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Household demand for private tutoring in Tunisia

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Abstract: This article is devoted to an analysis of household demand for private tutoring in Tunisia. The data come from the National Household Budget, Consumption and Standard of Living Survey. Logistic regression models are used to determine the association between family socio-economic conditions and the decision to use private tutoring. The results show that the demand for private tutoring is positively linked to a family's patrimony and its financial capacity. The negative coefficient of the dwelling factor may seem strange given that households which own their dwelling can be considered wealthy people, but this is not the case in Tunisia. Family size is positively and significantly correlated with private tutoring. This can be explained by the particularity of the Tunisian context. Location is an important factor, and households in coastal areas are more motivated for private lessons.

Keywords: education; private tuition; tutoring; household demand; Tunisia.

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1 Introduction

Since Schultz's (1960) seminal treatise that referred to education as human capital by treating it as an investment in man and treating its consequences as a form of capital, research on the economics of education has pullulated into a wide theoretical and empirical literature (Schultz, 1959, 1960, 1961, 1962; Mincer, 1962; Becker, 1964). Education has been considered to be a major factor for social and economic growth (Becker, 1962). There has been extensive analysis of education, including endogenous growth models and microeconomic analyses via measurements of investing in education (Zon and Antonietti, 2016; Paganetto and Scandizzo, 2003). In fact, education boosts the productivity of individuals and their lifetime earnings (Becker, 1993). It follows that economic growth can be attributed to enhanced education (Adu and Denkyirah, 2017; Benos and Zotou, 2014). From a neoinstitutionalist perspective, the growing importance of education in societies led to a worldwide expansion of the non-formal education sectors as a result of households being motivated to seek ever more educational opportunities (Baker, 2020; Baker and LeTendre, 2005; Byun et al., 2018; Entrich, 2018). The renaissance of private education occurred in the 21st century in the context of intense neoliberalisation of education (Holloway and Kirby, 2020). Recently, there has been seen a new phenomenon in education, namely an increase in parental investment in the non-formal education of children (Brown, 2006; Foondun, 2002; Bray, 1995, 1999). As a result, the linkage between the rising parental investments in private tuition, educational attainment, and the socio-economic accessibility of shadow education has received an increasing attention in the literature (Bae and Stecher, 2020; Entrich, 2021, 2018; Entrich and Lauterbach, 2020; Schneider et al., 2018). The parents' investment in private tutoring is represented in paying at present for their children to save their income in the future when they have gained academic successes (Nguyen et al., 2021; Bray et al., 2018; Pallegedara, 2018; Pallegedara and Mottaleb, 2018).

Private tutoring, widely called shadow education, has received more attention in the broader literature because of its coexistence with mainstream schooling and large parts of its content mimicking the regular school system (Zhang and Yamato, 2018; Azam, 2016; Bray et al., 2014). It is in the education activities outside formal school systems where the supply of knowledge is motivated by financial profits. Foondun (2002, p.487) defined private lessons as the "extra coaching in academic and examinable subjects that is given to students outside school hours for remuneration." Accordingly, private tuition is an issue of growing concern and is present in both developed (Kwo and Bray, 2014; Kim and Lee, 2010; Buchmann et al., 2010; Bray et al., 2014; Bray and Kwok, 2003) and developing countries (Pallegedara and Mottaleb, 2018; Mahmud and Bray, 2017; Azam, 2016; Tansel and Bircan, 2006). Early educational research has been devoted to analysing the social reproduction theory, which argues that education is an engine of social inequalities (Bourdieu et al., 1977; Collins, 2009). Numerous studies have canvassed the motivations of parents for engaging in behaviours that assist their children

to maintain or exceed their own social class (Carr and Wang, 2017; Aurini and Davies, 2005; Davies, 2004).

The most perspicuous driver of demand for private tuition is social competition. Households see that educational qualifications are a most important manner by which to either improve their socio-economic status or maintain their already high status (Bray, 2021; Pseiridis et al., 2018). Thus, private tutoring is a phenomenon that attracts the attention of researchers in pedagogy and economics in many countries (Pallegedara, 2012). The analyses are concerned with possible causes and consequences of this type of learning activity on the quality of students' education on the one hand and the violation of the principle of equality of opportunity on the other hand. Parents consider private tutoring to be an effective way to help their children in the educational competition. Hence, private lessons have been accepted widely by parents and their children (Nguyen et al., 2021). Private lessons are becoming more of a burden for families. Their shares in household education budgets continue to increase (Foondun, 2002). Many factors are responsible for the phenomenon of non-formal education. The differences in influence of the various factors may be related to socio-economic level, since more prosperous households can invest in both greater quantities and better qualities of tutoring (Bray, 2021). For instance, Elbadawy et al. (2007) and Sieverding et al. (2019) for Egypt and Buchmann (2002) for Kenya showed that families in higher socio-economic strata are more likely to secure shadow education than their counterparts in lower socio-economic strata. The literature has reported numerous psychological, cultural, and economic factors affecting children's parents willing to pay private tuition fees.

