Markets and opportunities : an explanation of economic life-chances

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Abstract:	

En esta tesis se presenta un argumento para explicar la heterogeneidad de oportunidades económicas que disfrutan los individuos en las economías de mercado. En principio, la movilidad de unas posiciones económicas a otras es posible. Las constituciones de las democracias occidentales recogen el principio de igualdad de oportunidades, y éste informa toda su organización legal. Sin embargo, tal principio formal no garantiza que la igualdad sea efectiva. No todos los individuos se pueden beneficiar de las oportunidades que, en principio, ofrece la igualdad formal. El argumento que se defiende en este trabajo es el siguiente: como consecuencia de las imperfecciones de los mercados, aquellos individuos con menores dotaciones iniciales de riqueza tienen que afrontar mayores sacrificios y dilemas entre los costes presentes y los beneficios futuros de inversiones en movilidad. La movilidad social es el resultado de un problema intertemporal. Como tal, conlleva un cálculo de costes presentes y beneficios futuros. En la tesis se desarrolla un modelo estilizado en el que se analiza las consecuencias de la organización de las economías de mercado, en concreto las imperfecciones de los mercados de capitales y de los mercados de riesgos, en las decisiones de inversiones en movilidad de individuos que son heterogéneos en su dotación inicial de riqueza. Este argumento une en un marco común varias líneas de investigación que han evolucionado por separado: la literatura sociológica sobre movilidad social, la literatura económica acerca de los efectos de las restricciones crediticias en la dinámica de la desigualdad y la teoría del consumo. La contribución de la literatura de movilidad social se ha limitado en gran medida al establecimiento de asociaciones entre variables, prestando poca atención a los mecanismos que producen tales asociaciones. En esta tesis se formula un argumento que ofrece una explicación de la movilidad social basado en las decisiones sobre inversiones en movilidad de los individuos, dadas las restricciones presupuestarias que afrontan, y en el marco institucional de las economías de mercado. En las tesis se presenta evidencia empírica que confirma la plausibilidad del argumento. Se presenta los resultados de una investigación de los determinantes de las oportunidades para adquirir renta en el mercado de trabajo de Estados Unidos. Tanto la movilidad salarial como la probabilidad de "escapar" a "trabajos de bajos salarios" (low–wage jobs) están relacionadas con la riqueza inicial. Los resultados de estos análisis ofrecen evidencia consistente con el argumento teórico. La dotación inicial de riqueza está asociada con las oportunidades futuras. Especialmente revelador de la capacidad explicativa del argumento es el

análisis de la desigualdad de oportunidades entre blancos y negros en Estados Unidos. La explicación de tal desigualdad, se discute en la tesis, constituye un experimentum crucis para el argumento. De acuerdo con los análisis presentados en este trabajo, se puede concluir que la disparidad de oportunidades entre estos dos grupos étnicos es en gran medida una consecuencia de la desigualdad de riqueza inicial entre ambos. Tanto la teoría como el material empírico presentado en este trabajo muestran que la riqueza tiene efectos estratificadores de las oportunidades económicas. Como consecuencia de las imperfecciones de los mercados, las dotaciones iniciales de riqueza están relacionadas con las oportunidades futuras. Esta conclusión tiene importantes implicaciones de orden positivo y normativo. El argumento establece las bases teóricas para una creciente literatura sociológica que trata la relación entre riqueza y el proceso de estratificación social. Además, aporta micro-fundamentos para la elaboración de una teoría (weberiana) de la estratificación y movilidad social. Finalmente, la tesis ofrece criterios para una evaluación de la relación entre economías de mercado y (des)igualdad de oportunidades.

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**MARKETS AND OPPORTUNITIES.
AN EXPLANATION OF
ECONOMIC LIFE-CHANCES**

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ABSTRACT

This dissertation puts forward an argument to explain individuals' heterogeneity in economic life-chances. I explore the relation between the institutional underpinnings of market economies and the mobility opportunities enjoyed by individuals endowed with different levels of initial assets. As a byproduct of the organization of market economies, particularly the imperfect nature of credit markets and the absence of most insurance markets, poor individuals face a relatively more severe trade-off between present sacrifices and future benefits of mobility investments, which obviously works to their disadvantage.

A good deal of evidence in support for the argument is provided. Assets are shown to be associated with the opportunities for earnings acquisition. Both the mobility of earnings as well as the probability of escaping low-wage jobs are associated with individuals' initial level of assets. Especially revealing of the explanatory power of the argument has been the analysis of the inequality of opportunities between Blacks and Whites in the USA. The explanation of such an inequality has been shown to be an *experimentum crucis* for the argument. Indeed, on the basis of the analyses developed in the thesis, it can be concluded that the Black/White opportunities gap is related to their differences in terms of assets ownership.

Both the theory and the empirical material presented in the thesis establish the *stratifying* effects of wealth. As a result of market imperfections, the initial level of wealth shapes future economic opportunities. This conclusion has important implications, both positive and normative. The argument in this dissertation provides some micro-foundations for a theory of social stratification and mobility, and supplies behavioral grounds for a growing body of sociological research on the relation between wealth and stratification. Finally, the thesis provides the basis for an analysis of the interrelation between market economies and (in-)equality of opportunity.

A mis padres, Juan y Virtudes

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"I am: I and my circumstances"
(José Ortega y Gasset, *Meditaciones sobre el Quijote*)

"Man is good, circumstances are bad"
(Ivan Turgenev, *Fathers and Sons*)

CHAPTER 1

ON MARKETS, LIFE-CHANCES, AND SOCIAL MOBILITY: AN INTRODUCTION

1.- Social Stratification and Mobility: Processes and Outcomes

Why do individuals differ in their economic life-chances? Why do some individuals gain access to better economic positions than others? In feudal societies, the answer to those questions was not difficult at all. The estate an individual inherited determined her life-chances. A plebeian's lot was to work for a lord from dawn until dusk and obtain an economic compensation that was at best around the subsistence level. And this was so only because of the family she was born into. But in contemporary societies, the access to social and economic positions is open. More precisely, contemporary Western societies are *formally* or *legally* open. The principle of equality is included in the Constitutions of Western democracies, and it informs their entire legal organization. However, *formal* equality does not necessarily guarantee *effective* equality.

Over the last decades, the literature on social mobility has made important contributions in relation to this issue. The analysis of intergenerational social mobility has revealed the extent to which the social class position is transmitted from parents to sons.

This literature has been one of the most technically active areas in the discipline and has employed rigorous statistical methods. These technical developments gave birth to numerous empirical studies in which the existence of an association between the social classes occupied by parents and sons has been established. In addition, the literature on social mobility has provided sound empirical findings, each having substantive implications for the openness of Western societies. Both the *class* (Erikson, Goldthorpe and Portocarero, 1979; Erikson and Goldthorpe, 1992) and the *vertical* perspectives (Hout and Hauser, 1992) have found that all countries display a common pattern of association between origins and destinations. National variations matter for the strength of such association, but not for its existence nor for its basic nature[1] (*vid*. Hout, 2002).

Several investigations have shown that the gap between formal and effective equality can hardly be closed. However egalitarian the inspiration for the educational reforms introduced in a number of countries, the marriage between effective and formal equality has failed to materialize. Halsey, Heath and Ridge (1980) show, in spite of the reforms introduced in the British educational system, a persistent inequality in educational attainment as revealed by the correlation between working class origins and educational attainment. Raftery and Hout's (1993) finding that class barriers persisted in the educational attainment of the cohorts that could have benefited from the 1967 educational reforms in Ireland lead them to the formulation of the "Maximally Maintained Inequality" hypothesis. The economic incentives for education faced by working class families worked against the possibility of these families taking advantage of the educational reforms -however the quasi elimination of the direct costs of secondary education.

However important the contribution of the literature on social mobility may have been, there is still a long way to go. The literature has paid much more attention to empirical issues,

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[1] Do note that these two perspectives are not dichotomous. The distinction between them depends on whether classes can be hierarchically ordered.

leaving the theoretical understanding of these issues relatively unattended. The numerous empirical investigations undertaken during the last few decades have been more concerned with establishing the correlates of *outcomes* rather than with identifying the *process* generating those outcomes. As Goldthorpe (2000: 163-4) has recently put it, "macrosociological regularities, expressing salient features of the class stratification of modern societies, have been empirically demonstrated. But, thus far, these regularities have been left opaque". Research has focused on the association between parents and sons' class positions, but has paid little attention to the mechanisms that produce such an association. The *process* that generates mobility *outcomes* remains under-explored.

This is not to say that the theoretical level has been wholly ignored. There have certainly been attempts to specify the relevant mechanisms, dating back at least to Blau and Duncan (1967). Although inductive and not of a theoretical nature, Blau and Duncan's (1967) model was an attempt at decomposing ascribed from achieved mechanisms underlying the process of stratification by means of path analysis. In an analogous spirit, the so-called Wisconsin model's concern with the social psychological mechanisms at work behind the process of educational and status attainment was an important landmark in the study of the processes generating stratification (*vid.* especially Sewell, Haller and Portes, 1969). Similarly, Featherman and Hauser's (1978) analysis of the underlying patterns of (im)mobility and exchange between occupational strata, both between generations and within individuals' occupational careers, was aimed implicitly at grasping the mechanisms behind the stratification process. There are examples of more explicit endeavors to specify stratification mechanisms. Boudon (1974) provides an explanation of educational inequality in terms of the costs and benefits of education to individuals. Raftery and Hout (1993) supply an explanation of the empirical regularity of "Maximally Maintained Inequality" in terms of rational choice. Breen and Rottman (1995) develop a framework to understand class stratification at the

micro-level. They discuss, first, how class is related to the resources individuals own, which, in turn, facilitate or constrain their actions, and, thereafter, how these actions generate the stratification of opportunities. Goldthorpe (1996) and Breen and Goldthorpe (1997) offer an explanation of educational inequality across social classes based on the differences in resources and constraints that individuals in different social classes face, without invoking "cultural" or "value" differences across classes.

Despite these recent theoretical undertakings, the analysis of both inter- and intra-generational mobility still retains a heavy empirical bias. This thesis aims to rebalance the field. In this dissertation, an argument is put forward to explain individuals' heterogeneity in life-chances. More particularly, I want to contribute to the theoretical analysis of stratification and mobility by, first, making explicit the organization of market economies and, second, by discussing how such an organization shapes individuals' actions. I explore how the institutional underpinnings of market economies are related to the mobility opportunities of individuals endowed with different levels of wealth. I formulate this argument in order to unpack the process through which economic life-chances are produced. I offer an explanation of economic life-chances based on the reconstruction of the choices made by individuals, given the constraints they face, and within the institutional environment provided by the organization of capital and insurance markets. In so doing, I examine how the institutional underpinnings of markets may give rise to stratification of life-chances and explain it, following Elster (1989), as the product of individual action.

The remainder of this Chapter is structured as follows. In Section 2, I introduce the main argument of the thesis, compare it with other explanations of life-chances in the literature, and show its empirical implications. In Section 3, I operationalize the *explanandum*: economic life-chances in the US. Finally, the plan of the dissertation is displayed by showing the logic behind the sequence and content of the different chapters.

2.- Wealth and Opportunities: The Argument

This dissertation develops an argument to explain economic opportunities. The theory on which it is based establishes a connection between individuals' initial assets and their (future) economic opportunities. This theory has been built on the assumption that market economies are *imperfect*. More specifically, market economies encompass neither perfect capital markets nor a complete set of insurance/risk markets[2].

As a result of the imperfections of markets, "assets inequality matters" (Birdsall and Londoño, 1997). Individual's initial wealth allows them to undertake actions to improve their socio-economic status[3]. Wealth provides a safety net[4]. If facing contingencies that affect their incomes, wealthy individuals can use their assets as a buffer stock. Similarly, if deciding to undertake investments to improve their prospects, wealth provides a basis to finance investments in what I call Mobility Enhancing Assets (hereafter MEA).

The organization of market economies, in particular the imperfect nature of credit markets and the lack of key insurance

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[2] Note that this is not a theory of differential access to credit and insurance markets among the rich and the poor. It is a theory of inequality persistence based on a (reasonable) assumption: capital markets are imperfect and most insurance markets are missing. *Vid*. Stigltiz and Weiss (1981) for an explanation of the origin of credit-markets imperfections based on an analysis of the implications of the information asymmetries among borrowers and lenders. *Vid*. Shiller (1998: Chapter 1) for evidence on the absence of insurance markets.

[3] At this point, it is worth noting that wealth and income are not technically the same. The former is a *stock* variable, while the second is a *flow* variable. Wealth is the total value of the economic resources that an individual or household has accumulated up to the time at which it is measured. Income, on the other hand, is a flow of economic resources over time. Wealth provides a more permanent source of economic resources and, therefore, it provides the basis for life-chances (*vid*. Keister, 2000: Chapter 1; Sorensen, 2000: 1528-1540).

[4] Do note that wealth is important in so far as it provides a safety net. Other sources of economic resources providing such a safety net, such as parents' income in the case of educational attainment, may fulfill the same role and are equivalent. I thank David Firth and Anthony Heath for drawing my attention to this point.

markets, has as a consequence that those individuals with low initial levels of economic resources face much more severe trade-offs than wealthy ones. What I stress is that, in order to explain the divergence of mobility opportunities across individuals, we do not need to make reference to any particular subculture. It is not that those individuals who get ahead are psychologically programmed to "defer gratification", while those who stay behind are the subjects of a "syndrome of under-achievement". The thesis that I defend is that the organization of market economies makes the trade-off between present sacrifices and future benefits from mobility investments less favorable for those individuals who command fewer resources.

This argument builds on two branches of (micro)economics literature: the literature on the effects of the existence of borrowing constraints on the dynamics of inequality and economic growth (Loury, 1981; Banerjee and Newman, 1993; Galor and Zeira, 1993; Ljunguist, 1993), and consumption theory. Drawing on that literature, I present an argument to explain social and economic mobility. The argument can be summarized in three steps. 1) Because of credit restrictions, wealthy and non-wealthy individuals have to finance their mobility in different ways. Those who are wealthy enough can finance their mobility by paying out of their assets. Those who are not so wealthy have to finance mobility projects by accumulating assets *via* a reduction in current consumption. 2) This implies that the non-wealthy face a trade-off between current and future consumption. The question of who invests in mobility turns out to be equivalent to asking who is responsive to intertemporal incentives: who reduces consumption today in order to take advantage of higher consumption tomorrow. As in any intertemporal choice problem, attitudes to risk are definitely important. The agent's aversion or love for risk influences her choices. 3) However, risk attitudes are not exogenously assigned to individuals, but contingent upon their level of economic resources.

This argument gives an account of life-chances that is substantially different from other explanations in the sociological

literature. It offers an explanation of opportunities that is distinctive from i) those that account for life-chances in terms of individuals' values and predispositions, and ii) from those explanations based on differences in intelligence. (I will refer to these explanations as the Value-Opportunities (hereafter VO) and Intelligence-Opportunities (hereafter IO) arguments).

The explanations of life-chances based on values and/or (cultural) predispositions are not new in sociology. They date back, at least, to the 1950s, and were revived during the 1980s by means of explanations of the emergence of an underclass in terms of the so-called "culture of poverty". Hyman (1953: 432) expressed the bottom line of this reasoning: "the lower class of individuals holds values of such a nature as to reduce his striving towards those ends which would result in his moving up the class structure". In particular, the absence of a "pattern of deferred gratification" (Schneider and Lysgaard, 1953) in those values, coupled with a "poverty of aspirations" (Richardson, 1977), is the reason why "the lower class of individuals" does not have good prospects. Arguments of this kind re-emerged in the 1980s as explanations of the rise of an underclass. The rise and growth of an underclass is, according to this perspective, the result of a "culture of poverty" characterized, among other things, by a short-time horizon and an inability to postpone gratification (Auletta, 1982; Murray, 1984)[5]. The common element to a number of the explanations in the spirit of the ones quoted above is that they assume that individuals have orientations/values that are exogenous to their economic situation, which have implications for the choices that they undertake and consequently for their *advantage* or life-chances.

Nor are the explanations of life-chances in terms of individuals' intelligence new in the field. They are reminiscent of Young's (1958) idea of *meritocracy*. Daniel Bell, thirty years ago, envisioned a society where opportunities did not arise from

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[5] *Vid*. Marks (1991: 449-54) for a review of the cultural explanations of the emergence and growth of an underclass.

ascribed characteristics but from intelligence. The coming of the "post-industrial society" was the arrival of a meritocracy: "The post-industrial society in its initial logic is a meritocracy […] what is central to the assessment of a person is the assumed relation of achievement to intelligence" (Bell, 1973: 410-1). This argument has been recently popularized by Herrnstein and Murray (1994) in *The Bell Curve*. Intelligence determines the economic opportunities of individuals and, eventually, where they end up. By implication, inequality is natural and inevitable. The increase in socioeconomic inequality in the US in the last two decades simply reflects the working of nature, and the consequent compensation that intelligent individuals obtain according to this argument.

Why do we need an alternative explanation? Are they not satisfactory enough? The problem with the two theories above arises from a shared underlying assumption, namely that market economies do not have imperfections. Both approaches ignore the way market economies are arranged and how their institutional underpinnings affect the opportunities individuals enjoy. They just abstract away from the constraints imposed by the institutional underpinnings of markets on the choices individuals undertake in order to improve their life-chances.

Indeed, those theories do not take into account the fact that decisions to pursue economic advancement are undertaken in economies that are imperfect. They just assume that there are intelligent vs. non-intelligent individuals (IO theory), or individuals who are prepared to sacrifice themselves in order to improve their prospects vs. conformist ones (VO theory). And that is precisely the reason why the existing inequalities of opportunities are (to a large extent) *natural*. However, when we find out how market economies are organized and realize that they are imperfect, we come to know that individuals' opportunities do not arise *naturally* from their predispositions to sacrifice, or from their intelligence, but that opportunities in market economies become, to a large extent, *designed*. The theory to be presented in the First Part of this thesis offers an explanation of how

individuals' initial assets work to their *advantage*, through influencing their (future) opportunities. The theory presented in the First Part offers an explanation of how –borrowing an expression from Fisher *et al*. (1996)- opportunities become *designed* in market economies.

Certainly, once the imperfections of market economies are considered, both the VO and the IO approaches become the subject of serious concern. Let me discuss them in detail.

The VO argument is inadequate because it does not tackle the causal process behind the production of life-chances in full. It offers an incomplete and partial account. The problem with such an explanation has to do with the status of values in the causal process that generates the inequality of individuals' opportunities. Even if a causal link between values and the *explanandum* could be established, such an account is insufficient. We need to explain why individuals hold a particular set of values and predispositions. Let us assume that a causal link between the values and predispositions people hold and the life-chances they enjoy has been established[6]. Is it sufficient to say that the origin of opportunities lies in the values people hold?[7] Such an explanation may or may not bear some truth. But it is clearly incomplete. Values are at best the last link in the causal process. It may be true that those individuals who display a pattern of deferred gratification may have better opportunities. But that is the last step behind the process generating life-chances. The theory presented in the First Part of the thesis offers an explanation of the origin of those predispositions. It gives an account, at least partial, of their basis. Since individuals cannot borrow in order to undertake investments in Mobility Enhancing Assets, and since they do not benefit from protection against unexpected eventual contingencies affecting their incomes, their wealth is important. Those who do

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[6] However, it is difficult to imagine that values and predispositions are exogenous to experience. *Vid*. Breen (1999) for an argument on how beliefs and predispositions may become updated in light of individuals' experiences.

[7] Brian Barry (1970) has made arguments along similar lines relating to the relationship between democratic values and the stability of democracy.

not own wealth are less prepared to undertake investments in Mobility Enhancing Assets that will eventually improve their opportunities. The pattern of "deferred gratification" that individuals display is related, at least in part, to their initial assets[8]. The link between the two arises from the institutional underpinnings of market economies[9].

The IO argument is also inadequate not only in that it is also incomplete, but, more importantly, in that its basic logic is deeply flawed. Its blindness in respect of the organization of markets and the constraints individuals face results in this explanation being insufficient. It attributes individuals' opportunities to their intelligence. Individuals' differences regarding their intelligence may certainly give rise to different opportunities for economic progression. However, the IO argument omits the constraints imposed by the organization of markets and as a result, it gives a biased account of the process behind the production of life-chances. If we recognize that market economies are imperfect, we realize that agents' opportunities do not emerge solely from their intelligence, but that the interaction of the organization of markets and the initial assets agents are endowed with may give rise to different opportunities. This is not to say that intelligence is not an important determinant of opportunities. Certainly, intelligence may help to improve one's prospects. Indeed, in the context of the model that I develop in Chapter 2, more intelligent individuals may have a higher probability of obtaining a "good position".

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[8] Sorensen (2000: 1539) has argued along similar lines. He claims that the differences in time orientation among socioeconomic classes has rational basis. The working class's discounting of the future is a rational reaction to the higher levels of uncertainty in living conditions and in the returns to investments in the personal development that they face.

[9] One caveat is needed. I would like to emphasize that this does not necessarily mean that the level of economic resources determines individual's predispositions or, using the terminology of Chapter 2, their rate of intertemporal substitution. Two agents enjoying the same initial endowment may certainly display different predispositions. What I stress is that there is a regular pattern of association between the two.

However, this does not imply that intelligence alone can enhance individuals' opportunities. It is just one factor among others[10].

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What is the empirical content of the argument of this thesis? How does it compare to the other two arguments summarized above? The VO argument does not have different empirical implications to those derived from the argument in Part I of this thesis. The nature of its problem is not an empirical one, but logical and theoretical. The problem with an account of life-chances based on individuals' values has to do with the level of the explanation. It establishes the origin of the causal process in an intermediate step in the process behind the generation of life-chances. To put it differently, it attributes the original cause of the phenomenon to an intermediate step, which is itself a consequence of the initial source of the problem. The initial wealth individuals are endowed with is linked to their propensities to "defer gratification". There is indeed substantial empirical evidence that the level of wealth is related to their attitudes towards intertemporal substitution (individuals' predispositions to sacrifice current for future consumption) and therefore to their ability to "defer gratification"[11].

On the contrary, a number of testable inferences from the theory of this thesis are different from those conventionally drawn from the IO approach to economic life-chances. According to the

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[10] Similar approaches to the comparison of the effect of intelligence or ability vs. socioeconomic variables are Halsey, Heath and Ridge (1980) and Breen and Goldthorpe (2001). The former compared the relative importance of intelligence and social class in the process of educational attainment. The latter have shown that ability does not rule out the effect of social class of origin on individuals' relative mobility chances for two British cohorts of children borne in 1958 and 1970.

[11] *Vid*. Atkenson and Ogaki (1996) for an empirical investigation of the relationship between wealth and the elasticity of intertemporal substitution. *Vid*. Katherine Newman (1999) and Ehrenreich (2002) for an illustration of the economic constraints that low-wage workers face in the US based on ethnographic evidence.

latter, economic opportunities arise from individuals' intelligence. If there is inequality of opportunity, it is because individuals are heterogeneous in terms of their intelligence. Wealth or economic resources may be important, but only because they are correlated with intelligence. More intelligent individuals accumulate more wealth and that is why wealth may seem to be important. However, such a relation is spurious. Once "intelligence" is controlled for, the net effect of the initial assets is nil. The argument of this thesis has different empirical implications. Wealth is important for the acquisition and accumulation of earnings-enhancing assets. Once we recognize that market economies are imperfect, and more particularly that credit markets are imperfect and that most insurance markets are missing, we realize that rich agents find a structure of choices that is more favorable to the improvement of their opportunities. This does not mean that intelligence is not important. As I noted above, the effect of intelligence is incorporated in the model developed in Chapter 2 through its effect on the probability of obtaining a "good position" or "good job". However, intelligence does not tell the whole story. In the context of the model of Chapter 2, the probability of obtaining a "good position" is one determinant of mobility outcomes. The constraints individuals face in order to meet the mobility costs and protect their income streams if facing unexpected contingencies is another one. This yields an entirely new set of empirical predictions: holding intelligence constant, individuals' assets are an important determinant of their opportunities.

3.- On the *Explanandum*: Economic Life-chances in the US

In order to test the argument I shall rely on an analysis of economic-life chances in the US during the last two decades. More particularly, I analyze the determinants of, first, individuals' opportunities for earnings acquisition and, second, individuals' chances of escaping low-wage jobs. This section is devoted to

justifying the nature of the *explanandum*: why I concentrate on earnings, and why I carry out a dynamic analysis.

Before I provide an answer to those questions, let me give an explanation for why I focus on the US as a case study. The process that generates individuals' life chances is very complex and is driven by forces of very different nature. Certainly, individuals' opportunities are related to forces that operate at different levels. Firstly, there is a *socioeconomic fabric* of opportunities: economic and social characteristics of individuals such as their income, their family etc. which may be related to their economic opportunities. And secondly, opportunities are produced in an *institutional fabric*. Educational systems (*vid*. for example, Shavit and Müller, 1998), labor markets institutions and welfare systems (*vid*. for example Esping-Andersen, 1990; Gallie and Paugam, 2000), influence different aspects of individuals' opportunities.

The aim of this thesis is to put forward an explanation for the *social fabric* of opportunities. The argument aims at providing an explanation of how certain aspects of individuals' social circumstances and characteristics are linked to their life chances. In order to test the argument, I design the research as follows: I hold the *institutional fabric* constant by focusing on one country, the US, and let the *social fabric* vary across individuals within such a particular institutional setting.

How to define life-chances? Why do I focus on earnings dynamics and transitions out-of low-wage jobs?

Firstly, I focus on earnings and low-wage jobs because they are the most salient risk dimension in the US. Western labor markets do not display a convergent set of disadvantaged or bad positions at the bottom of their labor markets. Domestic institutions have absorbed structural economic changes over recent decades, making the relative weight of risks (i.e. unemployment, low-pay) vary accordingly. In the US, unemployment has been very low –especially as compared with some European countries. The flexible response of this labor market to the economic changes of the 1980s has led to a low level of unemployment, together with a high proportion of low-wage jobs. In addition, the

distribution of earnings in the US has become more unequal. The distribution of earnings in the 1980s displayed rising inequality together with a stagnant median. It has displayed a polarized shape. The sizes of both the bottom and the top[12] of the distribution have increased. And the proportion of low-wage jobs has increased substantially (*vid*. Levy and Murnane 1992; Katz and Murphy, 1992; Freeman and Katz, 1994; OECD, 1996: chapter 3; Atkinson, 2002). Therefore, the most salient risk in the US has not been unemployment, but low pay.

Secondly, I carry out a dynamic analysis because the concept of life-chances does not make reference to the material welfare of an individual at a point in time, but to her opportunities during the life-course.

For these reasons, in the investigation of economic life-chances that I present in the empirical part of this thesis, I concentrate on the analysis of individuals' earnings potential. More specifically, I analyze earnings dynamics and the transitions out of low-wage jobs in the US. Let me justify this delimitation of the *explanandum* in some more detail.

Labor Market Institutions and the divergence of bad *positions in Western Economies*

Arguably, two facts about the evolution of Western economies during recent decades can be taken as given. Firstly, these economies have faced a period of structural change. The distribution of employment between economic sectors has changed, declining in the industrial and growing in the service

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[12] Piketty and Saez (2003) have shown that top wages in the US have increased so much since the 1970s that the working rich have replaced the *rentiers* at the top of the income distribution. *Vid*. also Wright and Dwyer (2003) in which they show evidence according to which the American jobs expansion in the 1990s has taken a polarized form, with an increase in the proportion of jobs both at the top and at the bottom of the employment structure, combined with a limited growth in the middle.

sector. The openness to international trade has increased the competition with Third World Countries in labor-intensive product markets. The incorporation of new technologies into the processes of production has required a more skilled workforce. These structural changes have affected the labor market by shifting the demand for labor. The demand for skilled labor has increased and that for non-skilled labor has decreased (Levy and Murnane, 1992; Freeman, 1995; Nickell and Bell, 1995; Leamer, 1996; Wood, 1994, 1995). Secondly, Western countries have experienced, during this period of time, episodes in which unemployment and wage inequality have increased. More precisely, some countries have experienced increases in the inequality of earnings, but their unemployment rate has been low. In other countries the experience has been the opposite: wage inequality has not increased substantially, but unemployment has grown. In the US unemployment has been low, but wage inequality and the proportion of low-wage jobs has increased. In some countries in Continental Europe the wage distribution has been less unequal but unemployment has increased, reaching a two-digit figure.

Therefore, there is an *association* between structural economic change, on the one hand, and either an increase in wage inequality (US) or a rise in unemployment (some European countries)[13] on the other. Some economists have gone further and stated that they are not just associated, but the first has *caused* the second. The increase in earnings inequality in the US and the growth of unemployment in Continental Europe are two sides of the same coin: the structural change faced by Western economies. A simple model of labor demand and supply is the basis for the argument. Structural changes have determined a decrease in the demand for low-skilled labor. Where wages have adjusted to the market-clearing level the effect of the decrease in the demand for low-skilled labor has been low-wage employment. Where wages have stayed high, the

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[13] For an analysis of the role of market forces in the evolution of earnings inequality and unemployment in OECD countries, *vid.* Gottschalk and Joyce (1998) and Baldwin and Cain (2000).

outcome has been unemployment (*vid*. for example, Krugman, 1995).

This stylized story is contestable[14]. For a start, it predicts a uniform pattern of unemployment in Europe. However, the evolution of unemployment in Continental Europe does not exhibit a uniform tendency. The variation is such that, as Nickell (1997: 56-57) has calculated, for the period 1983-96, 30% of Europeans have lived in countries where the unemployment rate has been lower than that of the US. And secondly, the argument is based on the assumption that the US labor market is flexible and the European rigid. The decline in demand has implied an adjustment via prices –wage- in the US, and via quantity – unemployment- in Europe. But the fact is that the European countries with lower unemployment rates (i.e., Austria, (West) Germany, Norway, Sweden, and Switzerland) do not have very flexible institutions like those of the US labor market. European labor markets have different labor market institutions, and they have absorbed the structural economic changes with varying degrees of sucess as far as the outcomes are concerned (*vid*. Calmfors and Drifill, 1988; Freeman, 1994; Soskice, 1990; Wallerstein, 1999; Esping-Andersen, 2000).

Thus, domestic institutions have determined how the changes in the supply and demand for labor associated with structural change have made labor market outcomes among Western countries divergent. In the US, wages have fluctuated at the lower-end of the distribution. Some countries in Continental Europe have not benefited from the same institutions as, say, Austria or Sweden in coping with the decline in the demand for workers at the bottom of the skill distribution. The outcome has been an increase in wage inequality and a growth in the proportion of low-wage jobs in the US, and also an increase in unemployment in those European countries. For this reason, the lines of socioeconomic disadvantage along which stratification modifications could take place are not

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[14] Atkinson (1999) has made a strong argument showing that simple models of international trade and labor markets, on which such a stylized story is based, are not applicable to the analysis of the differences between Europe and the US.

the same across Western labor markets. Since the strategies for labor market adjustment to economic restructuring have been different, and are likely to determine labor market outcomes, the shape of a new bottom (underprivileged) class, if it were in the process of emergence or growth, would vary accordingly (Buck, 1991; Esping-Andersen, 1993, 1999). This has an analytic implication for the research design of this study: the dependent variable of the analysis is, so to say, endogenous to the kind of risk positions created in the particular labor market in question.

It is certainly not a coincidence that in Europe the debates about the changes in the social structure and its connection with the economic changes beginning in the 1970s have been concerned with unemployment and have said little about low-wage jobs. The consequence of the prolonged episodes of unemployment has been the establishment of employment as a new issue on the basis of which distributional conflicts will evolve (Van Parijs, 1987), the emergence of a mass of outsiders, and an increasing social exclusion and marginalization of the population (Brown and Crompton, 1994). Meanwhile, the debates in the US have focused on the social consequences of the increasingly unequal distribution of earnings. The discussions have stressed the "declining middle" (Harrison and Bluestone, 1988), a future of "lousy jobs" (Burtless, ed., 1990) and the emergence of a new "underclass" (Freeman, 1991; Jencks, 1991). The basis of this debate has been the analysis of the evolution of earnings inequality in the United States. The distribution of earnings in the 1980s adopted a polarized shape. It displayed rising inequality together with a stagnant median. The sizes of both the bottom and the top of the distribution increased (Levy and Murnane, 1992; Freeman and Katz, 1994). Middle class jobs vanished (Bluestone and Harrison, 1982, 1988). The number of low-wage jobs was growing very fast, contributing to the development of a large "underclass" (Freeman, 1994: 14).

