A Qualitative Approach to the Estimation of Returns to Schooling in France*

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Abstract

This paper estimates returns to schooling within a framework which incorporates the qualitative nature of the French schooling system. We estimate a sequential dynamic discrete choice model of schooling decisions. In our model, individuals can acquire general skills or professional skills, both in High School and at higher education undergraduate level. Our approach allows us to account for individuals self-selection into various education paths. We find evidence that professional training offers interesting possibilities to those who do not have strong academic skills. Indeed, in some cases, those who complete professional training may outperform those who fail from the academic track.

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1 Introductory Remarks

In most advanced societies, increasing the general level of education is on the policy agenda. This objective is easy to validate within a simple theoretical framework in which individual abilities and competence are unidimensional, and in which schooling is treated as a simple ordered (quantitative) variable. However in presence of comparative advantages, or when skills are accumulated in the labor market as well as in school, the educational systems must be designed so to create the right incentives. For this reason, economists have paid attention to the estimation of returns in a context where the returns differ across individuals.

Indeed, a thorough examination of various components of the resent literature on the economic benefit of schooling would disclose the incidence of very weak (if not negative) effects of schooling on earnings. This is the case in the recent literature on mandatory schooling (Devereux and Hart, 2010).[1]

In the literature on ex-post returns to schooling, Carneiro, Hansen, and Heckman (2003) and Heckman, Humphries, Urzua and Veramendi (2011), report a substantial fraction of individuals who experience negative ex-post returns to schooling.[2] Depending on the model specification considered, the fraction is close to 20%.[3]

Finally, even in the applied literature on economic growth, it has already been noted that the link between aggregate measures of education and economic performance is actually tenuous (Klenow and Bils, 2000).

The contribution of this paper is to examine a particular aspect of heterogeneity in returns to schooling that has been ignored in the literature. We estimate the returns to schooling within a more realistic framework which incorporates the qualitative nature of the schooling system by considering both professional and general education.

[1] Belzil, Hansen and Liu (2011) use a calibrated dynamic skill accumulation model to show that all of those results are easily explained once comparative advantages are introduced into the analysis.

[2] The term "ex-post returns" is used to characterize the parameters of the actual earnings data generating process. In the presence of imperfect information, individuals may base their schooling decisions on a different set of parameters which reflect the information available at the time of schooling decisions.

[3] It is interesting to note that this number is also consistent with results reported in Belzil and Hansen (2007) who find that between 20% and 25% of the population analyzed (US males sampled from the NLSY 79) is endowed with an individual specific treatment effect of schooling inferior to the early career return to general experience.

The economic success of many countries is sometimes imputed to an efficient apprenticeship or vocational school system. For instance, the well developed German Apprenticeship system is often cited as a successful example. Yet, the German system has no real pendant in most European countries. In France (as in many other continental European countries), youth unemployment rate remains very high despite large enrollments in universities, and access to permanent job contracts remains difficult for a majority of those entering the market.

As a consequence, many policy analysts are starting to question the relevance of policies favoring a high level of enrollments in universities, and conjecture that a more important focus on vocational training and apprenticeship is called for.

For these reasons, it is important to identify the basic skills and tastes of those who choose an academic training stream, and those who prefer apprenticeship or vocational school. For policy purposes, it is equally important to measure the relative performance of those who enroll in professional training compared to those who target a more academic track. While it is universally recognized that those who complete successfully academic studies also reap much higher lifetime earnings, it does not necessarily follow that academic training is the best solution for everyone. For instance, it is important to measure relevant rates of return for those who are attracted to general education, but who only obtain minimal levels of education, such as high-school drop-outs, or those who initiate, but do not complete, higher education studies.

In contrast to Germany, France is known to favor an education system largely centered upon general skills. The French system provides professional opportunities both at high-school and higher education (undergraduate) levels, but many policy analysts claim that professional education is both under-developed and under-valued in France.

Because our main interest is to evaluate how different individuals self-select into various education paths, we must adopt a structural approach. The model is constructed so to take into account both the quantitative and the qualitative natures of the French educational system. The model is in the spirit of Cameron and Heckman (1998, 2001), and Belzil (2008). Precisely, we model individual trajectories as a collection of sequential dynamic discrete choices.

The model captures four essential features of individual human capital decisions. The first one is the sequential aspect of schooling decisions. The

second one is the qualitative nature of individual schooling choices. The third feature is the dynamic impact of schooling on wages (the model allows for education choices to affect wages even after conditioning on unobserved heterogeneity). Finally, the fourth feature is the degree of heterogeneity that characterizes the effects of schooling on wages.

At each grade level, the individuals are allowed to choose within a set of options. So, given a completed grade level, each choice (each element in the set) has its own latent utility equation, which is parameterized as a function of a large set of parental background variables and unobserved heterogeneity. As in a standard Roy model, there exists a different set of equations for each possible grade level. This model allows us to measure separate effects of education levels on wages. For instance, the effect of completed education on earnings is not captured by a single parameter but by a collection of several parameters characterizing individual unobserved abilities, and other parameters measuring the effect of parents' occupation, location and geographical origin on wages.

Our specification of the latent utility components that generate individual choices admits many possible interpretations. One natural interpretation is that the latent utility is the reduced-form of choice-specific Bellman equations of a rational/forward looking agent who behaves within a dynamic environment.[4]

To summarize our main results, our analysis goes beyond the classical (quantitative) approach to measuring the returns to schooling. In the classical approach, it is customary to report a positive correlation between earnings and schooling as measured in years. This purely quantitative approach does not allow to take into account the qualitative nature of most educational systems. We find strong evidence that professional training offers interesting possibilities to those who do not have strong academic skills. Indeed, in some cases, those who complete professional training may sometime outperform those who fail from the academic track. This seems true for both males and females. Taken globally, our results illustrate the importance of designing education systems that allow for non-academic tracks.

[4]Obviously, other behavioral assumptions such as myopic choices, non-separable preferences (with respect to time), imperfect information, and others, would also be admissible.

2 The French Education System

Before presenting the econometric model, and discussing the main results, we give a description of the French educational system. We focus on the role of professional secondary education, apprenticeship and technical early higher education. A schematic representation of the education system is presented in Table 1.

The French education system is basically organized in three main levels: primary education, secondary education and higher education. All individuals are enrolled in general primary education schools (*écoles primaires*). After completion of primary education, which typically happens at age 11 for those who have not experienced any interruption or any grade repetition, individuals enter secondary education.

2.1 Secondary Education

Secondary education basically takes place in two different consecutive institutions: *collège* (called "junior high school" hereafter) and *lycée* (called "high school" or HS hereafter). After completion of *collège* (normally around age 15), individuals choose one of the three types of *lycée*: general, technical or professional. The completion of High School delivers a national diploma, the French *baccalauréat*, comparable to the British A level, that is necessary to enter higher education.