This research paper attempts to analyse the patterns and the main determinants of private tuition in a developing country: Tunisia. The study of the Association for the Protection of Consumers indicated that 73.2% of 250 households in Tunisia reported that their children received private tutoring (Bray, 2021; Akkari, 2010). However, to our best knowledge, there is a woefully small number of studies investigating the demand for private tuition in Tunisia. In this vein, Rahmouni and Aleid (2020) examined the determinants of the time students spend learning outside of school to understand students' science learning in Tunisia. The authors put the finger on the effects of teaching practices on students' motivation and on the time they spend learning outside of school. Their study sought to analyse the factors linked to the number of hours devoted by students to private lessons and homework. Nevertheless, one may recognise that the effects of households' socio-economic conditions are undoubtedly more complex than what was dealt with in Rahmouni and Aleid's (2020) paper. This study will explore the associations between family socio-economic conditions and private tutoring decisions. Note that many empirical essays indicated geographic and socio-economic differences in demand for private tutoring (Pallegedara and Mottaleb, 2018; Mahmud and Bray, 2017). In fact, Coleman (1968a, 1968b) indicated that households' characteristics are the most important determinants of educational successes, particularly in the early stages of schooling. The socio-economic position of parents includes their education, occupation, and income. The occupational status is important in the choice of private lessons. Higher status of parents results in a more frequent choice to enroll their children in private schools over public ones (Rehman et al., 2010). Parents' intellectual level is one of the main factors affecting the choice of private tuition, as is parents' awareness of the importance of education. Thus, the more the education of parents is advanced, the more they are aware of the quality of educational institutions.

2 Literature review

Since the controversial landmark Coleman et al.'s (1966) report, entitled 'Equality of educational opportunity', premised that equality of opportunity should be assessed by equality of outcome rather than equality of input, a stream of prominent research papers has sprung up treating family characteristics as main determinants of educational achievement, particularly in elementary education. Thus, the relationship between educational achievement and the socio-economic accessibility of private tuition has received increasing attention in recent years (Entrich, 2021). There is often an overwhelmingly tight relationship between socio-economic status, non-formal education investments, and children's academic achievements. In fact, the socio-economic levels of households are positively associated with the academic performance of children (Mottaleb et al., 2019; Alves et al., 2017, 2016; Daniel et al., 2016; Álvarez et al., 2015; Rindermann et al., 2010; Strenze, 2007; Barnard, 2004; Bradley and Corwyn, 2002; Reynolds, 1992). Private tuition is strongly related to students' socio-economic status, contributing to the notion that, under all circumstances, the mere existence of shadow education intensifies social inequalities (Entrich, 2021; Buchmann et al., 2010; Baker et al., 2001). The influence of students' socio-economic status on their participation in private tuition varies widely across countries (Southgate, 2013) and regions (Kim and Lee, 2010). The differences in the socio-economic status gap in shadow education access are wider in some countries than in others (Marks, 2005). These inequalities in non-formal educational attainment can be explained by two competing theoretical lines of argumentation. The first line is the cross-national (or regional) differences model, which points to the cultural, economic, and institutional differences between societies as determining factors for shadow education use across societies and differences in social inequality in educational attainment (Aurini et al., 2013; Blossfeld et al., 2016; Byun et al., 2018; Hadjar and Gross, 2016; Zwier et al., 2020). The second set of explanations focuses on the social reproduction theories, which argue that investment in private tuition is an educational decision based on cost and revenue, where households use private tuition to take advantage of social exclusion to maintain their own status (Byun et al., 2018; Entrich, 2018; Kornrich and Furstenberg, 2013). Social competition is the main force underlying demand for private tuition (Bray, 2021; Rizk and Afriyie, 2014; Pallegedara, 2012). In fact, education is perceived as a major tool for social progress, and private tuition is seen as an investment for the future (Hultberg et al., 2021). Non-formal education may help students to catch up or get ahead.

Investment in private tuition may take a central role in the persistence of inequalities in most societies, given that shadow education yields significant benefits for educational attainment through horizontal differences in educational outcomes (Lucas and Byrne, 2017; Lucas, 2001). Hence, students from high socio-economic status families have a competitive advantage in easier access to private tuition and may have opportunities for better educational placement in the highest formal education and for a high-quality education. The competitive advantage gained through shadow education would help the high socio-economic status strata to guarantee their advantaged status (Entrich, 2021; Entrich and Lauterbach, 2020; Entrich, 2018; Park et al., 2016).

In developing economies, shadow education can be an attractive means of compensating for possible missing resources in mainstream schools (Dierkes, 2013). However, the financial resources of households play a predominant role in determining access to private tutoring. Higher income makes shadow education generally easier to

afford for households. Therefore, the gap in the utilisation of parallel education between students of different socio-economic status would be lower in the economies with a high average income. Park et al. (2016) noted that rising income inequality pushed households to higher investments in their children's education, with growing class gaps in educational spending, especially for private tuition. This pattern was also confirmed by Schneider et al. (2018) for the USA, where they found that the socio-economic status gap in alternative education access will be larger when income inequality is wider. Empirical studies showed that, generally, low-performing students who use private tutoring are more likely to be of low or middle socio-economic class than are high-performing students who use tutoring (Entrich and Lauterbach, 2020; Matsoso and Iwu, 2017). Sieverding et al. (2019, p.576) indicated that "having a mother with a secondary or higher education (which is likely to be a marker of high socio-economic status) predicted a significantly higher chance of private lessons. Compared with illiterate fathers, having a father with more education significantly increased the chances of private lessons." Also, the role of parents' education and, notably, the education levels of mothers on children's academic performance has been widely emphasised (Mottaleb et al., 2019; Oxford and Lee, 2011; Lemos et al., 2011; Rindermann et al., 2010; Martínez et al., 2004). The often posited explanation is that more educated parents make greater investments in children's human capital (Pallegedara, 2012; Brown, 2006; Strauss and Thomas, 1995).