Life-Chances: Static or Dynamic Concept?

The adaptation of domestic economies to the new economic scenario emerging from the late 1970s matters for the kind of disadvantaged positions created in the labor market. Disadvantaged positions are not the same across countries. This phenomenon is known in a static perspective. However, we need to know to what extent those positions are, using a metaphor due to Schumpeter (1951), like hotel rooms, always there but occupied by different guests, or like permanent residences for the people who hold them. In other words, we need to know the dynamics: flows into and out of disadvantage.

In principle, there is no reason why two individuals who hold the same position at a point in time have to display the same dynamics, both forward and backward. Both their history and prospects can be completely different. In addition, from a conceptual point of view, the term *life chances* makes reference to a temporal dimension[15]. It does not designate merely the material advantages that an individual is able to obtain at a particular point in time, but during her entire life, or at least for a prolonged period of time. The life chances of someone who has experienced economic deprivation at a point in time, and obtains good material advantages subsequently, are different from those of somebody who is locked in a disadvantaged economic situation. If life chances were understood in a static sense, individuals who enjoy different material advantages over their life span would be subsumed under the same category. To prevent such potential misconception, a dynamic analysis is essential. The consequence

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[15] One example of under-specification of the term life-chances is the definition of social class provided by Weber. The term of life-chances was at the core of his definition of a social class. For Weber (1978 [1921]), a social class is a group of individuals who hold common *life chances* generated in the market. However, he did not define the term. He wrote that "class situation is [...] market situation" (1978: 928), and he simply did not consider whether people always occupy the same market position. However, we know that intragenerational mobility occurs in contemporary societies (*vid.* for example Mayer and Carroll, 1987).

of adopting a static perspective is the aggregation of divergent trajectories that simply coincide at a point in time, and this implies a bias in the conclusions drawn concerning the stratification effects of structural economic changes. The main concern of this project is not what the individual has *achieved*, but on what her *potential* or economic *life-chances* are.

4.- Plan of the Dissertation

Let us restate the argument. Individuals differ in their economic life-chances because of –among other reasons- their initial endowments of economic resources. The thesis that I defend is that the organization of market economies makes the trade-off between present sacrifices and future benefits of mobility investments to be much more severe for those individuals who command fewer resources than for wealthy ones.

At this point, a qualification is in order. This dissertation is concerned with the inequalities in life-chances arising from individuals' socioeconomic characteristics. In particular, I analyze how the initial economic resources individuals are endowed with are likely to give rise to divergent opportunities for economic advancement. This is not to mean that all life-chances inequalities are the result of individuals' characteristics. Certainly, discriminatory practices and other forms of *social closure* restrict the access to certain socioeconomic positions to particular individuals and/or social groups. But that is a different issue. What I stress is that even in the absence of any form of formal or informal *closure*, not all individuals (may) take advantage of formal opportunities.

In order to test the plausibility of the argument, I perform a dynamic analysis of economic opportunities. Such analysis requires the use of panel data. Cross-sectional data do not capture transitions between different positions in the labor market. Those data show, at each point in time they are collected, the distribution of individuals between positions in the labor market -for example,

how many individuals earn low-wages each year. But that type of data does not show if individuals who earn low-wages continue holding such status in the future. To put it in statistical terms, the conclusions based on the analysis of these data suffer from an *aggregation bias*. What is needed is a longitudinal perspective like the one provided by data that follow the same individuals over a long period of time. In order to determine individuals' economic life-chances, we need a longitudinal database providing information on employment, earnings, occupation, family composition and other individual characteristics. These data are indispensable in analyzing life chances and advantage. The data set on which I rely is the *National Longitudinal Survey of Youth*. This data set collects information regarding labor market experiences, investments in education and training, family structure and background, and other variables, for individuals aged 14 to 21 in 1979. This is an ongoing panel that collects information for individuals from January 1978 to 1998.

<div align="center">***</div>

I proceed as follows. The First Part sets the theoretical framework. In Chapter 2, the argument is presented at an abstract level. Mobility is analyzed as an intertemporal choice problem. I discuss what trade-offs individuals face when they choose between different mobility options. And I determine the economic identity of those individuals who do take advantage of mobility opportunities, as well as that of those who do not. In Chapter 3, the level of analysis is made more specific. I consider individuals as embedded in concrete socioeconomic situations. In recent years, many contributions within Economic Sociology (*vid.* Granovetter, 1985; Coleman, 1987, 1990; Smelser and Swedberg, eds., 1990) have stressed that economic action is embedded in structures of social relations as a way of identifying the *social fabric* of economic choices and outcomes. But to say simply that "economic action is embedded in structures of social relations" (Granovetter, 1985) sounds good, but is of little analytical help. We need to move beyond grand-headlines. It is necessary to

specify the mechanisms linking the position of the individual in the social structure to her choices. In Chapter 3, I analyze how the social context affects mobility choices at different stages of individuals' life-courses. During her childhood, an individual has an *ascribed* endowment. When she is an adult, she *accumulates* or *acquires* resources. And those resources, both ascribed and acquired, affect their mobility potential and choices.

In Part II, I turn to investigate the empirical basis of the argument. More specifically, I am going to contrast the propositions derived from the theory presented in the First Part with others derived from the IO argument. This task is carried out in Chapters 4 and 5. In Chapter 4, I analyze how much leverage each of the arguments provides in accounting for the acquisition of (what I call in Chapter 2) Mobility Enhancing Assets (MEA). In turn, in Chapter 5, a similar logic is implemented to study individuals' opportunities for earnings acquisition. I contrast the inferences of competing propositions derived from the IO argument and from the theory in this thesis.

In Chapter 4, I analyze how MEA are acquired and accumulated. I show that the IO argument does not offer a complete account of how individuals acquire MEA. Individuals do not obtain and accumulate them solely in terms of their cognitive ability or intelligence, but also on the basis of the economic resources they are endowed with. I analyze the process behind the acquisition of three types of assets: education, wealth, and post-school human capital. I start by formulating testable propositions derived from the IO and Wealth-Opportunities theories. I show that the results offer empirical support for the argument of this thesis. Holding intelligence constant, individuals' initial assets are an important determinant of their capacity to acquire and accumulate further assets that enhance their opportunities.

In Chapter 5, I take a further step forward. The opportunities for earnings acquisition across individuals' labor market careers are analyzed. I investigate how individuals' accumulated assets are associated with their earnings mobility. If the argument presented in the First Part is correct, we should find accumulated assets to be

associated with earnings mobility. The underlying logic is that the poorer individuals are, the more unresponsive they become to intertemporal incentives. In order to finance mobility projects, they need to reduce their current consumption. That implies that poorer individuals find it harder to take advantage of mobility opportunities. The outcome is an association between assets and earnings mobility.

In the first section of Chapter 5, I estimate panel data models for earnings mobility. In the second section, I concentrate on a specific aspect of wage mobility: transitions out of low-wage jobs. Relying on a hazard rate econometric framework, I estimate the probability of transitions from low- to high-wage jobs across multiple spells: all the transitions that take place during the period under analysis. I show that accumulated assets matter for the opportunities individuals have to acquire earnings in the labor market. Net of the effect of a measure of cognitive ability, wealth is associated, in the expected direction, with earnings mobility and with an increase in the probability of escaping low-wage jobs, even after controlling for some possible sources of unobserved heterogeneity.

Finally, in the last section of Chapter 5, I set an *experimentum crucis* for the argument. I analyze whether the argument offers a satisfactory explanation of the Black-White Earnings Gap. The difference between blacks and whites in terms of their opportunities for earnings acquisition has constituted the battleground of different theories. In particular, Herrnstein and Murray (1994) have argued that the Black/White earnings gap is the result of their heterogeneity intelligence-wise: Blacks are less intelligent than Whites and that is why their earnings are lower.

In an extremely influential study, Oliver and Shapiro (1995) have shown that there are substantial differences among blacks and whites in terms of wealth holding. They are very unequal in terms of their assets ownership. Building on the findings of Oliver and Shapiro (1995), and based on the argument that I have developed in this thesis, I formulate the following proposition.

The Black/White earnings gap emerges from wealth inequality across these two ethnic groups.

I carry out two types of analysis in order to substantiate this point: an analysis of earnings mobility, and an analysis of the transition out-of low-wage jobs. If the explanation of opportunities in terms of intelligence is correct, we should find that the gap between whites and blacks would be closed when holding intelligence constant. However, I show that that is not the case. After controlling for intelligence, a substantial and significant gap remains between the two groups. Conversely, the argument of this thesis adds to the explanation of Blacks and Whites' opportunities differential. Once the accumulated wealth is held constant, the difference between blacks and whites becomes close to zero and turns out to be statistically non-significant. If blacks and whites were to own the same assets, they would have the same opportunities for earnings acquisition and have the same likelihood of escaping low-wage jobs. The inequality of earnings among Afro-Americans and Whites emerges, to a large extent, from their different initial wealth endowments.

Finally, in Chapter 6, the conclusions bring the argument together with the major findings of the thesis. In addition, the main implications and limitations of the argument are addressed.

CHAPTER 2

WEALTH, INTER-TEMPORAL CHOICE AND OPPORTUNITY (I): AN EXPLANATION OF LIFE-CHANCES

1.- Introduction

Why do individuals have different life-chances? Why do some individuals enjoy an upward mobility in their economic status? Western societies are formally open. In principle, socioeconomic mobility is possible for all individuals and citizens in Western societies and democracies. The principle of equality is included in their Constitutions and it informs their entire legal organization. However, *formal* equality does not necessarily guarantee *effective* equality of opportunity. Not all individuals take advantage of formal opportunities.

The thesis that I want to defend is that the organization of markets economies makes the trade-off between present sacrifices and future benefits of investments in mobility-enhancing assets (hereafter, MEA) much more severe for those individuals who command relatively few resources. Let me outline the argument at length.

Social and economic mobility are the outcome of an intertemporal choice. Mobility is costly. It requires making an investment –for example an investment in education. But it implies that considerable returns can be enjoyed in the future –e.g. a lifetime of higher earnings. At least in principle, one would think that the existence of inequality would create incentives for individuals to move out of bad jobs, however great the cost involved in the transition. Thinking dynamically, a lifetime horizon of better wages would more than compensate for the costs involved in investment in MEA, at least for young workers. The question then is how come some of them remain at the bottom forever?

My answer to those questions is that individuals remain at the bottom because they decide to. It is optimal for them to remain there. Let me explain myself before I am accused of writing propaganda. What I argue is that the structure of choices differs across individuals, and that there is a rational basis for that. It is not that they decide to remain at the bottom at their pleasure, nor that under any conditions they would undertake the same choices. It is that, given the organization of market economies and the resources that the poor command, it is optimal for them to remain at the bottom. In order to explain their behavior we do not need to make reference to any particular subculture. It is not that those individuals who get ahead are psychologically programmed to "deferred gratification" (Schneider and Lysgaard, 1953), while those who stay behind are the subjects of a "syndrome of under-achievement" (Rosen, 1956).

This chapter puts forward an argument to explain why some people get ahead while others stay behind: why some people take advantage of formal opportunities and others do remain in the least favorable economic positions forever. The thesis that I defend is that the organization of market economies makes the trade-off between present sacrifices and future benefits of mobility investments much less favorable for those individuals who command few resources than for wealthy ones. I formulate this argument with the aim of unpacking the process by which

economic life-chances are produced. I offer an explanation of economic life-chances based on the reconstruction of the choices made by individuals, given their constraints, and within the institutional environment made up by the organization of capital and insurance markets.

The structure of the chapter is as follows. In the next section, Section 2, I firstly discuss the sociological literature on which the argument of the Chapter is built. Thereafter, I introduce the tools that I use in the Chapter when analyzing the process of social mobility. In Section 3, I set up the mobility process as an inter-temporal choice problem. I analyze how the organization of capital markets is related to the means that individuals use when financing their mobility projects, and how the nature of insurance markets encourages or deters risk-taking behavior. In Section 4, I solve the inter-temporal choice problem. I analyze the determinants of the responsiveness of individuals to inter-temporal incentives, and determine the economic *identity* of those agents who may be responsive to those incentives. I discuss how asset ownership becomes a major determinant of mobility opportunities. In the last section, I recapitulate the argument and point out its implications for the analysis of the process of social stratification and mobility.

2.- Inter-temporal Choice and Social Mobility: The Rational Basis of (Dis-)Advantage

The argument that I am going to develop in this Chapter builds on two branches of literature. The first one is the sociology of the life-course. The second, the sociology of education; more particularly, the literature that deals with the process of educational attainment.

As a starting point, this thesis shares with the sociology of the life-course a focus on dynamic issues and intertemporal questions, seen from a micro-analytical perspective. A look at life-chances over individuals' lives provides us with empirical regularities that

constitute the *explanandum* of the argument that I put forward. Observed over time, the life-course establishes a process. The knowledge of such a process is especially important because of its far reaching consequences. Certainly, as Mayer (2000: 262) has put it, the representation of the life-course as a process "gets one nearer to mechanisms and therefore to more adequate explanatory accounts". The study of the life course provides us with empirical regularities of the way the process underneath individuals' life-chances evolve, and this, in turn, constitutes the basis from which a theory of life-chances may be formulated.

However crucial this literature might be, it does not provide us with such a theory. More generally, the sociology of the life-course has provided us with numerous empirical investigations. However, they do not supply an explicit treatment of the processes and choices behind the associations found. Indeed, as Mayer has put it when evaluating the contributions of this literature: "An area where I also see little or no progress is the field of explicit theory construction building …" "the reformulation of research problems as well as theory-building have not kept up the pace [of the growing number of empirical studies] […] theory-building has lagged behind the potential of the data" (pp. 268 and 277).

In order to get some insights into the determinants of the choices underneath the process of stratification, I have turned to a different area of the literature: the sociological literature on educational attainment. This literature constitutes an obvious start from which to put forward an argument about mechanisms and processes of stratification. The early literature was especially concerned with social psychological mechanisms. A landmark in the analysis of the process of educational and status attainment has been the development of the so-called Wisconsin model (*vid*. especially Sewell, Haller and Porters, 1969). In this model, the main mechanism behind the association between family background and educational attainment is of a social psychological nature. The family of origin influences children's aspirations and expectations.

Later contributions have emphasized the existence a different kind of mechanism behind the association between family background and educational attainment. Several undertakings have provided explanations for the association between the perceived costs and benefits of continuing in education. A key idea in each of these studies is summarized in the following quote from Raftery and Hout (1993: 59): "although we do not assert that aspirations are unimportant, we think that more basic economic factors may explain much of the observed pattern [of associations between family background and educational attainment]". That is the case of Boudon's (1974) explanation of educational inequality. An endeavor that considers more specifically the concrete costs and benefits is Raftery and Hout (1993). Their explanation of educational attainment in terms of rational choice is put forth as a solution to a *puzzle* found in an empirical investigation of the Irish case. The 1967 educational reforms in Ireland entailed the removal of tuition fees as well as other direct costs of education. Nonetheless, educational inequalities persisted. The explanation of Raftery and Hout (1993: 57-60) relies on an analysis of the economic incentives faced by the cohort that could have benefited from the reform. Although the direct costs of education were mostly removed, the indirect cost, namely the forgone earnings during the period of school enrollment, not only remained but, given the historically low level of unemployment of Ireland during the late 1960s, became more important for this cohort. Therefore, although the direct costs were almost eliminated, the indirect costs of education were so high that the net benefit of continuing in education was negative. Another undertaking in this direction is Breen and Goldthorpe (1997). They develop a formal model with the aim of explaining the persistence of class differentials in educational participation. Assuming that children and parents main strategies consist of avoiding downward class-mobility, namely the attainment of a class position lower than that of parents, Breen and Goldthorpe (1997) give an account of educational inequality in terms of the resources and constraints confronting individuals in different social classes.

The common denominator of these contributions is the idea that individuals in different classes have different perceptions of the benefits and costs of continuing in education and this, in turn, leads to uneven levels of educational attainment across different sections of society. It is this second set of contributions to the analysis of educational attainment that I take as a starting point and build on in order to develop an explanation of economic life-chances. I take a step forward in two directions. Firstly, I deal with a more general problem, namely the explanation of economic opportunities in a life-course perspective. And secondly, by making explicit the institutional context within which individuals' choices are undertaken, I draw the attention to the institutional underpinnings of market economies and analyze how markets and opportunities are related.

In the following parts of this section, I am going to present the tools that I will use in order to develop the deductive model that is at the core of this Chapter. More particularly, I discuss some economics literature on the relation between the institutional underpinnings of markets, risk-attitudes, the initial endowment of economic resources and mobility opportunities. Under the first subheading of this section, I discuss how the underpinnings of markets *matter*. In the second part of the section, the relation between risk-attitudes, initial endowments of wealth and opportunities is introduced.

2.1.- Of the Institutional Underpinnings of Markets and the Production of Opportunities

The organization, working, and presence and/or absence of some markets may affect mobility opportunities. In particular, the characteristics of credit and insurance markets are of enormous relevance in the production of mobility chances.

If capital markets were perfect, individuals could borrow the funds needed to invest in MEA. They would not need to be as wealthy as to own an amount of assets at least equal to the

mobility cost in order to take advantage of mobility opportunities. As long as mobility were seen as a profitable investment, as well as technologically viable, e.g. the agent has the ability to become educated, they would borrow the investment amount in the credit market and would *tailor* their opportunities. They would not be constrained by their initial wealth.

Similarly, if insurance markets provided enough protection against unexpected risks, e.g.: income shocks, unemployment, illness, individuals would be encouraged to take advantage of mobility investments. We know from the classic work by Domar and Musgrave (1944) that when insurance is available, risk-taking behavior is promoted. If individuals could obtain protection against unexpected contingencies, they would be encouraged to take advantage of mobility opportunities.

However, we know that the working of both capital and insurance markets is far from perfect. Informational issues give rise to problems of adverse selection and moral hazard between borrowers and lenders, between the insured and insurers[16]. In turn, the working of credit markets is imperfect (*vid*. Stiglitz and Weiss, 1981) and many insurance markets are missing. As a consequence, the real world is far from the ideal economy of perfect insurance established in Debreu (1959) and Arrow (1964, 1974). And these imperfections in capital and insurance markets may affect mobility opportunities.

Certainly, a number of recent papers have examined the consequences of credit-markets imperfections for the dynamics of (some dimensions of) economic status[17]. Galor and Zeira (1993)

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[16] *Vid*. Stiglitz (1994: chapters 3 and 4) for an accessible presentation of these issues.

[17] These papers are mainly theoretical, and their aim is not the analysis of mobility *per se*, but the examination of the effect of credit market imperfections on economic growth *via* human capital accumulation (*vid*. Piketty, (2000) Mookherjee and Ray (2002) for reviews of this literature). The model that I develop in this Chapter diverges from those quoted above in that it is mainly aimed at guiding an empirical investigation of mobility opportunities. For this reason, I develop a much more simple model that may be subjected to empirical testing.

analyze the long-run consequences of the initial distribution of wealth for economic growth that arise from individuals' investments in human capital when capital markets are imperfect. Individuals who initially have a low level of wealth prefer not to invest in human capital and remain unskilled. Banerjee and Newman (1993) show that in the presence of capital market imperfections, occupational choice is partially determined by the initial distribution of wealth. Poor agents become employees, while the wealthy become self-employed and employers. Bertola (1999) analyzes the effect of borrowing constraints on the mobility choices between bad and good jobs. He shows that however great the benefits of obtaining a good job, if workers cannot borrow to meet the mobility cost, non-wealthy individuals are unresponsive to wage differentials. In conclusion, what these papers show is that the access to (some) economic positions is (at least partially) determined by initial wealth. The effect of credit-market imperfections is to make access to favorable economic positions dependent on an individual's initial wealth. Individuals' initial endowment of wealth determines (partially) their opportunities.

The consequences of the lack of insurance markets have been explored in several theoretical papers and analyzed in numerous empirical investigations. Bardhan, Bowles and Gintis (2000) and Bowles and Gintis (2000: 1-5) provide a review of many empirical studies showing that the non-wealthy have high levels of risk-aversion. A revealing example is the paper by Rosenzweig and Wolpin (1993). They show that relatively poor Indian farmers prefer to hold assets that offer a low but secure return; in order to secure their consumption stream, they prefer holding bullocks to buying pumps. The return on pumps is higher than that on bullocks, but is more uncertain. Due to the absence of insurance, they prefer holding the less profitable but more secure asset.

The effect of the lack of insurance markets is not limited to developing economies. Dixit and Rob (1994) show that workers who cannot find insurance to smooth their income are not responsive to incentives to switch occupations. The absence of a complete set of risk markets prevents workers from changing

occupations. In a different context, Goldthorpe (2000: chapter 8) has argued that one of the reasons for the persistence of educational inequalities between social classes in Western societies, despite the reduction in the direct costs of education, is that working-class families are more at risk of experiencing fluctuations in their incomes, particularly because they face a higher probability of becoming unemployed, a risk that they cannot purchase insurance for. Such is the significance of the problem that Shiller (1993) has proposed the establishment of *macro markets* –some sort of risk markets- that would allow individuals to protect themselves against contingencies affecting their living standards that are not taken care of by the current social security arrangement of Western economies.

The lesson that we can take from this literature is that it may be worth exploring the institutional underpinnings of market economies in order to determine the production of economic life-chances. This literature provides us with the tools to deal with the under-explored sociological problem of the process of social mobility.

2.2.- Of Risk-Attitudes and Life-Chances

As noted above, mobility can be seen as the result of an intertemporal choice. The computation of the current costs and the future benefits is crucial for the determination of mobility choices. Making an investment in MEA –for example obtaining education- allows access to better positions in the labor market –e.g. a lifetime of higher earnings. But on the other hand, it is costly. Both benefits and costs are important determinants of mobility choices. But they are not the only determinants. As in any intertemporal choice problem, attitudes to risk are also crucial. The agent's risk aversion or tolerance influences her choices.

The view according to which risk-attitudes and economic opportunities are related is not a new idea. It goes back at least to Adam Smith. He argued that one of the causes of the "Inequalities

arising from the Nature of the Employments themselves" (Book I, Chapter X) is the "probability or improbability of success in them" (1930 [1776]: 107). Some professions offer good wages, but it is necessary to take the risk: "In the greater part of mechanic trades, success is almost certain; but very uncertain in the liberal professions" (page 107). In the 1950s Milton Friedman presented this idea using the tools of modern economics –in particular drawing on his earlier work on "The Utility Analysis of Choices Involving Risk" (Friedman and Savage, 1948). He suggested that attitudes to risk are important determinants of the personal distribution of income. Those who take the risk can have access to the highest positions in the distribution of personal income. This is why "a large part of the existing inequality of wealth can be regarded as produced by men to satisfy their tastes and preferences [for risk]" (Friedman, 1953: 290).

In this chapter I show that risk-attitudes are certainly important for the production of mobility opportunities. However, I will argue later in the chapter that their role is very different to the one attributed to them by Adam Smith [1776] and Milton Friedman (1953). Friedman in particular considered explicitly individuals' risk attitudes and economic status as two unrelated characteristics. He believed that risk attitudes were clearly different to individuals' economic resources: "Individual choice through the market can greatly modify the effect [of circumstances beyond the individual's control] on the personal distribution of income" (p. 277). No matter what an individual's inherited wealth is, its effect can be modified through assuming risks.

What I will argue is that risk-attitudes cannot be considered as exogenously assigned to individuals. If we bear in mind the institutional underpinnings of market economies, such an assumption that economic status and risk attitudes are unconnected does not seem very reasonable. Certainly, when making intertemporal choices, individuals do not live in a state of nature where they all are equal. Some have more resources than others. Wealth is unequally distributed. And the organization of markets, in particular capital and insurance markets, affects the

severity of the trade-offs that agents face when investing in MEA. When capital markets are imperfect, and when risk markets are incomplete, the poorer face tougher inter-temporal dilemmas.

3.- Markets and Opportunities

Does the market produce mobility opportunities for all? Do individuals enjoy access to opportunities to achieve the best positions in society? The answer to these questions depends on what one means by the market, and on what attributes of individuals' heterogeneity one has in mind. As Amartya Sen (1999: 116) has pointed out: "in assessing the market mechanism, it is important to take note of the forms of the markets". We need to know what markets and whose opportunities.

In this section I analyze how the organization of capital and insurance markets influences the mobility choices of poor and wealthy individuals. I first consider in a very simple and stylized way how the structure of capital markets influences the choices of different individuals, defined by their wealth, and consequently the opportunities they enjoy. In particular, I study their choices in two scenarios: when capital markets are perfect, and when they are not. Thereafter, I show how the organization of insurance markets affects their risk attitudes, and in turn their mobility potential.

3.1.- Markets and Opportunities (I): Capital Markets

The exposition in this section considers a very simple economy. It is a two-sector economy with two corresponding types of jobs. These jobs are differentiated by one dimension w, for example the wage rate they offer: w_g (good job) and w_b (bad job). Mobility between different types of jobs is possible, but costly. Obtaining a good job requires making an investment. We can think of such an investment as one in human capital. This investment is a fixed quantity I, $I>0$.

In this economy agents are differentiated by their initial wealth. They all prefer to occupy a good rather than a bad job, and they have the same potential to move out of bad jobs. This is not just a modeling simplification. In order to determine the economic identity of those agents who obtain access to mobility opportunities it is better to start out by considering differences between individuals that depend upon wealth and income. We need to fix some variables and let those relevant to the research question in hand to vary.

Perfect Capital Markets

Let us consider in the first place the case in which agents can access a perfect capital market. Individuals can borrow the amount of the mobility cost using as collateral their (future) lifetime earnings. In this case, and considering a two-periods -today vs. tomorrow- economy, the utilities of "moving" and "not moving" of an agent who in period *t*, the first period, is employed in a bad job are:

$$U_m = u(w_b) + [1/(1+\delta)] [\pi u(w_g-I) + (1-\pi)u(w_b-I)] \qquad (2.1)$$

$$U_{nm} = [(2+\delta)/(1+\delta)] u(w_b) \qquad (2.2)$$

where *u(.)* are concave and increasing utility functions. w_b, w_g, and *I* have been previously defined. Is δ the rate of discount. And π is the subjective probability of obtaining a good job at time *(t+1)* conditional on having been previously employed in a bad job.

U_{nm} is her expected utility if she chooses to remain in the bad job that pays w_b. U_m is her expected utility in the event that she switches to a good job. Note that since she can borrow *I* at time t, she has to repay that amount in the second period. The important point to note is that she does not need to have a level of assets at least equal to the investment needed, (i.e. it is not necessary that *W >= I*). The reason for this is that she can borrow the money

needed to invest in MEA, and then pay it back from her lifetime earnings.

It is obvious that in this favorable market environment, the conditions necessary for the individual to decide to move are not very demanding. The agent is indifferent between remaining in a bad job or investing in MEA when her expected utility in the second period is equal to the utility she obtains in the first period. From (1) and (2) it is clear that the individual is indifferent between the two alternatives, $U_m = U_{nm}$, when:

$$\pi u(w_g\text{-}I) + (1\text{-}\pi)u(w_b\text{-}I) = u(w_b) \tag{2.3}$$

How does the possibility of borrowing affect mobility choices? Who chooses to invest in MEA? Obviously, wealthy individuals have more choices than the non-wealthy. They can finance mobility by borrowing I, or they can de-cumulate assets in order to pay for the mobility investment. Non-wealthy individuals have only one option: borrow I and pay it back from their lifetime earnings. But the important point to note is that, as far as the returns make mobility to be a profitable investment[18], everyone decides to move to a good job. The possibility of borrowing implies that non-wealthy individuals need not reduce their present consumption in order to finance mobility. Therefore it is not only the wealthy that can finance mobility. The market produces opportunities for all.

Imperfect Capital Markets

However, we know that in reality, the working of capital markets is far from perfect. What are the implications for mobility opportunities? How does this fact affect individuals' utilities and choices? I consider the extreme case in which agents cannot

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[18] In this case, that is equivalent to the condition *[$\pi u(w_g\text{-}I) + (1\text{-}\pi)u(w_b\text{-}I)$] > $u(w_b)$.*

borrow at all to finance mobility projects. In this case, individuals have to finance mobility using their current resources and cannot, as in the case above, finance the investment in MEA from their (future) lifetime resources.

The utilities of agents who at time t are employed in bad jobs are:

$$U_m = u(w_b-I) + [1/(1+\delta)] [\pi u(w_g) + (1-\pi)u(w_b)] \tag{2.4}$$
$$U_{nm} = [(2+\delta)/(1+\delta)] u(w_b) \tag{2.5}$$

Note the effect of credit-restrictions on the utility of moving. Since the agent cannot borrow the amount of the mobility cost, she has to meet that cost in the first period. The utility she obtains in the first period is $u(w_b-I)$, while in the perfect capital markets case it was $u(w_b)$. This is crucial because in the first period the individual has low earnings (w_b). The cost of mobility implies a reduction in the level of earnings available for consumption. If she does not have any alternative source of funding, she needs to pay the cost out of such a low level of earnings.

3.2.- Markets and Opportunities (II): Insurance Markets

In the previous section I did not consider the possibility that individuals may face uncertainties regarding their future income. However, in the real world, because of various reasons, e.g., unemployment, illness, individuals face risks that affect their living standards, which are beyond their control.

If there were a complete set of risk markets, agents could obtain insurance against those contingencies. Markets are said to be complete if every possible contingency or state of nature can be insured against. In a world in which there were as many state-contingent claims markets as states of nature, individuals could insure their future income. Arrow (1964) formalized such an economy with a complete set of markets. In his formalization, there is a complete set of "Arrow securities": the number of

securities is equal to the number of possible contingencies or states of nature. In this economy, everyone can obtain insurance by buying the appropriate security. At time *t*, the individual buys a particular security in order to be protected against the eventual realization of state of nature "*s*" at time *t+1*. And if at time *t+1* state "*s*" occurs, the individual obtains a payment.

However, in reality, most risk markets are missing and individuals cannot protect their incomes. This is why markets are said to be incomplete. In the real world, as Hahn (1991: 113) has pointed out, "Arrow securities with pay-offs conditional on states of nature will not do the trick". Individuals face uncertainties. And they cannot hedge their incomes in (some) risk markets, for they do not exist[19]. They have to rely on their current resources in order to protect themselves against contingencies affecting their living standards[20]. Wealthy individuals can obtain protection by de-cumulating assets. They can smooth their consumption using their assets as a buffer stock (Deaton, 1991). However, those without wealth cannot smooth their consumption when facing some contingency. Therefore, it seems sensible to expect that the latter display higher levels of risk aversion than the former. As Dixit and Rob (1994: 49) have put it: "For most workers, future labor income constitutes their entire wealth, and significant risk-aversion is realistic [to be assumed]".

4.- Assets, Inter-temporal Choice and Opportunity in Imperfect Economies

Given the market imperfections described above, what implications can be drawn for mobility choices? How are market imperfections related to mobility opportunities? A text-book

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[19] Even if they did exist, informational problems would complicate the working of the Arrow securities (Hahn, 1991).

[20] The extent to which individuals have to rely solely on their own resources in order to protect their incomes depends on the availability and generosity of public insurance programs.

application of the net-present-value approach to investment would solve this problem by comparing the utilities of "moving" and "not moving". The expected utility the agent obtains when she decides to invest in MEA would be compared to that she obtains from the alternative choice of not investing. If the net-present-value of moving exceeds the utility that she obtains through remaining in a bad job then she decides to move.

However, before engaging in such a calculation, the agent needs to raise the amount of the mobility investment, I. Since she cannot borrow it using her lifetime earnings as collateral, she has to raise that amount in the first period –before she enjoys the return to the investment. This does not imply that mobility is not possible for non-wealthy agents. Obviously, wealthy individuals – those whose wealth exceeds the amount of the investment, i.e., $W>I$, can finance mobility projects by de-cumulating assets. But this does not imply that in principle mobility opportunities are restricted to them. Certainly, the inability to borrow is not synonymous with inability to save. Non-wealthy individuals can reduce their consumption today, invest in MEA tomorrow, and enjoy a higher level of consumption the day after.

In this section, I am going to examine the conditions under which agents will decide to undertake the investment and move from a bad- to a good-job.

Let us remember the assumptions made in analyzing the problem set out in Section 2:

1) Individuals have an interest in improving their material welfare.

2) There are two types of jobs: good and bad jobs. The former lead to higher levels of material welfare. Therefore, agents prefer being employed in a good rather than in a bad job. Figure 2.1 offers a graphical illustration of this assumption. The horizontal axis represents time. The vertical one stands for consumption. Over time, being employed in a good job is associated with more material advantages. Good jobs entail a consumption path that is superior to the one associated with bad jobs.