2.1.1 Professional High School

When individuals enter a professional HS, they can choose between two different diplomas: a CAP (*Certificat d'Aptitude Professionnelle*) or a BEP (*Brevet d'Etudes Professionnelles*). Both are professional certificates lasting 2 years. The BEP curriculum is slightly more generally oriented, which makes it more adequate to enter a subsequent educational qualification. After completing a CAP or a BEP, one may continue to professional HS and complete a professional *baccalauréat*, which takes two years. The professional *baccalauréat* provides a non-academic syllabus and gives mainly access to manual (blue collar) occupations. However, after the completion of a CAP or a BEP, one may also choose to enter another type of High School (the technical one in most of the cases) to take the corresponding *baccalauréat*. This path also takes two years.

Table 1: The French Education System

	French Terminology	English Translation	Entry Age	Terminal Age	Nature
Phase 1	*collège*	Junior High School	11	15	General
Phase 2	*Lycée professionel*	Senior High School (professional)	16	18 or 19	Professional
	Lycée technique	Senior High School (technical)	16	18	General
	Lycée général	Senior High School (general)	16	18	General
Phase 3	BTS-DUT	Technical Early Higher Education (undergraduate)	19	20	Professional
	DEUG	General Early Higher Education (undergraduate)	19	20	General
Phase 4	*Licence, maitrise*	Intermediate Higher Education (3 and 4 years college)	21	21 or 22	General
Phase 5	*Master, doctorat*	Advanced Higher Education (5 years college or more)	23	24 to 27	General

Note: Entry and terminal ages correspond to the normal ages, i.e. for those who have not experienced any interruption or any grade repetition.

2.1.2 General and Technical High Schools:

Individuals deciding to enroll in a general or technical High School can complete a **specific** *baccalauréat*. This usually takes three years. The technical *baccalauréat* provides a mix of technical and general education and is often supplemented with other types of technical higher education. The general *baccalauréat* delivers academic education and is usually followed by higher education in order to grant a marketable professional qualification.

2.2 Higher Education

The higher education system can be divided into three types of degrees. The first type is short-duration technical diplomas (two years after *baccalauréat*), such as BTS (*Brevet de Technicien Supérieur*) or DUT (*Diplôme Universitaire de Technologie*). These diplomas are opened to a limited number of students. Admission is granted through a relatively selective process.

The second type is a general university diploma (requiring 2 years or more beyond the *baccalauréat*). Basically, a student completes a DEUG (*Diplôme d'Etudes Universitaires Générales*), which entails passing the *baccalauréat* exam and studying for two more years. Then, the student has the option to continue so to obtain successively a bachelor (*licence*, three years after a *baccalauréat*), a *maîtrise* (four years after a *baccalauréat*) and a master degree (five years after a *baccalauréat*).[5] It should be noted that, in France, admission to a University is unrestricted, conditional on holding a *baccalauréat*.

The third type of higher education consists of all diplomas that may be obtained in *grandes écoles*. These schools give high level qualifications (*baccalauréat* and five years), mostly in the fields of engineering and management. Admission in these schools is very selective.

2.3 Apprenticeship

To obtain a degree granting a professional qualification (from BEP/CAP to higher education professional degrees) with an apprenticeship curriculum, individuals must enroll in a CFA (*Centre de Formation d'Apprentis*). When this option is chosen, the individual spends some time taking classes and

[5]This university system has been reformed in 2002, following the Bologna process (whose goal was to standardize higher educational systems across european countries). In France, it has consisted in the suppression of the DEUG and the maîtrise diplomas.

works for the residual time in a firm (with a very specific employment contract). Most of apprenticeship contracts apply to students enrolled in professional HS degrees (BEP, CAP and professional *baccalauréat*).

3 The Data: *Génération 98*

Génération 98 is a large scale survey conducted in France by Céreq.[6] It provides detailed information on the socio-demographic background and employment characteristics of young individuals who left school in the year 1998 and were interrogated in early 2001. Re-interviews have been conducted for parts of the sample in 2003, 2005 and 2007. The aim of *Génération 98* is to document many aspects of early labor market transitions. In particular, *Génération 98* provides information on spells of employment, unemployment, and training experienced between school completion (labor market entrance) and the date of the survey. Therefore, information on three years of the generation's working life is available and each period of employment is well documented. The personal labor market history of survey respondents has been reconstructed, month by month, during the observation period.

Because *Génération 98* is a national survey of those who left the educational system at a particular point in time (1998), all individuals faced the same labor market conditions after 1998.

The survey contains detailed information on the schooling paths followed by the individuals of the sample. Indeed, the data contain the educational level reached in 1998, the choice of High School (professional, technical or general), the type of *baccalauréat* passed and the type of higher education diploma obtained (technical or general). Those data permit to reconstruct the individual schooling decisions.[7]

Tables 2 and 3 give a descriptive statistics of some schooling decisions observed in the sample. First, with respect to High School (HS hereafter), we observe in Table 2 that the majority of individuals graduate from a general or technical HS (55%). This proportion is almost twice as high as the

[6]French Center for Research on Education, Training and Employment.

[7]In the data, there is a limited number of observations for technical HS enrollees that would prevent to estimate precisely the parameters associated to the full path of choices for individuals enrolled in this type of HS. Therefore, in our analysis, we group general and technical high schools in the same category. This choice is driven by the fact that the curricula are much closer between technical and general HS as they are between technical and professional HS.

Table 2: Summary Statistics: High School Exit

Do not enter HS	2%
Drop-out from HS	14%
Graduate from a professional HS	29%
Graduate from a general of technical HS	55%

proportion of those who graduate from a professional HS (29%). Among individuals who stop schooling right after a professional HS and do not pursue in higher education, 40% obtain their diploma though apprenticeship (not shown here).[8] It can also be noted that a significant portion of the population drops out from HS (14%) whereas 2% drop out in *collège*, i.e. before entering HS. School drop-out behavior is therefore quite important in France.

We now turn to higher education outcomes (see Table 3). Higher education entry rates are consistent with the possibilities offered by the different types of HS regarding continuing schooling. Almost all individuals who graduate from a general or technical HS continue studying in higher education, while this proportion is 7% for individuals holding a professional *baccalauréat*. Once individuals are enrolled in higher education, more than half of the ones who graduate from a professional HS drop-out from higher education without any diploma (54%), and the ones who graduate get mainly an undergraduate technical degree (37%). Among those individuals who graduate from a general or technical HS, 17% drop-out from higher education without a diploma and 47% get an intermediate or advanced degree.

4 The Econometric Model

4.1 Schooling Decisions

We model schooling decisions as a sequential dynamic discrete choice model. Given grade completion, individuals are assumed to make a choice about their enrollment at the next grade. More precisely, at each stage, individuals have to choose between a set of options composed by the different types of

[8]The data do not allow to observe if education in professional HS is taken with or without apprenticeship when the individual continues schooling after HS.

Table 3: Summary Statistics: Higher Education Outcomes

	After professional HS	After general or technical HS
Higher Education Entry Rate		
Enter HE	7%	95%
Higher Education Exit Level (conditional on HE entry)		
Higher education drop-out (with no diploma)	54%	17%
Early technical HE (*baccalauréat* and 2 years)	37%	31%
Early general HE (*baccalauréat* and 2 years)	3%	5%
Intermediate HE (*baccalauréat* and 3 or 4 years)	5%	24%
Advanced HE (*baccalauréat* and 5 years or more)	1%	23%

education available and, at some stages, labor market work. The choice set at each state g is denoted C^g and the elements of the choice set C^g are denoted $c_1^g, c_2^g, \ldots, c_{n_g}^g$, where n_g is the number of elements in the choice set C^g.