In addition, Glewwe and Jacoby (1994) found that a mother's education strongly influences her children's learning performance and reading level, contrary to the effects of a father's education. The findings are consistent with Lillard and Willis (1994) for Malaysia and Thomas (1994) for the USA, Brazil, and Ghana. Educated parents in poor households, however, may make compromises between dedicating their time to provide family necessities or interacting with their children. Likewise, more educated parents may earn higher wages and thus may have a higher opportunity cost of time spent away from the workplace. Alternatively, more educated parents may have higher efficacy and spend more time interacting with their children (Brown, 2006). Similarly, Behrman et al. (1999) showed that mothers' education may affect parental time allocation in India. Sathar and Lloyd (1994) found that in Pakistani households, educated mothers' spending on their children's education was up to 75% higher than that of uneducated mothers. In fact, they found that literate mothers allocate more time than illiterate mothers in total to 'child care'. Moreover, previous results suggested that more educated parents may make greater educational investments in both goods and time. Brown (2006) showed that more educated parents provide higher levels of both goods investments and time investments without any substitution between them. The demand for private tuition may be bolstered not only by parents' aspirations but also by feelings that they cannot themselves tutor their children.

Sieverding et al. (2019) also found important differences linked to fathers' work status. Children of irregular workers, who were the most economically vulnerable, were significantly less likely than others to receive private lessons. The patterns matched findings elsewhere in Africa and beyond (Entrich, 2018; Holloway and Kirby, 2020). Tansel and Bircan (2006) found that the most influential factors to explain receiving private tutoring are household income and parental levels of education. They highlight the great role of mothers' level of education. In fact, the wealthier a household is, the greater the portion of its income spent on private tutoring. Tansel and Bircan (2006) examined factors that determined household expenditures on private tutoring in

Turkey. Their findings emphasised the importance of household income and parental education levels as the most influential determinants of private tutoring expenditures, with a larger effect from the mother's education than from the father's. Rahmouni and Aleid (2020) also showed, for Tunisia, that students whose parents have higher levels of education and more prestigious jobs generally benefit from a wider range of resources that facilitate students' academic success compared to their peers from families with lower levels of education or less favoured jobs.

Households who want their children to move successfully from high school to university and then to occupational careers spend more time and money on informal educational activities (Stevenson and Baker, 1992). Kim and Lee (2010) emphasised that private tutoring is closely related to the economic competence of families. In this regard, Stevenson and Baker (1992, p.1643) asks if private tutoring is "an avenue for the transmission of social advantages from parents to their children in the contest for educational credentials." This implies that it could damage educational equity and diverge economic and social advantages in favour of wealthier households.

3 Insights into the Tunisian education system

In the aftermath of the country gaining independence, Tunisia's education system depends primarily on public establishments that serve a vast range of the population. This is in fact thanks to the free and compulsory system of education for children from the age of 6 to 15. It entails nine school years split into two distinct levels: six years of primary (or basic) schooling and three years of preparatory (or middle) schooling for 6- to 14-year-old students. Secondary schooling has a duration of four years and is divided into two-year levels: general academic and specialised; it comprises students aged 15 to 19 years (Krafft and Alawode, 2018; Rahmouni and Aleid, 2020; Rizk, 2019; Rizk et al., 2016). The education system is characterised by the predominance of the public education sector compared to the private sector. The high cost of private school leaves many students without the option to choose between private and public education (Akkari, 2005). Despite the public funding effort, the Tunisian education system still suffers from many inequalities. In fact, the majority of rural girls do not go far because they more frequently abandon their studies upon completion of primary instruction.

In Tunisia, education has long been considered to have powerful potential to achieve social development. It is seen as a means of social advancement, and schooling is almost generalised for girls as well as boys. One of the potency points of the Tunisian education system is the massive investment of the state in human and financial resources to promote this sector. However, its insufficiency is essentially due to poor governance, the aging of public schools, and pedagogical dilemmas such as teaching science programs in Arabic at the primary level then in French at the secondary level, outdated teaching methods, and a tendency to teach by indoctrination rather than training students to be capable of putting their knowledge into practice and having good civic education.

Parents trust in public school teaching quality, teacher reputations, school locations, and the importance of tutoring subjects for their children. Yet recently people seem to be losing faith in the public sector of education. An increasing orientation towards private schools and then private tuition has been noticed in recent years. Education being marketed and privatised attracts people who can afford to pay high fees. The increasing orientation towards private tuition is caused by different factors that boost

it over the public offerings. Students' access to this type of shadow education at all its levels (primary, secondary, and higher) is in fact and differentiated by social class, parental intellectual level, and the degree of reliance on the public sector, especially after the revolution. Private tuition has increased dramatically in recent years, even as the country has directed significant resources toward financing education. According to the Programme for International Student Assessment (PISA) results, Tunisia is among the countries where students spend more time learning outside of school rather than in usual classes (OECD, 2016).