3) Moving from a bad to a good job is possible. There are no formal restrictions on access to good jobs. There are no legal barriers that prevent individuals from obtaining good jobs.

The core of the problem is whether the superior material advantages associated with good jobs are sufficient for agents to undertake the corresponding investment. Given that market economies are imperfect, some individuals may not be prepared to take advantage of formal opportunities. Even in the absence of formal or legal restrictions to accessing good jobs, some agents may find constraints that prevent them from undertaking investments in MEA. Certainly, the economies in which these calculations are undertaken are *imperfect*. Agents face borrowing constraints, and cannot always find insurance against unexpected events that may affect their income streams in the transition process. If they are poor, they have to reduce their consumption for a period of time in order to accumulate assets and pay the

mobility investment, *I*. In Figure 2.2, they have to travel along a "transition valley". They need to reduce their consumption during a period of time in order to accumulate the assets that, when invested, will secure them a good job. The rich, on the contrary, may undertake the investment that will secure access to a good job without reducing their consumption. They may de-cumulate assets in order to pay for *I*. In Figure 2.3, their consumption path is constant during the transition period[21].

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[21] Do note that if capital markets were perfect and agents could borrow against their future earnings, the problem of the poor would be equivalent to that of the rich. They could borrow *I* and maintain constant consumption during the "transition period".

Therefore, in order to find out the determinants of mobility, two problems need to be solved. Firstly, we need to know who is able to pay the mobility cost. Rich agents can de-cumulate assets. Poor individuals can reduce consumption during the transition period. However, if consumption is already low, it may be extremely difficult to reduce it even more. I deal with this problem in section (4.1). Secondly, we need to know what triggers the behavior that enables individuals to escape bad jobs. To put it differently, we need to know how good "good jobs" need to be for individuals to engage in a mobility strategy. I analyze this problem in section (4.2).

4.1.- *Escaping the Borrowing Constraint: The Response to Intertemporal Incentives*

The existence of restrictions on borrowing implies, as shown in Section 3.1 above, that non-wealthy individuals and households have to finance mobility by accumulating assets *via* a reduction of their current consumption. They face an intertemporal tradeoff. Mobility secures a higher level of earnings and an associated higher consumption stream. But the required accumulation of assets entails an opportunity cost, which is that those resources are not used for current consumption. Therefore, determining who takes advantage of mobility opportunities, and who is responsive to intertemporal incentives are equivalent problems.

For non-wealthy individuals, the first choice to make is not whether to invest or not. That's not the first choice they have to make. To save or not to save, to accumulate or not to accumulate, to reduce or to maintain present consumption: those are the questions! To sacrifice today in order to enjoy better prospects in the future. To put it differently, for those agents whose wealth is lower than the required investment in MEA, i.e. $W < I$, working in a bad job, w_b, is associated to a consumption stream c_b. Once she becomes employed in a good job, w_g, she will enjoy a higher consumption, c_g. But in order to meet the mobility cost, she has to reduce her consumption to a level c_u that is lower than that she enjoys when employed in a bad job, $c_u < c_b$, in order to accumulate an amount of savings that is equal to the mobility cost.

In this section I analyze the determinants of the response to intertemporal incentives. To begin, I present the problem graphically. I *draw* the indifference curves for consumption over two-periods, and show what they look like for agents who are more and less responsive to intertemporal incentives. Secondly, using the tools of consumption theory, I analyze how consumption grows in response to intertemporal incentives. Finally, I discuss the substantive implications of that analysis for the determination of the socioeconomic identity of the agents that are more likely to take advantage of mobility opportunities.

Indifference Curves, Intertemporal Substitution and Economic Status.

We can represent the preferences of consumption over two periods, consumption today vs. consumption tomorrow, present vs. future consumption, in a two-dimensional space. The quantity of present consumption is represented on the horizontal axis, and the quantity of future consumption is represented on the vertical axis.

In Figure 2.4, the indifference curves of an individual over consumption at times *(t)* and *(t+1)* are presented. These curves show the combinations of present and future consumption over which the individual is indifferent. In Figure 2.4, the agent is indifferent between the combinations (a) and (b). One property of indifference curves is that more is preferred to less. This implies that curves to the northeast are preferred to those towards the southwest. In Figure 2.5, the point (c) is preferred to both (a) and (b), since it is situated on an indifference curve further to the northeast and represents combinations of higher consumption in both periods.

The slope of indifference curves represents how much future consumption the agent must be provided with in order to exactly compensate the loss of a unit of current consumption. Agents more willing to substitute display flatter indifference curves. Equivalently, those less willing to substitute present for future consumption display steeper indifference curves. In Figure 2.6, the indifference curves of two individuals are compared. The solid curve represents the preferences of the one less willing to substitute present for future consumption. For a given reduction of her current consumption, she requires a higher level of future consumption than the agent whose preferences are represented by the dotted curves.

Figure 2.4.- Indifference curves

c_{t+1}

a

b

c_t
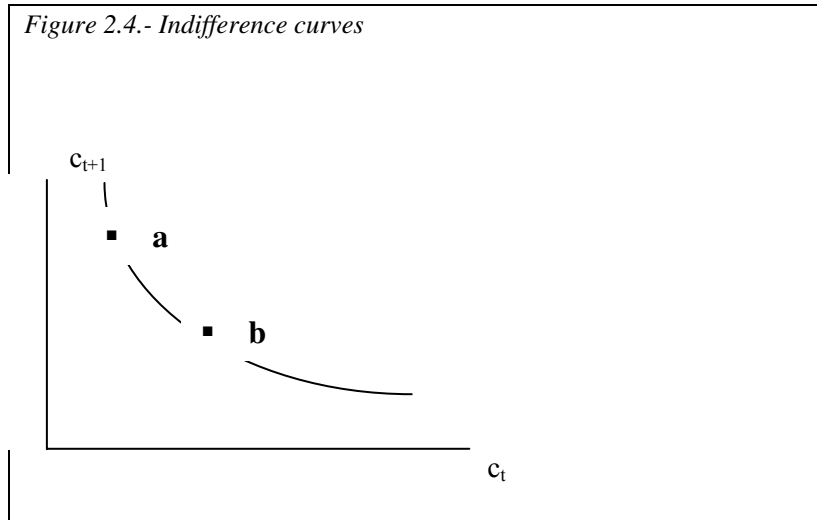
Figure 2.5.- Indifference curves

c_{t+1}

a

c

b

c_t

Figure 2.6.- Different Slopes of indifference curves

c_{t+1}

c_t
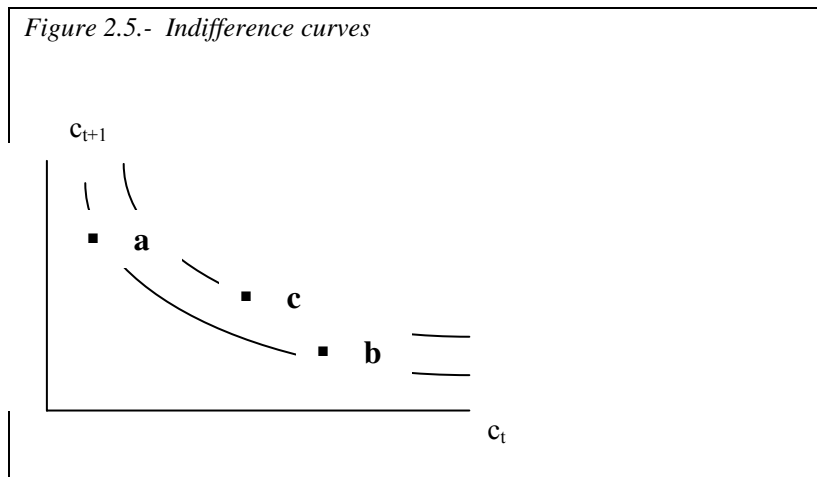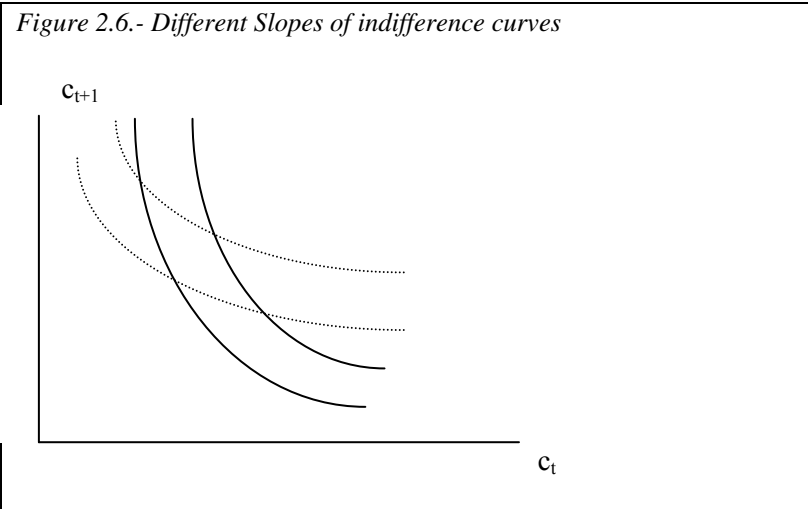
The shape of indifference curves represents whether an individual is more or less likely to respond to intertemporal incentives. Those agents willing to substitute their current consumption in order to accumulate the assets required to invest in MEA and enjoy higher consumption in the future display flatter indifference curves. Let us determine who they are and how their risk attitudes look like.

The Response to Intertemporal Incentives

Determining who takes advantage of mobility opportunities requires an analysis of how consumption varies in response to a high interest rate, which in turn depends on the rate of time preference.

Let us use the tools of consumption theory to analyze this problem[22]. The consumption choice is the outcome of the interaction of consumers' preferences and budget constraints. Preferences represent the consumption the consumer desires, and the budget constraint the consumption level that is affordable. The choice comes from obtaining the most desired consumption level, given what is feasible. It is the outcome of the maximization of preferences subject to the constraints imposed by the budget.

In a two-period world, today vs. tomorrow, the individual's utility of consumption is given by:

$$U = u(c_t, c_{t+1}) \tag{2.6}$$

where $u(.)$ is concave and increasing utility function, and c_i is consumption in period i.

Assuming that preferences are intertemporally additive, the total utility of consumption is the sum of the utilities of consumption in each period:

$$U = u(c_t) + [1/(1+\delta)]\, u(c_{t+1}) \tag{2.7}$$

The agent's labor income and assets determine her budget constraint. In the absence of a bequest motive, the budget constraint relates the sum of consumption in both periods to the individual's wealth –income plus assets- in the following way:

$$c_t + [1/(1+r)]c_{t+1} = A_t + y_t + [1/(1+r)]y_{t+1} \tag{2.8}$$

where r is the interest rate, A_t the individual's level of assets in period t, and y_t is her labor income in period t.

The consumption choice is the result of maximizing preferences (2.7) subject to the budget constraint (2.8). This

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[22] For general overviews of consumption theory *vid*. Deaton and Muellbauer (1980), Deaton (1992), and Muellbauer (1994).

maximization implies the following relation between the marginal utilities of consumption at times *t* and *t+1*:

$$u'(c_t)= [(1+r)/(1+\delta)] \ u'(c_{t+1}) \tag{2.9}$$

where $u'(c_t)$ is the agents' marginal utility of consumption at time *t*.

Now we can analyze how consumption responds to intertemporal incentives. How does consumption grow when the interest rate is higher than the rate of time preference? What is the rate of intertemporal substitution of consumption? The answer to these questions requires computing the derivative of consumption growth with respect to the interest rate: $d[(c_{t+1}- c_t) / c_t] / dr$.

If we take a first order Taylor approximation of $u'(c_{t+1})$ around $u'(c_t)$, we have that:

$$u'(c_{t+1})= u'(c_t) + u''(c_t) \ (c_t- c_{t-1}) \tag{2.10}$$

Substituting (2.10) in (2.9) and assuming that both δ and *r* are small, we have that consumption grows according to the expression:

$$[(c_{t+1}- c_t) / c_t] = -[u'(c_t)/ (c_t \ u''(c_t))] \ (r-\delta). \tag{2.11}$$

And the response of consumption growth to the interest rate is given by:

$$d[(c_{t+1}- c_t) / c_t]/dr = -[\ u'(c_t)/ (c_t \ u''(c_t))]. \tag{2.12}$$

The quantity $1/\sigma = -[(u'(c_t)/(c_t \ u''(c_t))]$ is the rate of intertemporal substitution of consumption. It measures how consumption grows in response to the intertemporal incentive *(r-δ)*. Note that this rate is the inverse of the Arrow-Pratt measure of

relative risk aversion[23]. Technically, this result implies that more risk-averse individuals are less likely to respond to intertemporal incentives. Risk-attitudes definitely inlfuence mobility outcomes[24].

Intertemporal Substitution and Economic Status

What are the substantive implications of this result? Does it imply that mobility, after all, is the result of an attitudinal or psychological characteristic of individuals? Is it simply that those who take the risk can *make it*? When making intertemporal choices, individuals do not live in a state of nature where they all are equal. Some have more resources than others. Wealth is unequally distributed. And the levels of economic resources they command affect their attitude to intertemporal choice. The fact that the agent is risk averse implies that her utility is very sensitive to small changes in consumption. Since in the context of Expected Utility Theory concavity and risk aversion are equivalent properties of the utility function (*vid.* Mas-Collel, Whinston, Green, 1995: 187), a reduction in current consumption implies a substantial decrease in utility. For poor households, a reduction of resources allocated to present consumption implies a high sacrifice because its consumption level is already low. In other words, poor individuals and households display utility functions characterized by a very high marginal utility of income for *low* amounts of income. The lower the income, the more concave the utility of income, and the more risk-averse the agent is.

Certainly, we know at least since the formulation of the Engel's law (Engel, 1895) that poorer households allocate a higher

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[23] The Arrow-Pratt measure of relative risk aversion of a utility function *u(.)* is given by *u (a)=-(au''(a))/u'(a).*

[24] The response of consumption growth to the interest rate is given by the rate of intertemporal substitution. When utility functions are assumed to be intertemporally additive, risk-aversion and intertemporal substitution rates are equivalent.

share of their total expenditure to *necessities* than do rich households. Therefore, when resources are plentiful, a household can respond to intertemporal incentives by eliminating luxuries from its consumption bundle. A poor household, on the contrary, finds it more difficult to dispense with items in its consumption bundle: there are very few luxuries to disregard. The household's level of economic resources is associated with its ability to substitute consumption.

In conclusion, those agents who are sensitive to small changes in consumption, i.e. less wealthy individuals and households and families compromising more people, are likely to be unresponsive to intertemporal incentives. Their sensitivity to small variations in consumption means that their utility function is very concave and, therefore, displays risk-aversion. Besides, their lack of protection against unexpected shocks to their living standards implies a further source of risk-aversion. The consequence is that their rate of intertemporal substitution is low and therefore become unresponsive to mobility opportunities. Risk attitudes, in conclusion, do seem to be contingent upon the agent's economic status.

4.2.- Wealth, Risk-aversion and the Mobility-Trigger

Individuals decide to meet the costs of mobility only if they consider "good jobs" to be good enough. They decide to undertake the investment and assume the associated risk only if their welfare is going to improve considerably. In this section, I analyze the determinants of the "mobility trigger". I study what triggers individuals into leaving bad jobs, and how this is related to their personal characteristics.

The problem of the individual entails choosing the course of action leading to a higher utility level. To put it differently, the agent chooses the strategy that maximizes her utility:

$$Max \{U_m, U_{nm}\} \tag{2.13}$$

When capital markets are imperfect, the utilities of "moving" and "not moving" are given by (*vid*. Section 3.1):

$$U_m = u(w_b - I) + [1/(1+\delta)] [\pi u(w_g) + (1-\pi)u(w_b)] \qquad (2.14)$$
$$U_{nm} = [(2+\delta)/(1+\delta)] u(w_b) \qquad (2.15)$$

In order to find out the value of the good job wage that triggers mobility, we need to solve a maximization problem. When $U_m = U_{nm}$, we obtain the following condition:

$$u(\tilde{w}_g) = u(w_b) + \frac{1+\delta}{\pi} [u(w_b) - u(w_b - I)] \qquad (2.16)$$

where $\tilde{w}_g$ is the trigger value, i.e. the value of the wage offered in the good job that leads to worker mobility.

The former expression does not lead to an analytical solution for $\tilde{w}_g$. However, it can be demonstrated that the higher the risk aversion of the individual, the higher the value of the mobility trigger. I provide a proof for such a proposition in an appendix at the end of the Chapter. In what follows, I discuss the substantive implications of this result.

Proposition. *The higher the agent's risk aversion, the higher the value of wage in the good job needed to trigger mobility.*

Discussion. There is an inverse relation between the risk aversion of the worker and the mobility trigger. The higher the risk aversion, the higher the wage differential needs to be for the individual to decide to meet the cost of mobility. More risk averse individuals are less responsive to opportunities. This is the technical meaning of the result. What is the substantive content of this finding? What are its implications? In order to provide an answer to these questions, we need to remind ourselves how

markets are institutionally organized, and how they affect mobility opportunities.

If workers would have access to perfect financial markets, as in the model due to Lucas and Prescott (1974), they would borrow the amount of the mobility investment and repay using their future earnings. Similarly, if insurance markets were perfect, their living standards would be guaranteed. All in all, they would enjoy high and stable consumption independently of their wealth.

However, since the market mechanism does not provide individuals with enough protection, and since they cannot borrow against their future earnings, wealth becomes important. Wealthy workers can use their assets as a buffer stock (*vid*. Deaton, 1991; Carroll, 1997). In addition, they can use their wealth as a stock of resources from which to finance investments in Mobility-Enhancing-Assets. Therefore, their behavior can be approximated by risk-neutral utility functions. On the contrary, non-wealthy individuals are less protected against unexpected contingencies that may affect their living standards. They cannot find insurance by running down of assets because the do not own any. As a result, it seems sensible to suppose that they are more risk-averse and less prepared to undertake risky behavior (*vid*. Dixit and Rob, 1994; Sinn, 1995)[25].

5.- Summary

This chapter has presented an explanation as to why some people take advantage of formal opportunities and others remain in the least favorable economic positions forever. This argument can be summarized as follows. Because of market imperfections, the initial wealth individuals are endowed with is an important determinant of their mobility opportunities. Given the imperfections of credit markets, the wealthy and the non-wealthy

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[25] In fact, there is some empirical evidence that reveals a relation between wealth and risk-aversion (*e.g.* Atkenson and Ogaki, 1996 and Ogaki and Atkenson, 1997).

have to finance their mobility in different ways. Those who are wealthy enough can finance their mobility using their assets. Those who are not so wealthy have to finance mobility projects by accumulating assets *via* a reduction in current consumption. If their consumption is already very low, they may find it impossible to reduce it even more and to take advantage of mobility opportunities. In addition, given the lack of insurance markets, the non-wealthy are less protected against eventual contingencies affecting their living standards and are less prepared to invest in their personal development and to follow risk-taking behavior.

In conclusion, since market economies are imperfect, wealth becomes an important determinant of mobility opportunities. This does not mean that mobility is impossible for the non-wealthy. What the argument implies is that the non-wealthy face a trade-off between present sacrifices and future benefits of mobility investments which is much more severe than the one that wealthy individuals face. Therefore there is a rational basis for expecting that that wealth plays a crucial role in the evolution of social stratification and mobility. The argument developed in this Chapter establishes the micro-foundations from which to explain the relation between wealth and opportunities suggested in a growing body of sociological research on social stratification (*vid*. Spilerman, 2000; Keister, 2002).

Appendix 2.1.-
Proof of the Proposition in Section 4.2.

I am going to demonstrate the proposition formulated in Section 4.2, namely the existence of an inverse relation between risk aversion and the value of the mobility trigger. I do so in two steps: (i) and (ii).

(i)

If we take a Taylor approximation of $u(\tilde{w}_g)$ (*vid.* expression (2.16) above) around w_b of interval $(\tilde{w}_g - w_b)$, we obtain the following inequality:

$$u'(w_b) \cdot (\tilde{w}_g - w_b) < \frac{1+\delta}{\pi}[u(w_b) - u(w_b - I)] \qquad (2.17)$$

If we take a Taylor-approximation of $u(w_b)$ around $u(w_b - I)$ and use the fact that the utility function is concave, and that *I> 0*, it follows that $u'(w_b - I) > u'(w_b)$ and therefore (2.17) implies:

$$u'(w_b) \cdot (\tilde{w}_g - w_b) < \frac{1+\delta}{\pi} \cdot I \cdot u'(w_b) \qquad (2.18)$$

Simplifying:

$$\frac{1+\delta}{\pi} \cdot I > (\tilde{w}_g - w_b) \qquad (2.19)$$

(ii)
Let us assume that the utility function is of the form

$$u(x) = e^{-\rho x} \qquad (2.20)$$

This is a constant elasticity of substitution utility function. ρ is a positive number that measures the degree of concavity of the function. The higher the value of ρ, the higher the concavity of the utility function and, therefore, the higher the risk aversion of the individual.

The proposition states that the higher the risk aversion of the individual, the better the good job needs to be for the individual to decide to leave the bad job. To put it differently, the higher the level of risk aversion, the higher the good job's wage needs to be for the agent to decide to pursue it. This is equivalent to saying that the derivative of the "mobility trigger" with respect to the parameter that controls the degree of risk aversion is positive. Therefore, we have to demonstrate that:

$$\frac{\partial}{\partial \rho} \widetilde{w}_g(\rho) > 0 \quad \text{(or using a different notation, } w'_g(\rho) > 0 \text{)}$$

(2.21)

Substituting the utility function in (2.20) into the expression (2.16) we have:

$$e^{-\rho \widetilde{w}_g} = e^{-\rho w_b} + \frac{1+\delta}{\pi}\left[e^{-\rho w_b} - e^{-\rho(w_b - I)}\right] \quad (2.22)$$

If we differentiate (2.22) with respect to ρ we obtain:

$$e^{-\rho \widetilde{w}_g}\left[\widetilde{w}_g + \rho \widetilde{w}_g'(r)\right] = w_b e^{-\rho w_b} + \frac{1+\delta}{\pi}\left[w_b e^{-\rho w_b} - (w_b - I)e^{-\rho(w_b - I)}\right]$$

(2.23)

Rearranging:

$$\tilde{w}_g + \rho \tilde{w_g}'(r) = \frac{w_b\left[e^{-\rho w_b} + \frac{1+\delta}{\pi}\left(e^{-\rho w_b} - e^{-\rho(w_b - I)}\right)\right] + \frac{1+\delta}{\pi} \cdot I \cdot e^{-\rho(w_b - I)}}{e^{-\rho \tilde{w}_g}}$$

(2.24)

Substituting (2.16) in (2.24):

$$\tilde{w}_g + \rho \tilde{w_g}'(r) = \frac{w_b\left[e^{-\rho w_b} + \frac{1+\delta}{\pi}\left(e^{-\rho w_b} - e^{-\rho(w_b - I)}\right)\right]}{e^{-\rho w_b} + \frac{1+\delta}{\pi}\left(e^{-\rho w_b} - e^{-\rho(w_b - I)}\right)} + \frac{\frac{1+\delta}{\pi} \cdot I \cdot e^{-\rho(w_b - I)}}{e^{-\rho \tilde{w}_g}}$$

(2.25)

Simplifying (2.25), we obtain:

$$\tilde{w}_g + \rho \tilde{w}_g'(\rho) = w_b + I \cdot \frac{1+\delta}{\pi} \cdot \frac{e^{-\rho(w_b - I)}}{e^{-\rho \tilde{w}_g}}$$

(2.26)

$$\rho \tilde{w}_g'(\rho) = \frac{1+\delta}{\pi} \cdot I \cdot e^{\rho I} \cdot e^{\rho(\tilde{w}_g - w_b)} - (\tilde{w}_g - w_b)$$

(2.27)

Using the inequality (2.19) obtained above, we can derive the following inequalities:

$$\rho \tilde{w}_g'(\rho) > (\tilde{w}_g - w_b) \cdot e^{\rho I} \cdot e^{\rho(\tilde{w}_g - w_b)} - (\tilde{w}_g - w_b)$$

(2.28)

$$\tilde{w}_g'(\rho) > \frac{1}{\rho}[e^{\rho I} \cdot e^{\rho(\tilde{w}_g - w_b)} - 1] \cdot (\tilde{w}_g - w_b)$$

(2.29)

Since $r > 0$ and $I > 0$, then $e^{\rho I} \cdot e^{\rho(\tilde{w}_g - w_b)} > 1$. Since by definition $\tilde{w}_g > w_b$, it follows that $\tilde{w}'_g(r) > 0$.

Q.E.D.

Figure 2.1.- Welfare paths of
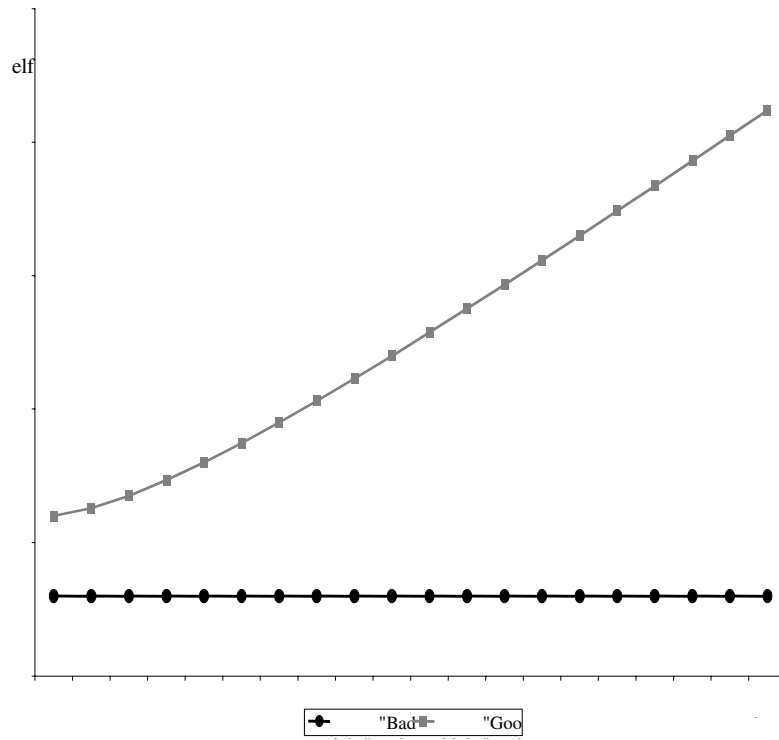
Figure 2.2.- Poor's welfare path when climbing up

| "Bad jobs" path | | "Good jobs" path |
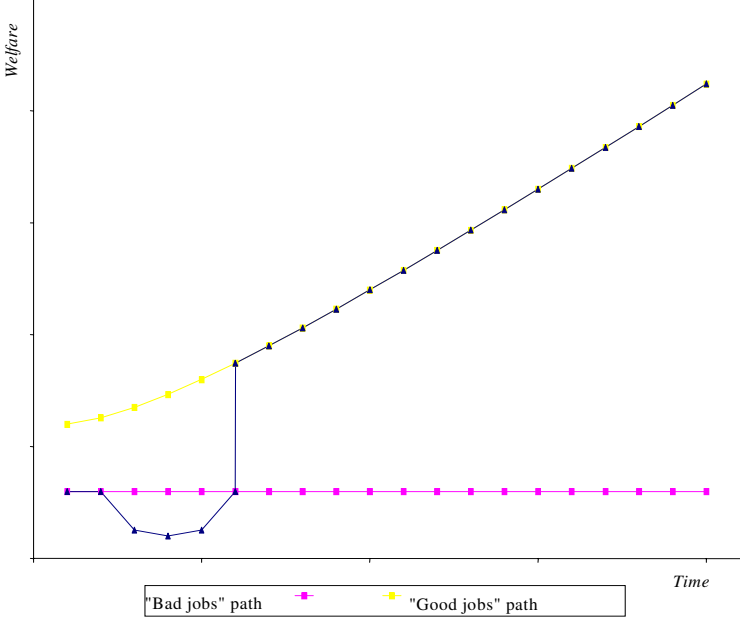
Figure 2.3.- Rich's welfare path when climbing up
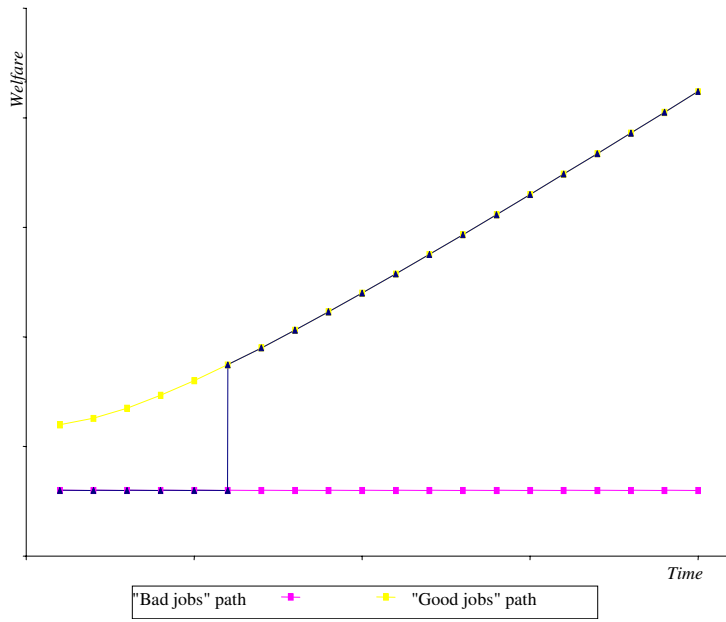
CHAPTER 3

ASSETS, INTER-TEMPORAL CHOICE AND OPPORTUNITY (II): THE SOCIAL CONTEXT OF INTER-TEMPORAL CHOICES

1.- Introduction: Economic Action and the Social Context

During recent decades, numerous contributions in sociological theory, particularly in rational choice theory and economic sociology, have stressed that economic actions are not undertaken by atomized individuals, but by agents exposed to the influence of the social structure. These contributions have emphasized the need of taking into account how individuals' social context affects their economic action. The literature has underlined that economic action is *embedded* in structures of social relations (Granovetter, 1985), that sociological explanations need to establish a *macro-micro link* (Coleman, 1987, 1990), and that those explanations should specify how the *initial conditions* actors face influence their actions (Lindenberg, 1985).

These contributions have made clear that better specifications of models of economic action are needed. In order to understand how the position of the individual in the social structure shapes the course of economic action we have to move beyond grand-

headlines, as these are of little analytical help. Ultimately, economic action is the result of individual choice. If the social structure has an effect on economic action, it is via its influence on the parameters that affect agents' actions.

In this chapter I shall "sociologize" the model of Chapter 2. Its aim is to explore some of the engines of the *social fabric* of opportunities. I will incorporate some relevant social factors into the model of Chapter 2. This ensures that the problem of economic action is better specified. At the same time, analytical rigor and parsimony are not compromised. In order to do this, I shall bring together the implications of the model and some of the sociological contributions to the study of life-chances.

The argument developed in Chapter 2 provides a framework for the explanation of social mobility, both intra- and inter-generational. In fact, it supplies the basis for analyzing the common logic of a series of interrelated social processes relating inequality persistence. Given the market imperfections described in the previous chapter, the initial endowment of wealth is related to individuals' future opportunities. The initial inequality may persist over time among identical agents. In market economies, individuals who are unequal solely in terms of their initial wealth enjoy different mobility opportunities. The framework and the argument presented in Chapter 2 provide a benchmark for explaining the process of mobility. It is useful because it supplies a reference point to be compared with more complex social situations. Certainly, when we introduce the model in a social context, we find out that individuals face social circumstances that extend their heterogeneity beyond their initial wealth. Economic resources are important, but they are not the only determinant of investments in MEA. Partly as a result of their social circumstances, individuals are equipped with different initial stocks of human capital and this, in turn, facilitates (or hampers) the profitability of investments in their personal development. This heterogeneity applies to both the process of inter- and that of intra-generational mobility.

Let me illustrate the main argument of the chapter by means of a metaphor. In order to gain access to a "good position", individuals have to travel a distance. In the benchmark model, such a distance was assumed to be the same for everyone. In this chapter, such assumption is going to be replaced by a more realistic one: the distance to be traveled is not constant, but individual-specific. How far someone needs to travel depends on her initial stock of human capital. The person with more human capital travels a shorter distance. And that is so partly because of her *social milieu*.