At stage g, the optimal choice for an individual i is the following:

$$\widehat{c}_i^g = \arg\max_{c_j^g \in C^g} \left\{ U_{i,c_j^g}^{g*} \right\}$$

where $U_{i,c_j^g}^{g*}$ is the utility from choosing option c_j^g at stage g. The general expression of this latent variable is given by:

$$U_{i,c_j^g}^{g*} = X_i \beta_{c_j^g}^g + \epsilon_{i,c_j^g}^g$$

where X_i is a vector of observed variables, $\beta_{c_j^g}^g$ is a vector of parameters measuring the effects of these variables, and $\epsilon_{i,c_j^g}^g$ is unobservable by the econometrician.

To estimate the model, we use several observable factors (contained in the vector of covariates X_i): family characteristics (parents' occupation and location), gender, immigration status and a cognitive skill variable, "late at school", indicating delay during primary school.

Then, assuming that $\epsilon_{i,c_j^g}^g$ is an i.i.d. extreme value variable, we can write the probability that an individual i exits to the outcome c_j^g at level g as an

extension of McFadden's (1974) conditional logit model:

$$\Pr\left(D^g_{i,c^g_j}=1|X_i\right)=\begin{cases}\dfrac{\exp\left(X_i\beta^g_{c^g_j}\right)}{1+\sum_{a=c^g_1}^{c^g_{n_g-1}}\exp\left(X_i\beta^g_a\right)} & \text{for } c=c_1,\ldots,c^g_{n_g-1}\\ \dfrac{1}{1+\sum_{a=c_1}^{c^g_{n_g-1}}\exp\left(X_i\beta^g_a\right)} & \text{for } c=c^g_{n_g}\end{cases}$$

where $D^g_{i,c^g_j}=1$ if individual i's outcome at level g is $c^g_j\in C^g$, i.e. if $\widehat{c}^g_i=c^g_j$. This probability can be written in the more compact following form :

$$\Pr\left(D^g_{i,c^g_j}=1|X_i\right)=H^g_{i,c^g_j}=\Lambda(U^{g*}_{i,c_j})$$

where $\Lambda(.)$ designs the logistic distribution.

Now, we define more precisely the different schooling decisions considered in our model. We model exactly 6 stages, that is $g=1,\ldots,6$, at which schooling decisions are taken. A graphical representation of the model is presented in Figure 1.

4.1.1 Stage 1: Junior High School (*collège*) Completion

All individuals are enrolled in junior HS. Two options are considered: (i) complete junior HS, (ii) drop-out and enter the labor market.

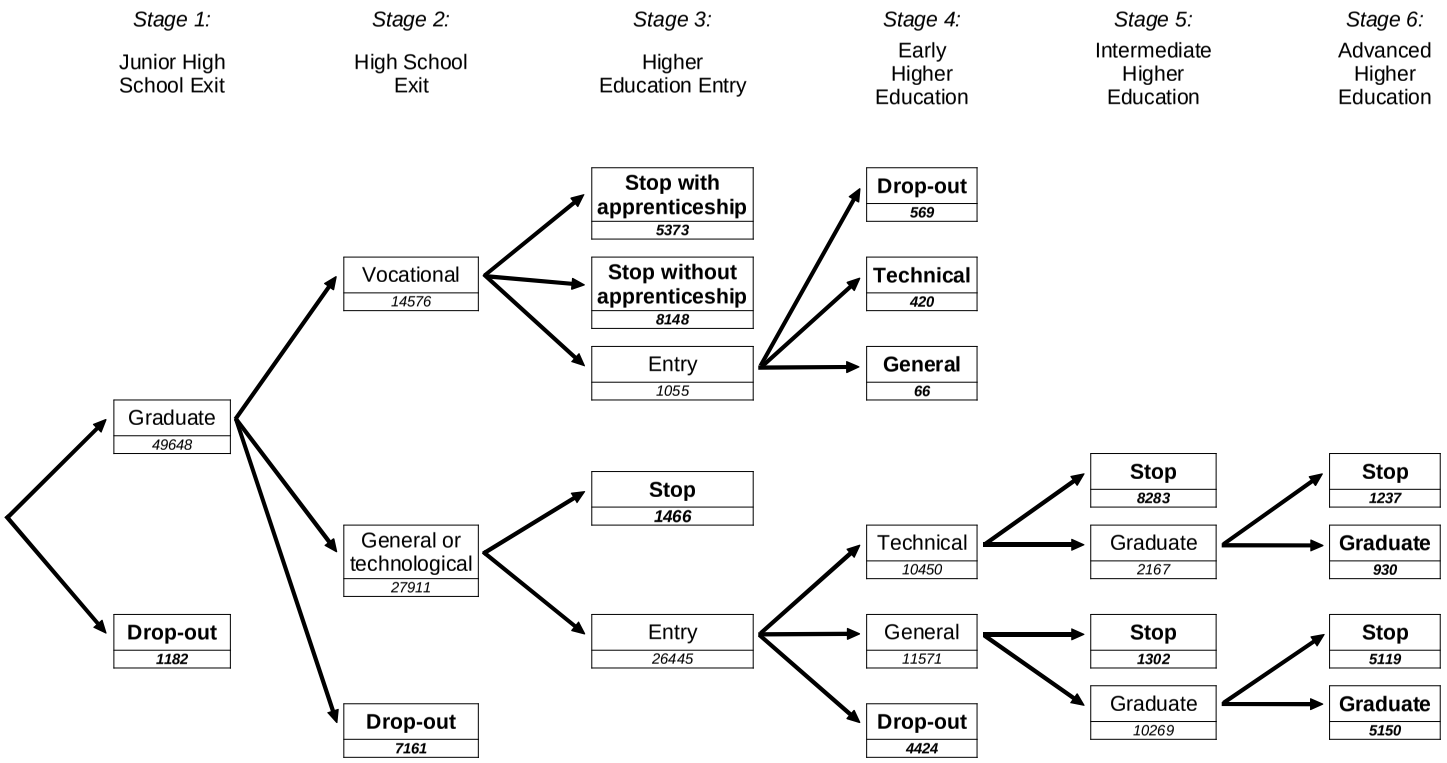
4.1.2 Stage 2: High School Exit

Once individuals complete junior HS, they enter either a professional, a technical or a general High School. We model their exit state after entry into HS. We consider three possible HS exit states: (i) complete a professional HS diploma, (ii) complete a general or technical diploma, (iii) drop-out and enter the labor market.

4.1.3 Stage 3: Higher Education Entry

Once an individual completes any of the HS (professional, technical or general), he decides either to enter higher education or to stop schooling and enter the labor market. After graduation from a general HS, we consider

Figure 1: Econometric Model Representation



In bold: labor market exit states.
Number of individuals written on the bottom part of each cell.

the two following options: (i) entering Higher Education and (ii) stopping schooling. However, after graduation from a professional HS, we introduce the distinction between entering the labor market with a professional diploma taken with and without apprenticeship.[9] Therefore, there are three options after graduation from a professional HS: (i) enter Higher Education, (ii) stop schooling with a diploma taken with apprenticeship, (iii) stop schooling with a diploma taken without apprenticeship.