Private tutoring was regulated in 2008 by authorising teachers to tutor up to three groups of students with a maximum of four students per group, but those students could not be from the teachers' regular classes (Bray, 2021; JORT, 2008). In 2015, regulations restricted private tuition to school premises, with permission from principals and district education offices (JORT, 2015).

This provides a motive for an examination of household demand for private tutoring using household survey data to assess inequality of opportunity in education.

4 Data and estimation methods

4.1 Data and variables

The data used in this paper are from the National Survey on Household Budget, Consumption, and Standard of Living (EBCNV 2010) given by the National Statistical Institute of Tunisia. This national survey was based on a sample of 11,281 households drawn using a two-stage stratified random sampling in each of the country's 24 governorates. The survey aimed to provide detailed information on purchases of goods and services for consumption. Its data was collected from direct observation of household consumption to provide the elements necessary to assess the situation and the evolution of the standard living conditions of households.

The variables presented in Table 1 include economic and sociodemographic factors (region, marital status, household size, employment, spending, etc.). Our dependent variable is the private tutoring decision described by a binary variable denoting whether a household had any private tutoring. We have used the first and the fifth consumption quintiles so that we consider not only the average behaviour but also the extreme behaviours of the consumer. Thereby, we characterise consumer behaviour such that 20% of the measures are below the bottom quintile and 80% are below the top quintile. Considering education as social elevator, one may ask about the motivations or capabilities of vulnerable and poor groups for private tuition. The variable 'vulnerablePoor' indicates the vulnerable families, especially those living in poverty. The other variables like owning a private car, taking holidays, and having a computer at home, are a description of the living status of a family.

The average size of a household is equal to 4.47. Moreover, 95% of households are composed of fewer than seven persons. The median age is around 30 years. Note that the age class (25–30 years) constitutes a pivotal age group [INS, (2014), pp.13–14]. Moreover, the youth dependency ratio is estimated at 34% of the population, which means that two-thirds of the population financially support the rest. One may observe more active persons and then more earnings in households of larger sizes.

Table 1 Variables description

Variables	*Description*	*Type*	*All regions*		*Coastal region*		*Internal region*	
			Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*
privateTutoring	Equals 1 if household accept private tutoring	Binary	0.164	0.371	0.184	0.388	0.134	0.341
spouseNotEduc	Indicating if the spouse has no education level	Binary	0.831	0.375	0.803	0.398	0.876	0.329
retired	Indicating if the the main head has a pension	Binary	0.265	0.441	0.285	0.451	0.234	0.423
employee	Indicating if the the main head is an employee (active)	Binary	0.632	0.482	0.619	0.486	0.653	0.476
vulnerablePoor	Indicating if the household is vulnerable to poverty	Binary	0.144	0.351	0.091	0.287	0.226	0.418
havingComputer	Indicating if the household has at least one computer	Binary	0.183	0.387	0.225	0.418	0.118	0.323
takeHolidays	Indicating if the family takes holidays	Binary	0.094	0.292	0.112	0.316	0.066	0.248
carPossession	Indicating if the household has a mean of transport	Binary	0.287	0.453	0.329	0.470	0.223	0.416
Q1consumption	Indicating if the household is in the first quintile of consumption	Binary	0.194	0.396	0.108	0.310	0.327	0.469
Q5consumption	Indicating if the household is in the fifth quintile of consumption	Binary	0.207	0.405	0.275	0.447	0.101	0.302
dwelling	Indicating if the household own dwelling	Binary	0.882	0.322	0.866	0.341	0.908	0.290
houseCredit	Indicating if the household has a house credit	Binary	0.040	0.195	0.046	0.209	0.030	0.172
familySize	Number of persons in household	Numeric	4.465	1.885	4.415	1.825	4.542	1.972
childrenPrivSchool	Indication if there are other children in private school	Binary	0.021	0.143	0.021	0.143	0.021	0.143
coastalRegion	Indication if the family is in a coastal zone	Binary	0.606	0.489	NA	NA	NA	NA

4.2 Estimation methods

Our objective in the empirical analysis is to investigate the main socio-economic determinants of private tutoring in Tunisia. In our case, private tutoring is measured by a binary response variable which is equal to 1, if at least one child in a household takes private tuition and equals 0 if no child does. A logistic regression model is used to determine the variables that condition the probability of private tutoring at the global level. The logistic regression establishes that the binary dependent variable (a household's decision to use private tuition) is governed by a latent variable that is a function of other explanatory socio-economic factors, i.e., to associate with a vector of

random variables $(x_1, ..., x_k)$, a binomial random variable generically denoted y. Let us say that p is the probability of private tutoring and $logit(p) = \beta X$ or $\log(p/q) = \beta X$ where $q = 1 - p$. Thus, $logit(p) = \log(odds) = \log(p/q)$. In other words, the logistic regression is based on the following fundamental assumption:

$$\ln\left(\frac{P(y=1)}{P(y=0)}\right) = \ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 x_1 + ... + \beta_k x_k \tag{1}$$

Hence, the odds are mathematically defined as the ratio of the probability of the response of interest occurs ($y = 1$) to the probability that it does not occur ($y = 0$).

$$odds = \frac{p}{1-p} = \exp(\beta_0 + \beta_1 x_1 + ... + \beta_k x_k) \tag{2}$$

Therefore, by analogy to the partial slope in a multiple linear regression, the odds ratio summarises the net effects of the covariates by indicating the multiplicative effect on the odds for a unit increase in a given covariate, net of all other explanatory variables in the model. For categorical covariates, a 'unit increase' is equivalent to being in the category coded 1 on a given dummy variable as opposed to being in the reference category coded 0 (DeMaris, 1993).