This chapter should be seen as an extension of the benchmark model (hereafter Constant-Distance Model or CDM) toward a Variable Distance Model (hereafter VDM) in the vein of accounting for its sociological content. The sections of this Chapter are steps aimed at unpacking each of the factors underpinning the VDM. Building on the sociology of the life-course and on the sociology of education, two key sets of social circumstances that affect mobility potential are identified. In Sections 2 and 3, I discuss how the life-course and the family are related to the *length* of the distance to be *traveled*. Once these two dimensions are identified, a broader formulation of the model is presented in Section 4 that incorporates both the effects of the life-course and of the family. Although the implications of the new model may seem obvious, they make clear the need of taking into account the social context of mobility investments. The problem of the social context of economic action can be seen as an example of the statistical problem of "omitted variables bias". Simulations are presented based on the CDM and the VDM that help to illustrate such an insight.

2.- The Life-Course Context of Inter-temporal Choices

The life-course is, as Mayer has put it, a self-referential process: "the person acts or behaves on the basis of, among others, prior experiences and resources. We must, therefore, expect

endogenous causation already on the individual level ….
[individuals'] past facilitates and constrains their future" (Mayer,
2003: 467). This is a common feature of individuals' biographies.
But it is specially the case for one type of MEA investments,
namely human capital investments. Individuals' capacity to
enhance their human capital at a point in time depends strongly on
their (initial) stock of human capital.

The first effect of the life-course arises from the length of time
individuals have to recover their investment. Older individuals
have shorter time horizons to enjoy the returns of the investments,
making the investment less profitable (Becker, 1964). But the life-
course has another sort of influence on mobility choices. If
mobility is produced through a sequence of investments, and the
mobility potential at one stage is correlated with the choices made
at previous stages, individuals will diverge in their "technology",
i.e. their ability to progress after the first period. Even if
individuals are homogeneous in their mobility potential in the first
period, they may become heterogeneous later on due to self-
selection based on their financial capacity to make the necessary
investments in the first period.

How the first effect works is straightforward. Other things
being equal, the shorter the horizon to enjoy the returns to
investment, the less likely that such an investment will be
undertaken. Let us now turn to the second effect. If mobility is
produced through a sequence of investments, individuals will have
different levels of ability after the first period, even if they did not
initially. Let us think of mobility occurring through investments in
human capital. This kind of investment has a peculiarity. Human
capital cannot just be *purchased*. It needs to be produced (*cf.* Ben-
Porath, 1967). Once agents have entered the labor market, after
having completed the period of regular schooling, they have
different abilities to create it. More educated individuals find it
easier to enhance their human capital. Human capital
accumulation is a self-reinforcing process with strong synergies:
early investments promote further investments. As Heckman
(1999: 6) has put it: "Learning begets learning. Skills acquired

early on make later learning easier"[26]. In other words, the choices made at one stage of the life course –*e.g.* the educational level to attain when the individual was enrolled in formal schooling- are not a one-off thing, but have an effect that extends over subsequent periods. For example, if early skills make the acquisition of further skills easier, more and less educated individuals will diverge in their capacity to transform educational expenditures into educational achievement.

Therefore, when viewed from a life-course perspective, the relationship between individuals' and households' economic resources[27] and mobility choices established in the model of Chapter 2 launches a *cumulative* process. A low level of economic resources early in life, during childhood, increases the likelihood of obtaining a poor education. And low education leads to low earnings and an increasing cost of enhancing human capital in the future. There is a two-way relation between economic resources and human capital enhancement. Obviously, education has returns. We know from human capital theory and from numerous empirical investigations that investments in education have returns (*vid*. Card, 1999 for a recent review). But education is itself a choice. If all individuals face the same financial constraints, other things being equal[28] (*e.g.* parents' education), they would make much more similar schooling decisions (*vid*. Rosen, 1977). The effect of assets on mobility opportunities consists of the (cumulative) self-selection experienced by individuals at different stages of their life-course. If a child is born in a family that is financially constrained, she will find it more difficult to obtain an adequate education. And once she enters the labor market, she will be more likely to earn low wages. This, in turn, will make

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[26] *Vid.* Heckman, Lochner and Taber (1998) for a model of sequential human capital investments.

[27] Do note that, as pointed out in the previous chapter, the importance of economic resources does not arise just from the fact that they constitute a source of financial resources to finance educational expenditures. In addition, they provide individuals and families with a safety net and, in turn, encourage the application of risk-taking behavior.

[28] Some of these "other things" are the subjects of the next section.

mobility harder in the later stages of her life-course. For that reason, from a dynamic perspective, the implications of the argument resemble what Gunnar Myrdal (1957: Chapter 2) called a process of *circular cumulative causation*: a social process that "concerns a complex of interlocking, circular and cumulative changes" (page 14), that, because of such circular causation, "tends to become cumulative and … gather(s) speed at an accelerating rate" (page 13).

3.- The Family Context of Inter-temporal Choices: Ascribed Resources, Accumulated Resources, and Mobility

It seems important to take into account the stage of the life-course at which mobility investments are undertaken. The biography of an individual contains some of the determinants and causes of peoples' futures. There is yet another reason why considering the *timing* of investments in MEA is important. It allows us to identify the key dimensions of the social context influencing investment decisions. During childhood, parents, or parents together with their children, undertake educational decisions with the aim of facilitating the access to the *good life*[29]. And the adult that the child eventually becomes will live in a family that will smooth or constrain her ability to undertake

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[29] There are obviously other social factors related to the determination of children's educational attainment that have been put forward in the literature. Particularly active has been the literature on the effects of the neighborhood of residence on children educational outcomes (*vid*. Hill and Duncan, 1987; Haveman, Wolfe and Spaulding, 1991; Brooks-Gunn *et al*., 1993; Duncan, 1994). In spite of this, the neighborhood of residence is itself a family choice and obviously depends on the family income (*vid*. Epple and Romano, 1996, 2002; Nechyba, 1999, 2002; Rangazas, 1995). Therefore, neighborhood effects are to a very large extent endogenous to the family income. Additionally, it is very difficult to identify them statistically (*vid*. Manski, 1993, 1995), and the empirical evidence that has tried to isolate them has found small effects (for example, Mayer and Jencks, 1989). For these reasons, I do not consider explicitly neighborhood effects in the discussion of the relation between individuals' social context and their mobility opportunities.

investments that improve her economic situation. The family is a key dimension of the social context that affects individuals' human capital investments and mobility opportunities. The economic resources the family possesses, as well as the number of individuals sharing those resources, are essential in financing human capital investments. When the individual is a child, she has an ascribed endowment. And when she is an adult, she faces family conditions and economic necessities that are related to her capacity to accumulate assets.

Family of Origin and Children's Education: The Financial and Learning Roles of Families

The family of origin constitutes both a source of financial resources and a learning environment for children. The economic resources that parents hold have implications for the educational attainment of their children. Because capital markets are incomplete, and because certain insurance markets do not exist, parents in poor families –or they together with their children- have to undertake harder sacrifices than wealthy parents when making educational choices. In addition, the family equips children with "cultural capital" that smoothes the process of educational attainment. Let me elaborate on these points.

The unequal initial distribution of economic resources, in a market economy in which the poor face credit restrictions and do not find full protection against contingencies affecting their incomes, may bring about different investment opportunities for poor and rich parents. Since human capital investments are partly self-financed and their returns are uncertain, educational expenditures require larger sacrifices for poor than for rich parents. Because of this, parents and their children may be less responsive to intertemporal incentives and therefore do not take advantage of educational opportunities. There is a rational basis

for their behavior[30]. This argument adds to the literature another explanation of the inequalities in educational attainment based on the benefits and costs of following different educational paths (*vid*. Keller and Zavalloni, 1964; Boudon, 1974; Gambetta, 1987; Raftery and Hout, 1993; Goldthorpe, 1996; Breen and Goldthorpe, 1997; Breen, 2001).

In addition, the family of origin influences children's educational attainment through another process. Being a source of finance for educational expenditures is one channel. But the family of origin also constitutes a learning environment. It is the place in which much learning takes place. We know that families, and not just schools, shape children's learning potential and play a crucial role in their educational success. This insight, which is an old idea revived in the mid-1960s with the publication of the Coleman report (Coleman *et al.*, 1966), has given rise to new research in the sociology of education. A growing number of concepts and approaches has appeared in the specialized literature with the aim of understanding how different social institutions, especially families and schools, interact, and how their interaction relates to children's educational achievement. This is the common denominator of the Boudon's (1974) notion of the "primary effects" of the family on educational attainment, Coleman's (1988) idea of "social capital in the creation of human capital", the "theory of the overlapping spheres of influence" (Epstein, 1987, 1996), and the various versions of the notion of parents' "cultural capital" (Bourdieu and Passeron, 1977; DiMaggio, 1982; De Graaf, De Graaf, and Kraaykamp, 2000).

The common idea of all these contributions is to analyze the role of the family as a learning environment. Learning is not acquired just from the school curriculum, for much of it takes

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[30] It is not necessary to assign parents and children from the "lower classes" to some sort of sub-culture. We do not need to assume that "the lower class individual holds values of such a nature as to reduce his striving towards those ends which would result in his moving up the class structure" (Hyman, 1953: 432). *Vid*. Chapter 1 for a lengthy discussion of the shortcomings and inadequacies of explanations of life-chances in terms of the values people hold.

place within the family. By virtue of the family they are born and raised in, some children enjoy –using an expression by Laureau (1989)- a "home advantage". Children with more educated parents obtain positive influences in the development of their cognitive ability (*vid*. Danziger and Waldfogel, 2000; Currie, 2001) and their ability to learn. Hence, they may be more efficient at turning economic resources into actual educational achievement (*vid*. Stafford, 1996). To put it differently, in order to achieve a given educational level, children have to undertake different levels of investment depending on the "home advantage" they benefit from. To use a Boudon (1974: 23) metaphor, children in families with low-educated parents have "to travel a longer social distance" than those with educated parents. Hence, the former, in order to achieve the same education as the latter, have to undertake a higher investment. Consequently, the cost of attaining a given level of education is not the same for all children and their families. Some children have a less (more) favorable learning environment and therefore face higher (lower) costs when obtaining an education.

The Family and Adults' Investments: Consuming, Earning, and Learning

The adult the child eventually becomes may have entered the *good life*. But if she has not, she may still undertake mobility investments in order to improve her prospects. She may go to community college, take courses in nursing schools, business colleges, vocational and technical institutes, etc. These investments are costly. They require meeting some direct costs – e.g.: tuition fees, class materials-, as well as the indirect cost of the earnings that will not be earned. But, thinking dynamically, a lifetime horizon of better prospects will more than compensate the costs of the investment.

Hence, if the benefits are higher than the costs, why do not all individuals take advantage of investment opportunities?

Firstly, given the institutional underpinnings of market economies, asset ownership becomes crucial for improving one's opportunities. Poor individuals have to make large sacrifices if they are to take advantage of investment opportunities. If improving their life-chances requires a reduction in the resources available for consumption, those who are very sensitive to reductions in current consumption will obviously be disadvantaged when it comes to improving life chances. This argument has implications both for inter- as well as for intra-generational mobility. It is the latter possibility that I shall develop. As children become adults, they set up a family and increase its size by having children. This implies a greater dependence on resources for current consumption. Families with small children are more sensitive to small reductions in their consumption. If the family income is low, they cannot afford to reduce consumption, however large the increase in welfare that they would enjoy if they were to undertake mobility investments. Current earnings are more important for larger families because basic needs are also greater.

In addition, when individuals transit from child- to adulthood, they become self-selected in terms of their ability to produce mobility-enhancing assets. The educational level that a child attains has implications for his or her capacity to improve their prospects when adults. The education they obtain influences mobility opportunities in two ways. Firstly, more educated individuals obtain higher paying jobs and therefore, over time, may accumulate more assets than those with low-education. Secondly, the education they obtain influences their efficiency at transforming educational expenditures into the actual enhancement of their human capital. Correcting skills-deficiencies later in life will be less successful and more ineffective if people have not developed their cognitive abilities previously. Earlier decisions by their parents influence the opportunities faced by a the new generation of children. The education obtained when a child affects the "learning technology" of the adult.

Therefore, from a life-course perspective, a cumulative process is at work. Let me put it in a mechanistic way in order to highlight the concatenation of factors giving rise to such a process. A low level of economic resources early in life, during childhood, can lead to low education. Low education leads to low earnings and an increasing cost of human capital acquisition during adulthood. In addition, when families increase their size by having children, adults have more basic needs. As a result, if the adult did not obtain an adequate education during her childhood, 1) she does not earn much, 2) she faces high-costs in upgrading her human capital. And, if she has set up a family and has children, 3) she becomes more sensitive to changes in current consumption. Because of (2), the enhancement of her human capital is expensive. And because of (1) and (3), she is not prepared to accumulate assets to finance her (expensive) human capital acquisition. Obviously, this concatenation of factors is far too mechanistic. To be sure, the relations between the variables are not deterministic, but of a probabilistic nature. There is no exclusive link between the variables, but a *social regularity*. Having parents with low income and low education increases the chances of the child obtaining a poor education. This, in turn, will affect the mobility potential of the adult the child has eventually become. She will be more prone to earn low wages than a highly educated one. Additionally, remedial education will be less effective for him. Therefore, enhancing her human capital will be expensive, and the resources available to finance it will be limited.

4.- Inter-temporal Choices in a Social Context: The Variable Distance Model

The availability of economic resources for financing mobility costs is one determinant of individuals' capacity to undertake investments in MEA. Their ability to produce further human capital is another one. Individuals' differences regarding the second dimension make the investment agent-specific. In this

section, the CDM is extended in the following direction. Since individuals enjoy different mobility potentials, the cost of moving out of bad jobs is not constant –as was in the CDM, but depend on the stock of human capital. Because of this, I will refer to the second model as the Variable Distance Model (VDM).

As argued above, the social context has *externalities*, which may be positive or negative: they may work in favor of or against people's ability to enhance their human capital. Individuals find circumstances that influence the capacity to improve their human capital. As a consequence of that, their efficiency at transforming educational expenditures into actual educational achievement is not constant. The family of origin exerts *externalities* on children's educational attainment. Children with more educated parents enjoy a learning-atmosphere that smoothes their educational progress. These externalities are not just instantaneous, but have long-lasting effects. Later in the life-course, the initial stock of human capital inherited from parents and the one obtained in school influence the efficiency of future mobility investments. More educated workers will find it easier to increase and update their human capital than less educated ones. Learning now is related to what was learned in the past. As a result, investments' costs are neither the same for all individuals nor constant over time. A monetary unit spent on educational investments has different returns depending on the initial stock of human capital. In order to achieve a given return, well (poorly) educated individuals need to undertake a higher (lower) investment.

The Variable Distance Model

The investment that has to be undertaken in order to move from a bad to a good job is not the same for every agent. It

depends on her initial stock of human capital[31]. The investment required is inversely related to the initial stock. H_{0i} is the stock of human capital of agent (i). Let us assume that H_0 is continuously distributed in an interval *(0, 1]: 0< H_{0i} <= 1*, and that the functional form of the relation between *I* and H_0 is given by:

$$I_i(H_{0i}) = k / H_{0i} \tag{3.1}$$

where I_i is the investment agent *i* needs to undertake in order to obtain a good job, and *k* is a constant greater than zero. This functional form, represented graphically in Figure 3.1, is meant to

Figure 3.1.- Mobility Investment and Initial Stock of Human Capital

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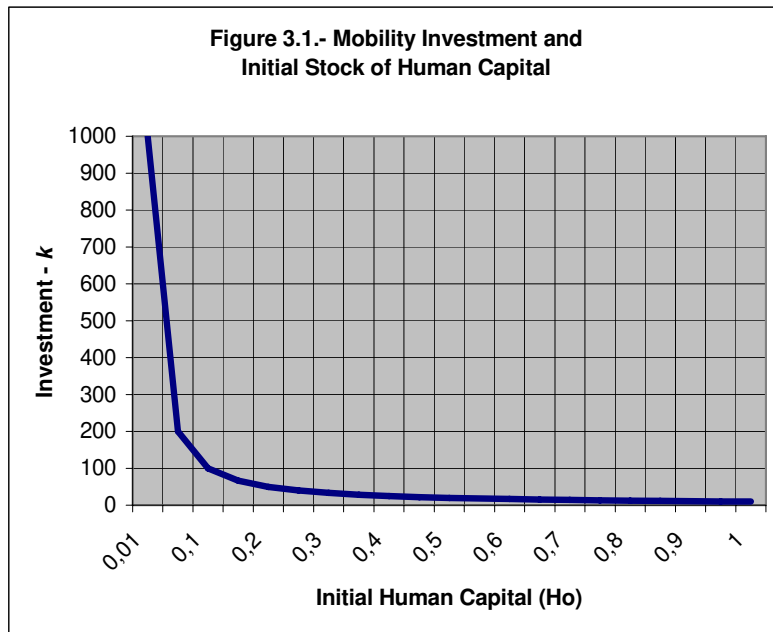
[31] H_0 can be understood as i) parents' education in an intergenerational application of the argument, and as ii) the educational level the individual attained when she left school in a life-course or intra-generational context.

establish that there is a minimum investment to be undertaken in order to move from a bad- to a good job. Those agents who have obtained the highest level of initial human capital, $H_{0i} = 1$, need not to invest any additional amount of money than the quantity k. We can see in Figure 3.1 that when the initial stock of human capital is equal to one, the extra-investment (*Investment* – k) is equal to zero. The lower the initial stock, the higher the additional investment. In the extreme case in which the initial stock is very close to zero, such investment approaches infinity.

Let us consider the same simple economy as in Chapter 2. It is a two-sector economy in which there are two types of jobs. These jobs are differentiated by one dimension w, the wage rate they offer: w_g refers to a good job and w_b to a bad job. Mobility between different types of jobs is possible, but costly. Obtaining a good job requires making an investment. We can think of this as human capital enhancement: the agent increases her human capital in order to get a good job. This investment, in the VDM, is not a fixed quantity, but depends on the individuals initial stock of human capital. Individuals cannot borrow in the capital market the money needed for the investment that they have to undertake. Taking into account this, an agent i's utilities from "moving" and "not moving" from a bad- to a good job are given by the following expressions:

$$U_{im} = u(w_b - I_i) + [1/(1+\delta)] [\pi u(w_g) + (1-\pi) u(w_b)] \qquad (3.2)$$
$$U_{inm} = [(2+\delta)/(1+\delta)] u(w_b) \qquad (3.3)$$

where δ is the rate of time preference, which varies between zero and one, and π is the conditional probability of obtaining a good job once the investment has been undertaken.

Solving the maximization problem in the same way as in Chapter 2, we find that the minimum value of the wage in the "good job" that triggers mobility, $\tilde{w}_g$, is the one satisfying the following equation:

$$u(\tilde{w}_g) = u(w_b) + [(1\text{-}\delta)/\pi][u(w_b) - u(w_b - I_i)] \qquad (3.4)$$

The former expression does not give an explicit solution for $\tilde{w}_g$, but, as shown in Chapter 2, the higher the concavity of the utility function, the higher will be the mobility trigger.

What are the implications of the CDM and the VDM? Let us begin by presenting a simulation based on the first model. In the table below, we see that the values of the trigger-wage associated with different specifications of the utility function. We can see from the results of the simulation (Table 3.1) that the more concave is the individual's utility function, the higher the mobility trigger. More risk averse agents opt for "moving" only if they are going to attain very high benefits.

Table 3.1.- Values of $\tilde{w}_g$ that trigger mobility in the CDM
(Given $\delta= 0.5$, $w_b= 10$, $I= 5$, $\pi= 1$)

	$u(x)=x$	$u(x)=x^{1/2}$	$u(x)=x^{1/10}$	$u(x)=x^{1/100}$
CDM	17.50	20.72	26.04	28.03

According to the CDM, more risk-averse individuals are more likely to remain in bad-jobs. Only if offered (very) high wages, do they undertake the mobility investment. Since a market to finance investments in MEA is absent, the substantive implication of the model is that poorer individuals are more likely to remain in bad jobs.

The second model, the VDM, allows individuals to differ in the amount of the mobility investment that they need to undertake in order to escape bad-jobs. Because of their different initial stocks

of MEA, the investment that they need to undertake is individual-specific. Let us consider the case of two individuals, *i* and *j*, whose utility functions display the same degree of risk aversion. Their initial stocks of human capital are different: $H_{0i} = 1$, $H_{0j} = 2/3$. As can be seen in Table 3.2, for every utility function, the mobility-trigger is higher for the individual with the lower initial stock of human capital.

$\sim$

Table 3.2.- Comparison of values for w_g for two agents

(Based on a VDM)

(Given $\delta = 0.5$, $w_b = 10$, $k = 5$, $\pi = 1$)

	$u(x) = x$	$u(x) = x^{1/2}$	$u(x) = x^{1/10}$	$u(x) = x^{1/100}$
Individual i: $H_{0i} = 1$	17.50	20.72	26.04	28.03
Individual j: $H_{0j} = 2/3$	21.25	30.63	58.98	77.22
Ratio w_{jg}/w_{ig}	1.2	1.48	2.27	2.75

The results presented in Table 3.2 are very straightforward. The lower the initial stock of human capital, the higher the investment that has to be undertaken as part of the mobility process. Consequently, for the individual to undertake the investment, the wage in the good job has to be higher. The comparison of the results for the two models can be compared with the statistical problem arising from the omission of relevant variables from a model[32]. If we assume that the CDM is an accurate representation of the world, we would attribute all differences in mobility opportunities to capital market imperfections. If the CDM were incomplete because the effect of

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[32] The problem of omitted variables bias in statistics arises when a statistical model is incompletely specified. If a relevant variable is not considered when estimating the model, the estimates of the coefficients in the rest of the model may be biased.

some other variables is not considered, the estimation of the role of borrowing constraints and risk aversion would be biased upwards.

According to the CDM, the mobility variance across individuals arises from the borrowing constraints poor agents face. Since the non-wealthy cannot borrow, they have to finance mobility investments by reducing consumption. If they obtain a subsidy to finance mobility investments, their behavior would be like that of wealthier individuals. However, if agents are heterogeneous in terms of their "abilities to learn" the conclusion may not hold. That is, not all individuals are equally prepared to finance mobility projects. Individuals (may) differ in the "mobility technologies" they command. As discussed above, a consequence of the context in which their lives evolve is that individuals have different capacities to accumulate MEA. At the time of entry into the labor market, they are equipped with different levels of education. The life-course of the individual, her history of (previous) choices and achievements, is important for her future choices. If individuals have different "abilities to learn" and we do not take this into consideration, our estimates of the role of borrowing constraints would be biased, and our account of the story underneath would be misleading.

Let us do the following experiment in order to illustrate this last point. Let us consider an individual whose utility function is of the form $u(x)= x^{1/2}$. A researcher does not know this. He just observes that an individual moves from a bad- to good-job when offered a wage $\tilde{w}_g = 28.25$ [33]. From this piece of information and from one assumption, the researcher tries to calculate the form of the utility function. Assuming that the CDM is an accurate representation of the world, the researcher finds out that the individual's utility function is $u(x)= x^{1/1000}$. However, we know that its real form is $u(x)=x^{1/2}$. From this assumption, his estimate

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[33] The other parameters are set to the values that they took in the previous simulation.

of the role of risk aversion in the determination of mobility opportunities is biased upwards.

Table 3.3.- Utility Function associated with a mobility-trigger in the CDM and the VDM

	Utility function under the CDM and the VDM
Parameters Given $\delta= 0.5$, $w_b= 10$, $k= 5$	**CDM**
	$u(x)= x^{1/1000}$
Value of mobility trigger $w_b= 28.25$	**VDM**. $H_{0i} = 0.71$
	$u(x)= x^{1/2}$

5.- Summary

In the first chapter of this dissertation, an argument was presented that tried to explain why individuals do not enjoy the same opportunities to enhance their economic prospects. Given the institutional underpinnings of market economies, asset-less agents face a trade-off between present sacrifices and future benefits when making mobility investments. As a consequence of this, they may not take advantage of formal opportunities to improve their economic prospects.

This argument offers a parsimonious account of the production of economic opportunities in market economies. It establishes a causal link between individuals' initial endowments and their life-chances. It provides the basis for comprehending a series of interrelated social phenomena relating to inequality persistence. Nevertheless, as I have shown in this chapter, in order to guide specific sociological analysis, one has to consider the role of an agents' social context. If one does not do so, all (imm)mobility

outcomes will be attributed to market imperfections, i.e. to the imperfections of credit markets and the credit rationing poor individuals face, and this could obscure our understanding of economic opportunities. Of course, this is not to say that asset ownership is not important. We should be careful not to throw the baby out with the bathwater. The bottom line of this chapter is that in order to determine the role of economic resources, we need to consider the *externalities* generated by individuals' social contexts. More particularly, when the model is set in the social context in which mobility is produced, it is possible to capture the dynamic process through which life-chances are related to decisions taken at different stages in individuals' lives, and to separate long-term factors from short-term borrowing constraints.

CHAPTER 4

THE UNDERPINNINGS OF MOBILITY-ENHANCING ASSETS: FROM ASCRIPTION TO ACCUMULATION

1.- Introduction

In the first part of the dissertation –Chapters 2 and 3-, an argument has been put forward to explain the interrelation between markets and opportunities. The explanation is based on a reconstruction of individuals' choices, given their constraints, and within the institutional environment made up by the organization of capital and insurance markets. In Chapter 2, the argument is presented at an abstract level. Mobility is analyzed as an inter-temporal choice problem. I discuss the trade-offs that individuals face when they choose between different mobility options, and determine the economic identity of those who may (or may not) take advantage of mobility opportunities. In Chapter 3, the level of analysis is made more specific. I consider individuals in the social contexts in which their mobility choices are made. And I analyze how the interaction of markets with the social context affects agents' mobility choices at different stages of their life-courses.

The conclusion of Part I of the thesis is that the acquisition of assets that enhance individuals' economic opportunities depends on the interaction of markets and the social context on individuals. I am going to start this chapter by showing that there is a series of Mobility Enhancing Assets (MEA) that, indeed, have implications for individuals' economic progression. In Section 2, I am going to show some broad empirical regularities or associations between the family background, education, wealth accumulation and earnings mobility. Thereafter, I will break down those regularities into their intermediate steps and show how they are concatenated.

In the following sections of the chapter I analyze how MEA are acquired and accumulated. I show that they are not exogenously assigned to individuals, but they acquire them on the basis of, among other things, the economic resources they are endowed with, and the interaction of those resources with the features of their social contexts. I analyze how the social context affects mobility choices at different stages of individuals' life-courses. During her childhood, an individual has an *ascribed* endowment. When she is an adult, she *accumulates* or *acquires* resources. And those resources, both ascribed and acquired, affect their mobility potential and choices. In section 3, I analyze the process of children's educational attainment. In section 4, I analyze how individuals' social context and life-courses are associated with their capacity to build up wealth. Finally, in section 5, I show another relation between the choices undertaken at one stage of the life-course and another type of capital accumulation: post-school human capital acquisition. This last section aims simply at illustrating how the human capital acquired at one stage of individuals' life-course is related to the previous educational decisions.

2.- The Empirical Regularity: MEA and Economic Life-Chances

Is there a connection between individuals' initial economic resources, the MEA that they accumulate, and their earnings potential? Are individuals' economic life-chances associated with their parents' economic resources, with their family background? How do education and earnings mobility relate one to each other? Is the stock of economic resources that individuals accumulate over time associated with their (future) earnings progression? Is the accumulated wealth associated with earnings mobility? Let us explore how parents' income, education, and wealth accumulation are associated with earnings mobility, and how they concatenate one with each other.

Data

The original data set that I have used is the *National Longitudinal Survey of Youth*. This data set is conducted at Ohio State University under the sponsorship of the U.S. Department of Labor. This data set collects information regarding labor market experiences, investments in education, family structure, family background, and other variables, for individuals aged 14 to 21 in 1979[34].

I have reorganized the original data in a form that is conducive to statistical analyses. From these data, I have created a yearly time-series cross sectional data set for the variables of interest. In order to have available a measure of parents' income, the sample has been restricted to those individuals who as of January 1978 were aged 13 to 16 years. I have generated time-series for the following groups of variables:

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[34] More information on the original data, samples and variables can be found in a Data Appendix at the end of the dissertation.

- Demographic: race (Black, Hispanic, non-Black and non-Hispanic (hereafter Whites)), age.
- Education: two variables: number of years of completed education, and educational level (high-school dropout, high-school graduate, some college education (not completed), college graduate).
- Family of origin: parents' income (measured in 1978, at the time of the first wave of the panel); number of siblings; parents' educational level. These are time-invariant variables.
- Information regarding the current family of the individual: total amount of liquid assets, total household income, and family size. These are time-variant variables measured every year.
- Earnings: total annual earnings divided into the total number of hours worked[35].

Models and estimation

The empirical content of the substantive questions posed above consists of a dynamic analysis. We need to study the relations over time between individuals' ascribed and accumulated resources and their earnings mobility. We want to determine whether individuals' earnings progression is associated with their parents' income, their own education, and the wealth (or assets) that they have accumulated. I use an error correction specification in order to determine the dynamic relation between the mobility of earnings and the independent variables. The error correction framework used in this study provides some insights into the co-movement of ascribed assets, accumulated assets, and the opportunities for earnings acquisition. In addition, it is a computational way of removing the autocorrelation of the error term (*vid*. Greene, 2000: 733 and ff.).

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[35] Unless otherwise specified, all the economic variables used in the econometric analyses presented in this chapter are inflation-adjusted and expressed in 1978 US Dollars.

I have estimated a set of equations of the form[36]:

$$\Delta y_{it} = \alpha + \delta y_{it-1} + \Sigma \boldsymbol{\beta}' \Delta \boldsymbol{x}_{it} + \Sigma \boldsymbol{\beta}' \boldsymbol{x}_{it-1} + \Sigma \boldsymbol{\beta}' \boldsymbol{c}_{it} + u_i + \varepsilon_{it} \qquad (4.1)$$

where:

Δ is the first difference operator: $\Delta y_t = y_t - y_{t-1}$.

y_t is the log of the earnings rate (total annual earnings divided by the total number of hours worked that year) at time t.

y_{t-1} is the lagged (log) earnings rate at time *t-1*.

$\boldsymbol{x}$ is a vector including the relevant variables for testing the argument.

$\boldsymbol{c}$ is a vector of control variables: age, age square, and race.

u_i and ε_{it} are the two components of the error term. The first one, u_i, is an individual effect, which is taken to be constant over time and specific to the unit of observation. The second one, ε_{it}, is a random disturbance capturing individual effect at each point in time. Assuming u_i to be randomly distributed across the cross-sectional units of observation, the estimation of equation (4.1) is based on a random-effects framework.

The model states that the difference in earnings between two years is the result of the initial level of the covariates as well as of its increment. It states that the change in the earnings rate from the previous period consists of the long-term and short-term effects of the independent variables. The parameter on the lagged independent variables is a measure of the long-term effect on the equilibrium path of the dependent variable. The parameter of the first-difference measures the short-term effects of the independent variables on the long-run equilibrium (*vid*. Beck and Katz, 1996; Greene, 2000: Ch. 17).

I estimate the parameters using a random-effects estimator. I have estimated the following three models[37]:

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[36] This form of the Error Correction Model is derived in the Appendix at the end of the Chapter.

[37] The descriptive statistics of the independent variables in all the analyses in this dissertation can be found in an appendix at the end of each empirical chapter.

- Model 1: In this model, the vector of independent variables includes parents' income and the number of siblings. The parents' family income is measured in the first wave of the panel. Although it is not a measure of the permanent income of the family, it is the only measure of economic resources available in the data set. The race of the individual, the age, and the age square are also included as control variables.

- Model 2: the vector of independent variables is argumented by adding a new variable: the number of years of education that the individual has completed.

- Model 3: This model, in addition to the former variables, includes the lag and the first difference of the amount of liquid assets the individual owns.

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From the estimated parameters of Model 1, we can see that there is an association between parents' economic resources and their economic life-chances. Individuals' earnings potential is associated with their initial economic resources. The income of their parents and the number of siblings they have are associated to their earnings progression during their adulthood. Her future market capacity depends on her inherited circumstances. The income of the household and the number of members sharing those resources are associated to the mobility of earnings the child eventually receives when adult.