4.1.4 Stage 4: Early Higher Education Graduation (undergraduate)

Once an individual enters higher education, he enters either a technical undergraduate program (BTS or DUT) or a general program (in university or a *grande école*). Therefore, we model the following three options concerning graduation from early higher education: (i) obtain a technical early higher education diploma, (ii) obtain a general early higher education diploma, (iii) drop-out and enter the labor market. Given the low number of workers who graduate from early higher education after a professional HS, we do not model the subsequent schooling transitions for those individuals. Therefore, workers having graduated from a more advanced level in higher education are considered as stopping schooling at the same level as early higher education graduates.

4.1.5 Stage 5: Intermediate Higher Education Graduation

For the individuals who do not drop-out during undergraduate studies, they decide either (i) to stop schooling and enter the labor market, or (ii) to continue schooling and obtain an intermediate higher education degree (*baccalauréat* and three or four years).

4.1.6 Stage 6: Advanced Higher Education Graduation

The last schooling decision modeled is the graduation from an advanced higher education degree. Conditional on having chosen to continue schooling

[9]The data allow us to observe if the diploma taken in 1998 has been passed with or without apprenticeship. However, for the individuals who decide to continue after a professional HS, we are not able to observe if their professional diploma is taken with apprenticeship or not.

at the previous stage, individuals have two options: (i) stop schooling investment and enter the labor market, (ii) pass an advanced higher education degree (*baccalauréat* and five years or more) and enter the labor market.

From the probabilities defined at each decision stage, we can derive the probability that the individual completes an optimal grade level, given optimal choices at each previous stage. For a given exit state, this probability is equal to the product of taking the schooling decisions at each stage on the path leading to this exit state.

4.2 Wages

Consistent with the recent literature on treatment effects, and in the spirit of the Roy Model, we define one outcome equation for each possible final level of schooling. Therefore, we model a wage equation at each of the 15 possible states of entry into the labor market. The wage measure taken into account in the estimation is the monthly wage for workers employed in a full-time job three years after their exit from schooling.

Table 4 provides the list of the 15 schooling levels that we consider. They are a combination of the terminal schooling level and the nature of the diplomas obtained in the past.

Given the attainment of the final schooling grade f, the earnings equation takes the following form:

$$w_i(f) = X_i\phi_1(f) + \eta_i(f) \text{ for } f = f_1, \ldots, f_{15}$$

where $\phi_1(f)$ is a vector of grade specific parameters and $\eta_i(f)$ is an error term. We denote by $\Pr(w_i(f))$ the associated probability.

4.3 The Importance of Selectivity

We take into account the non random selection of individuals into educational paths by making both wages and educational outcomes depend on unobserved heterogeneity. To do so, we decompose the unobserved elements of the schooling latent utility, ϵ^g_{i,c^g_j}, and of the earnings equation, $\eta_i(f)$, between an individual time-invariant specific component and an error term. The distribution for the individual specific unobserved heterogeneity is approximated with a discrete distribution. Therefore, assuming that there are

Table 4: School Exit Levels

f_1	Junior HS drop-out
f_2	HS drop-out
f_3	Professional HS graduate with apprenticeship
f_4	Professional HS graduate without apprenticeship
f_5	General or technical HS graduate
f_6	Early HE drop-out after professional HS
f_7	Early HE drop-out after general or technical HS
f_8	Technical early HE graduate after professional HS
f_9	Technical early HE graduate after general or technical HS
f_{10}	General early HE graduate after professional HS
f_{11}	General early HE graduate after general or technical HS
f_{12}	Intermediate HE graduate after general or technical HS and technical early HE
f_{13}	Intermediate HE graduate after general or technical HS and general early HE
f_{14}	Advanced HE graduate after general or technical HS and technical early HE
f_{15}	Advanced HE graduate after general or technical HS and general early HE

Note: HS stands for "High School", HE stands for "Higher Education".

M types of individuals, the unobserved components take the following form for each schooling option c_j^g at grade g and each final schooling grade f:

$$\epsilon^g_{i,c_j^g} = \epsilon^g_{m,c_j^g} + \tilde{\epsilon}^g_{i,c_j^g} \qquad \text{for } m = 1, \ldots, M$$

$$\eta_i(f) = \eta_m(f) + \tilde{\eta}_i(f) \qquad \text{for } m = 1, \ldots, M$$

where ϵ^g_{m,c_j^g} and $\eta_m(f)$ are the type specific unobserved terms and $\tilde{\epsilon}^g_{i,c_j^g}$ and $\tilde{\eta}_i(f)$ are i.i.d.error terms. The probabilities associated to the M types are specified as logistic transforms:

$$p_m = \frac{\exp q_m}{\sum_{m=1}^{M} \exp q_m} \qquad m = 1, \ldots, M$$

where q_m's are parameters to be estimated, with the restriction that $q_M = 0$.

Finally, The likelihood for an individual who completes the optimal schooling path q, associated to the final grade level f, and gets a wage w_i is:

$$L_i(X_i) = \Pr(\widehat{q}_i = q, f) \cdot \Pr(w_i(f))$$

The model is estimated by maximization of the sum of all individual log likelihoods.

5 Empirical Results

As a first stage, we estimate our model without introducing unobserved heterogeneity. This is equivalent as considering that there is only one type in the population. Therefore, all heterogeneity is accounted for by observed regressors (family background). Put differently, the stochastic specification of the favored model is along the lines of standard "Matching" estimators found in the empirical literature, and in which a form of conditional independence is usually assumed.[10] In the end, this means that our model is based on an assumption that selectivity is fully accounted for by conditioning on observables. The next step will be to estimate the model by introducing additional types, in order to see if adding unobserved heterogeneity helps to account for selectivity.

The parameter estimates can be found in Appendix A. They need to be transformed into quantities easily comparable with those reported in the literature. To evaluate returns, we compute the difference in log of expected earnings at different exit schooling levels. These earnings are computed at the mode of the covariates distribution, that is for an individual living in an urban area, not being delayed at school and having a white collar father, a white collar mother both born in France.

5.1 The "Classical" Return to Education

Before analyzing more specific differences in expected earnings that take into account the qualitative structure of the education system, we compare the expected earnings at each exit schooling level with the expected earnings for individuals who quit schooling with no diploma. As is done commonly in the literature, we also investigate the premium associated to higher education. These differences are presented in Table 5.

First, those results show that workers who stop schooling after HS get wages that are around 20% higher than the ones who stop schooling before the end of junior High School. This is not surprising.

Second, as expected, obtaining a higher education degree translates into high wage gains. Precisely, the wage gains from graduating with a higher education diploma after a professional HS are 47% for men and 40% for women.

[10] The fundamental assumption behind Matching methods is that selection on unobservables is rendered unnecessary by conditioning on a sufficiently large number of regressors.

