General Introduction

This thesis is a collection of three essays in the fields of microeconometrics and applied labor economics. We investigate economic issues related to schooling decisions, employment contract outcomes and intra-firm promotions. The common feature of the three essays is that they involve dynamic decision-making, in which economic decisions made at one particular period depend on decisions taken at earlier periods. Our principal concern in each essay, is to assess the impact of past choices on subsequent choices or outcomes.

The crucial empirical issue in analyzing the dependence of a choice (or an outcome) on previous choices is to disentangle the state from the spurious dependence (Heckman, 1981). Indeed, for an individual, the correlation between a choice made at time $t-1$ and a choice made at time t may be due to persistent (generally unobserved) individual characteristics. Such a dependence is called "spurious", whereas the dependence that remains after controlling for unobserved factors is called "true" or "sate" dependence. The analyst who wishes to measure the causal impact of a past endogenous variable (i.e. the true dependence) has therefore to adopt an econometric specification in which both types of dependence can be separately identified.

Two approaches have been developed in the econometric literature to assess the impact of endogenously determined variables (like past choices): the experimental and the structural approaches. The first one relies on exogenous variables (instruments) that are correlated to the endogenous variable, but uncorrelated with the error term of the equation determining the dependent variable. It has become very popular in labor

economics, especially since the result of Imbens and Angrist (1994) on the ability of the IV estimator to identify the Local Average Treatment Effect (LATE), in the presence of heterogeneity in the impact of the treatment. The second approach, more in line with economic theory, consists in explicitly modeling individual preferences from which choices and outcomes are determined. For a comparison of these two approaches, see Keane (in press).

On top of the fact that the experimental approach is less close to the underlying theory, implementing it faces a fundamental difficulty: finding an instrument (or a set of instruments) that satisfies the exogeneity assumption. Addressing such a difficulty in the dynamic set-ups considered in the following essays would be almost impossible, since it would require a too large number of instruments. Our econometric strategies are therefore based on the second approach. In line with structural modeling, we jointly model choices and outcomes in a sequential framework, in which present choices or outcomes depend on past choices and where the state and spurious dependences are separately identifiable. However, unlike fully structural models, we do not explicitly model individual preferences. Instead, the value functions associated to possible choices are approximated by latent utilities in which we do not distinguish between the present and the future components. This approach is usually called semi-structural.

The semi-structural approach offers the advantage of respecting the sequentiality of economic decisions, more in line with the theoretical framework. Moreover, since value functions are not explicitly modeled but approximated by latent utilities, it obviates the need to numerically solve them. However, since individual preferences and beliefs about outcomes are not modeled, results are open to many possible interpretations. One natural interpretation is that the latent utility is the reduced-form of some choice-specific value functions of a rational/forward looking agent who behaves within a dynamic environment.

In this thesis, this semi-structural approach is adopted to analyze three labor economic issues arising in dynamic contexts. In the first essay, we assess how important are schooling attainments in explaining the gap in the access to permanent employment

between two populations, characterized by the country of birth of their parents. In the second essay, we study the first employment contract transitions in the career of workers, by focusing on the role played by schooling investment. Finally, the third essay is devoted to investigating the role played by fast tracks and the functional area in explaining promotion outcomes of executives in their firm's hierarchy.

The first two essays analyze the link between schooling attainments and employment contract outcomes during the early career. The increase in unemployment rates at the end of the 70's, especially in European countries, has pushed policy makers to adopt new labor market legislations. The first type of measure concerns employment protection for workers actually employed. It takes the form of firing costs (like severance payments) paid by the employers when an employment downsizing is necessary. In parallel, governments introduced more flexibility in the hiring and firing processes, by creating a new form of employment contract, characterized by a limited duration and the (quasi-)absence of firing costs. Nowadays, this type of employment contract (called fixed term contract in this thesis) represents a significant share of total employment (14% in France and 15% in EU25 countries, European-Commission, 2007).