This association is weakened when controlling for the educational level the individual has achieved. In Model 2, the partial derivative of the earnings mobility with respect to the number of siblings and the parents' income becomes reduced. And when controlling for the wealth accumulated when an adult –see the estimation of Model 3-, the effect of the number of siblings on earnings mobility is not statistically significant any more, and that of the parents' income is weakened again, and is statistically significant only if we adopt a relatively low confidence level of a 93%.

Table 4.1.- The Broad Regularities: The Determinants of Earnings Mobility

Variables	Model 1 Coefficient (Standard Error)	Model 2 Coefficient (Standard Error)	Model 3 Coefficient (Std Error)
Lagged Dependent Variable	-.686*** (.006)	-.700*** (.006)	-.596*** (.009)
Age	.0145*** (.001)	.013*** (.001)	.016*** (.002)
Age Square	-.0000175*** (1.32e-06)	-.000015*** (1.33e-06)	-.0000199*** (2.60e-06)
Race (Reference: White)			
- Hispanic	.011 (.018)	.017 (.018)	.023 (.022)
- Black	-.065*** (.016)	-.080*** (.017)	-.021 (.022)
Parents' income	.111*** (.009)	.081*** (.010)	.0246++ (.013)
Number of siblings	-.012*** (.002)	-.005+ (.003)	-.005 (.004)
Number of years of completed education	-	.035*** (.003)	.015*** (.003)
Assets: First Difference	-	-	.041*** (.005)
Lag	-	-	.064*** (.004)
Constant	-2.795*** (.164)	-2.679*** (.164)	-2.857*** (.327)
R^2	30%	31%	27%
N	2081	2078	1565

*** significant at $p < 0.001$; ** significant at $p < 0.005$; * significant at $p < 0.01$
\+ significant at $p < 0.05$; ++ significant at $p < 0.10$

This statistical exercise reveals that the independent variables are not exogenously assigned to individuals. It seems that they acquire MEA (partly) on the basis of their initial economic resources. The accumulation of assets, the acquisition of education, and parents' economic resources seem to be concatenated. Or to put it statistically, they are not exogenous. Therefore, the lesson we should take from this introductory exercise is that we need to control for the endogeneity of the independent variables, and to investigate how they are concatenated. In the following sections of this Chapter, I explore whether the argument presented in the First Part of the dissertation provides an explanation of the way individuals acquire MEA. The remaining sections of the Chapter are devoted to that task. The next two sections are devoted to the analysis of the accumulation of assets (Section 4), and the attainment of education (next section, Section 3).

3.- The Allocation of Education: Family Background and Educational Attainment

The argument presented in the first part of this dissertation has implications for the explanation of educational inequality, namely for the relation between parents' economic resources and children educational attainment. The argument presented at an abstract level in Chapter 2 and extended in Chapter 3 grounds that macro-social regularity of educational inequalities in a micro-level elaboration of parents and their children choices, i.e. it explains the macro-result of inequalities in educational attainment in terms of rational individual behavior. The resources children and their parents enjoy establish the conditions and structure of choices that they undertake[38].

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[38] Incidentally, it may contain some of the basis from which to build up an explanation for a very well established macro-regularity in the sociology of education: the persistence of inequalities in educational attainment across social classes (*vid.* Shavit and Blossfeld, 1993). If poor families are less responsive to

Let us recapitulate the implications of the argument for the explanation of educational inequalities. The argument presented in the Chapter 2, the Constant Distance Model (hereafter CDM), provides a framework for the explanation of this sociological problem. The economic resources parents are endowed with have implications for their children's educational attainment[39]. Because a market to finance children's human capital investments is absent in market economies, parents have to undertake both family consumption and children's educational choices simultaneously. If such a market did exist, parents would undertake educational expenditure and household consumption decisions separately. But since such a market is missing, parents cannot borrow against their children's future earnings and, if they do not have any assets, they have to reduce the household current consumption in order to pay for their children's' education. In this situation, parents have to weight the cost of a low current household consumption against their children's future earnings and consumption. Therefore, parents in poor families, together with their children, have to assume harder sacrifices. Given the organization of market economies, parents with fewer resources face a structure of choices less favorable to increase their children's human capital. And therefore, they require relatively higher returns in order to invest in their children's human capital. It is not that children in poor families are less prepared to "defer gratification" or that individuals in the lower classes have a "poverty of aspirations" (Richardson, 1977). Given the resources children and their parents enjoy, and given the organization of market economies, we should expect that rational individual behavior would give raise to inequalities in educational among children with different endowments.

This argument was set in the social context in which much learning takes place, the family, in Chapter 3. The family is a key

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intertemporal incentives, and insofar as a relation between social class and economic resources exists, the argument supplies some foundations for an explanation of such an empirical regularity.

[39] *Vid*. Krueger (2002: 1028) for a lengthier elaboration of this argument.

learning environment. It facilitates children's production of human capital. Children in families with educated parents enjoy what Laureau (1989) has called a "home advantage". Children with more educated parents enjoy a more learning-friendly environment. And this, in turn, allows them to be more efficient at turning economic resources into actual educational achievement (*vid*. Stafford, 1996). Hence, for achieving a given educational level, the investment that they have to undertake is not the same across children independently of their parents' educational level. Children in families with low-educated parents have "to travel a longer social distance" than those with educated parents (*cfr*. Boudon, 1974) and therefore, they need a higher level of economic resources in order to arrive at the same educational destination. In conclusion, the distance that children have to travel in order to arrive to a given educational destination is not constant, but depend on their parents' education. This is why I will refer to this model which controls for the externalities generated as a result of the "home (dis-)advantage" as the Variable Distance Model (hereafter VDM).

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Which is the empirical content of these two arguments? Which are their empirical implications? According to the CDM, children face an educational selectivity on the basis of their parents' economic resources. Inequalities in educational attainment among equally able individuals arise as a consequence of the resources the family commands. Therefore, holding constant ability, we should find an association between parents' economic resources and their children's educational attainment. The underlying logic was explained above. Since there is not a market for human capital, parents' wealth influences the opportunities their children may take advantage of.

Furthermore, economic resources may be important in conjunction with children's probability of success. Parents' estimation of the probability of success of their children in the educational system may certainly be an important trigger of

investments in education. Non-wealthy parents, in the light of some positive information about the ability of their offspring, could assume an extra financial burden in order to meet the costs of their talented children's educational expenditures. Parents with a low income could exert some additional economic effort if they have positive evidence or signals regarding their offspring's probability of success in the educational system. The probability of success might be a forceful factor among more credit-constrained families. For this reason, an interaction between parents' income and their children's ability may be expected[40].

In addition, as elucidated and emphasized in the sociology of education, the family is a "learning place": much learning takes place within the family. This is the base from which the VDM has been formulated. Children in families with educated parents enjoy a "home advantage" that boosts their efficiency independently of parents' economic resources. When turning economic resources into actual educational achievement, children with (non-)educated parents confront a (negative) positive *externality*, which influences their educational acquisition and is independent of the financial support they obtain from their parents. Furthermore, as enlightened in Chapter 3, if we do not take into consideration that such an externality or "home (dis-)advantage" exists, our estimates of the role of economic resources on children's educational attainment may be biased.

3.1.- Data, Variables and Econometric Framework.

The data that I analyze in this section records, among other variables, the maximum educational level achieved by the individual, together with information from which educational careers or transitions between grades may be reconstructed. In

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[40] I thank David Firth and Anthony Heath for having drawn my attention to this issue.

order to have information on parents' income, I have restricted the sample to individuals who were aged 13 to 16 in January 1978.

How do I measure educational attainment? The study of the determinants of educational attainment was originally based on the analysis of the maximum educational level attained. The standard procedure consisted of regressing a measure of the education attained at the time of leaving school permanently on a series of independent variables. In the mid-seventies, Boudon (1974) pointed out that the analysis of educational attainment should be treated as a process and, therefore the core of the analysis should not be solely the outcome of the process, but also the intermediate steps leading to the final outcome of educational attainment. Mare (1980) expanded on this insight, developing a statistical approach for analyzing the process of educational attainment as a set of transitions or school continuation decisions. The logic underneath Mare's model is that the effect of the family background on children's educational attainment needs not be the same across educational careers[41]. This model disaggregates the effect of children's family background into the various grade transitions that the educational system entails. By so doing, it allows us to determine whether the children's socioeconomic background has different effects on the transition between educational levels.

Recently, Cameron and Heckman (1998) have criticized the Mare model as a tool for the analysis of educational attainment and have developed an alternative statistical model. Their analysis is based on a non-parametric estimation of a discrete choice ordinal model in which the dependent variable is the maximum educational level attained. The substantive rationale for their statistical model is based on rational forward-looking behavior. Their substantive model is developed on the assumption that parents, after a rational calculus of the marginal costs and benefits of educational investments, choose *an* educational level for their children.

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[41] Recently, Breen (2001) has provided some behavioral foundations for the study of educational transitions based on the Mare model.

Although the Cameron and Heckman (1998) model may at first sight seem to be based on an extreme assumption (*vid*. Breen, 2001 for a critique), the fact is that their model fits the data better than the Mare or schooling-transition model, despite the fewer parameters that their model includes as compared with the Mare model.

Therefore, there are arguments both in favor and against any of the two measures of educational attainment. The substantive logic underneath the Mare model seems to be, form a substantive point of view, more sensible. However, the Cameron and Heckman (1998) model fits the data better. Since the debate about which is the best measure of educational attainment is far from being closed, and in order to gain robustness in the statistical analysis in this section, I shall carry out two parallel analyses based on two dependent variables: the maximum education attained, and educational transitions.

I am going to use two measures of the (maximum) Educational Attainment: 1) the educational level achieved (high-school dropout, high-school graduate for those individuals who completed high school, and college graduate for those who have a college education); and 2) the number of years of education the child has completed. Therefore, because of the different nature of the dependent variables, I estimate two different types of models. In order to find out the determinants of the educational level attained, I am going to estimate a multinomial logistic model. The analysis of the determinants of the number of years of completed education is based on the estimation of a linear regression model.

In addition, I will estimate models of transitions between educational levels following Mare (1980). In the analyses in this chapter I am going to analyze the determinants of two crucial educational transitions: completing high school, and completing college.

The econometric models that I estimate are detailed below.

Maximum Education Attained

Educational level achieved: A Multinomial Logistic Regression

In order to find out the determinants of the educational level achieved, I estimate a trinomial logit model[42]:

$$Prob\ (Y= j)= exp\ (\boldsymbol{\beta}'\boldsymbol{x})\ /\ [1+\ \Sigma_j\,exp\ (\boldsymbol{\beta}'\boldsymbol{x})] \tag{4.2}$$

where:
$j=$ 1 (high-school dropout), 2 (high-school graduate), 3 (college graduate).
$\boldsymbol{x}$ is a vector of covariates that includes the variables of Model 1 to 4, which are detailed below.
The parameters of the model are estimated by Maximum Likelihood, and reported in the Table 4.2.

Number of years of completed Education: Linear Regressions

I estimate a linear regression model in order to find out the determinants of the number of years of completed education:

$$y_i = \alpha + \boldsymbol{\beta}'_i\boldsymbol{x}_i +\ \varepsilon_i \tag{4.3}$$

where:
$\boldsymbol{x}$ is a vector of covariates or independent variables.

The parameters of the model are estimated by Ordinary Least Squares, and are reported in Table 4.3.

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[42] I have carried out a likelihood-ratio test to find out whether the parallel regressions' assumption of the ordinal model does hold, i.e. whether the coefficients of the model are equal across all the categories of the dependent variable. The null hypothesis that the coefficients are equal across categories has been rejected. This is why I have estimated a multinomial logistic model.

Educational transitions

In order to study the effects of social background on educational careers, I shall rely on the estimation of logit models for two dichotomous dependent variables. For each transition, I estimate a binary logit model conditioned on the previous grade having been completed, were one value of the dependent variable is to complete the next educational grade, and the other value is the opposite: the next grade is not completed.

The transitions that I analyze are the following ones: 1) drop out from high-school vs. continue to the next educational level; 2) drop out from regular school before obtaining a college degree vs. continue in education until obtaining a college degree, conditioned on having completed high-school.

The models that I estimate are the following ones:

$$Prob\ (y_1 = 1) = exp\ (\boldsymbol{\beta_1}'\boldsymbol{x})\ /\ [1 + exp\ (\boldsymbol{\beta_1}'\boldsymbol{x})] \qquad (4.4)$$

$$Prob\ (y_2 = 1 \mid y_1 = 1) = exp\ (\boldsymbol{\beta_2}'\boldsymbol{x})\ /\ [1 + exp\ (\boldsymbol{\beta_2}'\boldsymbol{x})] \qquad (4.5)$$

where:

y_1 is refereed to the first transition; $y_1 = 1$: continue in regular school and complete high-school, $y_1 = 0$: drop out from high school.

y_2 is refereed to the second transition; $y_2 = 1$: continue in regular school and obtain a college degree, $y_2 = 0$: do not continue in education until obtaining a college degree.

3.2.- Estimation of the models of educational attainment

According to the CDM, children's educational attainment is a function of their parents' economic resources. And according to the VDM, parents' education filters the effect of economic resources into their educational achievement. In order to determine the empirical support these arguments obtain, I am going to estimate the following models:

- Model 1: The vector of independent variables includes parents' income and the number of siblings. The family income is measured at the time when the child was 13. It is therefore a time-invariant variable. Although it is not a measure of the permanent income of the family, it is the only measure of economic resources available in the data set[43].

- Model 2: The vector of independent variables in this model includes the variables in Model 1, plus a measure of cognitive ability (Armed Forces Qualifying Test's score, hereafter AFQT). This is a continuous variable (varying from 0 to 100) that is constant over time[44].

- Model 3: The vector of covariates of Model 2 is augmented with one variable: mothers' educational level. This variable is measured as follows. It is a categorical variables encompassing three categories: high-school dropout, high-school graduate (for those individuals who completed high-school), and college graduate (for those who have a college education). I control for this variable in order to capture and make constant the effect of, or externalities generated by, parents' education on children educational attainment. By so doing, the role of parents' income can be obtained net of the influences of other variables.

- Model 4: The vector of independent variables in this model includes all the variables in Model 3, and one variable more: the interaction of parents' income and the AFQT. The logic for the inclusion of this variables was explained above. The probability of success of children may be a crucial dimension for non-wealthy parents to decide to undertake educational expenditures on their children. The AFQT may be a good signal from which parents may estimate such a probability.

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[43] The income variable has been centered. In other words, the variable used in the analyses is the difference between the individual's family income and the mean of such variable in the sample.

[44] The AFQT variable has been centered. In other words, the variable used in the analyses is the difference between the individuals' AFQT score and the mean of such variable in the sample.

Table 4.2.- The Educational Level Attained: Multinomial Logistic Models

Variables	Model 1 Coefficient (Std Error)	Model 2 Coefficient (Std Error)	Model 3 Coefficient (Std Error)	Model 4 Coefficient (Std Error)
	High-School	**Dropout**	**vs**	**College**
Race (Reference: White)				
- Hispanic	.040	-.673**	-.727***	-.766***
	(.195)	(.223)	(.224)	(.223)
- Black	-.789***	-1.819***	-1.774***	-1.773***
	(.203)	(.222)	(.218)	(.217)
Parents' Income (log)	-.944***	-.377**	-.286+	-.580*
	(.105)	(.121)	(.124)	(.233)
Number of siblings	.151***	.032	-	-
	(.028)	(.032)		
Cognitive Ability (AFQT)	-	-.095***	-.091***	-.091***
		(.007)	(.007)	(.007)
Mother's Educ. (Reference: High-School Dropout)	-			
- High-school			-.412+	-.419+
			(.193)	(.193)
- College			-1.423+	-1.405+
			(.630)	(.632)
Parents' Income * AFQT	-	-	-	-.024*
				(.009)
Constant	-1.674***	-1.665***	-1.262***	-1.151***
	(.141)	(.197)	(.206)	(.210)
	High-School	**Graduate**	**vs**	**College**
Race (Reference: White)				
- Hispanic	-.019	-.304+	-.319+	-.358*
	(.128)	(.140)	(.143)	(.145)
- Black	.015	-.514***	-.472***	-.468***
	(.116)	(.132)	(.132)	(.133)
Parents' Income (log)	-.345***	-.184*	-.114	-.136++
	(.069)	(.075)	(.077)	(.077)
Number of siblings	.064***	.020	-	-
	(.019)	(.020)		
Cognitive Ability (AFQT)	-	-.023***	-.021***	-.019***
		(.002)	(.002)	(.002)
Mother's Educ. (Reference: High-School Dropout)	-			
- High-school			-.094	-.122
			(.111)	(.112)
- College			-1.104***	-1.083***
			(.203)	(.207)
Parents' Income * AFQT	-		-	-.016***
				(.002)
Constant	.216*	.721***	.901***	1.054***
	(.087)	(.102)	(.105)	(.109)
Pseudo R-square	4%	12%	13%	14%
N	2447	2340	2342	2342

*** significant at p< 0.001; ** significant at p< 0.005; * significant at p< 0.01
   + significant at p< 0.05; ++ significant at p< 0.10

3.2.1.- Maximum Education Attained

The results are consistent across the two measures of the education attained –i.e. level of completed education (Table 4.2 above), and number of years of completed education (Table 4.3 below). Hence, the following discussion of the results applies to both.

Table 4.3.- The Number of Years of Completed Education: Linear Regression Models.

Variables	Model 1 Coefficient (Std Error)	Model 2 Coefficient (Std Error)	Model 3 Coefficient (Std Error)	Model 4 Coefficient (Std Error)
Race (Reference: White)				
- Hispanic	-.202	.442***	.516***	.529***
	(.145)	(.124)	(.125)	(.125)
- Black	.308+	1.137***	1.089***	1.089***
	(.134)	(.116)	(.115)	(.115)
Parents' Income (log)	.904***	.340***	.249***	.278***
	(.075)	(.065)	(.066)	(.067)
Number of siblings	-.191***	-.076***	-.058***	-.060***
	(.021)	(.018)	(.018)	(.018)
Cognitive Ability (AFQT)	-	.054***	.051***	.049***
		(.002)	(.002)	(.002)
Mother's Educ. (Reference: High-School Dropout)	-	-		
- High-school			.385***	.392***
			(.101)	(.100)
- College			1.371***	1.335***
			(.191)	(.191)
Parents' Income * AFQT	-	-	-	.005**
				(.002)
Constant	13.620***	12.811***	12.469***	12.427***
	(.099)	(.087)	(.111)	(.112)
R-square	14%	40%	42%	42%
N	1956	1899	1899	1899

*** significant at $p < 0.001$; ** significant at $p < 0.005$; * significant at $p < 0.01$
+ significant at $p < 0.05$; ++ significant at $p < 0.10$

From the estimated parameters of Model 1, it seems that the family income has a strong effect on children's educational attainment. There is a strong association between family income and children educational attainment. In addition, the child's number of siblings and his educational attainment are also associated. These results are consistent with a credit-constraints interpretation of the process of educational attainment. Certainly, those families with less income and more children are more likely to obtain low levels of education.

However, it could be the case that the family income is correlated with other variables that are really driving the process of educational attainment. In particular, the parents' income may be correlated with their children's ability. Therefore, testing the *real* role of economic resources requires holding constant individuals' ability. We need to study the effect of parents' economic resources *net* of differences in cognitive ability. If the argument is correct, the effect of income should stand even after controlling for (a measure of) cognitive ability.

In Model 2, I have estimated such an equation as such. The estimation of the parameters shows, as compared to Model 1, a decline in the effect of household income on children educational attainment. However, although the effect of parents' economic resources is weakened when controlling for cognitive ability, its effect is still quite considerable and highly statistically significant –it is so at a level of confidence almost equal to 100% (higher than a 99.999%). Parents' economic resources seem to be important determinants of their children educational attainment. However, if we do not consider that individuals are heterogeneous regarding their ability, we would attribute the inequalities in educational attainment solely to their parents' economic resources, and this would result in an upward biased estimate of their importance[45].

Certainly, the "ability to learn" is an important determinant of educational attainment. And that is related to the family children

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[45] *Vid.* the simulations presented in the last section of Chapter 3 and the discussion of their implications.

are born and raised in. The family is not only a source to fund educational expenditures, but also a learning environment that influences how efficiently children process educational expenditures into actual educational achievement. In Model 3, I have estimated an equation that includes mothers' education in the vector of explanatory variables –besides those variables already included in Model 2. The estimation of the parameters of the model that govern the determinants of children's educational attainment when controlling for the quality of the learning context –as measured by parents' education- reveals a decline in the influence of economic resources. It also shows a reduction of the marginal effect of cognitive ability on educational attainment. Therefore, part of the effect of parents' income and of children's cognitive ability on educational attainment is operating through the (quality of the) learning environment children benefit from. A more learning-friendly environment facilitates turning both resources and ability into educational attainment. This result supports the VDM discussed above. Externalities are certainly important, affecting the efficiency of children when turning economic resources into education acquisition. However, this is not to mean that economic resources are not an important determinant. Certainly, after controlling for cognitive ability and parents' education, income remains significantly associated with educational attainment.

Furthermore, economic resources may interact with parents' estimated probability of success in the educational system. In Model 4, I have estimated an equation that, in addition to the variables in Model 3, includes the interaction between family income and cognitive ability. The rationale for estimating the significance of such an interaction was explained above. If parents estimate that their children have a high probability of success, even if their resources are not very high, they may readjust their consumption plans in order to meet the cost of the educational investment of their offspring. The AFQT score seems to be a good measure from which parents may estimate the probability of success of their children. The estimated parameters are presented

in Tables 4.2 (educational level attained) and 4.3 (number of years of completed education). We can see from the estimated parameters that such an interaction does indeed take place.

The results of Model 4 reinforce the argument. It is true that parents' "cultural capital", by generating (negative) positive externalities, provides children with a "home (dis-)advantage" which (impedes) facilitates their learning and acquisition of education. But such an externality does not rule out the influence of parents' income, which remains significant.

The same applies to cognitive ability. That variable does not rule out the effect of parents' income. Additionally, the measure of cognitive ability may be endogenous to the family background. And if we do not take into consideration its endogeneity, and given that it is correlated with parents' economic resources, the estimated parameter of the family income may underestimate its real impact. In the equation in Model 4, the measure of cognitive ability may be a consequence of previous home investments made earlier in the child's life[46]. Therefore, in order to investigate the effect of the family income on children's educational attainment, we need to decompose the "home advantage" into two steps: a "home advantage" that enhances the child's cognitive ability, and a "home advantage" for actual educational achievement. Put it in statistical terms, we need to estimate a system of equations as the following one:

education $= \alpha_1 + \beta_1$ *race* $+ \beta_2$ *ln(parents' income)* $+ \beta_3$ *ln(parents' income)* AFQT* $+ \beta_4$ *father's education* $+ \beta_5$ ***cognitive ability*** $+ \varepsilon_1$ (4.6)

cognitive ability $= \alpha_2 + \beta_6$ *mother's education* $+ \beta_7$ *nsibling* $+ \varepsilon_2$ (4.7)

The first equation contains an endogenous variable among the covariates. Since cognitive ability is the dependent variable in

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[46] Certainly, the measure of cognitive ability is taken when the child is aged fifteen or sixteen years old, and we know from life-span psychology that by that age, cognitive capacities are substantially developed (*vid.* Fisher *et al.*, 1996: Chapter 2 for a discussion).

Equation (4,7), the error terms in (4.6) and (4.7) may be correlated. The covariates in (4.6) are the same as in the equation estimated in Model 4 (Table 4.3)[47]. The covariates in (4.7) are: mother's education, and the number of siblings. The rationale for including these variables in Equation (4.7) is that the time-quality inputs are important for children's cognitive development. More educated the parents are, the higher the learning-inputs that the time they spend with their children includes, and therefore the higher the contribution to their cognitive development[48]. Similarly, other things being equal, the higher the number of siblings, the lower the time that parents can allocate to their children (*vid*. Blake, 1989).

Given i) the existence of two endogenous variables and ii) the correlation structure of the errors in the equations in the system above, I estimate the parameters of this system by Three Stages Least Squares (3SLS) (*vid*. Kmenta, 1986 [1971]: Chapter 13, Greene, 2000: 692-3). Let me explain further this estimation procedure.

Since the equation (4.6) contains an endogenous variable among the independent variables, the disturbance term is correlated with the *two* endogenous variables of the system, namely the number of years of completed education and the measure of cognitive ability. In addition, since cognitive ability has the double role of being an explanatory variable in equation (4.6) and the endogenous variable in equation (4.7), the error terms in the two equations may be correlated.

The estimation of a system of equations, as the one established by (4.6) and (4.7), has some especial requirements different from those of the estimation of a single equation. The correlation of the

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[47] There is only one exception. Instead of mother's education, I use father's education in equation (4.6). I do so in order to have available one instrument more when estimating the system of equations.

[48] There is indeed a large empirical literature in economics and psychology on the connection between the quality of time inputs and children cognitive development (*vid*. Zajonc and Markus, 1975; Denham and Lieberman, 1980; Stafford, 1987; Datcher, 1988).

error term with the endogenous variables entails a violation of one of the assumptions of the estimation by Ordinary Least Squares. Furthermore, the correlation of the error terms in the two equations needs to be taken into consideration. Failure to give an account of it entails loosing information about the equations. The combined effect of i) correlation between the error term and the endogenous variables, and ii) correlation of the error terms in the two equations, posses problems for both the consistency and the efficiency of the estimates of the parameters.

The method on which I shall rely is the 3SLS (*vid*. Kmenta, 1986: 695-701 and Greene, 2000: 692-3 for a lengthy explanation). This estimation procedure yields consistent and efficient estimates of the parameters. It consists of a combination of two approaches: instrumental variables and generalized least squares (GLS). The first is aimed at tackling the consistency problem, while the second is intended to account for the correlation of the error terms and obtain efficient estimates of the parameters. The name of the method, *three*-SLS, derives form the number of steps in which it is implemented. In the first one, the problem of consistency is being tackled by estimating the equations following an instrumental variables approach. In the second step, a consistent estimate of the variance-covariance matrix is obtained. Finally, using such a matrix, and with the instrumented values of the endogenous variables in the system, the parameters are estimated by GLS.

In Table 4.4, the estimated parameters of the two equations (4.6) and (4.7) are reported.

Table 4.4.- The Financial and Learning Roles of Families: A Simultaneous Equation Model

Variables	Coefficient (Std Error)
Equation 1: Number of years of completed Education	
Race (Reference category: White)	
- Hispanic	.366*
	(.151)
- Black	.664***
	(.188)
Parents' Income (log)	.386***
	(.098)
Cognitive Ability	.056***
	(.009)
Father's Educ. (Reference: high-school dropout)	
- High-school	.311*
	(.138)
- College	1.415***
	(.245)
Parents' income*AFQT	.010***
	(.003)
Constant	12.303***
	(.091)
R-square	39%
N	1899
Equation 2: Cognitive ability	
Number of siblings	-2.480***
	(.212)
Mother's Education (Reference: h-s dropout)	
- High-school	15.931***
	(1.134)
- College	30.917***
	(2.224)
Constant	.180
	(1.240)
R-square	25%
N	1899

*** significant at $p < 0.001$; ** significant at $p < 0.005$; * significant at $p < 0.01$; + significant at $p < 0.05$; ++ significant at $p < 0.10$

In this system of equations, the effect of the family background is decomposed into two steps. In the first one, the family affects the development of the child's cognitive ability. In the second step, the family affects the acquisition of education. When we consider the endogeneity of the measure of cognitive ability, we find that its role is weakened in the second step, and the one of parents' economic resources is, on the contrary, enhanced. Once controlling for the part of the family background that is affecting the development of children' cognitive ability, the role of economic resources becomes stronger. The marginal effects of both income and the interaction of income and cognitive ability turn out to be enhanced, as compared with the marginal effect of the same variables in Model 4 (Table 4.3 above).

3.2.2.- Educational Transitions: Mare's model of educational transitions

In Tables 4.5 and 4.6, the estimated models of educational transitions are presented. In Table 4.5, the estimated parameters of the model of the transition dropout from high school vs. continue in formal education are reported. Table 4.6 reports the parameters of the estimated model of the transition drop out from school after completing high school vs. continue in the educational system until obtaining a college degree.

The results of the estimated models broadly parallel those obtained in the estimation of models of the maximum level of education obtained by the individual, measured both as the educational level attained and as the number of years of completed education. Parents' income is an important determinant of grade transitions (Model 1). However, if we do not consider the effect of ability, upwardly biased estimates of the influence of income are found (Model 2). In addition, the externalities generated by the learning-friendly quality of the home environment are important – especially, once having obtained a high-school degree, for obtaining a college education (Model 3 in Table 4.6). Further-

Table 4.5.- Family Economic Resources and High-school completion

Variables	Model 1 Coefficient (Std Error)	Model 2 Coefficient (Std Error)	Model 3 Coefficient (Std Error)	Model 4 Coefficient (Std Error)
Race (Reference: White)				
- Hispanic	-.061 (.177)	.444+ (.196)	.486* (.195)	.491* (.194)
- Black	.795*** (.189)	1.433*** (.198)	1.419*** (.193)	1.421*** (.191)
Parents' Income (log)	.716*** (.093)	.236+ (.107)	.198++ (.109)	.493+ (.224)
Number of siblings	-.108*** (.024)	-.017 (.028)	-	-
Cognitive Ability (AFQT)	-	.079*** (.007)	.076*** (.007)	.077*** (.007)
Mother's Educ. (Reference: High-School Dropout)	-	-		
- High-school			.340+ (.174)	.327++ (.174)
- College			.760 (.618)	.713 (.620)
Parents' Income * AFQT			-	.012 (.008)
Constant	2.473*** (.129)	2.800*** (.182)	2.530*** (.190)	2.526*** (0.193)
Pseudo R-2	6%	22%	22%	23%
N	2447	2340	2342	2342

*** significant at p< 0.001; ** significant at p< 0.005; * significant at p< 0.01
+ significant at p< 0.05; ++ significant at p< 0.10

Table 4.6.- Family Economic Resources and College Graduation.

Variables	Model 1 Coefficient (Std Error)	Model 2 Coefficient (Std Error)	Model 3 Coefficient (Std Error)	Model 4 Coefficient (Std Error)
Race (Reference: White)				
- Hispanic	.025	.320+	.352*	.370*
	(.129)	(.141)	(.145)	(.146)
- Black	-.015	.512***	.483***	.478***
	(.116)	(.132)	(.134)	(.133)
Parents' Income (log)	.338***	.179*	.114	.132++
	(.068)	(.075)	(.078)	(.077)
Number of siblings	-.062***	-.021	-.009	-
	(.019)	(.020)	(.021)	
Cognitive Ability (AFQT)	-	.023***	.021***	.019***
		(.002)	(.002)	(.002)
Mother's Educ. (Reference: High-School Dropout)	-	-		
- High-school			.096	.125
			(.113)	(.112)
- College			1.106***	1.095***
			(.206)	(.208)
Parents' Income * AFQT	-	-	-	.016***
				(.003)
Constant	-.223*	-.721***	-.882***	-1.064***
	(.086)	(.101)	(.132)	(.110)
Pseudo R^2	2%	7%	8%	9%
N	2189	2096	2096	2097

*** significant at $p< 0.001$; ** significant at $p< 0.005$; * significant at $p< 0.01$
+ significant at $p< 0.05$; ++ significant at $p< 0.10$

more, parents' income interacts with the probability of success of the children –as measured by AFQT. If we do not take into account such an interaction, the relation between income and the second transition, i.e. drop out from school after completing high-school vs. continue in the educational system until obtaining a college degree, could be questioned on statistical grounds (Model 3 in 4.6) –the p-value or significance level is higher than 0.10 in Model 3 of such a transition. If we would base our conclusions about the importance of economic resources on educational transitions on this model, we would conclude that such a relation exists only if we are prepared to assume low levels of statistical confidence (lower that a 90%). However, in Model 4, after controlling for the interaction between income and the probability of success in the educational system, as measured by the AFQT score, modifies that inference. When we control for the interaction income/cognitive ability, we find that, in addition to such an interaction being significant, the (independent) role of income becomes enhanced. The estimated parameter of income becomes now significant at a confidence level higher than a 90%, and the size of its coefficient increases. The comparison of the estimated parameters of the parents' income variable in Models 3 and 4 reveals that part of the effect of income interacts with parents' estimation of the probability of success in obtaining a college degree of their offspring. The substantive content of such an interaction may consist of the following. Parents with lower income, if estimating a high probability of success of their children, may increase their financial effort in order to meet the costs of the educational investments of their children. When such a calculus is taken into account, the independent role of income becomes enhanced.