If a continuous independent variable x_i increases by 1 unit, the odds ratio can be defined as:

$$\frac{odd(x_i + 1)}{odd(x_i)} = \exp(\beta_i) \tag{3}$$

Therefore, for every one-unit increase in x the odds are multiplied by $\exp(\beta_i)$. Each coefficient β implies that a one-unit change in the covariate results in a β unit change in the log of the odds ratio. By exponentiating β we get the odds ratio, which is equal to $\exp(\widehat{\beta})$, indicating how much the odds increases multiplicatively with a one-unit change in an explanatory variable. For a binary regressor, the odds ratio may be interpreted directly as odds ratio between groups. In fact, changing the value of a dichotomic variable, x_i, from the category 0 to the category 1 will change the estimated odds coefficient by $\exp(\beta_i)$.

In order to assess the efficiency of the predicted classification against the observed classification, we used the rate of correct prediction provided by the STATA software. Also, the goodness of the fit is measured by the Nagelkerke's pseudo-R^2 to assess the explained variation (Nagelkerke, 1991). Unlike the R^2, the pseudo-R^2 values are in general low and we should interpret them with caution.

Collinearity between some variables only widens the confidence interval of the variables involved and therefore reduces the precision of the estimated coefficients, which weakens the statistical power of the regression model. However, dropping a variable that belongs in the population model can lead to bias. Note that there are two different situations which involve multicollinearity. The first type of multicollinearity is not completely relevant when some covariates are included in the model as control variables and not because they are of interest per se. Thus, this in no way affects the estimates of the covariates we are truly interested in. The second type of collinearity concerns the variables that truly interest us. In this case, if the standard errors of the coefficient estimates for the variables of interest are small enough (or if the 95%

confidence interval is narrow enough), then we have sufficiently precise estimates of the effects of the key variables, and then there is no problem. However, if there are vast confidence intervals, the estimates become less precise. Fortunately, this problem may be solved with the large sample we have that can reduce the variance of the regression coefficients. For more discussion about multicollinearity and micronumerosity, see Goldberger (1991) and Wooldridge (2015).

5 Results and discussion

Table 2 presents the results from different logistic regression models with robust standard errors. In order to assess the robustness of the results, we also report the estimated parameters of eight models (m_1 to m_8) implied by the logit regression. The various specifications used here show almost the same results for all the coefficients of the explanatory variables. For each model, the corresponding column represents the estimated coefficients of the independent variables related to a unit change in the log of the odds ratio of private tutoring. Statistical inference of the estimated coefficients, β, is constructed by performing the z-test statistics under the null hypothesis $\beta = 0$, given between parenthesis to assess the statistical significance of estimates. The last row gives the goodness of fit for each model using the proportions of correct predictions. By the Wald-test, the p-values are used to assess the statistical significance of the estimates at the levels of 1%, 5% and 10%. All presented models are acceptable since many variables explain the private tutoring and these models yield more than 80% of the correct classification cases.

We regress the response variable indicating the private tutoring on some covariates describing the economic situation – like vulnerability, car possession, having a computer at home, holiday travel, and dwelling – and the socio-economic factors, like region of residence, household size, and having another child in a private school. In the choice of the proxy variables for household living standards, we considered two dimensions: the necessities and the consumption time horizon. So, for example, the 'travel for holidays' variable is a short-term luxury. By contrast, owning a car is a proxy for long-term needs. Travel for holidays constitutes a good well-being indicator. Moreover, the well-being proxy cannot include only purchases of durable goods (which are generally spread over many years) because the measurements of poverty and inequality are short-term indicators. These variables are also introduced separately in the models, and the significance of the estimated coefficients remains unchanged. Vulnerability is a description of the living status of a family. According to Chaudhuri et al. (2002), it is an ex-ante measure that reflects the future prospects of poverty in the presence of risks. However, poverty is a current state of lacking resources or failure to satisfy current needs. INS (2012) mentioned that many households in Tunisia remain vulnerable to shocks like job loss, rising prices, and other types of risks such as illness or catastrophic events which would plunge them into poverty, especially in rural zones. The proportion of the vulnerable population is about 14% (see Table 1). The negative coefficient of the variable 'vulnerablePoor' indicates that vulnerable or poor households are less likely to demand private lessons. This may express a risk aversion toward private tutoring fees. From the estimation results, the odds ratio is between 0.37 and 0.40, which indicates that the odds of demanding private tutoring for poor families (or value 1) are 2.5 times less than for the non-poor households. This evidence is in line with Park et al. (2016) and