A noticeable empirical fact about fixed term contracts is that they widely concern workers with no experience, since about 70% of newly hired workers in the French labor market get a Fixed Term Contract for their first job. This proportion decreases to 31% after three years in the labor market, and 15% after seven years (Céreq, *Génération 98*). Therefore, it appears of particular interest to determine if and how schooling attainments affect early employment contract outcomes.

This question is the baseline of the first two essays, which have a somewhat different approach, that will be explained in details below. In both essays, we model jointly sequential schooling decisions and employment contract outcomes in the following way. While he is in school, after the completion of each grade, an individual has the choice between acquiring more schooling and entering the labor market. When he enters the labor market, he can be employed either in a permanent contract or in a

fixed term contract. Our approach is based on the human capital investment model developed by Mincer (1958), Becker (1964) and Ben-Porath (1967). In this framework, an individual decides to acquire more schooling if his expected gains in doing so are higher than the actual costs. Costs are composed by a direct component, like paying the tuition fees, and an indirect one, namely the opportunity cost of receiving no wage during the time spent in school. Expected gains are measured by higher lifetime earnings corresponding to a higher productivity level, resulting from human capital accumulation. In our framework, instead of considering earnings, we consider the type of employment contract. When an individual decides to acquire more schooling his expected gains in doing so correspond to a higher employment stability through a higher probability of permanent employment.

Based on the human capital investment model, the estimation of structural dynamic programming models of schooling choices was developed in the last twenty years (see, for example, Keane and Wolpin, 1997, and Belzil and Hansen, 2002). These models rely on the assumption that agents are forward looking and their estimation proceeds in the combination of two steps: solving the model given a set of parameters and estimating parameters that maximize an objective function. As already stated, the models developed in the first two essays are not fully structural. Indeed, they approximate the value functions by latent utility equations, where the present and future components are not dissociated. Therefore, our models, which result from a semi-structural approach, are considered as reduced-form dynamic models of education and early career outcomes, in the spirit of Cameron and Heckman (2001).

We now turn to a more detailed description of the first two essays. The first essay analyses the determinants of schooling attainments and access to permanent employment, focusing on the comparison between second-generation immigrants whose parents are born in an African country and their French-natives counterparts. The data of *Génération 98* show that there is a huge gap in the rate of employment in a permanent contract, at the beginning of the first job, between these two sub-populations. This rate is equal to

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23% for children of Africans whereas it is 32% for young French-natives. While discrimination is often advanced as a possible explanation for the relatively poor performances of second-generation immigrants, potential differences in pre-market skill investment (such as differences in education) may also be important. As an illustration, the same data show that only 19% of African-natives get a higher education diploma, whereas this proportion is 46% among French-natives. From an economist perspective, differences in early career outcomes between natives and second-generation immigrants, which persist after conditioning on education, are particularly interesting because they are difficult to justify from a standard theoretical perspective. It is those differences that are particularly important to quantify in order to evaluate the incidence of racial discrimination.

A large literature has been devoted to studying the performance of second-generation immigrants. For the United States, Chiswick and DebBurman (2004) and Card (2005) find no gap in schooling attainments and wages between second-generation immigrants and US-natives. In Europe, however, the situation of second-generation immigrants appears to be poorer, like shown, for example, by Nielsen et al. (2003) for Denmark or Van Ours and Veenman (2003) for the Netherlands. In France, despite the fact that second-generation immigrants have much lower employment outcomes than their French-natives counterparts,[1] very few economists have studied the determinants of such a discrepancy (Aeberhardt et al., in press, and Aeberhardt and Pouget, 2007, are two noticeable exceptions, analysing wage gaps). This lack of evidence has certainly to do with the French legislation on collecting survey data, that prevents from asking information on the ethnicity of the respondents, due to an egalitarian priciple.

