teachers in this school have the following qualifications? 1. Below matriculation 2. Matriculation 3. FA/FSc	Index

Form	Description	Units
	4. BA/BSc	
	5. MA or above	
	Medium of instruction:	
	1 = Urdu	
	2 = English	
	School building characteristics	
	1 = pukka bricks	
	2 = kachha bricks/mud	
	3 = other (specify)	
	Does the school have the following facilities:	
	1 = boundary wall/fence	
	0 = no boundary wall/fence	

Source: Author's calculations.

Table A2: Collinearity diagnostics

Variable	VIF	SQRT VIF	Tolerance	R-squared
Capability	1.01	1.00	0.9918	0.0082
Parents' aspirations	1.01	1.00	0.9918	0.0082
Mean VIF	1.01			
	Eigenvalue	Cond. index		
1	2.9137	1.0000		
2	0.0633	6.7869		
3	0.0230	11.2483		
Condition number	11.2483			
Eigenvalues and cond. index computed from scaled raw SSCP (with intercept)				
Det. (correlation matrix)	0.9918			

Note: The collinearity diagnostic is applied to determine the collinearity between parents' aspirations and their perception of a child's capability. The variance inflation factor (VIF) and tolerance calculates the multicollinearity between variables. A commonly given rule of thumb is that a VIF of 10 or more (equivalently, a tolerance of 0.1 or less) may indicate multicollinearity. Moreover, if the condition number is 15, multicollinearity is a concern; if it is greater than 30, multicollinearity is a very serious concern. In this model, the VIF is lower than 10, the tolerance is greater than 0.1, and the condition number is less than 15. This indicates that the model is not prone to multicollinearity.

Source: Author's calculations.

Table A3: Marginal effects for investment in schooling

Explanatory variables	Private school enrolment			
	Probit a	IV probit b	IV probit (boys) c	IV probit (girls) d
<i>Individual characteristics</i>				
Parents' desired number of years of child's education	0.0122309 (0.0047421)	0.0837205 (0.1172678)	0.1054754 (0.1273216)	0.0359117 (0.1354324)
Age	0.0416194 (0.0356004)	0.1460366 (0.1226030)	0.1058847 (0.1616706)	0.2612872 (0.2248464)
Age squared	-0.0028563 (0.0018420)	-0.0100965 (0.0062933)	-0.0092597 (0.0085028)	-0.0148274 (0.0118475)
Gender	-0.0286046 (0.0287268)	-0.1657164 (0.2108653)		
Number of older siblings	-0.0076084 (0.0089528)	-0.0178954 (0.0423067)	0.0017642 (0.0545651)	-0.0419406 (0.0482303)
Capability	0.0643960 (0.0255551)	0.2118141 (0.0973849)	0.2367376 (0.1290744)	0.1922500 (0.1442911)
<i>Household characteristics</i>				
Father's education	0.00596540 (0.00406040)	0.0183138 (0.0168733)	0.0125106 (0.0220101)	0.0272139 (0.0196669)
Mother's education	0.00803990 (0.00628250)	0.0224293 (0.0274151)	0.0535374 (0.0284062)	-0.0008340 (0.0460890)
Wealth index	0.03582570 (0.01027860)	0.1141691 (0.0561349)	0.1064551 (0.0681131)	0.1297347 (0.0551767)
Household income	0.00015960 (0.00012940)	0.0004998 (0.0004763)	0.0002981 (0.0004992)	0.0011569 (0.0005701)
Mother's income	-0.00000259 (0.00097050)	0.0003382 (0.0035063)	0.0017399 (0.0030558)	-0.0032752 (0.0037420)
<i>Community characteristics</i>				
Index for government school characteristics	0.0080441 (0.0199449)	0.0397689 (0.0658620)	0.037811 (0.0802548)	0.0348769 (0.0631260)
Index for private school characteristics	0.0069869 (0.0274661)	0.0242024 (0.0970766)	0.0433283 (0.1249408)	-0.0276021 (0.1022475)
District dummies	Yes	Yes	Yes	Yes
Observations	931	931	507	424

Notes: Clustered standard errors are given in parentheses.

* Significant at 10 percent, ** significant at 5 percent, *** significant at 1 percent.

a and b = marginal effects for probit and IV probit regression in Table 3; c and d = marginal effects for IV probit for boys and girls in Table 4.

Source: Author's calculations.

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