Table 5: "Classical" Return to Education

	Men		Women	
Reference level: junior High School Drop-out	-		-	
Senior High School Drop-out	0.183	(0.035)	0.146	(0.033)
Professional HS degree with apprenticeship	0.233	(0.037)	0.213	(0.034)
Professional HS degree without apprenticeship	0.241	(0.037)	0.207	(0.034)
General or technical HS degree	0.214	(0.039)	0.176	(0.036)
Drop-out from higher education	0.264	(0.037)	0.213	(0.034)
Higher education degree after professional HS	0.467	(0.046)	0.401	(0.041)
Early higher education degree[1]	0.426	(0.036)	0.436	(0.033)
Intermediate higher education degree[1]	0.489	(0.035)	0.435	(0.033)
Advanced higher education degree[1]	0.807	(0.035)	0.733	(0.034)

[1] After a general or technical HS only.

Note1: Returns are taken in difference with respect to the reference level: junior High School drop-out.

Note2: In parenthesis: Standard errors computed using parametric bootstrap.

For those who have been through a general or technical HS (the most natural way), the wage premium is about 43% for early higher education graduates (baccalauréat and 2 years), 49% for intermediate higher education graduates (*baccalauréat* and 3 or 4 years) and 81% for advanced higher education graduates (*baccalauréat* and 5 years or more). The equivalent numbers are equal to 44%, 43% and 73% for women. In general, we note that wage gains are higher for men than for women, except for early higher education graduates (undergraduates).

5.2 The return to Academic vs. Professional High School

We now turn to a more detailed analysis of the qualitative nature of the French educational system. First, we look at differences in wages due to the type of High School completed (professional versus general or technical).

Table 6 shows measures of the impact on earnings of graduating from a professional HS compared to graduating from a general or technical HS. These measures are obtained by subtracting the expected wage at a particular exit schooling level obtained after a professional HS from the expected wage at the same exit level after a general or technical HS. They show that the

type of HS has no impact when stopping schooling after HS graduation, even when school is left after some university without getting any diploma (i.e. during the first two years of higher education).

Regarding apprenticeship, we are also able to compare the expected wage obtained when stopping professional HS with apprenticeship and without apprenticeship. This result, not shown in this table, shows that the difference is not significant, which suggests that apprenticeship does not have a significant impact on wages.

Concerning Higher Education (HE hereafter) graduates, we find no significant difference between wages obtained after technical early HE with respect to the type of HS completed. However, for individuals who graduate from higher education after general early HE, men get 27% and women 24% lower wages if they completed a professional HS before, compared to having completed a general or technical HS. This result suggests that completing a professional HS implies a loss in earnings only for the workers who get a higher education degree after general early HE. Such a loss is not observed after technical early HE.

In order to measure the economic benefits of entering academic education (as opposed to professional education) at High School (*lycée*) level, it is informative to evaluate the return when High School level is terminal, as well as a measure of the return that encompasses all possible options (the option value of academic vs. professional training).

To compute those option values, an average wage over different exit states must be computed, and weighted by the expected probability to stop schooling at the corresponding level. The standard deviations of the differences considered are obtained by parametric bootstrap. When we compute the difference in average expected earnings after each type of HS, we find that earnings are 22% higher for men and 20% higher for women after a general or technical HS compared than after a professional HS. These figures reflect the fact that schooling attainments are much higher after general secondary education (see descriptive statistics in Table 3).

5.3 The Impact of Choosing a Technical vs. a General Undergraduate Training

As explained earlier, one of the originalities of the French educational system is the availability to take a technical undergraduate degree (early higher

Table 6: Impact of Graduating from a Professional High School

		Men		Women	
Exit level:	Professional HS graduate with apprenticeship (f_3)	0.018	(0.027)	0.038	(0.024)
Exit level:	Professional HS without apprenticeship (f_4)	0.027	(0.028)	0.031	(0.025)
Ref. level:	General or technical HS graduate (f_5)	-		-	
Exit level:	HE drop-out after professional HS (f_6)	0.008	(0.032)	-0.006	(0.028)
Ref. level:	HE drop-out after general or technical HS (f_7)	-		-	
Exit level:	HE graduate after professional HS and technical early HE (f_8)	-0.006	(0.034)	-0.041	(0.030)
Ref. level:	HE graduate after general or technical HS and technical early HE (f_9, f_{12}, f_{14})	-		-	
Exit level:	HE graduate after professional HS and general early HE (f_{10})	**-0.267**	(0.056)	**-0.237**	(0.050)
Ref. level:	HE graduate after general or technical HS and general early HE (f_{11}, f_{13}, f_{15})	-		-	

Note 1: In parenthesis: Standard errors computed using parametric bootstrap. In bold: significant differences at 5%.

Note 2: The impact provided is the difference in the expected wage obtained at the exit state level (after a professional HS) and the expected wage obtained at the reference state level (after a general or technical HS).

education diploma) which is professionally oriented.

It is therefore interesting to assess how the type of early higher education affects wages. Table 7 reports differences in expected wages at different higher education exit levels between degrees taken after technical and general early HE, conditional on the type of secondary education taken. For individuals who complete a professional HS, graduating from technical early HE increases wages by 16% (same gain for men and women) compared to graduating from general early HE. After the completion of a general or technical HS, wages averaged over higher education attainments are higher by 10% for men and 4% for women if general early higher education is taken (not shown in the table). This difference is explained by the fact that the probability of attaining advanced higher graduation (associated with the highest wage level) is much higher after general early higher education.

Therefore, it is interesting to compare the difference in expected wages at the early, intermediate and advanced higher education exit states after both types of early higher education. These results, shown in the second part of Table 7, show that men have a 9% and 13% wage gain form graduating from technical early HE if they stop schooling after early and intermediate higher education respectively. The gains for women are a bit lower, respectively 6% and 8%. However, the difference with respect to the type of early higher education does not remain significant when the stopping level is advanced higher education. One interesting aspect to be noted here is that the magnitude of the positive effects from technical early HE graduation are slightly higher after a professional HS than after a general or technical HS.

5.4 The Impact of Dropping-out from Higher Education

Now, we measure how dropping-out from higher education without any diploma affects earnings. Table 8 reports the difference in expected earnings obtained after dropping out from higher education compared to stopping schooling immediately after High School completion. The results indicate that quitting higher education without any diploma does not lead to significant different wages than quitting schooling immediately after the completion of HS. This result is identical whatever the type of HS completed.

Table 7: Impact of Graduating from Technical Early Higher Education

(a) After a professional High School

		Men		Women	
Exit level:	HE graduate after technical early HE (f_8)	**0.158**	(0.061)	**0.156**	(0.055)
Ref. level:	HE graduate after general early HE (f_{10})	-		-	

(b) After a general or technical High School

		Men		Women	
Exit level:	Technical early HE graduate (f_9)	**0.091**	(0.027)	**0.063**	(0.025)
Ref. level:	General early HE graduate (f_{11})	-		-	
Exit level:	Intermediate HE graduate after technical early HE (f_{12})	**0.133**	(0.029)	**0.076**	(0.026)
Ref. level:	Intermediate HE graduate after general early HE (f_{13})	-		-	
Exit level:	Advanced HE graduate after technical early HE (f_{14})	0.037	(0.027)	0.021	(0.026)
Ref. level:	Advanced HE graduate after general early HE (f_{15})	-		-	

Note 1: In parenthesis: Standard errors computed using parametric bootstrap. In bold: significant differences at 5%.