This is so not only in the case of the second transition, i.e. obtaining a college education conditioned on having completed high school, but also applies to the first transition, i.e. dropping out from high school. In this latter case, income is significant even if the interaction discussed above is not being controlled for (Model 3 in Table 4.5). But when such an interaction is taken into

consideration, the estimated parameter of the parents' income variable increases substantially.

Even if the results of educational transitions resemble those of the determinants of the maximum level of education attained, an interesting issue arises, which has implications for the test of the argument, and therefore require some more attention. The logic underneath the Mare model consists of the following: the effect of socioeconomic background needs not be the same across educational transitions. The comparison of the estimated conditional logit models of the two transitions reveals that such an insight is sound. Two main issues reveal it.

Firstly, the effect of parents' income is different in magnitude for the two transitions. As shown in numerous studies of educational careers using social class as an independent variable, the effect of social origin decline as pupils move to later transitions (*vid.* for example the empirical investigations in Shavit and Blossfeld, 1993). Insofar as social class is a proxy for parents' financial capacity to meet educational investments, the results in this Section resemble those quoted above. Once the first transition has been completed, the effect of income, even if it does remain significant, is weaker.

Secondly, the estimated parameters of the interaction between income and cognitive ability display important differences in the two transitions. In the case of the second transition, it is significant ($p < 0.000$), while in the case of the first transition is significant only at a relatively high p-value ($p = 0.14$). If, as argued above, the interaction in question is a measure of the financial effort that families decide to undertake in combination with their estimation of the probability of success of their children in the educational system, the comparison of the models of the two transitions reveals that such a calculus may be more important for the decision of continuing in regular school until obtaining a college degree than for the decision of continuing in education until graduating from high-school vs. dropping-out from high-school. Since the financial burden associated with high-school is much

lower than the one involved in obtaining a college education[49], it seems sensible to expect that parents are much more concerned with the probability of success of their children in the latter case – especially when providing their offspring with economic support requires a strong financial effort from them.

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These analyses reveal two main issues. First, economic resources seem to be an important determinant of children's educational attainment. Certainly, after controlling for their cognitive ability, parents' education, and the interaction of their parents' education and the family income, the economic resources of the family remain an important determinant of the education children obtain, both when the dependent variable is the maximum education attained and when it is the transition between consecutive educational grades. And second, whatever the effect of economic resources, if we do not consider those dimensions of individuals' social context that affect their learning ability, we obtain upward biased estimates of the relative importance of economic resources on their educational attainment. This is not to mean that economic resources are not important. We should be careful not to throw out the baby with the bath water. What the results show is that if we do not do so, all the inequalities in educational attainment would be attributed to market imperfections, i.e. to the imperfections of credit markets and the credit rationing poor individuals face, and this would obscure our understanding of the *social fabric* of economic opportunities. Particularly, when the model is set in the social context in which much learning takes place, it is possible to capture the "home

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[49] Ellwood and Kane (2000) have found evidence supporting the view that the credit constraints faced by children in low-income families may prevent them from obtaining a college education. They show evidence according to which the enrollment in four-year college of children in families in the lower quartile of the income distribution did not increased in the 1980s, in clear opposition to the experiences of children in the other quartiles, for which enrollment did increased.

advantage" those children with educated parents enjoy, and to separate the long-term factors associated with them from the short-term borrowing constraints implied by capital market imperfections. Finally, the decomposition of the process of educational attainment into its intermediate steps or grade transitions, allows us to establish where economic resources matter most, i.e. when the influence of credit constraints on educational careers may be stronger.

4.- Escaping the Borrowing Constraint: The Accumulation of Assets

In the fist part of the dissertation, an argument has been put forward to explain individuals' life-chances. If mobility is costly, those below a certain level of wealth may be prevented from taking advantage of investment opportunities to enhance their labor market potential. The argument does not imply that opportunities are restricted to the wealthy. What it entails is that poor and rich agents face divergent structures of choices. Rich agents can pay out of their assets. And poor individuals, in principle, may overcome their lack of assets and the borrowing constraints they face by saving. They could adjust their consumption and saving plans in order to build up capital as a means to overcome the borrowing constraint. They may accumulate wealth by reducing their current consumption and increasing their saving.

Therefore, when adopting intertemporal plans, the first choice that poor agents have to undertake is not whether to invest in MEA. Their first problem consists of whether to sacrifice today in order to improve their prospects tomorrow. Are all agents equally prepared to build up capital? Who may accumulate assets that will eventually let her undertake investments in MEA? From consumption theory, we should expect that those individuals and families who are sensitive to small changes in consumption are not prepared to reduce their current consumption. We know from the

Engel's law (Engel, 1895) that families with low income are less likely to reduce current consumption. Households and individuals who are more sensitive to small variations in their current consumption, e.g. families with low-income, families with a bigger size, are likely to be unable to eliminate items from their consumption bundle.

In this section, I analyze the social determinants of wealth accumulation. I analyze, by estimating panel data models, how family income and family size affect the accumulation of (liquid) assets[50]. The relevance of this analysis comes from its implications for the capacity individuals have to escape bad jobs. If they want to move from a bad to a good job, and this mobility requires bearing some costs, individuals who have no assets would have no way to buffer their consumption during the transition from a bad to a good job. In order to asses the extent to which this is actually the case, I perform the following analyses.

Data, Variables and Models

I am going to estimate three models. In the first one, used as a benchmark, I regress the mobility of wealth on education and cognitive ability. In the second model, two sets of variables are added to the vector of covariates: family income (lag and first difference), and family size (lag and first difference). Finally, in the last model, one variable more is included as a regressor: the log of parents' income. The models and the variables included in each of them are the following ones:

- Model 1: age, age square, race, education, cognitive ability.
- Model 2: the variables in Model 1, together with the family income (both the lag and the first difference), and the family size (both the lag and the first difference).

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[50] Do note that I have moved from a focus on the family of origin to the respondent's own family.

- Model 3: one additional variable is included in the vector of independent variables: the log of parents' income.

The sample and variables used were described in Section 2, and are described in more detail in the Data Appendix at the end of the dissertation.

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I use an error correction specification in order to determine the dynamic relation between family size, family income, and the difference of assets between periods. The model states that the difference in assets between two years is the result of the initial level of family income and of the initial family size, as well as of the changes in the family income and size between two consecutive periods. This leads to the estimation of equations of the form:

$$\Delta y_t = \alpha + \delta\, y_{t-1} + \beta' \Delta x i_t + \beta' x_{i\,t-1} + \beta' c_{i\,t} + u_i + \varepsilon_{i\,t} \qquad (4.8)$$

where:

Δ is the first difference operator: $\Delta y_t = \Delta y_t = y_t - y_{t-1}$.

y_t is the log of the total amount of liquid assets at time t.

y_{t-1} is the lag of the (log of the) total amount of liquid assets.

$\Delta x_{j,\,t}$ are the first difference of (log) family income, the first difference of family size, and the first difference of family size square. β_j^1 are the corresponding parameters to be estimated.

$x_{j,\,t-1}$ are the lag of the (log) family income, the lag of family size, and the lag of family size square. β_j^2 are the corresponding parameters to be estimated.

$c_{j,\,t}$ are control variables: the (log) of the parents income –as a proxy for *inter-vivos* transfers and, more generally, intergenerational transfers[51]- age, age square, education, cognitive

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[51] In addition to human capital investments, parents may transfer economic resources to their children. Other things being equal, the higher the income of the parents, the higher the financial transfers they can make to their children.

ability, and race. β_j^3 are the corresponding parameters to be estimated.

<center>***</center>

The models and their estimated parameters are reported in Table 4.7. Before I proceed to interpret the findings, let me reiterate how the lagged and the differenced independent variables are to be interpreted in an Error Correction Model. The parameter of the lagged variable measures the long-term relation between the independent and dependent variables, while the differenced term measures the short-term effect of changes in the independent on the dependent variable. In Model 1, the mobility of wealth is associated with education and cognitive ability. We can see from the estimated parameters of Model 2 that the accumulation of assets follows indeed the path expected from consumption theory: those individuals with higher incomes, and those with smaller families do indeed accumulate more assets. In addition, as shown in Model 3, those who have parents with more income may receive more intergenerational transfers. The accumulation of assets is significantly associated with the former variables and in the expected direction. However, it is not significantly associated with the measure of cognitive ability.

What are the implications of these associations for an understanding of the process of wealth accumulation? An extremely useful way to provide an answer is by examining the evolution of the Black/White wealth-mobility gap in the three estimated models. In Table 4.8, the evolution of the gap in the three models is presented and summarized. The unequal opportunities of blacks and whites for wealth accumulation do not arise solely from their difference in terms of education and cognitive ability or intelligence. A considerable and highly significant gap (p-value= 0.001) remains between the two, net of the effect of education and the AFQT score.

Table 4.7.- Escaping Borrowing Constraints: The Accumulation of Assets

Variables	Model 1 Coefficient (Standard Error)	Model 2 Coefficient (Standard Error)	Model 3 Coefficient (Standard Error)
Lagged Dependent Variable	-.447*** (.008)	-.476*** (.009)	-.477*** (.009)
Age	.006 (.004)	.004 (.004)	.004 (.004)
Age Square	-7.34e-06 (5.56e-06)	-4.88e-06 (5.97e-06)	-5.17e-06 (6.18e-06)
Number of years of completed Education	.075*** (.008)	.057*** (.009)	.052*** (.009)
Cognitive Ability (AFQT)	.003*** (.001)	.002+ (.001)	.001 (.001)
Race (Reference: White)			
- Hispanic	-.078++ (.045)	-.057 (.050)	.010 (.053)
- Black	-.145*** (.044)	-.099+ (.049)	-.005 (.053)
Family Income	-		
- First Difference		.234*** (.023)	.243*** (.024)
- Lag		.318*** (.021)	.307*** (.022)
Family Size	-		
- First Difference		-.022 (.015)	-.017 (.016)
- Lag		-.066*** (.011)	-.065*** (.011)
Parents' income	-	-	.144*** (.030)
Constant	.935 (.633)	-1.013 (.692)	-2.339** (.769)
R-square	18%	19%	20%
N	1777	1641	1514

*** significant at p< 0.001; ** significant at p< 0.005; * significant at p< 0.01
+ significant at p< 0.05; ++ significant at p< 0.10

Table 4.8.- Race and Wealth Mobility

	Model 1	Model 2	Model 3
Coefficient for Black (Reference: White)	-0.145	-0.099	-0.005
p-value	0.001	0.042	0.926

Part of the gap arises from blacks' socioeconomic characteristics. The lower average income of Blacks has as a side effect that they are less prepared to accumulate wealth. Other things being equal, the lower the income, the lower the capacity to save out of such an income. In addition, black families are larger. The average black family is larger than the white one. The combined effect of obtaining a lower average income and having larger families is a lower capacity to accumulate wealth. Indeed, in the context of the error correction model estimated in Model 2, both a short- and a long-term relation between income and wealth mobility has been found to exist. Furthermore, there is a long-term negative relation between the size of the family and the accumulation of wealth, together with a short-term one, which is also negative –although statistically significant only at a relatively low level of confidence (85%).

The results in Model 2 give support to the prediction based on consumption theory according to which the family income and size are associated with the consumption requirements of the family. Other things being equal, the lower the income and the higher the size of the family, the less prepared it is to save part of the income and build up wealth. As regards to the Black/White wealth mobility gap, we can see in Tables 4.7 and 4.8 that, once we take into account the effect of these two variables, the differences between blacks and whites become narrowed. Adding to the benchmark model the lag and first difference of both family income and family size, reduces the gap.

Nevertheless, a difference remains. What is the origin of such an inequality of wealth accumulation among blacks and whites?

The existence of this gap should not come at a surprise if we realize that, to a considerable extent, intergenerational transfers are a crucial aspect underneath the process of wealth accumulation (*vid*. Altonji, Hayashi and Kotlikoff, 1997). The transfers that parents make to their offspring become crucial for the wealth accumulation of the latter. This insight, together with the history of discrimination, segregation and low-wages experienced by former generations of blacks in the US[52], lead us to provide an explanation of the origin of the gap. If intergenerational transfers do indeed matter for the process of wealth accumulation, and if current generations of blacks have not inherited much wealth from their parents because the former generations could not accumulated much, we should expect the wealth gap to emerge from the inequality of intergenerational transfers of blacks and whites. In other words, if blacks and whites would have enjoyed the same financial support from their parents, other things being equal, they would be as well prepared as whites for building up wealth. Certainly, we can see from the estimated parameters of Model 3 that the black/white wealth-mobility gap becomes closed once we control for the measure of parents' income. The coefficients reported in Tables 4.7 and 4.8, show that the coefficient of the dummy variable "black" –being "white" the reference category- is as low as –0.0049, and, furthermore, we can affirm that, at a confidence level as low as a 7% (p-value= 0.926), such a gap is statistically non-significant.

<div align="center">***</div>

In conclusion, not all individuals are equally capable of accumulating wealth. Assets are not randomly allocated to individuals. Two sets of circumstances work in such a way as to *design* the selection of individuals in terms of their capacity to build up wealth: *achieved* and *ascribed* characteristics. On the one hand, education, income, and the size of his own family, are an important determinant of the accumulation of wealth. On the other

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[52] *Vid*. Oliver and Shapiro (1995) for a lengthier elaboration of this point.

hand, intergenerational transfers are important as well. In addition, achieved and ascribed characteristics do not operate in isolation one from the each other. The attained education is, at least partly, the result of the economic resources of parents. This result suggests that a circular process may be at work. The concatenation of processes is as follows. Individuals who were raised in families with fewer resources were more likely to obtain less education. Those with less education accumulate fewer assets. And those with fewer assets will find it much more difficult to escape low wages because they do not have assets to smooth their consumption and undertake mobility investments. They are less financially prepared to take advantage of mobility opportunities. This last step will be at the core of the analyses of Chapter 5.

5.- The Accumulation of Post-school human capital

In the previous section, we have seen that the education the individual brings into the labor market is associated with his capacity to build up wealth. More educated individuals accumulate more wealth. In addition, education has further implications for the acquisition of human capital. If we take into account that the individual's biography is to a large extent the context where learning takes place, we should expect that the human capital the adult brings to the labor market to be associated with the enhancement of his human capital. As argued in Chapter 3, when individuals leave formal schooling, they become self-selected in terms of their ability to produce generate mobility-enhancing assets. The education they have brought into the labor market influences their capacity to accumulate more human capital. As Heckman has put it: "learning begets learning" (Heckman, 1999: 6)[53]. This last section aims simply at illustrating how the human capital, which is acquired at one stage of an individuals' life-

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[53] *Vid*. Chapter 3, Section 2, for a further elaboration of this point.

course, is related to the previous educational choices undertaken during childhood.

Data and Empirical Content

In this section, I am going to show two pieces of empirical evidence regarding the determinants of post-school educational investments. I am going to analyze how personal characteristics influence the training individuals acquire. Particularly, I examine how the economic resources and the initial stock of human capital influence jointly the accumulation of post-school human capital.

The data used in the statistical analyses in this section are also from the NLSY. They consist of yearly time-series cross-sections, resembling those used in the analyses in Sections 2 and 4 in this Chapter. The only difference is that the time period for which these data are available is much shorter, 1978 to 1991[54]. Full information on the data can be found on Parent (1999).

Because human capital is not all the same, I distinguish between two types of training: on-the-job training, and off-the-job training. On-the-job training is company-provided training. Off-the-job training includes training received from business colleges, barber or beauty schools, nursing schools, vocational and technical institutes, and correspondence courses.

The dependent variables used in the analyses below move beyond a simple incidence measure –i.e. receiving vs. not receiving training, dummy type of variable. I analyze the determinants of the accumulated time spent on the two types of training –i.e. on-the-job and off-the-job training– as it is done, for example, in Lynch (1992). The dependent variable is the accumulated time (measured in years) that the individual has spent in training activities in the year at which it is measured. In addition, from the information available in the NLSY, it is possible to identify whether individuals completed or did not complete any training program in which they were enrolled. In the

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[54] I thank Daniel Parent for sharing this data with me.

analyses in this Chapter, I study the accumulation of human capital by means of training programs that have been completed. The dependent variables in this study are two. The first one is the accumulated time spent in off-the-job training programs that have been completed. The second one is the accumulated time spent in on-the-job training programs that have been completed. Both variables are measured in years.

Off-the-job training

First of all, we need to know the peculiarities of the kind of educational activities included under the category off-the-job training. As explained above, off-the-job training includes training received from business colleges, barber or beauty schools, nursing schools, vocational and technical institutes, and correspondence courses. This type of training encompasses a series of educational activities that provides individuals with the specific learning to carry out a profession that may improve their chances of obtaining a good job.

Which are the empirics of the arguments as applied to the accumulation of off-the-job training? According to the CDM, individuals' accumulation of off-the-job training is a function of their economic resources. In addition, and according to the VDM, their education should also be important. In order to determine the empirical support these arguments receive, I am going to estimate a model that includes in the vector of independent variables a measure of the individual's economic resources, and a measure of his education. The measure of economic resources that I use is the lagged family income[55]. The variable of education used is the educational level attained by the individual, which has been measured as in Section 3, namely using a categorical variable with

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[55] Unfortunately, a wealth variable is not available in this dataset. For this reason, although wealth would be more appropriate as a measure of the resources the individual can rely on when undertaking this type of investments, I have used the family income instead of wealth.

three categories: high-school dropout, high-school graduate, and college graduate.

As expressed in the following equation, the accumulation of off-the-job training is stated to depend on a series of independent variables relevant for the argument.

$$y_t = \alpha + \delta y_{i\,t-1} + \boldsymbol{\beta' x}_{i\,t} + u_i + \varepsilon_{i\,t} \qquad (4.9)$$

In this equation:

- y_t is the accumulated time spent on off-the-job training (expressed in years)
  - y_{t-1} is the lagged dependent variable.
  - x_{ijt} is a vector of independent variables

I estimate the parameters of the former equation using a random-effects estimator. In the Table 4.9, the estimated parameters of the former models are reported.

From the estimated parameters of the equation in Table 4.9, we can see that the income of the family is associated with the off-the-job training individuals accumulate. This effect is significant after controlling for the educational level achieved. Therefore, the economic resources the individual possesses seem to be important for his accumulation of post-school human capital. The formal education the individual has attained is also relevant. There are some differences in the time spent on off-the-job training across educational groups. As expected, the more educated accumulated more off-the-job training. This gives support to the expectation according to which the initial human capital brought into adulthood matters for the future human capital that is obtained.

Table 4.9.- The Accumulation of Off-the-job Training

Variables	Model Coefficient (Standard Error)
Lagged Dependent Variable	0.900***
	(0.006)
Lagged Family Income (log)	0.0031 +
	(0.0014)
Education (Reference: high-school dropout)	
- High-school	0.0075*
	(0.0028)
- College	0.0084+
	(0.0041)
Constant	-0.0243++
	(0.0129)
R-square	88%
N	1869

*** significant at p< 0.001; ** significant at p< 0.005; * significant at p< 0.01
+ significant at p< 0.05; ++ significant at p< 0.10

On-the-job Training

The empirics of on-the-job training are different. The employer funds most of on-the-job training[56]. As a result of this, individuals' economic resources are not so important as a determinant of the acquisition of employer-provided training. For employers, it is worth training more educated workers since they

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[56] There is some empirical evidence that suggests that most of the employer-provided training is paid by the employer and only a small proportion of the costs are met by workers in the form of a period of lower wages while receiving training. *Vid*. Loewenstein and Spletzer (1998).

may be trained more efficiently[57]. And as a result, we should expect that the more educated receive more on-the-job training.

In order to pin down the determinants of the accumulation of on-the-job training, I have estimated a model in which the on-the-job training that is accumulated over time is regressed on the educational level obtained by the individual. The accumulation of on-the-job training is modeled as following this equation:

$$y_t = \alpha + \delta\, y_{it-1} + \beta'education_{i\,t} + \beta'c_{i\,t} + u_i + \varepsilon_{i\,t} \qquad (4.10)$$

where:

y_t is the accumulated on-the-job training

y_{t-1} is the lagged dependent variable.

$c_{j,t}$ are control variables: experience (measured as the number of weeks spent working), and the type of industry (measured following the standard classification of the 3-digit classification of industries in twelve categories). These variables are explained fully in the Data Appendix at the end of the dissertation.

Estimation results

In Table 4.10, the estimated parameters of the former model are reported. We can see from the estimated coefficients that college-educated and high-school graduates receive more employer-provided training than high-school dropouts[58]. As compared to the manufacturing sector, only those employed in two sectors are more likely to receive company provided training: "Transportation, Communication and Other Public Utilities" and "Finance, Insurance and Real State".

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[57] Some available descriptive evidence supports this argument. For instance, Frazis *et al*. (1998) reports that employers are more likely to offer training to more educated workers. Therefore, we should expect that more educated workers receive more company-provided training.

[58] Contrary to Lynch (1992), 1) there are important and significant differences across educational groups regarding the on-the-job training that they accumulate; and 2) there are no significant differences across racial groups after controlling for the relevant variables of on-the-job training accumulation.

Table 4.10.- The Accumulation of On-the-job Training

Variables	Coefficient (Standard Error)
Lagged Dependent Variable	0.945***
	(0.006)
Education (Reference: High-school dropout)	
- High-school	0.0037++
	(0.0020)
- College	0.0146***
	(0.0030)
Experience	0.0000208***
	(4.64e-10)
Type of industry[59] (Reference: Manufacturing)	
- Transportation, Communication and Other Public Utilities	0.0065+
	(0.0027)
- Finance, Insurance and Real Estate	0.0098*
	(0.0037)
Constant	-0.0031
	(0.0026)
R-square	87%
N	1994

*** significant at $p < 0.001$; ** significant at $p < 0.005$; * significant at $p < 0.01$
+ significant at $p < 0.05$; ++ significant at $p < 0.10$

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[59] I report only the coefficients of the categories which are statistically significant. The other categories included in the "type of industry" variable are non-significantly related with the probability of accumulating on-the-job training. The other types of industries are specified in the Data Appendix.

These analyses support the prediction that the initial human capital brought into adulthood is related to future human capital obtained latter in life.

6.- Summary

In this chapter, it has been shown that MEA are not exogenously assigned to individuals. On the contrary, the intersection of the institutional underpinnings of markets, the economic resources individuals are endowed with, and their social contexts across different stages of their life-courses contains the MEA they can acquire and accumulate. In Section 3, using different measures of educational attainment, evidence has been shown from which to state that, net of the effect of cognitive ability and the externalities generated by the "cultural capital" of parents, economic resources are an important determinant of educational attainment. In Section 4, the process of wealth accumulation has been analyzed. Evidence has been shown according to which wealth accumulation is not the result of a "natural" characteristic such as cognitive ability, but of *achieved* and *ascribed* socioeconomic characteristics. Indeed, the socioeconomic characteristics of individuals, together with the intergenerational transfers that they receive from their parents, rule cognitive ability out as a factor underneath the accumulation of wealth. In addition, the choices undertaken at one stage of individuals' life-courses have been found to have lasting consequences. The education attained has consequences for the accumulation of two types of capital: wealth and human capital. In Section 4, it has been shown that it is related with the accumulation of wealth. In Section 5, evidence has been shown according to which education has consequences both for the type and quantity of human capital acquired after completing regular school. More educated workers receive more on-the-job human capital than the non-educated.

In the next chapter, I turn to analyze the implications of MEA for individuals' economic opportunities. Since, as it has been shown in this chapter, MEA are not randomly assigned to individuals, we need to consider their endogeneity in order to determine their role in the production of economic opportunities.

Appendix 4.1.-
Derivation of the form of an Error Correction Model[60]

An Error Correction Model is a model design to study dynamic relations between variables. It is derived from an Autoregressive Distributed Lag Model. In its most common form, this model is presented as follows:

$$\Delta y_t = \alpha + \beta_0 \Delta x_t + (\gamma - 1)(y_{t-1} - \theta x_{t-1}) + \varepsilon_t \qquad (A.4.1)$$

In this model, there is an equilibrium relationship between the variables y and x. The independent variable, x, has two types of effects on the long-run equilibrium path of the dependent variable. This model allows us to distinguish between short-term and long-term effects of x on the equilibrium path of y. The short-term effect is given by the coefficient of the first difference, β_0. The long-run effect is given by the coefficient of the lagged variable, θ.

If we do some mathematical manipulation in (A.4.1), we obtain the form used in this Chapter (*vid*. Equation (4.1) for a general formulation). If we define $\gamma = \delta + 1$ and $\theta = -\beta_1/\delta$, the Error Correction Model can be rewritten as:

$$\Delta y_t = \alpha + \delta y_{t-1} + \beta_0 \Delta x_t + \beta_1 x_{t-1} + \varepsilon_t \qquad (A.4.2)$$

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[60] In this Appendix I draw upon Hendry (1995: 286-306), Beck and Katz (1996) and Greene (2000: 733).

Appendix 4.2.-
Descriptive Statistics

Sections 2 and 4

	Mean	Std. Dev.
Lagged earnings rate (log)	1.260	.521
Age	292.118	8.498
Age squared	90193.050	4961.589
Parents' income (log)	9.548	.746
Number of siblings	3.684	2.531
Number years comp. educ.	11.942	1.812
First difference assets (log)	.094	.760
Lagged assets (log)	6.696	1.469
Cognitive Ability	33.443	27.010
First diff. fam. income (log)	.016	.239
Lagged family income (log)	9.407	.648
First diff. family size	-.128	.177
Lagged family size	3.544	1.192

Section 3

	Mean	Std. Dev.
Number of siblings	3.761	2.650
Parents' income (log)	9.537	.771
Cognitive ability	35.068	27.626
Parents' income (log). Centred: (Parents' income – Mean (Parents' income))	-.003	.771
Cognitive ability centred (Cognitive ability – Mean(Cognitive ability))	.068	27.626
Parents' income centred * Cognitive ability centred	9.489	20.286

Section 5

	Mean	Std. Dev.
Lagged Off-the-job training (years)	.0413	.132
Lagged On-the-job training (years)	.034	.104
Lagged Family income (log)	9.552	.655

CHAPTER 5

ASSETS, *SELF-DECOMMODIFICATION* AND OPPORTUNITIES

1.- Introduction: Opportunities for Earnings Acquisition in Imperfect Economies

In order to improve their economic opportunities, individuals need to be equipped with a safety net. Only when their living-standards are guaranteed independently of the working of market forces, may people start thinking about improving their prospects. If agents are concerned with their mere day-to-day survival, they cannot undertake investments that will improve their prospects. If earnings are the only source of their income, they cannot move beyond the mere satisfaction of their basic needs. In order to achieve a minimum living standard, they need to participate in the labor market. It is in this sense that their living standards are *commodified*. And only when a minimum level of resources is guaranteed such as to provide enough welfare and security, may individuals be expected to undertake investments that will result in an improvement of their opportunities.

If our economies were perfect, the market mechanism would provide individuals with a safety net. If capital markets were perfect, individuals could borrow the funds that they would invest

in Mobility Enhancing Assets (hereafter MEA). Similarly, if insurance markets were perfect, individuals could turn to them in order to find protection against unexpected contingencies affecting their incomes. However, credit markets are imperfect and most insurance markets are missing.

The welfare state provides some protection of individuals' living standards. However, it replaces individuals' income at neither a one hundred percent rate nor during an indefinite period of time. In addition, in the US *residual* welfare state, income replacement is limited to those incapable of market participation. Therefore, it does not provide individuals with a safety net, which in turn gives them an incentive to undertake risky earning-enhancing investments.

This does not mean that individuals' welfare cannot be made independent from market forces, even in an ideal-type case of complete absence of state protection. As Esping-Andersen (1990: 37) writes "de-commodification is … a process with many roots". The sources of de-commodification may be multiple. However, there is a primary source that neither Polanyi (1944) nor Esping-Andersen (1990) has considered: the *self*. Individuals can rely on their wealth in order to isolate their living standard from market participation. If they find neither market-protection nor state-decommodification, they can rely on their own resources. If this is the case in general, it is even more true in the case of the US. Individuals, in the absence of economic protection through the market mechanism, can find *self-decommodification* by relying on their own wealth. They can use their wealth to undertake investments that will secure them a good life. Certainly, assets enable people to invest in their future. In addition, they provide individuals and families with protection against eventual economic contingencies: they can find protection, i.e. insurance, by running down their assets. All in all, wealth creates a safety net and stimulates risk-taking behavior (*vid*. Sinn, 1995).

In this chapter, I will analyze to what extent wealth is an important determinant of life-chances. More particularly, I am going to analyze the relation between the initial and evolving

wealth of individuals and their opportunities for earnings acquisition in the labor market. In other words, I will study the extent to which opportunities are *designed* in the sense of Fisher *et al*. (1996) as to how individuals' opportunities do not arise *naturally*, but are related to the unequal distribution of economic resources in society. If the argument presented in Part I of the thesis is correct, we should find the existence of a dynamic relation between individuals' initial wealth and the mobility of earnings. The underlying logic is that, armed with a safety net, individuals are prepared to undertake investments in MEA. Those who have a right to income outside the market, like the wealthy do, find it easier to take advantage of mobility opportunities. If facing unexpected risks, the wealthy can use their assets as a buffer stock. If undertaking investments, they can use their wealth as a piggy bank. Wealthy individuals may be more responsive to opportunities ahead. They can undertake investments in MEA while maintaining their living standard independently of market participation. The poor, or asset-less, on the contrary, need to participate in the market in order to satisfy their material needs. Earnings are the only source of their income. As a result, they enjoy less protection against eventual contingencies affecting their income stream, and have a lower capacity to finance investments in their personal economic development.

The body of the Chapter is as follows. In Section 2, I estimate panel data models of earnings mobility. In Section 3, I concentrate on a specific aspect of wage mobility: transitions out of low-wage jobs. I estimate hazard rate models of the transitions from low-wage to high-wage jobs across multiple spells using all the transitions that take place during the period under analysis. In both cases, I show that individuals' initial wealth is indeed an important determinant of their (future) opportunities. Net of the effect of a measure of cognitive ability, wealth is associated in the expected direction with the mobility of earnings and with the probability of escaping low-wage jobs -even after controlling for some possible sources of unobserved heterogeneity. In Section 4, I apply the argument to the explanation of the Black/White Earnings Gap. I

show that the inequality of opportunities for earnings acquisition between these two groups emerges to a considerable extent from the unequal pattern of wealth holding that characterizes Blacks and Whites. In the last Section, I summarize the findings of the Chapter, highlight the implications of the argument for the explanation of the Black/White Earnings Gap, and suggest its implications for social stratification and mobility research.

2.- The Opportunities for Earnings Acquisition: Wealth and Earnings Mobility

Since wealth is not a variable very common in the tool-kit of sociologists, I would like to start this section with a short excursion about the conceptual differences between income and wealth. Although related, wealth, income and earnings are not synonymous. The difference between wealth and income (the same applies to earnings) is that the former is a *stock*, and the second is a *flow* variable. Wealth is the total value of the economic resources that an individual or household has accumulated up to the time at which it is measured. Income, on the other hand, is a flow of economic resources over time. It is the total amount of resources that an individual obtains during a period of time.

Econometric Framework

If the theory developed in Part I is correct, we should find an association between individuals' initial assets and their earnings mobility. Given the imperfections of markets described above, wealth ownership becomes an important determinant of life-chances. There is a number of advantages associated to wealth ownership. Wealth removes the dependence on market participation for meeting the most basic necessities. In addition, it provides a cushion against unexpected financial emergencies (e.g. unemployment and illness). Furthermore, it provides a piggy bank that can be used to finance investments in the own personal

development or on that of one's children. In short, wealth provides a safety net and constitutes a source of finance that, all in all, establishes the favorable basis to secure a *good life*.

In order to test the plausibility of the argument as applied to the explanation of the opportunities for earnings acquisition across individuals' life-courses, we have to examine the relation over time between individuals' accumulated assets and their earnings mobility. I rely on an error correction model in order to determine the existence of a dynamic relation between the mobility of earnings and wealth. An error correction model provides the tool to study the relations over time between the dependent and independent variables of interest. It provides insights into the co-movement of the variables of interest (*vid*. Greene, 2000: 733 and ff.). The generic form of an error correction model is the following one:

$$\Delta y_{it} = \alpha + \delta y_{it-1} + \Sigma \beta_1 \Delta x_{it} + \Sigma \beta_2 x_{it-1} + u_i + \varepsilon_{it} \qquad (5.1)$$

where:

Δ is the first difference operator: $\Delta y_t = y_t - y_{t-1}$,

y_t is the dependent variable,

y_{t-1} is the first lag of the dependent variable.