As of now, no one has investigated whether or not the employment and wage gaps are only the mirror image of a schooling gap that exists between French-natives and second-generation immigrants. This is precisely the question that we address in the first chapter. We consider two sub-populations that are indexed by the country of origin of the parents: "French-natives" (those born in France for whom both parents were

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[1]In 1999, the unemployment rate of second-generation immigrants aged 19-29 was 30% (nearly 40% if the parents came from Algeria or Morocco), whereas it was 20% for children with both parents born in France.

born in France with French citizenship), and "African-natives" (those born in France for whom both parents were born in an African country with a non-French citizenship). We estimate a reduced-form dynamic model of schooling decisions and employment outcomes, separately for each group of origin. At each grade level, the agent decides between continuing schooling investment at the next grade, or entering the labor market. In this last case, we model three options: (i) employment in a permanent contract, (ii) employment in a fixed term contract or (iii) unemployed.

The results show first that African-natives are slightly under-educated, after conditioning on their observable characteristics. Ethnic origin accounts for a small portion (5%) of the probability of getting a higher education diploma. Second, ethnic origin explains a limited part of the access to permanent employment (3% to 6%), whereas differences in schooling attainments account for 60%. Third, after controlling for observed characteristics and schooling attainments, we do not find support for a lower permanent employment probability for African-natives.

The second essay still analyses the link between schooling decisions and early employment contract outcomes, but focuses on the transition between fixed term and permanent contracts. From a theoretical perspective, the impact of accepting a fixed term contract on the probability of employment in a permanent contract is ambiguous. When he is employed in a fixed term contract, a worker acquires productive skills that have a positive effect on his level of human capital, and thus on his productivity level. Moreover, fixed term employment allows the worker to benefit from being in contact with potential future employers. These two elements affect positively the probability of permanent employment. However, the impact of employment in a fixed term contract can be negative if the worker lowers his job search intensity during fixed term employment or if employers associate a stigma to this form of employment.

Assessing whether employment in a fixed term contract affects positively or negatively subsequent employment outcomes is currently widely investigated in Europe. Booth, Francesconi, and Frank (2002) for the UK, Berton, Devicienti, and Pacelli (2008)

for Italy, Cockx and Picchio (2009) for Belgium and Givord and Wilner (2009) for France constitute a representative sample of this literature. Globally, available evidence rather supports a "port of entry" (positive) than a "dead-end" (negative) role of fixed term contracts in the access to stable employment. Despite the variety of methods and situations analyzed in the existing literature, the role played by educational attainments has remained relatively uncovered. Our objective is precisely to determine if and how early employment contract transitions are affected by schooling attainments.

We build a reduced form dynamic model in which we jointly estimate schooling decisions, the first employment contract outcome, and the second contract outcome for workers firstly employed in a fixed term contract. Like in the first essay, such a model allows us to separately identify the spurious form the causal impact of schooling attainments. Moreover, we are also able to measure the causal impact that the first fixed term contract has on employment outcomes, once controlling for schooling attainments, observed and unobserved individual specific characteristics.

Our results first show that the impact of accepting a first fixed term contract on the probability of employment in a permanent contract varies with respect to schooling attainments and unobserved heterogeneity. Even if the impact is positive for a large set of the population, a negative effect is found for a limited set (characterized by certain combinations of schooling attainments and unobserved characteristics). For this last group of individuals, we show that they benefit from a subsequent unemployment period to find a permanent contract, if their first fixed term contract is not converted into a permanent contract in the same firm. Secondly, we show that around one third of the variance of the first employment outcome probability is explained by schooling attainments. This proportion is identical for explaining subsequent employment outcomes, except for the probability of conversion of a fixed term contract lasting more than 3 months into a permanent contract in the same firm, where schooling represents only 17% of the variance. This decreasing importance is discussed regarding empirical results on employer learning (Altonji and Pierret, 2001).

The third essay is devoted to the analysis of intra-firm promotions. Promotions have attracted attention in the personnel economics literature since the seminal work of Doeringer and Piore (1971) on internal labor markets. They argue that careers in organizations are not consistent with standard labor economics results, but are governed by intra-firm institutional rules.[2] Two important theoretical frameworks have arisen to explain promotion outcomes. The first one concerns models of tournaments (Lazear and Rosen, 1981), in which workers compete for a position. A worker advances in the firm's hierarchy if his performance is relatively higher than others'. The second framework corresponds to job assignment models (assuming either full information, such as Gibbons and Waldman, 1999, or asymmetric information, such as Waldman, 1984, and Bernhardt, 1995). These models assume a fixed hierarchy with heterogeneous jobs, where the allocation of workers to jobs are driven by their individual ability. In the empirical literature, evidence about promotions is provided, among others, by Lazear (1992) and Baker, Gibbs, and Holmstrom (1994a,b) from intra-firm analysis. These contributions make clearly apparent that promotions are an important determinant of wage growth. Lazear (1992) shows that the starting pay and the position at hiring are strong determinants of the evolution of career earnings, whereas Baker, Gibbs, and Holmstrom (1994b) find that levels in the firm explain 70% of the wage variance across employees in a given year.