Schneider et al. (2018), who found that wealthy people spend more for private tutoring. On the other hand, the variables indicating traveling for holidays, having a computer, and car possession are positively related to the probability of private tutoring. Estimates show that persons who travel for holidays are more likely to use private tutoring. The chance of private tutoring demand by people who travel for holidays is twice that of those who stay at home (exp(0.741) = 2.09). Also, the variable indicating the possession of a computer at home has a significant and positive contribution to the adoption of private lessons. In fact, in a developing country, only middle-income and high-income families can have a computer or access the internet. This variable may be considered as a tell-tale sign of family wealth and may explain the financial capacity. Indeed, parents' investment in private lessons is represented by the fact that they are currently paying for children to save their income in the future when they have achieved academic success (Hultberg et al., 2021; Nguyen et al., 2021; Bray et al., 2018; Pallegedara, 2018; Pallegedara and Mottaleb, 2018).

Regarding size of household, we observe that the variable 'familySize' is positively and significantly correlated with private lessons. This 'paradoxical' result-as one may expect poverty to rise with household size-may be explained by many factors that characterise the particularity of the Tunisian context. As the number of earners in a household increases, one can observe that household's income rising. For example, Amara and Jemmali (2017) found that compared to a household without earners, the odds of escaping extreme poverty are multiplied by 1.36 for each additional earner. Another explanation, which we cannot confirm empirically in this paper because of a lack of data, is that the age of children may be an important factor which interacts with family size. In fact, Pallegedara (2012) found a positive and significant impact of the number of children-especially aged between 6 and 18-on a household's private tuition expenditure. This result contrasts with Tansel and Bircan (2006), who found that in Turkey, a household having more children is associated with lower private tuition spending. The positive sign of the variable 'childrenPrivSchool', indicating that there was at least one other child in a given household was attending a private school, may also support the idea that households with children in private schools are more confident in private lessons. Therefore, they are motivated to access shadow education.

All the coefficients are statistically significant. The negative sign of the coefficient of the housing factor may seem strange, given that households which own their accommodations can be considered wealthy people, but this is not the case in Tunisia, where housing cannot be considered as an indicator of wealth. In fact, more than 80% of Tunisian people across all income categories own their houses, one of the highest ownership rates in the MENA region. Indeed, since the country's independence in 1956, successive Tunisian governments have engaged in affordable housing policies by encouraging home ownership. The National Program for Slum Elimination was established in 1977, and then the National Solidarity Fund was launched in 1992. These policies resulted in a lack of a necessary relationship between home ownership and the availability of adequate housing in concentrated areas characterised by higher poverty incidence and less access to basic public services. Housing conditions in Tunisia have been characterised by a quantity-quality mismatch (Filali, 2012; McVitty, 2013). In Tunisia, despite all this, many families still do not have access to housing finance through loans due to worsening housing prices and the loss of household purchasing power, as incomes cannot keep pace with the rate of increase in consumer goods prices and other expenditures. This has resulted in a heavy reliance on informal means of

financing, which makes improving living conditions a very long-term process (McVitty, 2013). This becomes clear when looking at the balanced distribution of home ownership across expenditure categories. Despite the high ownership rate, only 4% of people take out a loan for construction (the wealthiest families), which is why construction is largely self-financed (see Table 1). This may therefore support the idea that wealthy households with certain housing obligations (duties) choose private lessons. It can also be seen that geographical location is an important factor. As shown in Table 2, households in coastal regions are more motivated to access private tuition.

We also introduced the professional status of the head of household and the level of education of the spouse. In fact, the socio-economic position of parents includes their education, occupation, and income. The occupational status is influential on the choice of whether to use private lessons. A higher status of parents results in a higher choice of them enrolling their children in private schools over public ones (Rehman et al., 2010). Parents' intellectual level is one of the main factors affecting the choice of private tuition as it directly relates to parents' awareness of the importance of education. Thus, the more advanced the education of parents, the more they are aware of the quality of educational institutions. The INS (2012) indicated that the socioprofessional category of the head of household is an adequate indicator of the household's standard of living. Incidentally, including the two variables indicating whether the principal head is salaried (active) or whether he receives a pension (retired) in the same model would induce perfect multicollinearity and would have no interesting meaning. These variables were also introduced separately in the estimation models and the significance of the estimated coefficients remains unchanged. The effects of the two variables 'retired' and 'employee' are opposite. The dummy variable 'employee' is positively related to private tutoring, in contrast to the variable indicating if the main head of household is retired or has a pension. The signs and statistical significance of these two variables stay approximately constant across the different models. Rahmouni and Aleid (2020) also found that students whose parents have more advantaged occupations generally benefit from a broad range of support and resources that facilitate student academic success, compared to their peers from less educated or disadvantaged families. Sieverding et al. (2019), Entrich (2018), and Holloway and Kirby (2020) emphasise the importance of fathers' work status. In fact, irregular workers or unemployed persons, who are more vulnerable, are less inclined to pay for private lessons for their children.