$\Delta \mathbf{x}_t = \mathbf{x}_t - \mathbf{x}_{t-1}$ is a vector that includes the first difference of the independent variables,

$\mathbf{x}_{t-1}$ is a vector that includes the first lag of the independent variables.

The model states that the difference in the dependent variable between two periods of time is the result of both the lagged covariates as well as of the difference between two periods of the covariates. It states that the there is both a long- and a short- term relation between the dependent and independent variables. The parameter of the lagged independent variables (β_2') measures the long-term effect of those variables on the equilibrium path of the dependent variable. The parameter of the first-difference (β_1') measures the short-term effects of the independent variables on

the long-run equilibrium (*vid*. Beck and Katz, 1996; Greene, 2000: Ch. 17).

Data and Variables

The data set and the variables used in the econometrical analyses were described in Chapter 4. The only difference is the definition of the sample. In the analyses in Chapter 4 I restricted the sample to males aged 14 to 16 as of January 1978. The motivation behind such a restriction was the availability of information on parents' income. Such information is only available for a sub-sample of the original data set. In the analyses in this Chapter the sample is not limited to that sub-sample[61].

As described in Chapter 4, the original data set is the National Longitudinal Survey of Youth. I analyze the labor market experiences of males aged 14 to 21 at the time of the first interview (1978). The period of analysis goes from 1978 up to 1997, and the periodicity of the data for the analysis in this section is the year. The variables used in the estimated models are:

- Wage rate. Total annual earnings divided by the total number of hours worked. It is expressed, as all the economic variables, in 1978 US dollars.
- Assets. The assets variables included in the NLSY have not been asked in all the years of the survey. In order to obtain long time series, I have limited the asset variables to the total amount of money assets owned by the individual. This variable is available yearly from 1985 onwards.
- Cognitive ability. I use as a measure of cognitive ability the "Armed Forces Qualifications Test" (AFQT)[62].

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[61] *Vid*. the data appendix for a lengthier description of the data and variables used in the statistical analyses in this Chapter.

[62] This is the proxy for intelligence used in Herrnstein and Murray (1994). I will be using the same variable in this investigation, taken from the same survey, namely the NLSY. Even assuming that such a variable is actually measuring intelligence, I show in that it does not rule the effect of asset ownership out in

- Gini coefficient. It is the gini coefficient of the distribution of income for every year. I use this variable is to include as a control for the effect of aggregate macroeconomic factors in inequality that in turn may affect mobility opportunities.

- Type of industry. It is a battery of 12 dummy variables that groups the 3-digit classification of industries as follows:
    - Agriculture, Forestry and Fisheries.
    - Mining.
    - Construction.
    - Manufacturing.
    - Transportation, Communication and Other Public Utilities.
    - Wholesale and Retail Trade.
    - Finance, Insurance and Real State.
    - Business and Repair Services.
    - Personal Services.
    - Entertainment and Recreation Services.
    - Professional and Related Services.
    - Public Administration.

- Labor market experience:
- Experience working: accumulated number of weeks spent active and employed until the current year (measured in weeks).

- Experience unemployed: accumulated number of weeks spent active and unemployed until the current year (measured in weeks).

- Experience of inactivity: accumulated number of weeks spent out-of the labor force (inactive) until the current year (measured in weeks).

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explaining individuals' economic opportunities. However, it is worth noting that the very same use of this variable as a measure of intelligence is problematic (Fisher *et al.*, 1996: Chapter 2).

Estimated Models

If the argument is correct, we should find a long-term relation between assets and earnings mobility. In order to find out whether that is the case, I have estimated the parameters of the following equation:

$$\Delta \log(earnings)_{i\,t} = \alpha + \delta \log(earnings)_{i\,t-1} + \beta_1 \Delta\log(assets)_{i\,t} + \beta_2 \log(assets)_{i\,t-1} + \Sigma\beta_3 c_{i\,t} + u_i + \varepsilon_{i\,t} \qquad (5.2)$$

where:
   c is a vector of control variables: age, age squared, and race.

From the estimated parameters of equation (5.2), we can see that the (accumulated) assets are associated with the mobility of earnings. There is a relation between individuals' (accumulated) assets and the (future) earnings. This result provides support for the argument presented in the First Part of the thesis. There is a long-term dynamic relation between asset ownership and the mobility of earnings.

The estimated parameters of Model 1 supply evidence in favor of a credit-constraint interpretation of labor market careers. Nevertheless, it could be that such an association between assets and earnings mobility is spurious. Certainly, Herrnstein and Murray (1994) would argue that wealth is significantly associated with earnings, but just because more intelligent individuals have better prospects to acquire earnings and at the same are better prepared to build up wealth. An account of life-chances in terms of intelligence would interpret the association found in Model 1 in this way: Wealth is important solely as long as it is correlated with intelligence.

Table 5.1.- Wealth and Earnings Mobility[63]

Variables	Model 1 Coefficient (Standard Error)	Model 2 Coefficient (Standard Error)	Model 3 Coefficient (Standard Error)	Model 4 Coefficient (Standard Error)
Lagged Dependent Variable	-0,587*** (0,006)	-0,586*** (0,006)	-0,582*** (0,006)	-0,613*** (0,009)
First Difference Assets (log)	0,051*** (0,003)	0,048*** (0,003)	0,045*** (0,003)	0,108*** (0,006)
Lagged Assets (log)	0,072*** (0,003)	0,066*** (0,003)	0,059*** (0,003)	0,185*** (0,011)
Age	0,106*** (0,001)	0,010*** (0,001)	0,007*** (0,001)	0,004*** (0,001)
Age Square	-0,0000123*** (1,30e-06)	-0,0000114*** (1,32e-06)	-8,80e-06*** (1,50e-06)	-5,69e-06*** (1,66e-06)
Gini coefficient	-53,614++ (31,109)	-24,668 (31,773)	-69,347+ (33,196)	-132,713*** (36,763)
Gini square	60,860++ (35,143)	29,227 (35,896)	78,643+ (37,474)	151,894*** (41,534)
Cognitive Ability	-	0,002*** (0,0002)	0,001*** (0,0002)	0,00034 (0,00022)
Number of years of completed education	-	-	0,016*** (0,003)	-
Experience				
- Experience Out-of the labor force	-	-	0,00005 (0,0001)	0,0001 (0,0001)
-Experience Employed	-	-	0,0005*** (0,0001)	0,00036*** (0,0001)
-Experience Unemployed	-	-	-0,0004079+ (0,00021)	0,0006064* (0,0002275)
Experience squared				
-Experience - square Out-of the labor force	-	-	-1,01e-07 (1,70e-07)	-1,36e-07 (1,68e-07)
-Experience - square Employed	-	-	-2,14e-07*** (6,26e-08)	-1,64e-07+ (6,91e-08)
-Experience - square Unemployed	-	-	3,91e-08 (8,56e-07)	1,64e-06++ (9,17e-07)

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[63] The sample size in the models presented in this Chapter does not stay constant across different specifications. I have re-estimated the different models in the Chapter using the same sample across different specifications. The re-estimations confirm that the results presented in this Chapter are indeed robust to the different sample sizes (i.e., the estimation results do not change). As an example, I show the result of the new estimated models for Table 5.1 in Table 5.1B at the end of this Chapter.

Variables	Model 1 Coefficient (Standard Error)	Model 2 Coefficient (Standard Error)	Model 3 Coefficient (Standard Error)	Model 4 Coefficient (Standard Error)
Type of industry (Reference: Manufacturing)				
Agriculture, Forestry and Fisheries	-	-	-0,296*** (0,028)	-0,334*** (0,030)
Mining	-	-	-0,007 (0,043)	-0,0005 (0,044)
Construction	-	-	-0,0289++ (0,0162)	-0,0307++ (0,0168)
Transportation, Communication and Other Public Utilities	-	-	-0,012 (0,016)	-0,013 (0,017)
Wholesale and Retail Trade	-	-	-0,126*** (0,013)	-0,103*** (0,013)
Finance, Insurance and Real State	-	-	0,023 (0,020)	-0,010 (0,020)
Business and Repair Services	-	-	-0,051*** (0,016)	-0,050** (0,017)
Personal Services	-	-	-0,152*** (0,031)	-0,110*** (0,034)
Entertainment and Recreation Services	-	-	-0,199*** (0,034)	-0,179*** (0,036)
Professional and Related Services	-	-	-0,066*** (0,015)	-0,035+ (0,015)
Public Administration	-	-	-0,013 (0,018)	-0,003 (0,019)
Race (Reference: white)				
- Hispanic	-0,021 (0,014)	0,024++ (0,014)	0,027+ (0,014)	0,030+ (0,013)
- Black	-0,043*** (0,013)	0,016 (0,014)	0,006 (0,014)	0,021 (0,014)
Constant	10,147 (6,781)	3,674 (6,928)	14,055+ (7,271)	27,717 (8,049)***
R-square	26,9%	27,2%	27,9%	23,7%
N	3517	3353	3305	3171

*** significant at p< 0.001; ** significant at p< 0.005; * significant at p< 0.01
+ significant at p< 0.05; ++ significant at p< 0.10

If the explanation of earnings mobility *à la* Herrnstein and Murray (1994) were correct, we should find that wealth is not associated with the increase of earnings once controlling for intelligence. Holding intelligence constant, individuals' assets should not be significantly associated with their earnings opportunities. Both the long- and the short-term relation should become statistically non-significant. In Model 2, I have estimated a model in which a new variable is added to the vector of independent variables: the AFQT-score. This variable is the measure of intelligence that Herrnstein and Murray (1994) used in *The Bell Curve*.

$$\Delta \log(earnings)_{i\,t} = \alpha + \delta \log(earnings)_{i\,t-1} + \beta_1 \Delta\log(assets)_{i\,t} + \beta_2 \log(assets)_{i\,t-1} + \beta_3 c_{i\,t} + \beta_4 AFQT_i + u_i + \varepsilon_{i\,t} \qquad (5.3)$$

The estimation of the parameters of the equation in Model 2 reveals that wealth remains an important determinant of the mobility of earnings. Its effect is still significant and becomes only modestly weakened after controlling for the AFQT score. Therefore, it seems that there is a robust relation between assets and earnings mobility. Holding constant intelligence/cognitive ability, both a short- and a long-term relation between assets and the increase of earnings remains. This result supports the argument developed in the First Part of the thesis. Intelligence or cognitive ability may help to improve one's prospects. Indeed, more intelligent individuals may have a higher probability of obtaining a "good position". However, this does not imply that intelligence alone can let individuals to have access to opportunities. It is but one factor among others.

Therefore, the relation between assets and earnings mobility holds even after controlling for the AFQT score. Nevertheless, a question could be raised as to whether these results confirm the link established between assets and opportunities for earnings mobility. It could be that these results are the realization of a different causal process. For instance, they could be the result of the following process: more educated individuals get higher

paying jobs; thus, over time, more educated individuals have higher earnings, save more, and as a result accumulate more assets. But there is no causal link from assets to earnings.

In order to find out whether that is the case, I have estimated a new model (Model 3) in which the vector of independent variables includes some more variables: education (measured as number of years of completed education), type of industry (dummy variable with 12 categories constructed from the 3-digit standard classification of industries), and experience unemployed, experience out-of the labor force, and experience in the labor force (all the experience variables are measured in weeks). We know that education (*vid.* Card, 1999 for a review), the type of industry (Kalleberg, Wallace and Althauser, 1981; Baron, 1984; Smith, 1990), the accumulation of experience and/or the interruption of careers (e.g. Spilerman 1977; Rosenfeld 1992: 45-50; Tienda and Stier, 1996; Wilson, Tienda and Wu, 1995; Hsueh and Tienda, 1995) have effects on wages. In Model 3 I control for all those variables.

$$\Delta \log(earnings)_{i\,t} = \alpha + \delta \log(earnings)_{i\,t-1} + \beta_1 \Delta \log(assets)_{i\,t} + \beta_2 \log(assets)_{i\,t-1} + \beta_3 c_{i\,t} + \beta_4 AFQT_i + \beta_5 experience_i + \beta_6 industry_i + \beta_7 education_i + u_i + \varepsilon_{i\,t} \tag{5.4}$$

We can see from the estimated parameters that the coefficient of assets is still significant, and that the size of the coefficient has decreased just slightly (Model 3 in Table 5.1).

It seems that the relation between assets and earnings mobility is robust. Yet, however the robustness of such a relationship between assets and earnings mobility, the estimated coefficient may not be very precise. There are strong statistical, economic and social grounds from which to expect assets not being randomly assigned to individuals. And because of its endogeneity, the estimates of the coefficients of the asset variables may not be very accurate. There are three main factors that bring about such an endogeneity of wealth.

Firstly, there is a bi-directional relation between assets and earnings. If the theory of this thesis is correct, assets ownership may enhance the opportunities to acquire earnings. But, on the other hand, earnings are partly saved contributing to the accumulation of wealth.

Secondly, the right-hand side variables of the earnings equation may be correlated. The asset variables are definitely related with some of the other independent variables. For instance, as shown in Chapter 4, education is positively associated with the accumulation of wealth.

Thirdly, it is obvious that assets or wealth are not randomly assigned to individuals and families. Both the family of origin and the current family arrangements are intimately related with individuals' capacity to build up wealth. Indeed, as shown in Chapter 4 (Section 3), assets are not exogenously assigned to individuals and families. Both the family background and the social context of the individual affect her ability to build up wealth. Intergenerational transfers are an important factor behind the process of wealth accumulation. Parents make transfers to their offspring, which constitute the basis from which they may initiate their own process of wealth accumulation (*vid*. Altonji, Hayashi and Kotlikoff, 1997). Indeed, wealth is an excellent summary measure of how (dis-)advantages become cumulated over time (*vid*. Oliver and Shapiro 1995). In addition, individuals and families are heterogeneous on their earnings and income, as well as on their consumption profiles. The accumulation of assets depends on what people earn and on what they spend on consumption.

In order to give an account of the endogeneity of wealth, I will estimate the model by relying on an instrumental variables approach. I will instrument the variable measuring the long-term relation between wealth and earnings mobility (the lag of assets). I shall use as instruments two sets of variables. Firstly, variables that measure individuals' propensity to attain economic resources, and secondly, variables that capture their capacity to save a fraction of those resources and build wealth.

In the first group of instruments, I include the following variables:

1) Intergenerational transfers, i.e. parents' capacity to make intergenerational transfers to their offspring: parents' education[64] and the number of sons and daughters that they had.

2) Education.

3) Total family income. The higher the income of the family, the higher the saving potential and therefore the wealth that an individual may build up.

The second group of instruments includes the size of the current family. This is a good measure of the propensity to save out of the family income. It is interrelated with the capacity to save part of the income and, therefore, with the capacity to accumulate wealth. The bigger the size of the family, the higher its consumption requirements and therefore the lower the saving potential. Other things being equal, bigger families need to spend a higher share of the family income on consumption, and for that reason they are less prepared to accumulate wealth.

To sum up, I instrument the lag of assets using as instruments the following variables: parents' education, number of siblings, individual's own education, second lag of family income, and second lag of family size (individual's own family)[65].

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[64] The best measure of parents' capacity to transfer resources to their offspring is the family wealth. However, that information is not available in the data set that I have used. The NLSY includes a measure of parents' income, but it is available for a sub-sample only (children who in 1978 were aged 14 to 16). In Chapter 4, I restricted the analyses to that group. In this Chapter, I will not restrict the sample as in the previous one and, therefore, information on parents' income is not available.

[65] I use the second lag of both the family income and of the family size as instruments of the first lag of wealth (or assets) because, by definition, the relation between income and family size on the one hand and the accumulation of wealth on the other one is not a contemporary one, but one that takes place within a lag. Wealth is a *stock* variable –the value of what the individual owns up to the period at which it is measured, while income is a *flow* variable (the same applies to the family size). A proportion of one's income, if not consumed, will become

These sets of variables (groups 1 and 2 above) include at least one variable that seems to be a good instrument[66]. All the listed variables, as discussed above (and further in Chapter 4), are related with the accumulation of assets. Intergenerational transfers, education, the total family income, and the size of the family are all related with the capacity to build up wealth. In addition, at least one of the variables above is not related to the dependent variable –the first difference of the earnings rate. As it has been argued above and being shown empirically in Chapter 4, the size of the family is related with the capacity to accumulate assets –the variable to be instrumented. However, there are no strong theoretical grounds from which to expect that there is a causal link between the size of the family and the earnings *potential* –the dependent variable. I emphasize that the dependent variable is a measure of the earnings *potential* in order to set aside possible misinterpretations. If the dependent variable would be a measure of the *total* earnings, the family size would not be a good instrument. Certainly, there are strong reasons for which to expect the size of the family to be related to the *total* earnings[67]. Although such an argument is convincing enough, it does not apply here. Do note that the dependent variable in equation (5.5) is not the *total* earnings, but the *increase in the earnings rate* (total

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part of wealth in the next period. To put differently, if one does not consume her income today, she will be richer tomorrow, but not today. One's wealth today depends on what she saved –or did not consumed- the day before. Equivalently, wealth at time (t-1) is related with the income at time (t-2).

[66] In the context of the Instrumental Variables (IV) estimation, a variable is said to be a good instrument if it is associated with the variable to be instrumented, but not with the dependent variable. In our case, we need to find variables that are related with individuals' capacity to build up wealth, but not with the earnings potential -i.e., mobility of the earnings rate. (*vid*. Deaton, 1996: 111-6).

[67] The causal link results from the following underlying process. The bigger the size of the family, the higher the consumption requirements. Those needs may be met via an increase in the supply of labor. In order to satisfy the consumption needs of his family, an individual may work more hours in order to raise more income. For that reason, an association may be expected between the size of the family and the total earnings.

earnings divided by the total number of hours worked). It is a measure of the earnings capacity, and not of the total earnings.

In Model 4 (Table 5.1), I have estimated a new model in which the variable that measures the long-term relation[68] between wealth and earnings (the lag of assets) is instrumented as explained above. We can see that the relation between wealth and earnings mobility remains significant and its coefficient becomes increased. On the other hand, the variable AFQT turns out to be statistically insignificant. Once we take into consideration the process behind the accumulation of wealth, we obtain a more precise estimate of the role of wealth in the determination of the earnings capacity. Its role becomes enhanced when tackling its endogeneity. This result offers support for the theory developed in Part I.

3.- Escaping Low-wage Jobs: Wealth and the Transitions Out-of Low-wage Jobs

In this section, I will investigate the plausibility of the argument of Part I as applied to the explanation of the transition out-of low-wage jobs. If the argument is correct, we should find that the economic resources that one has accumulated, her wealth or assets, is a determinant of the likelihood of escaping low-wage jobs. Assets can be used to buffer consumption and to finance the costs associated with the mobility process. Wealth is a like a piggy bank that can be used to meet the cost of upward mobility and to enjoy a minimum living standard independent of market participation. Hence, wealth provides a safety net that may stimulate risk-taking behavior.

The argument developed in Part I applies to the explanation of individuals' opportunities to escape low-wage jobs. If the mobility from a bad to a good job is costly –as assumed in the model developed in Chapter 2- those who own assets are more likely to

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[68] *Vid.* the description of the Error Correction Model above.

escape bad jobs. The wealthy can afford to meet the costs associated to the mobility process. Conversely, those without assets may find it extremely difficult to escape low-wage jobs. Being employed in a low-wage job coupled with owing no assets may be a way to become trapped in a bad-job. If earnings are the only source of economic resources, and if earnings are low, low-wage workers are not prepared to build up assets that, if adequately invested, may improve their chances to escape low-wage jobs.

In order to test the proposition derived from the theory of Chapter 2 –according to which wealth is a determinant of individuals' opportunities of escaping low-wage jobs- I will analyze the labor market experiences of a sample of individuals. The analysis of the determinants of labor market experiences, more particularly the likelihood of ending a low-wage spell by means of a transition towards a non-low-wage job, will be based on the estimation of an extended hazard rate model. In the following parts of this section, I firstly describe the empirical framework on which I rely. In the second part, I present the results of the estimated models and discuss how the empirical evidence relates to the theoretical argument.

3.1.- The Empirical Framework

Data

The data set from which the labor market histories have been obtained is the *National Longitudinal Survey of Youth*. Monthly time-series have been generated from the original dataset. A lengthier discussion of the data set can be found in the Data Appendix at the end of the dissertation.

A sub-sample of individuals have been selected following these criteria:

- Males. The rationale behind this criterion is the avoidance of any interaction between mobility and fertility choices that may obscure the test of the theoretical argument (*vid*. Chapter 1).

- After they have left the period of regular school. I have defined the moment at which individuals have left school as the time after which individuals have spent more than 12 months out of any form of regular schooling. The motivation behind this selection is the avoidance of the inclusion in the sample of jobs that are not a substantial part of labor market careers.

- Individuals who have missed a maximum of three of the interviews in the period 1979 to 1998.

I have reorganized the original data in a form that is conductive to estimating hazard rate models. The raw data have the following format: for every interview year, the substantive variables (e.g. education, labor market status) are accompanied by a set of variables regarding i) whether, with respect to the previous interview year, the individual has experienced any change in her status (e.g. has completed college education), and ii) the starting and ending dates (month and year) of those changes. From these data, I have generated monthly time-series for the variables concerning the argument and propositions to be tested.

States

In order to analyze the determinants of individuals' opportunities to escape low-wage jobs, we need detailed information regarding the labor market position and personal characteristics that may influence the transition probabilities. In particular, we need information about the labor market status (employed, unemployed, out of the labor force) and the wage rate in order to construct the labor market experience.

From the information available in the NLSY, it is possible to identify the labor market status the individual occupies every month. In addition, from the information on the wage rate an employed individual is paid in his current job, it is possible to

distinguish whether he is employed in a low- or in a non-low-wage job. Every month, individuals occupy one, and only one, of the following states:

- o   0: Out-of-the labor force.
- o   1: Unemployed.
- o   2: Employed in low-wage job.
- o   3: Employed in a non-low-wage job.

These states represent an exhaustive and mutually exclusive set of labor market positions. Every individual, at each month, occupies one and only one of the four states.

The differentiation between low- and high-wage jobs is based on the standard definition of low-wage jobs as those which have a wage rate lower than two-thirds of the median of the wage distribution. Using data from various years of the *Current Population Survey* of the US (1978-97), I have calculated the value of the median of the distribution of the hourly wage for full-time male workers, and from this I have calculated the low-wage threshold. The values of the threshold are reported in the Table 5.2 below. The value of the wage rate of the job occupied by the individual in the current month has been compared with the low-wage threshold in the year including such month and, if lower, the individuals' labor market status has been defined as low-wage.

In order to show the relevance of the study of the dynamics of low-wage jobs, I am going to present some descriptive evidence. In Table 5.3, two measures of the number of individuals who earned low-wages both in 1978 and in the years in the columns are reported. Let us referred to such numbers as (i). In order to avoid the influence of cohort effects, this descriptive evidence is referred to individuals who are the same age, in particular males who were 20 or 21 in 1978. The first row shows the proportion resulting from dividing the quantity (i) into the number of individuals who earned low-wages in 1978. The second row reports the proportion resulting from dividing the same quantity (i) into the total population under analysis.

Table 5.2.- The Low-wage threshold

Year	Low-wage threshold (USD current year)
1978	3,96
1979	4,42
1980	4,84
1981	5,19
1982	5,46
1983	5,61
1984	5,82
1985	6,07
1986	6,36
1987	6,53
1988	6,64
1989	6,73
1990	6,96
1991	7,19
1992	7,31
1993	7,43
1994	7,45
1995	7,75
1996	7,90
1997	8,13
1998	8,53

Source: *Current Population Survey*. Wage Data for Male Workers (several years).

We can see that after 19 years, almost one fifth of those who earned low-wage jobs in 1978 have low-earnings again. Or using as a base the total population, more that a ten percent of the total cohort of the subsample under analysis earned low-wages both in 1978 and in 1997.

Table 5.3.- Proportion of workers employed in low-wage jobs both in 1978 and latter years

Year (y)	*y= 1979*	*y= 1982*	*y= 1986*	*y= 1990*	*y= 1994*	*y= 1997*
Earned low-wages both in year= y and in 1978 ——————————————— *Earned low-wages in 1978*	50%	41%	31%	19%	17%	17%
Earned low-wages both in year= y and in 1978 ——————————————— *Total Population of males aged 20 to 21 in 1978* (**N= 704**)	32%	26%	20%	12%	10%	11%

Source: Author's own calculations from a selection (individuals aged 20 to 21 in 1978) of the sample of the NLSY described in Section 2.

These data are simply a description of the experience of low-wages. They are just snapshots showing the proportion of those who, having earned low-wages in 1978, experience the same earnings status in the subsequent years in the columns of the table. However, they do not show the proportion of those who are *still* employed in low-wage jobs in those years. Put it differently, they just show *pictures* of individuals at different years, but neither their experiences in between nor the determinants of their opportunities to remain or escape low-wage jobs. In the following section I shall introduce the tools that I will use in order to study the *movie* followed by their careers. I shall study the mobility out of low-wage jobs using a more refined measure of time - instead of the year, I will adopt the month as the time unit. And in order to analyze their careers or opportunities to move out of low-wage jobs, I will rely on a semi-Markov econometric framework that I shall present under the next subheading.

An Econometric Framework: a Semi-markov Model[69].

The monthly time-series described above provide us with detailed and extensive information on the labor market histories of individuals during twenty years of their lives. It supplies data on the labor market status that individuals occupy every month, as well as information on personal characteristics (economic, social and demographic attributes). It provides the basis for the analysis of the determinants of the opportunities to escape low-wage jobs. Since it includes data on wealth holding, cognitive ability, education, etc. it supplies the information required for testing the argument put forward in this dissertation as applied to the explanation of the opportunities to escape low-wage jobs.

1. The mobility across states as a stochastic process

In order to find out the determinants of the transitions out of, as well as permanence in, low-wage jobs, I will rely on a hazard rate model (i.e., an event-history model as is most commonly known in sociological applications). These models supply the statistical tool for analyzing the determinants of the movements or transitions across different labor market states. It provides a framework from which to find out the determinants of the length of spells in low-wage jobs, and the probability that a low-wage spell ends up in the individual obtaining a high-wage job.

The mobility process across states is characterized by the following three elements:

i- Time, a continuous variable.
ii- State space.
iii- Timing of transitions between positions within the state space.

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[69] In the description of the models I rely on Blossfeld, Hamerle and Mayer (1989: Chapter 3), Tuma and Hannan (1984), Lancaster (1990), and Greene (2000: 937-50).

The mobility process, the transition or movement from state to state, generates a sequence of points across time. Since the movements across states are probabilistic, and the points in time at which transitions take place are random variables, the mobility of individuals may be represented as the realization of a stochastic process. This process is then defined by:

- i) *T* time, a random continuous variable,
- ii) *Y={1, 2, 3, …, k}* (*k* a finite number) a qualitative variable presenting the state space, and
- iii) A set of random variables measuring the points of time at which transitions take place: $t_1, t_2, t_3, ….$

2. Functions describing the stochastic process

This process is fully characterized by three statistical functions: the hazard rate, the density, and the survival function. Since those functions are related in a unique way, any of the three describes fully the stochastic process.

The hazard function is defined as the instantaneous rate per unit of time at which the state that the individual currently occupies is left. The hazard rate is the ratio between the probability that the individual leaves the state currently occupied in the short period of time Δt, and the length of time. The probability is given by:

$$P\left(t \leq T < t + \Delta t \mid T \geq t\right) \tag{5.5}$$

The hazard rate is the ratio between that probability and the length of time. As the period of time becomes infinitesimal, the hazard rate becomes the rate at which the individual leaves the current state per unit of infinitesimal time:

$$\lambda(t) = \lim_{\Delta t \to 0} \frac{P\left(t \leq T < t + \Delta t \mid T \geq t\right)}{\Delta t} = \frac{\partial}{\partial t} P\left(t \leq T < t + \Delta t \mid T \geq t\right)$$

$$(5.6)$$

Any of these three functions describes the process: the density, the probability, and the survival function.

- the random variable T has a distribution function f(t). The Cumulative Density, or Probability Function, is:

$$F(t) = \int_t f(t) = P(T \leq t) \tag{5.7}$$

- the survival function measures the probability that a spell lasts for at least a time t:

$$S(t) = P(T \geq t) = 1 - F(t) \tag{5.8}$$

These functions are related as follows:

$$\lambda(t) = \frac{f(t)}{S(t)} \tag{5.9}$$

$$\lambda(t) = -\frac{\partial}{\partial t} \ln S(t) \tag{5.10}$$

$$f(t) = S(t) \cdot \lambda(t) \tag{5.11}$$

The knowledge of the relation among these functions will become useful when estimating the hazard rate, and, more particularly, when writing down the Maximum Likelihood function.

3. A first extension of the simple model: Multiple Destinations

In the analyses of this section, the state space is composed of four states:

$$S=\{o, u, l, h\} \tag{5.12}$$

where o, u, l, and h represent the following states:

o: out of the labor force
u: unemployed
l: employed in a low-wage job
h: employed in a high-wage job

Therefore, in the analysis in this chapter, a person employed in a low-wage job may end up a low-wage spell by making a transition towards either a high-wage, unemployment, or out-of the labor force. When an individual leaves a low-wage job, he may get a high-wage job, but also may transit to unemployed or out-of the labor force. Where an individual moves to after leaving a low-wage job matters tremendously and therefore we cannot just collapse the three possible destinations into a single state.

This introduces a further complication into the model. The state space does not consist simply of two alternating states, but of multiple ones. Therefore, multiple destinations are possible after the individual completes a spell in a given state. A spell in a low-wage may be terminated by a transition to a high-wage job, to unemployment, or to out-of the labor force.

In order to formulate the model, I will rely on a *Competing Risk Model*. This model is based on the assumption that there are *D* independent random variables that measure the time at which a transition to destination-state (*d*) from origin-state (*o*) takes place. Then, the hazard function of exiting the origin state o toward the destination state d is given by an origin-destination specific hazard rate (λ_{od}).

Given the substantive interest of this chapter, I am going to estimate the transition from low- to high-wage jobs. Equivalently, I will estimate the hazard rate of ending a low-wage spell by making a transition to a high-wage job:

$$\lambda_{lh}(t|\ x) \tag{5.13}$$

where the first subscript represents the origin and the second the destination state.

4. A Second extension: multiple failures

Once a low-wage spell has been completed, an individual may return to such a state in the future. Imagine someone who escaped a low-wage and moved towards a high-wage, but after some time returned to the original state. Similarly, another individuals could, after a low-wage spell, have become unemployed, later on left the labor force, and after sometime returned to a low-wage job.

In the analyses in this chapter, I consider the multiple failures that take place during the labor histories of individuals, i.e., all the transitions occurring during the period under analysis. It is especially important to use of all the available information, and not only the one provided by the time until the first failure. Since states are not *absorbing*, they may be revisited. Ignoring the additional transitions that take place after the completion of the first spell is not sufficient. Such an approach does not take advantage of the additional information included in the subsequent transitions, which will possibly be especially relevant. For this reason, I estimate not the hazard rate for the first transition, but the one corresponding to multiple failures or transitions.

The inclusion of multiple transitions into the analyses provides a more accurate account of the mobility process and enhances the robustness of the analyses. However, it introduces one additional complication into the hazard rate framework presented above. The multiple spells are typically correlated across the unit of

observation. Having escaped a particular state in the past may definitely be correlated with the probability of leaving such a state in the future. In order to tackle this statistical problem, I am going to rely on what in the literature is called "Variance Corrected Models" (*vid*. Lin and Wei, 1989; Wei, Lin and Weissfeld, 1989). This approach deals with the problem by adjusting the Variance-Covariance matrix in order to give an account of the additional correlation that the inclusion of multiple failures or transitions entails. From this correction, robust standard errors may be obtained that will provide the basis for calculating the t-statistics and significance levels of the estimated parameters.

5. Parameterization and estimation of the hazard function

The hazard rate can be modeled directly using, for example, an exponential specification as follows:

$$\lambda(t) = \lambda \qquad\qquad (5.14)$$

This is equivalent to the following survival function:

$$S(t) = e^{-\lambda t} \qquad\qquad (5.15)$$

I have parameterized the hazard rate as an exponential function. I have selected such a parameterization after comparing the estimation of three hazard rates parameterized as: i) a Weibull function, ii) a Gompertz function, and iii) an Exponential function. The effect of the estimated parameters on the hazard ratio is very close in the three cases. In addition, the duration dependence is almost nonexistent[70]. Therefore, since nothing is really gained by

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[70] The exponential model assumes that the time spent in a state is not related to the hazard of escaping such a state. To put it differently, there is no time dependence. The Weibull and Gompertz parameterizations allow for monotonic time dependence. The longer the time spent a state, the higher (positive time

fitting more complex models, I have relied on the exponential model, which is computationally less expensive.