Despite the central role of promotions on career prospects (especially on earnings), there is little evidence on the determinants of promotions. The purpose of the third essay is precisely to explain promotion outcomes, focusing on the role played by fast tracks and the functional area. The existence of fast tracks (which designates the fact that workers promoted quickly from low levels are promoted subsequently more quickly) has been emphasized in Baker, Gibbs, and Holmstrom (1994a). In job assignment models, assuming either full or asymmetric information, fast tracks reflect differences in workers' ability levels: more able workers are promoted quicker than less able

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[2]For example, they argue that wages are less driven by human capital characteristics than job assignments in the firm.

ones. On top of this effect, fast tracks can have their inherent effect on subsequent promotions (after controlling for worker ability). This happens if learning about workers' ability is asymmetric (employers do not observe the ability of workers employed in other firms). In this case, when an employer promotes a worker, he has to increase the wage, since the promotion signals to outside employers that the worker is of high ability. Workers promoted in the past have already been signaled of being of high ability, so their promotion is less costly for their employer, compared to the promotion of workers not already promoted. Speedy promotions thus have their own effect on subsequent promotions. Concerning the functional area, despite it appears in the management literature to explain job allocation, its potential role in the promotion process has not attracted the attention of personnel economists. In management, Vroom and MacCrimmon (1968) find that promotion opportunities vary with the functional area and are better in finance and marketing. Forbes and Piercy (1991) show that the time to reach various top positions in the organization varies with the functional area. This validates the efficiency of heterogeneity in task and talent within the same hierarchical level of the firm, emerging in theoretical work (Hecker, 2009).

The third essay contributes therefore both to the personnel and management literatures. Using an employer-employee panel of over 300 of the largest corporations in the U.S., we estimate a reduced-form model of promotions. The promotion probability is written as a function of individual characteristics (human capital variables, promotion opportunities and level in the firm's hierarchy), firm characteristics (profits, sales and size), individual unobserved heterogeneity and the executive's past speed of promotions. A major econometric issue is to disentangle the causal from the spurious impact of the speed of past advancement. To address it, we condition individual heterogeneity on the speed of past advancement measured at the time executives enter the sample. The initial speed variable thus accounts for the spurious fast track effect whereas the past speed of promotions, measured at each period, captures the causal effect. When we turn to the analysis of the functional area, we estimate the same model by adding functional area indicators, measured at the entry in the sample, in the initial condition.

In this essay, we also analyze the predictability of promotions, by assessing to what extent the promotion probability is explained by information on the promotion history of the worker, available to outside employers. To do so, we estimate a non-causal model of promotions, in which unobserved heterogeneity is not introduced. The model is estimated with five alternative indicators of promotions: the speed of past advancement, the functional area, and three measures of recent wage growths combined with ancient past advancement: total compensation, base pay and bonus pay.

The main finding of the essay is that, when promotion is defined as a change in job title resulting in a higher pay grade midpoint, the principal determinant of promotions is unobserved heterogeneity. The initial speed of past advancement in pay grade has a strong impact, whereas the recent speed has no significant effect. This result suggests that fast tracks do not have a causal impact on promotions. The second finding is that the functional area has a high explanatory power in promotion outcomes, which is correlated with the impact of the initial speed of past advancement. Finally, the estimation of promotion predictability models shows that past base pay growths is the best predictor of the promotion probability among our five candidates. It also shows that the functional area constitutes a good predictor, whereas past bonus growths appears to be the poorest predictor.