Note 2: For a given exit level, the figure shown is the difference of the expected wage obtained when the exit level is attained after completion of technical early HE compared to when it is attained after general early HE.

Table 8: Impact of Dropping-Out from Higher Education

(a) After a professional High School

		Men		Women	
Exit level:	Early higher Education drop-out (f_6)	0.039	(0.033)	-0.006	(0.029)
Ref. level:	Professional HS graduate with apprenticeship (f_3)	-		-	
Exit level:	Early higher Education drop-out (f_6)	0.030	(0.033)	0.001	(0.029)
Ref. level:	Professional HS graduate without apprenticeship (f_4)	-		-	

(b) After a general or technical High School

		Men		Women	
Exit level:	Higher Education drop-out (f_7)	0.049	(0.027)	0.038	(0.024)
Ref. level:	General or technical HS graduate (f_5)	-		-	

Note: In parenthesis: Standard errors computed using parametric bootstrap. In bold: significant differences at 5%.

6 Summary and Conclusion

In this paper, we estimate a sequential dynamic discrete choice model of schooling decisions. This model captures the qualitative nature of the French educational system, in which individuals can acquire professional skills, both in High School and at higher education undergraduate level.

We now summarize the main findings.

- The structure of the returns that we have computed are compatible with relatively important option values of choosing academic training. Average expected earnings of those who have entered a general or technical High School are around 20% higher than those who have entered a professional HS.
- For certain types of educational attainments, whether someone has attended general or professional high school has no impact on earnings. This is the case for (i) HS graduates, (ii) higher education drop-outs and (iii) higher education graduates who passed a technical undergraduate degree.
- The type of high school has an impact on the wage of higher education graduates who passed a general undergraduate degree: having attended a general or technical HS provides higher wages than having attended a professional HS.
- There is a substantial premium from obtaining a technical undergraduate. For instance, when schooling is left after early or intermediate higher education graduation, wages of those who have obtained a technical undergraduate are superior to those who graduate from a general undergraduate. When schooling is left after advanced higher education graduation, wages are not statistically different with respect to the type of undergraduate.
- Wages obtained after dropping-out from higher education without graduating are not statistically different from the wages obtained after quitting schooling immediately after High School graduation, whatever the type of HS attended.
- Wage gains from professional qualifications are significant both for men and women. The gains obtained by men from technical early higher education are slightly higher than the gains obtained by women.

Our analysis has allowed us to go beyond the classical (quantitative) approach to measuring the returns to schooling. In the classical approach, it is customary to report a positive correlation between earnings and schooling as measured in years. This purely quantitative approach does not allow to take into account the qualitative nature of most educational systems. This is the case in France. There is strong evidence that professional training offers interesting possibilities to those who do not have strong academic skills. Indeed, in some cases, those who complete professional training may sometime outperform those who fail from the academic track. Taken globally, our results illustrated the importance of designing education systems that allow for non-academic tracks.

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Appendices

A Parameter Estimates of Latent Utilities of Schooling Choices

Table A.1: Parameter Estimates: Schooling Decisions at Stages 1 and 2

	Stage 1 **Junior HS exit**		**Stage 2** **High school exit** (ref: drop-out)			
	Graduate		Professional		Gen or tech	
	Coef	(S.E.)	Coef	(S.E.)	Coef	(S.E.)
Intercept	4.269	(0.023)	1.145	(0.010)	1.074	(0.010)
Father's occupation						
Tradesman	0.152	(0.022)	0.068	(0.018)	0.619	(0.022)
Executive	1.231	(0.028)	0.123	(0.012)	1.551	(0.022)
Technician	0.747	(0.029)	0.299	(0.022)	1.086	(0.022)
White collar	-0.042	(0.009)	0.059	(0.011)	0.339	(0.014)
Blue collar	ref.		ref.		ref.	
No occupation	0.055	(0.018)	-0.185	(0.017)	0.195	(0.020)
Mother's occupation						
Trader	0.127	(0.027)	0.122	(0.022)	0.499	(0.026)
Executive	0.565	(0.033)	0.111	(0.015)	1.368	(0.027)
Technician	0.605	(0.028)	0.108	(0.031)	0.680	(0.030)
White collar	-0.048	(0.008)	0.092	(0.009)	0.418	(0.012)
Blue collar	ref.		ref.		ref.	
No occupation	-0.489	(0.024)	-0.162	(0.013)	-0.020	(0.012)
Parents' country of origin						
France	ref.		ref.		ref.	
OECD	-0.454	(0.028)	-0.205	(0.021)	-0.284	(0.022)
non-OECD	-0.679	(0.025)	-0.618	(0.021)	-0.476	(0.020)
Urban location	0.158	(0.010)	-0.041	(0.008)	0.622	(0.012)
Late at school	-1.289	(0.023)	-0.397	(0.014)	-2.282	(0.019)
Man	-0.052	(0.012)	-0.256	(0.012)	-0.836	(0.013)

Table A.2: Parameter Estimates: Schooling Decisions at Stages 3 and 4 after a Professional High School

	Stage 3 **HE entry** (ref: entry into HE)				**Stage 4** **Early HE** (ref: drop-out)			
	Stop with appr.		Stop without appr.		Technical		General	
	Coef	(S.E.)	Coef	(S.E.)	Coef	(S.E.)	Coef	(S.E.)
Intercept	2.101	(0.016)	3.003	(0.017)	0.587	(0.026)	-3.017	(0.028)
Father's occupation								
Tradesman	0.037	(0.021)	-0.300	(0.025)	0.331	(0.029)	0.061	(0.037)
Executive	-0.586	(0.028)	-0.727	(0.028)	0.471	(0.029)	0.840	(0.029)
Technician	-0.391	(0.026)	-0.255	(0.026)	0.432	(0.029)	0.447	(0.033)
White collar	-0.039	(0.017)	-0.122	(0.018)	-0.009	(0.028)	0.143	(0.030)
Blue collar	ref.		ref.		ref.		ref.	
No occupation	-0.075	(0.021)	-0.120	(0.022)	-0.592	(0.029)	0.810	(0.029)
Mother's occupation								
Trader	-0.468	(0.027)	-0.484	(0.028)	-1.099	(0.031)	-0.219	(0.031)
Executive	-0.843	(0.028)	-0.582	(0.027)	-1.012	(0.031)	0.441	(0.030)
Technician	-0.580	(0.028)	-0.289	(0.027)	-0.082	(0.029)	0.161	(0.031)
White collar	-0.523	(0.019)	-0.387	(0.019)	-0.376	(0.028)	0.375	(0.034)
Blue collar	ref.		ref.		ref.		ref.	
No occupation	-0.434	(0.023)	-0.108	(0.016)	-0.375	(0.029)	0.639	(0.029)
Parents' country of origin								
France	ref.		ref.		ref.		ref.	
OECD	-0.014	(0.024)	0.028	(0.023)	-0.517	(0.029)	-0.120	(0.029)
non-OECD	-0.932	(0.026)	-0.369	(0.025)	-0.995	(0.028)	0.049	(0.028)
Urban location	-0.741	(0.017)	-0.656	(0.017)	-0.285	(0.029)	0.375	(0.028)
Late at school	0.475	(0.020)	0.354	(0.021)	-0.638	(0.028)	-0.260	(0.029)
Man	0.992	(0.017)	-0.065	(0.012)	0.068	(0.032)	-0.239	(0.028)