In the last step, the analysis of the correlation between the variables 'vulnerablePoor' and 'coastalRegion' shows that they are not independent (p-value of Pearson's chi-squared test is less than 0.01). In addition, the odds ratio emphasises that the odds of a household being poor in the inland region are three times larger than the odds of a household being poor in the littoral region. Additionally, more than 80% of vulnerable people are in the first quintile of consumption. Therefore, in models m_7 and m_8, we removed the variable 'vulnerablePoor' and introduced the variable indicating that the household is in the first-quintile consumption class, which may be statistically more accurate. In addition, we used the highest consumption quintile to compare the magnitude of influence of different consumption levels on demand for private tutoring. The negative and significant coefficient of the first-quintile class suggests that households that lack resources are four times less likely to pursue private lessons compared to the wealthiest ones. The positive sign of the fifth consumption quintile coefficient indicates that indicates that households with more financial capacity are motivated to use private tutoring. These results are consistent with Rizk and Afriyie

(2014) findings that households within the first income quintile on average spend less on education than those within the fifth income quintile.

Table 2 Logit regression models

Models	m_1	m_2	m_3	m_4	m_5	m_6	m_7	m_8
familySize	0.258***	0.217***	0.261***	0.263***	0.265***	0.259***	0.287***	0.234***
	(17.314)	(15.686)	(17.440)	(17.549)	(17.450)	(17.165)	(18.403)	(15.907)
employee	1.002***	0.942***	0.996***		0.426**	0.405*	0.364*	0.564***
	(12.466)	(11.878)	(12.324)		(2.057)	(1.944)	(1.726)	(2.756)
spouseNotEduc	–0.530***	–0.449***	–0.370***	–0.373***	–0.296***	–0.265***	–0.259***	–0.312***
	(–7.656)	(–6.163)	(–5.047)	(–5.099)	(–3.965)	(–3.517)	(–3.501)	(–4.071)
childrenPrivSchool	0.496***	0.512***	0.435***	0.439***	0.355**	0.314*	0.290*	0.404**
	(3.063)	(3.122)	(2.607)	(2.611)	(2.110)	(1.841)	(1.731)	(2.395)
dwelling	–0.316***	–0.252***	–0.272***	–0.270***	–0.239***		–0.225***	–0.203**
	(–3.893)	(–3.056)	(–3.267)	(–3.250)	(–2.842)		(–2.679)	(–2.428)
vulnerablePoor	–0.990***		–0.931***	–0.966***	–0.926***	–0.898***		
	(–9.594)		(–8.946)	(–9.299)	(–8.868)	(–8.611)		
coastalRegion	0.311***		0.259***	0.256***	0.218***	0.228***	0.116*	0.286***
	(5.147)		(4.222)	(4.173)	(3.526)	(3.680)	(1.850)	(4.641)
takeHolidays		0.741***	0.684***	0.689***	0.614***	0.617***	0.575***	0.612***
		(8.898)	(8.249)	(8.297)	(7.218)	(7.274)	(6.810)	(7.038)
carPossession		0.365***	0.295***	0.303***	0.182***	0.167***	0.173***	0.188***
		(6.108)	(4.858)	(4.991)	(2.865)	(2.616)	(2.725)	(2.936)
retired				–1.049***	–0.663***	–0.698***	–0.758***	–0.505**
				(–12.260)	(–3.010)	(–3.166)	(–3.395)	(–2.323)
havingComputer					0.567***	0.565***	0.519***	0.567***
					(8.025)	(7.979)	(7.362)	(7.899)
houseCredit						0.627***		
						(5.397)		
Q1consumption							–1.344***	
							(–12.771)	
Q5consumption								0.174**
								(2.157)
Constant	–2.954***	–2.957***	–3.289***	–2.314***	–2.879***	–3.097***	–2.792***	–3.071***
	(–21.406)	(–22.328)	(–22.558)	(–19.203)	(–12.074)	(–13.427)	(–11.617)	(–12.864)
Wald-chi^2	600.53***	628.34***	698.75***	703.06***	763.66***	788.57***	805.39***	719.05***
df	7	7	9	9	11	11	11	11
pseudo-R^2	0.116	0.116	0.132	0.132	0.144	0.147	0.163	0.129
Correctly classified	81.13%	81.38%	81.28%	81.26%	81.21%	81.36%	81.31%	81.18%
Obs.	9,215	9,210	9,210	9,210	9,205	9,202	9,205	9,205

Notes: z-values are presented in parens.
Significance levels: *** at 1%, ** at 5%, and * at 10%.

The results show a significant association between private lessons and being in the coastal region. The positive sign of the coefficient of the variable 'coastalRegion' indicates that children of households in coastal areas are more likely to attend private lessons. Furthermore, we estimate the role of parents' education, and notably mothers who are not educated, on the demand for private lessons. In fact, spouses, mainly women, who are not educated negatively and significantly affect the use of extracurricular learning, as indicated Table 2. This evidence is in line with Krafft

and Alawode (2018), who found that mothers' education is positively related to higher educational attainment in Tunisia. Fathers' education level is almost always significant, but the disparities correlated with mothers' education are relatively higher. We found that educated spouses (in general, women) have more willingness to pay for private tutoring, as Mottaleb et al. (2019), Oxford and Lee (2011) and Lemos et al. (2011) asserted that educated mothers spend more and make greater investments in their children's education. Likewise, Sathar and Lloyd (1994) found that in Pakistani households, educated mothers spent up to 75% more on their children's education than did uneducated mothers.