Table A.3: Parameter Estimates: Schooling Decisions at Stages 3 and 4 after a General or Technical High School

	Stage 3 HE entry		**Stage 4 Early HE** (ref: drop-out)			
	Entry		Technical		General	
	Coef	(S.E.)	Coef	(S.E.)	Coef	(S.E.)
Intercept	1.658	(0.024)	0.738	(0.012)	-0.264	(0.011)
Father's occupation						
Tradesman	0.263	(0.029)	0.264	(0.022)	0.534	(0.023)
Executive	0.883	(0.027)	0.370	(0.018)	1.098	(0.018)
Technician	0.175	(0.028)	0.418	(0.023)	0.592	(0.023)
White collar	0.049	(0.012)	0.107	(0.015)	0.216	(0.017)
Blue collar	ref.		ref.		ref.	
No occupation	0.331	(0.028)	0.060	(0.022)	0.468	(0.027)
Mother's occupation						
Trader	0.312	(0.028)	0.085	(0.025)	0.524	(0.030)
Executive	0.850	(0.028)	0.117	(0.015)	0.979	(0.021)
Technician	0.403	(0.028)	0.079	(0.024)	0.496	(0.026)
White collar	0.367	(0.021)	-0.059	(0.013)	0.260	(0.013)
Blue collar	ref.		ref.		ref.	
No occupation	0.406	(0.026)	0.038	(0.016)	0.541	(0.021)
Parents' country of origin						
France	ref.		ref.		ref.	
OECD	0.100	(0.025)	-0.324	(0.025)	-0.157	(0.024)
non-OECD	0.218	(0.025)	-0.695	(0.023)	-0.465	(0.023)
Urban location	0.727	(0.020)	0.060	(0.009)	0.619	(0.014)
Late at school	-1.121	(0.026)	-0.377	(0.025)	-1.096	(0.026)
Man	0.212	(0.018)	0.074	(0.011)	-0.265	(0.015)

Table A.4: Parameter Estimates: Schooling Decisions at Stages 5 and 6 after a General or Technical High School

	Stage 5 Intermediate HE				**Stage 6 Advanced HE**			
	After technical early HE		After general early HE		After technical early HE		After general early HE	
	Graduate		Graduate		Graduate		Graduate	
	Coef	(S.E.)	Coef	(S.E.)	Coef	(S.E.)	Coef	(S.E.)
Intercept	-2.435	(0.019)	0.966	(0.021)	-1.076	(0.024)	-1.776	(0.017)
Father's occupation								
Tradesman	0.299	(0.027)	0.508	(0.027)	0.405	(0.029)	0.567	(0.026)
Executive	0.618	(0.024)	0.964	(0.026)	0.719	(0.027)	1.051	(0.021)
Technician	0.242	(0.026)	0.568	(0.027)	0.296	(0.028)	0.381	(0.026)
White collar	-0.005	(0.018)	0.160	(0.025)	0.072	(0.027)	0.288	(0.023)
Blue collar	ref.		ref.		ref.		ref.	
No occupation	0.265	(0.027)	0.387	(0.028)	0.604	(0.028)	0.631	(0.026)
Mother's occupation								
Trader	0.324	(0.028)	0.507	(0.030)	-0.689	(0.029)	0.322	(0.028)
Executive	0.629	(0.026)	0.638	(0.027)	-0.345	(0.028)	0.637	(0.024)
Technician	0.215	(0.027)	0.189	(0.029)	-0.213	(0.028)	0.595	(0.027)
White collar	0.132	(0.016)	0.212	(0.020)	-0.467	(0.026)	0.297	(0.019)
Blue collar	ref.		ref.		ref.		ref.	
No occupation	0.457	(0.026)	0.344	(0.027)	-0.399	(0.028)	0.506	(0.025)
Parents' country of origin								
France	ref.		ref.		ref.		ref.	
OECD	0.315	(0.028)	0.071	(0.032)	0.071	(0.028)	0.050	(0.026)
non-OECD	0.030	(0.026)	-0.264	(0.027)	0.212	(0.030)	0.055	(0.023)
Urban location	0.384	(0.019)	0.330	(0.018)	0.286	(0.025)	0.442	(0.017)
Late at school	-0.677	(0.028)	-0.922	(0.028)	-1.132	(0.029)	-0.499	(0.028)
Man	0.522	(0.021)	0.198	(0.022)	0.936	(0.026)	0.778	(0.021)

A.1 Parameter Estimates of Wage Equations

Table A.5: Parameter Estimates: Wage Equations for Junior High School and High School Drop-Outs

	Junior HS drop-out		HS drop-out	
	Coef	(S.E.)	Coef	(S.E.)
Intercept	6.709	(0.013)	6.830	(0.004)
Father's occupation				
Tradesman	-0.046	(0.025)	-0.039	(0.011)
Executive	0.094	(0.026)	0.014	(0.013)
Technician	-0.005	(0.026)	0.004	(0.014)
White collar	-0.003	(0.019)	-0.010	(0.007)
Blue collar	ref.		ref.	
No occupation	-0.006	(0.024)	-0.035	(0.010)
Mother's occupation				
Trader	0.065	(0.027)	0.036	(0.016)
Executive	0.189	(0.027)	-0.009	(0.017)
Technician	0.096	(0.028)	0.000	(0.016)
White collar	0.025	(0.017)	-0.013	(0.005)
Blue collar	ref.		ref.	
No occupation	0.036	(0.019)	-0.006	(0.007)
Parents' country of origin				
France	ref.		ref.	
OECD	0.084	(0.023)	0.026	(0.010)
non-OECD	0.078	(0.020)	0.006	(0.008)
Urban location	-0.058	(0.014)	0.011	(0.004)
Late at school	0.031	(0.016)	-0.017	(0.005)
Man	0.074	(0.015)	0.111	(0.004)
Error S.D.	0.099	-	0.058	-