Table 3 Estimations by regions

	Coastal			*Inland*		
	Beta	*Std.*	*Sig.*	*Beta*	*Std.*	*Sig.*
spouseNotEduc	–0.100	0.088	0.255	–0.59	0.135	0.000
childrenPrivSchool	0.174	0.202	0.388	0.497	0.266	0.061
employee	0.323	0.246	0.189	0.486	0.393	0.216
retired	–0.839	0.261	0.001	–0.592	0.419	0.158
havingComputer	0.550	0.081	0.000	0.410	0.138	0.003
takeHolidays	0.612	0.099	0.000	0.379	0.166	0.022
carPossession	0.112	0.075	0.136	0.288	0.115	0.012
familySize	0.282	0.022	0.000	0.307	0.028	0.000
dwelling	–0.205	0.098	0.036	–0.282	0.159	0.077
Q1consumption	–1.313	0.153	0.000	–1.332	0.138	0.000
Q5consumption	0.115	0.091	0.207	0.114	0.161	0.481
Constant	–2.764	0.283	0.000	–2.719	0.438	0.000

In addition, INS (2012) mentioned that degree of urbanisation has an influence on the average level of household spending on education. Therefore, we stratified the households according to their residential areas, especially whether they are in a coastal region or not. Accordingly, we divided our estimates into two parts: coastal and inland areas. Further findings concern the differences between significant factors in coastal and inland regions. Table 3 shows that the coefficient of the variable indicating that spouses are not educated is not significant for the coastal region, where families have more information and lack of parental education can be substituted by other sources or factors. However, mothers' education in the inland region contributes significantly to demand for private lessons.

Having a car can be more interesting in the inland zone (which is in large part rural) than in the coastal one. Poor and vulnerable people in the first spending quintile are less likely to use private lessons. The magnitude of this variable is the same for the two regions. Note that the descriptive statistics in Table 1 show that only 22% of people in the inland region own a car. Thus, the possession of a means of transport can be considered as a kind of luxury and constitutes a motivation to adopt a mode of consumption different from those of disadvantaged groups, including the tendency to pay for private lessons. Poor and vulnerable people in the first spending quintile are less likely to use private lessons. The magnitude of this variable is the same for all regions. If the status of having a pension is significant at the global level, it loses its

significance at the level of the inland region because it is no longer a factor of economic discrimination.

6 Conclusions

This paper has been dedicated to an analysis of household demand for private lessons in Tunisia. It explores the relationship between family socio-economic conditions and the decision to use private lessons, which may vary widely across countries and regions. The difference can be explained by the cultural, economic, and institutional differences between societies as determining factors for shadow education use across societies and differences in social inequality in educational attainment.

In the Tunisian context, our results show that demand for private tutoring is positively linked to familial patrimony and financial capacity. The negative coefficient of the dwelling factor may seem strange given that households which own their dwelling are often considered wealthy, but this is not the case in Tunisia where household housing conditions are characterised by a quantity-quality mismatch. Students whose parents are educated and/or have more prestigious jobs generally benefit from a wider range of resources that facilitate students' academic success compared to their peers from families with lower levels of education or less favoured occupations. Other findings concerned the differences between factors in coastal and inland regions. Location is an important factor, and households in coastal areas are more motivated for private lessons. Indeed, the coefficient of the variable indicating whether the spouse is educated is not significant for the coastal region, where families have more information and then parents' lack of education can be replaced by other factors. However, the education of mothers in the inland area contributes significantly to the demand for private lessons.

We limit our analysis to the socio-economic determinants of demand for private lessons. Other explanations can be centred on the theories of social reproduction which state that investment in private lessons is an education decision based on cost and income, where households use the school support to take advantage of the social exclusion and maintain their own status. Social competition is also a major driving force behind the demand for private lessons. Indeed, education is seen as a major tool for social progress, and private lessons are seen as an investment for the future. Non-formal education can help students catch up or get ahead.

It is important to emphasise that household demand for private tutoring in Tunisia is not only a micro-level dimension related to household characteristics, and thus that policies should be implemented at the regional level to improve social outcomes such as the unemployment rate, industrial composition, wages, and income distribution (Cotter, 2002). We also believe that educational policy should aim to increase the level of the stock of human capital through investments in public infrastructure, especially in inland areas, to reduce social disparities (Ibourk and Amaghouss, 2014). Thus, we recommend that scholarship schemes target children coming from households with fewer financial resources in order to increase equality of access to learning opportunities (Rizk and Afriyie, 2014; Rizk, 2019). Actually, private tutoring expenditure has changed from a luxury to a necessity good, and this growing phenomenon is mainly driven by intense social competition, as labour wages increasingly depend on the education level of workers (Pallegedara, 2012).

Note that we have neglected some variables because of the reduced number of observations in the survey or the weak association with the response variable private tutoring, such as the case of extremely poor households. Unfortunately, it is not clear from the data whether parents' decisions about private lessons are gender sensitive or not. This information could trigger interventions from policymakers to provide equal educational opportunities and outcomes.

This analysis can usefully be extended more widely to investigate not only whether students are receiving private lessons but also how much households spend on them, identifying factors at the school, household, and individual levels.

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