Table A.6: Parameter Estimates: Wage Equations after a Professional High School

	Voc HS degree with apprenticeship		Voc HS degree without apprenticeship		HE drop-out		HE degree after technical early HE		HE degree after general early HE	
	Coef	(S.E.)	Coef	(S.E.)	Coef	(S.E.)	Coef	(S.E.)	Coef	(S.E.)
Intercept	6.876	(0.003)	6.880	(0.003)	6.892	(0.011)	7.040	(0.012)	7.264	(0.023)
Father's occupation										
Tradesman	0.004	(0.009)	0.005	(0.010)	0.050	(0.022)	0.027	(0.022)	0.051	(0.028)
Executive	0.034	(0.011)	0.038	(0.011)	0.002	(0.022)	0.043	(0.021)	0.088	(0.027)
Technician	0.013	(0.011)	0.028	(0.010)	0.065	(0.023)	0.063	(0.023)	-0.113	(0.028)
White collar	-0.007	(0.006)	-0.006	(0.005)	-0.015	(0.017)	0.005	(0.018)	-0.110	(0.027)
Blue collar	ref.		ref.		ref.		ref.		ref.	
No occupation	0.005	(0.010)	0.013	(0.009)	0.053	(0.022)	0.001	(0.025)	-0.115	(0.028)
Mother's occupation										
Trader	0.016	(0.013)	0.023	(0.014)	0.001	(0.024)	0.049	(0.027)	0.754	(0.029)
Executive	0.066	(0.015)	0.032	(0.014)	0.088	(0.024)	0.203	(0.025)	0.089	(0.028)
Technician	-0.007	(0.015)	0.001	(0.013)	-0.031	(0.026)	0.003	(0.026)	-0.252	(0.029)
White collar	-0.001	(0.004)	-0.003	(0.004)	-0.031	(0.014)	0.035	(0.014)	-0.150	(0.025)
Blue collar	ref.		ref.		ref.		ref.		ref.	
No occupation	-0.004	(0.007)	-0.011	(0.006)	-0.036	(0.018)	-0.025	(0.021)	-0.242	(0.028)
Parents' country of origin										
France	ref.		ref.		ref.		ref.		ref.	
OECD	0.019	(0.010)	0.025	(0.010)	-0.038	(0.023)	-0.001	(0.025)	-0.394	(0.029)
non-OECD	0.051	(0.012)	0.017	(0.008)	0.044	(0.019)	-0.021	(0.023)	0.093	(0.027)
Urban location	0.017	(0.004)	0.009	(0.004)	0.034	(0.011)	0.010	(0.012)	-0.070	(0.023)
Late at school	-0.019	(0.005)	-0.013	(0.005)	-0.012	(0.016)	-0.041	(0.019)	0.072	(0.026)
Man	0.094	(0.004)	0.109	(0.004)	0.138	(0.013)	0.136	(0.015)	0.134	(0.025)
Error S.D.	0.047	-	0.054	-	0.055	-	0.061	-	0.055	-

Table A.7: Parameter Estimates: Wage Equations for High School and Early Higher Education Levels after a General or Technical High School

	Gen or tech HS degree		HE drop-out		Gen early HE degree		Tech early HE degree	
	Coef	(S.E.)	Coef	(S.E.)	Coef	(S.E.)	Coef	(S.E.)
Intercept	6.833	(0.008)	6.846	(0.004)	7.032	(0.003)	7.062	(0.009)
Father's occupation								
Tradesman	0.002	(0.018)	0.025	(0.013)	0.009	(0.008)	0.013	(0.020)
Executive	0.003	(0.018)	0.012	(0.010)	0.058	(0.006)	0.074	(0.016)
Technician	0.064	(0.018)	-0.004	(0.014)	0.025	(0.008)	-0.001	(0.020)
White collar	0.019	(0.013)	-0.012	(0.008)	0.002	(0.005)	-0.003	(0.014)
Blue collar	ref.		ref.		ref.		ref.	
No occupation	0.011	(0.020)	-0.028	(0.013)	0.010	(0.010)	0.018	(0.021)
Mother's occupation								
Trader	0.011	(0.023)	0.046	(0.018)	0.044	(0.012)	0.043	(0.025)
Executive	0.038	(0.021)	0.016	(0.014)	0.050	(0.008)	0.015	(0.019)
Technician	-0.008	(0.022)	-0.013	(0.017)	0.065	(0.011)	-0.007	(0.022)
White collar	0.006	(0.010)	0.011	(0.006)	0.036	(0.004)	-0.003	(0.011)
Blue collar	ref.		ref.		ref.		ref.	
No occupation	0.064	(0.017)	-0.024	(0.010)	0.028	(0.007)	0.002	(0.018)
Parents' country of origin								
France	ref.		ref.		ref.		ref.	
OECD	0.071	(0.021)	0.058	(0.014)	0.015	(0.011)	0.055	(0.022)
non-OECD	0.012	(0.020)	0.018	(0.011)	0.024	(0.009)	-0.009	(0.019)
Urban location	-0.009	(0.009)	0.042	(0.005)	0.048	(0.003)	-0.001	(0.009)
Late at school	-0.009	(0.015)	-0.004	(0.012)	-0.029	(0.009)	0.001	(0.021)
Man	0.113	(0.011)	0.124	(0.006)	0.064	(0.004)	0.035	(0.013)
Error S.D.	0.057	-	0.061	-	0.059	-	0.079	-

Table A.8: Parameter Estimates: Wage Equations for Intermediate and Advanced Higher Education Levels after a General or Technical High School

	Intermediate HE degree				Advanced HE HE degree			
	After technical early HE		After general early HE		After technical early HE		After general early HE	
	Coef	(S.E.)	Coef	(S.E.)	Coef	(S.E.)	Coef	(S.E.)
Intercept	7.119	(0.008)	7.018	(0.004)	7.363	(0.009)	7.303	(0.004)
Father's occupation								
Tradesman	0.086	(0.018)	0.050	(0.012)	0.030	(0.019)	0.053	(0.013)
Executive	0.069	(0.014)	0.078	(0.008)	0.055	(0.013)	0.082	(0.006)
Technician	0.061	(0.018)	0.045	(0.012)	0.011	(0.019)	0.043	(0.013)
White collar	0.004	(0.015)	0.002	(0.008)	-0.012	(0.017)	0.006	(0.010)
Blue collar	ref.		ref.		ref.		ref.	
No occupation	-0.002	(0.021)	0.052	(0.014)	0.035	(0.021)	0.051	(0.014)
Mother's occupation								
Trader	0.042	(0.023)	0.041	(0.016)	0.126	(0.024)	0.096	(0.018)
Executive	0.068	(0.017)	0.072	(0.009)	0.033	(0.016)	0.115	(0.008)
Technician	0.040	(0.022)	0.053	(0.016)	0.017	(0.022)	0.069	(0.014)
White collar	0.037	(0.011)	0.015	(0.006)	0.039	(0.012)	0.061	(0.007)
Blue collar	ref.		ref.		ref.		ref.	
No occupation	0.036	(0.017)	0.029	(0.011)	-0.004	(0.018)	0.082	(0.010)
Parents' country of origin								
France	ref.		ref.		ref.		ref.	
OECD	0.020	(0.021)	-0.003	(0.015)	0.057	(0.022)	0.026	(0.016)
non-OECD	0.032	(0.020)	-0.022	(0.013)	0.036	(0.021)	0.023	(0.012)
Urban location	0.012	(0.009)	0.062	(0.005)	0.034	(0.009)	0.033	(0.004)
Late at school	-0.021	(0.022)	-0.033	(0.018)	-0.039	(0.027)	-0.049	(0.021)
Man	0.160	(0.011)	0.103	(0.007)	0.158	(0.010)	0.142	(0.006)
Error S.D.	0.079	-	0.075	-	0.070	-	0.083	-