The parameters of the hazard rate function can be estimated by Maximum Likelihood. Given the nature of duration data, some issues have to be considered when writing the Log-Likelihood function to be maximized. Censoring is a common feature of duration data. Since the process is ongoing at the time at which the variables are measured, some of the spells have not been completed at the time of measurement. Although a transition has not taken place by the time of measurement, it may do so later on. The spells that are still ongoing at that time cannot be considered as spells that have ended in no-transition, but they are censored spells. The Log-Likelihood function has to give an account of both the non-censored and the censored spells as in the following equation:

$$\ln L = \sum_{u} \ln f(t \mid \gamma) + \sum_{c} \ln S(t \mid \gamma) \qquad (5.16)$$

where u is the set of uncensored observations, c is the set of censored observations, and γ is the vector of parameters to be estimated.

6. One more extension: unobserved heterogeneity

The vector of independent variables or covariates is intended to include all the relevant covariates that capture individuals' heterogeneity. However, in the real world, the model is never completely specified. Some relevant individual attributes have not been measured because they are not available or simply because

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dependence) or lower (negative time dependence) the hazard of escaping such a state. I have estimated Weibull and Gompertz hazard rate functions. The estimated parameters measuring time dependence are very small, showing that it is almost nonexistent. For that reason, I have relied on the exponential model.

they cannot be measured. As a result, some heterogeneity is not contained in the covariates and remains unobserved.

The model above can be extended in order to control for unobserved heterogeneity. I will deal with the problem of unmeasured heterogeneity parametrically[71]. This is a direct approach that consists of modeling the heterogeneity in a parametric model. The survival function conditioned on the individual specific effect that remains unobserved, υ, is given by:

$$S(t) = E_{\upsilon}\big[S(t\,|\,\upsilon)\big] \tag{5.17}$$

If the distribution of the unobserved heterogeneity is known, we can obtain the unconditional survival function as follows:

$$S(t) = \int_{\upsilon} S(t\,|\,\upsilon)\delta\upsilon \tag{5.18}$$

Assuming that the distribution of the heterogeneity follows a Gamma distribution, we can obtain the survival and the hazard rate functions. Assuming a gamma distribution with mean 1 and variance 1/k:

$$f(\upsilon) = \frac{K^{K}}{\Gamma(K)} e^{-K\upsilon} e^{K-1} \tag{5.19}$$

Then the conditional survival function is:

$$S(t\,|\,\upsilon) = e^{-\upsilon\lambda t} \tag{5.20}$$

and the unconditional survival function is:

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[71] In this presentation I rely on Greene (2000: 947).

$$S(t) = \int_0^\infty S(t \mid \upsilon) f(\upsilon) d\upsilon = \left[1 + \theta(\lambda \cdot t)\right]^{-1/\theta}, \qquad (5.21)$$

and the hazard rate is:

$$\lambda(t) = \lambda \cdot \left[S(t)\right]^{\theta}. \qquad (5.22)$$

When $\theta = 0$ the model corresponds with the model without heterogeneity.

3.2.- Wealth and Opportunities to Escape Low-wage Jobs: The Empirical Results

At this point, let me recapitulate the argument to be tested. Wealth ownership is important when undertaking investments that will let individuals escape low-wage jobs. Among the many functions of wealth, it equips individuals with a safety net, provides funds to undertake investments, and offers income security that in turn may stimulate risk-taking behavior. This argument gives an account of the opportunities to escape low-wage jobs that is substantially different from the explanations *à la* Herrnstein and Murray (1994). According to an explanation of the likelihood of escaping low-wage jobs in terms of intelligence, opportunities arise from individuals' intelligence.

In order to test the plausibility of the propositions derived from the theories above, I will estimate two models. The first one controls for the AFQT score. The second model adds the accumulated wealth to the vector of independent variables. The rationale behind the estimation and comparison of the parameters of these two models is the following. If economic constraints were not an important determinant of career mobility, and more particularly, if the opportunities to escape low-wage jobs were not related to individuals' assets, we should find that net of the effect

of intelligence and ability, as measured by the AFQT score, the assets individuals' command have no relation with their opportunities to move out of low-wage jobs. Put it in statistical terms, after controlling for the AFQT score, the accumulated wealth should not display any significant statistical association with the likelihood of ending a low-wage spell up by means of a transition towards a high-wage job.

In Table 5.4, I present the results of the estimation of those two models. I have estimated exponential models, considering multiple failures and adjusting the variance-covariance matrix from which robust standard errors have been calculated[72].

We can see that there is an association between individuals' accumulated wealth and their opportunities to escape low-wage jobs. There is a link between the (past) assets and the (future) hazard of ending up a low-wage spell and transiting towards a high-wage job. From the estimated parameters, we can see that wealth is significantly associated with the hazard rate of escaping low-wage jobs. An increase of a 1% in wealth increases the hazard rate of escaping low-wage jobs by a 5%. Even controlling for AFQT, wealth is an important determinant of the probability of ending up a low-wage spell. These results give support to the argument of the dissertation as applied to the explanation of the determinants of the transitions out-of low-wage jobs.

It is worthy to note how the other covariates in the models are related with the opportunities to escape low-wage jobs. Experience in the labor market displays an association that goes in the expected direction. The longer the experience both unemployed and out of the labor force, the lower the probability of escaping low-wage jobs. On the contrary, other things being equal, the longer the employment experience, the higher such a probability is. Similarly, education and the hazard of ending a low wage spell display a positive association.

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[72] I postpone the estimation of the models with unobserved heterogeneity to the next section. I do so because it has interesting implications for the explanation of black/white unequal opportunities to escape low-wage jobs.

Table 5.4.- The transition Out-of Low-wage jobs

Variables	Model 1 Hazard Ratio (Robust Standard Error)	Model 2 Hazard Ratio (Robust Standard Error)
Race (Reference: white)		
- Hispanic	0,977	1,020
	(0,024)	(0,019)
- Black	0,887***	0,994
	(0,022)	(0,020)
Gini coefficient	2,10e-31+	7,66e-29++
	(6,74e-30)	(2,93e-27)
Gini square	4,52e+34++	4,09e+31++
	(1,63e+36)	(1,76e+33)
Experience		
- Out-of the labor force	0,999***	0,9998++
	(0,00015)	(0,0001)
- Employed	1,0026***	1,0015***
	(0,0001)	(0,0001)
- Unemployed	0,9978***	0,9996
	(0,0003)	(0,0003)
Experience squared		
- Out-of the labor force	1,000001*	1
	(2,92e-07)	(2,70e-07)
- Employed	0,9999987***	0,9999993***
	(8,30e-08)	(7,98e-08)
- Unemployed	0,9999997	0,9999958+
	(1,33e-06)	(1,70e-06)
Type of industry (Reference: Manufacturing)		
Agriculture, Forestry and Fisheries	0,542***	0,634***
	(0,034)	(0,039)
Mining	1,151***	1,026
	(0,051)	(0,037)
Construction	0,981	0,961+
	(0,019)	(0,016)
Transportation, Communication and Other Public Utilities	1,008	0,966+
	(0,019)	(0,015)
Wholesale and Retail Trade	0,746***	0,808***
	(0,015)	(0,015)

Variables	Model 1 Hazard Ratio (Robust Standard Error)	Model 2 Hazard Ratio (Robust Standard Error)
Finance, Insurance and Real State	0,938* (0,022)	0,942** (0,018)
Business and Repair Services	0,812*** (0,018)	0,873*** (0,016)
Personal Services	0,670*** (0,039)	0,719*** (0,040)
Entertainment and Recreation Services	0,709*** (0,035)	0,742*** (0,039)
Professional and Related Services	0,838*** (0,019)	0,896*** (0,017)
Public Administration	1,104*** (0,024)	1,073*** (0,018)
Age	1,012*** (0,002)	1,005** (0,002)
Age Square	0,9999832*** (2,18e-06)	0,9999921*** (2,18e-06)
Number of years of completed education	1,038*** (0,004)	1,017*** (0,003)
Cognitive Ability	1,003*** (0,0003)	1,001*** (0,0003)
Lagged Assets (log)	-	1,047*** (0,003)
N	2935	2688
Log-Likelihood	940789	640556
Wald Chi2 (df)	4210 (25) ***	1667 (26) ***

*** significant at p< 0.001; ** significant at p< 0.005; * significant at p< 0.01
+ significant at p< 0.05; ++ significant at p< 0.10

The sector of activity in which the individual is employed is related to his chances of escaping low-wage jobs. The most salient result in this regard has to with the lower opportunities associated with the service sector as compared with the (traditional) industry sector. This is especially the case of some areas within the service sector, particularly -and in order of magnitude- in the area of personal services, entertainment and recreation services, business and repair services, and professional and related services.

Finally, the aggregate level of income inequality displays a puzzling negative U-shaped relation with the opportunities to escape low wage jobs. The higher the inequality, the lower the hazard of making a transition to a high-wage job –although the negative coefficient of the Gini-squared suggests that such a negative relation takes place at a decreasing rate-.

In the next section I shall explore the relation between one final set covariates and the opportunities for earnings acquisition, namely race.

4.- Wealth, *Self-Decommodification*, and the Color of Economic Opportunities: An Explanation of the Black/White Earnings Gap

In Sections 2 and 3 in this Chapter, I have showed that assets do indeed matter. Individuals' accumulated wealth is related with their opportunities for earnings acquisition. Both the mobility of earnings and the probability of escaping low-wage jobs are related with the initial assets individuals are endowed with.

In this section, I provide additional evidence in support of the argument. I set an *experimentum crucis* for the "assets matter" proposition. I investigate whether it supplies a satisfactory explanation of the Black-White Earnings Gap. The difference between Blacks and Whites in terms of their opportunities for earnings acquisition has constituted the battleground of different theories. In particular, Herrnstein and Murray (1994) have argued that the Black/White earnings gap is mainly or substantially the

result of their heterogeneity with respect to intelligence: blacks are less intelligent than whites and this is why their earnings are lower. If the explanation of opportunities in terms of intelligence would be correct, we should find the gap between these two groups to turn out to be eliminated when holding intelligence constant. However, I show that that is not the case. After controlling for intelligence, a substantial and significant gap remains between the two groups.

Recently, Oliver and Shapiro (1995) have shown in a very influential book that blacks and whites display an extremely unequal pattern of wealth holding. Furthermore, I showed in Chapter 4 that blacks are less likely to accumulate wealth over their life-courses than whites. Net of the effect of education, propensity to save, and cognitive ability, blacks build up fewer assets[73]. Therefore, if the argument of this thesis is correct, it should explain at least partly the origin of the Black/White Earnings Gap. If the initial inequality in the distribution of assets gives rise to unequal opportunities for earnings acquisition, and if blacks and whites display an extremely unequal pattern of wealth holding, the Black/White Earnings Gap is at least partly the result of the assets inequality between them.

In the parts in this Section, I firstly describe the *explanandum*, i.e., the Black-White Earnings Gap. Thereafter, I set the *experimentum crucis* for the argument and proceed to test to what extent the inequality of life-chances between blacks and whites is

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[73] A considerable part of this inequality is the result of what Oliver and Shapiro (1995: Chapter 2) call "the sedimentation of racial inequality". The history of blacks' discrimination, economic segregation and low-wages is the factor underlying such a wealth inequality. Blacks, in the past, faced legal. social and economic circumstances that worked against their ability to build up wealth. Former generations faced segregation and discrimination that brought about reduced opportunities to build up wealth. New generations have not inherited much wealth and, because of the strong intergenerational component underneath the buildup of wealth, are not able to accumulate much. This is why a focus on wealth provides the basis from which to "discover how black's socioeconomic status results from a socially layered accumulation of disadvantages passed on from generation to generation" (Oliver and Shapiro, 1995: 6).

related with their unequal initial wealth. The main finding of this section is that, if blacks and whites were to own the same assets, they would have the same opportunities for earnings acquisition and for escaping low-wage jobs.

4.1.- Race and Opportunities: The Persistent Color of Life-Chances

De jure, blacks and whites are *equal*. Needless to say, *de facto* they are *unequal*. Although it has been a long time since slavery came to an end, even if extreme forms of segregation have been put apart, and in spite of the achievements of the Civil Rights movement, blacks still have less favorable economic opportunities than whites. More particularly, blacks and whites earn different wages. The mean hourly wage for white males in 1995 was \$19. The equivalent figure for black males was \$12[74]. Although some progress was made in reducing the black/white earnings gap during the 1960s and early 1970s, such a gap has stagnated for the last two decades (*vid*. Altonji and Blank, 1999: 3146-64 for a review).

This regularity has attracted the attention of social scientists and many explanations have been put forward to explain it. The explanations can be broadly divided into two groups: demand- and supply-side explanations. The explanations in the first group emphasize the role of employers' decisions and hiring practices as the main underlying reason of the lower earnings of blacks. More particularly, the *gap* emerges from the application of discriminatory hiring practices by employers who decide not hiring, or hiring only in bad-jobs, black workers because of the color of their skin and not because of their job-related personal characteristics[75]. Such discrimination results in blacks becoming

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[74] Data from the Current Population Survey, March, 1996 taken from Altonji and Blank (1999: 3147).

[75] The literature on discrimination is quite broad. Although the common element is that blacks are relegated to low-paying jobs, the motivation behind

concentrated in, or being relegated to, economic sectors where wages are lower. That is, at least partly, the reason why they have lower wages than whites.

The explanations in the second group emphasize the role of the supply-side of the labor market. They offer an account of the earnings gap based on the individual characteristics of black workers that operate against their labor market advantage. These personal characteristics are of two types: pre-market differences, and market-factors. The bottom line of the explanation in terms of pre-market factors is the following one: blacks and whites do not attain the same level of education and acquire different skills *before* entering the labor market. As a result, they are less prepared to obtain higher-paying jobs (*vid*. O'Neill, 1990; Maxwell, 1994; Neal and Johnson, 1996). The market-factors explanations, on the other hand, emphasize the role of market-related factors as the underlying cause of the racial gap: blacks accumulate less labor market experience and this results in obtaining lower wages (*vid*. Rosenfeld, 1992 for a review)[76].

Needless to say, the many explanations produced in the literature have shed light on the factors affecting the earnings disparity of blacks and whites. However, a gap remains still unexplained. In the statistical models estimated and presented below, control variables have been included that capture the factors behind the emergence of the black-white earnings gap highlighted in the specialized literature. We can see that after controlling for both pre-market and market factors, blacks

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employers has not to respond to a single factor. In this branch of the literature two types of discrimination are distinguished: prejudice (*e.g*. Becker, 1971) and statistical discrimination as a device to overcome imperfect information about the job-related personal characteristics of the discriminated group (*e.g*. Borjas and Bronars, 1989; Black, 1995).

[76] Two papers worthy of note are Tienda and Stier (1996) and Western (2002). Tienda and Stier (1996) show how racial disparities in the access to entry-level jobs and longer periods of unemployment give rise to earnings differentials for blacks and whites. Western (2002) shows that the impact of incarceration on wage mobility and inequality is channeled through the interruption of careers that imprisonment brings about.

experience less earnings mobility than whites (Model 1 in Table 5.5) and have a lower probability of escaping low-wage jobs (Model 1 in Table 5.6).

In this section, I am going to put forward a new explanation. Building on the theory developed in Part I of this thesis, and given the empirical findings of Oliver and Shapiro (1995) -according to which Blacks have lower wealth than Whites- I articulate a new explanation, which is made explicit below in Section 4.2.

4.2.- *Race, Wealth and Opportunities: A New Explanation of the Black/White Opportunities Gap*

The argument that I have developed in this thesis provides the basis from which to formulate an explanation of the Black/White earnings gap. If assets inequality matters for improving individual's economic opportunities, and if wealth is unequally distributed between blacks and whites, we should predict different opportunities for them. Let us make explicit the underlying syllogism in order to clarify the argument.

1) Assets inequality matters. In the first part of the thesis, a theory has been put forward to explain individuals' opportunities. Given the imperfections of market economies, individuals' wealth becomes an important determinant of economic opportunities. In the former sections of this chapter (Sections 2 and 3), I have provided empirical evidence that support such an argument.

2) Blacks and whites are unequal wealth-wise. As a consequence of what Oliver and Shapiro (1995) have called "the sedimentation of inequality", blacks have less wealth than whites. Net of the effect of education, income, propensity to save, and other determinants of wealth accumulation, blacks and whites are characterized by a very unequal pattern of asset holding.

3) The logical conclusion that we can obtain from the former premises is that the Black/White Earnings Gap arises from their

unequal initial wealth. If they would have the same wealth, their opportunities for earnings acquisition would be similar.

Consequently, an implication –or application- of the argument of this thesis consists of providing a framework for the explanation of the Black/White Earnings Gap. This has an interest on its own, because of its substantive content. But, in addition, explaining the Earnings Gap constitutes an *experimentum crucis* for the argument of this dissertation. If the argument is correct, given that blacks and whites are unequal wealth-wise, the earnings gap between these two groups should be reduced once controlling for wealth. If we could make the distribution of assets between blacks and whites more equal, the earnings gap would be reduced. Put it differently, in a regression context, controlling for the accumulated wealth, the Black/White gap should be reduced.

4.2.1.- Race, Wealth, and Opportunities for Earnings Mobility

In this section, I will estimate three models (*vid*. Table 5.5 below). In the first model, I do not control for wealth. In Model 2 I consider the effect of wealth. In Model 3, I estimate the same equation than in Model 2 using a two-stages method. Since assets are endogenous and not randomly assigned, I instrument the lag of assets. This variable, in the context of an error correction model, measures the long-term relation between assets and earnings mobility[77].

The variables included in the three models in Table 5.5 control for the main dimensions of black-white heterogeneity underlying the earnings gap. I include in the vector of independent variables the number of years of completed education and a measure of cognitive ability in order to control for the role of pre-market factors in the generation of the earnings gap. The economic sector

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[77] The instruments are the same as those used in Model 4 in Table 5.1 (Section 2 in this Chapter).

Table 5.5.- Race, Wealth and Earnings Mobility

Variables	Model 1 Coefficient (Standard Error)	Model 2 Coefficient (Standard Error)	Model 3 Coefficient (Standard Error)
Lagged Dependent Variable	-0.697***	-0,582***	-0,613***
	(0,004)	(-0,006)	(-0,009)
First Difference Assets (log)	-	0,045***	0,108***
		(-0,003)	(-0,006)
Lagged Assets (log)	-	0,059***	0,185***
		(-0,003)	(-0,011)
Age	0.009***	0,007***	0,004***
	(0,001)	(-0,001)	(-0,001)
Age Square	-0.0000114***	-8,80e-06***	-5,69e-06***
	(9,40e-07)	(-0,0000015)	(-0,00000166)
Gini coefficient	-115,135***	-69,347+	-132,713***
	(12,851)	(-33,196)	(-36,763)
Gini square	128,296***	78,643+	151,894***
	(14,600)	(-37,474)	(-41,534)
Cognitive Ability	0,002***	0,001***	0,00034
	(0,0002)	(-0,0002)	(-0,00022)
Number of years of completed education	0,031***	0,016***	-
	(0,002)	(-0,003)	
Experience			
- Experience Out-of the labor force	-0,0001	0,00005	0,0001
	(0,00008)	(-0,0001)	(-0,0001)
-Experience Employed	0,0010***	0,0005***	0,0004***
	(0,0001)	(-0,0001)	(-0,0001)
-Experience Unemployed	-0,001***	-0,0004+	0,0006*
	(0,0001)	(-0,0002)	(-0,0002)
Experience square			
-Experience - square Out-of the labor force	3,34e-07+	-0,0000001	-0,0000001
	(1,52e-07)	(-0,0000002)	(-0,0000002)
-Experience - square Employed	-3,99e-07***	-2,14e-07***	-1,64e-07+
	(4,59e-08)	(-6,26e-08)	(-6,91e-08)
-Experience - square Unemployed	1,81e-06***	3,91e-08	1,64e-06++
	(4,43e-07)	(-0,000000856)	(-0,000000917)

Variables	Model 1 Coefficient (Standard Error)	Model 2 Coefficient (Standard Error)	Model 3 Coefficient (Standard Error)
Type of industry (Reference: Manufacturing)			
Agriculture, Forestry and Fisheries	-0,301***	-0,296***	-0,334***
	(0,017)	(-0,028)	(-0,030)
Mining	0,086**	-0,007	-0,0005
	(0,028)	(-0,043)	(-0,044)
Construction	-0,039***	-0,029++	-0,031++
	(0,011)	(-0,016)	(-0,017)
Transportation, Communication and Other Public Utilities	-0,021++	-0,013	-0,013
	(0,012)	(-0,016)	(-0,017)
Wholesale and Retail Trade	-0,155***	-0,126***	-0,103***
	(0,009)	(-0,013)	(-0,014)
Finance, Insurance and Real State	0,012	0,023	-0,001
	(0,017)	(-0,020)	(-0,021)
Business and Repair Services	-0,115***	-0,051***	-0,050**
	(0,011)	(-0,016)	(-0,017)
Personal Services	-0,213***	-0,152***	-0,110***
	(0,020)	(-0,031)	(-0,033)
Entertainment and Recreation Services	-0,163***	-0,199***	-0,179***
	(0,022)	(-0,034)	(-0,036)
Professional and Related Services	-0,138***	-0,066***	-0,035+
	(0,012)	(-0,015)	(-0,015)
Public Administration	-0,045**	-0,013	-0,003
	(0,015)	(-0,019)	(-0,019)
Race (Reference: white)			
- Hispanic	0,045***	0,027+	0,030+
	(0,011)	(-0,014)	(-0,013)
- Black	-0,039***	0,006	0,021
	(0,010)	(-0,014)	(-0,014)
Constant	24,383***	14,055+	27,717***
	(2,776)	(-7,271)	(8,049)
R-square	31, 2	27,9	23,7
N	4382	3305	3171

*** significant at p< 0.001; ** significant at p< 0.005; * significant at p< 0.01
+ significant at p< 0.05; ++ significant at p< 0.10

in which the individual is employed is intended to capture the role of segregation. And the accumulated experience out-of the labor force, the experience unemployed, and the experienced employed (all measured in weeks) are intended to capture the role of market factors and the accumulation of labor market experience.

We can see that, once controlling for wealth, there are no significant differences between blacks and whites in terms of earnings mobility. The gap between the two becomes close to zero and turns out to be statistically non-significant. Furthermore, when we consider the social context of wealth accumulation, using family background information as an instrument of the lag of wealth, the same result applies. In Model 3, we find that blacks enjoy more earnings mobility than whites -although such a difference is not statistically significant. In any case, the results of Model 3 reinforce those of Model 2. If blacks and whites would own the same level of assets, they would enjoy the same opportunities for earnings acquisition across their life-courses.

4.2.2.- *Race, Wealth, and the Opportunities to Escape Low-wage Jobs*

The same rationale underneath the analyses of earnings mobility applies to the investigation of the opportunities to escape low-wage jobs. I estimate two models that are different only in one of the variables included in the vector of covariates. Model 2 includes the accumulated assets. Model 1 does not. In both cases, the analyses resemble the ones carried out in Section 3 in this chapter.

From the estimated parameters of the models in Table 5.6, we can see that the gap in the probability of escaping low-wage jobs among blacks and whites disappears once we control for wealth. Certainly, when we do not control for wealth (as in Model 1), the hazard rate of escaping a low-wage job is a 10% lower for blacks than for whites. When controlling for wealth, as in Model 2, the differences between blacks and whites cease to exist. The

Table 5.6.- Wealth, Race and the transition Out-of Low-wage jobs (I).

Variables	Model 1 Hazard Ratio (Robust Standard Error)	Model 2 Hazard Ratio (Robust Standard Error)
Race (Reference: white)		
- Hispanic	0,977	1,019
	(0,024)	(0,019)
- Black	0,887***	0,994
	(0,022)	(0,020)
Gini coefficient	2,10e-31+	7,66e-29++
	(6,74e-30)	(2,93e-27)
Gini square	4,52e+34++	4,09e+31++
	(1,63e+36)	(1,76e+33)
Experience		
- Out-of the labor force	0,9994***	0,9998++
	(0,0001)	(0,0001)
- Employed	1,0026***	1,0015***
	(0,0001)	(0,0001)
- Unemployed	0,9978***	0,9996
	(0,0003)	(0,0003)
Experience square		
- Out-of the labor force	1,000001*	1
	(2,92e-07)	(2,70e-07)
- Employed	0,9999987***	0,9999993***
	(8,30e-08)	(7,98e-08)
- Unemployed	0,9999997	0,9999958+
	(1,33e-06)	(1,70e-06)
Type of industry (Reference: Manufacturing)		
Agriculture, Forestry and Fisheries	0,542***	0,634***
	(0,034)	(0,040)
Mining	1,151***	1,026
	(0,051)	(0,037)
Construction	0,981	0,961+
	(0,019)	(0,016)
Transportation, Communication and Other Public Utilities	1,008	0,966+
	(0,019)	(0,015)
Wholesale and Retail Trade	0,746***	0,808***
	(0,016)	(0,015)

Variables	Model 1 Hazard Ratio (Robust Standard Error)	Model 2 Hazard Ratio (Robust Standard Error)
Finance, Insurance and Real State	0,938*	0,942**
	(0,022)	(0,018)
Business and Repair Services	0,812***	0,873***
	(0,018)	(0,016)
Personal Services	0,670***	0,719***
	(0,039)	(0,040)
Entertainment and Recreation Services	0,709***	0,742***
	(0,035)	(0,039)
Professional and Related Services	0,838***	0,896***
	(0,019)	(0,017)
Public Administration	1,104***	1,073***
	(0,024)	(0,018)
Age	1,012***	1,005**
	(0,002)	(0,002)
Age Square	0,99998***	0,999992***
	(2,18e-06)	(2,18e-06)
Number of years of completed education	1,038***	1,017***
	(0,004)	(0,003)
Cognitive Ability	1,003***	1,001***
	(0,0004)	(0,0003)
Lagged Assets (log)	-	1,047***
		(0,003)
N	2935	2688
Log-Likelihood	940789	640556
Wald Chi2 (df)	4210 (25)***	1667 (26)***

*** significant at $p < 0.001$; ** significant at $p < 0.005$; * significant at $p < 0.01$
+ significant at $p < 0.05$; ++ significant at $p < 0.10$

Table 5.7.- Wealth, Race and the transition Out-of Low-wage jobs (II).

Variables	Model 1 Hazard Ratio (Robust Standard (Error)	Model 2 Hazard Ratio (Robust Standard Error)
Race (Reference: white)		
- Hispanic	0,983	1,026
	(0,042)	(0,036)
- Black	0,823***	0,931+
	(0,028)	(0,027)
Gini coefficient	7,89e-18**	5,02e-30+
	(9,94e-17)	(1,40e-28)
Gini square	1,36e+19**	4,70e+32+
	(1,92e+20)	(1,47e+34)
Experience		
- Out-of the labor force	0,9995***	0,9994***
	(0,00014)	(0,00016)
- Employed	1,0023***	1,0016***
	(0,00007)	(0,00009)
- Unemployed	0,9992***	0,99956
	(0,0002)	(0,000312)
Experience square		
- Out-of the labor force	1,000001*	1++
	(2,31e-07)	(2,75e-07)
- Employed	0,9999989***	0,9999993***
	(3,58e-08)	(4,54e-08)
- Unemployed	1,000005***	1
	(6,31e-07)	(1,18e-06)
Type of industry (Reference: Manufacturing)		
Agriculture, Forestry and Fisheries	0,6978***	0,759***
	(0,013)	(0,020)
Mining	1,215***	1,062
	(0,030)	(0,041)
Construction	0,984	0,986
	(0,010)	(0,015)
Transportation, Communication and Other Public Utilities	1,021++	1,008
	(0,011)	(0,015)
Wholesale and Retail Trade	0,816***	0,860***
	(0,073)	(0,011)

Variables	Model 1 Hazard Ratio (Robust Standard (Error)	Model 2 Hazard Ratio (Robust Standard Error)
Finance, Insurance and Real State	0,935***	0,946*
	(0,015)	(0,020)
Business and Repair Services	0,873***	0,928***
	(0,088)	(0,012)
Personal Services	0,779***	0,774***
	(0,016)	(0,024)
Entertainment and Recreation Services	0,732***	0,740***
	(0,017)	(0,023)
Professional and Related Services	0,922***	0,948***
	(0,011)	(0,015)
Public Administration	1,063***	1,079***
	(0,015)	(0,020)
Age	1,010***	1,004***
	(0,0006)	(0,0009)
Age Square	0,99998***	0,999993***
	(8,18e-07)	(1,18e-06)
Number of years of completed education	1,054***	1,040***
	(0,005)	(0,005)
Cognitive Ability	1,004***	1,002***
	(0,0006)	(0,0005)
Lagged Assets (log)	-	1,020***
		(0,002)
N	2935	2688
Log-Likelihood	961496	645935
LR Chi2 (df)	15231 (25) ***	2945 (26) ***
Likelihood Ratio Test of $\theta = 0$ Chi-2 (df)	4,1e04 (1) ***	1.1e04 (1) ***

*** significant at p< 0.001; ** significant at p< 0.005; * significant at p< 0.01
+ significant at p< 0.05; ++ significant at p< 0.10

coefficient of the dummy variable "Black" is zero (and the hazard ratio is equal to one) and turns out to be statistically non-significant. This result implies that if blacks and whites had the same initial wealth at the time of starting a low-wage spell, they would enjoy the same opportunities to end up such a spell and transit towards a high-wage job.

This result holds even when controlling for unobserved heterogeneity. In Table 5.7, I have estimated the same equations of Models 1 and 2, now controlling for the possible existence of unobserved heterogeneity.

We can see from the estimated models that after controlling for unobserved heterogeneity, wealth is still an important determinant of the likelihood of escaping low-wage jobs. Starting a low-wage spell and having some assets is associated positively with the probability of ending such a spell. The effect of the proxy for intelligence on the hazard rate of transiting towards a high-wage job remains very low. An increase in the AFQT score of one unit (the range of the variable is 1-100) increases the hazard rate only by a 0.18%.

When controlling for wealth, the difference in the hazard rate between blacks and whites declines by a 10% -exactly the same decline observed when not controlling for unobserved heterogeneity (Models 1 and 2 in Table 5.6). However, taking into account the effect of unobserved heterogeneity, a gap between Blacks and Whites remains. This is not by any means because wealth does not help to close it. If a gap remains, it is because it becomes larger when controlling for unobserved heterogeneity. Certainly, wealth does exactly the same job in Table 5.7 as in Table 5.6. It works in the same direction and has the same magnitude. It closes the gap in the hazard rate escaping low-wage jobs by a 10%.

Which is the nature of the unobserved heterogeneity? Is it intelligence? Although Herrnstein and Murray (1994) argue that the AFQT's score measures intelligence, it is not clear whether that is the case. It could be that some unmeasured intelligence remains, which would be captured by the unobserved

heterogeneity. However, a comparison of Models 2 in Tables 5.6 and 5.7 points out that such an interpretation of the unobserved heterogeneity as intelligence is not plausible. The following two arguments can be raised against such interpretation:

i) The first argument is a "strong" version. If it were intelligence, the unobserved heterogeneity would be highly correlated with the measure of cognitive ability (the score in the AFQT Test). Therefore, the coefficient of the AFQT variable would turn out to be non-significant. However, as can be in Model 2 in Table 5.7, this is not the case. AFQT remains significant at a very high level of confidence (higher than a 99.999%).

ii) A second, less "extreme", version of the former argument is as follows. If the unobserved heterogeneity is some unmeasured form of intelligence, it should certainly be correlated with AFQT. However, the correlation needs not to be 100%. Even if they are correlated, they may not be perfectly multi-collinear and therefore the estimated coefficient of the AFQT may still be statistically significant. Nevertheless, for the interpretation of the unobserved heterogeneity as intelligence to be correct, the coefficient of the AFQT should decline substantially as compared to the model without unobserved heterogeneity (Model 2 in Table 5.6). However, that is not the case. The coefficient is almost the same both when and when not controlling for unobserved heterogeneity.

5.- Summary: *Self-Decommodification* and Persistent Inequalities

In this chapter, we have seen that assets do indeed matter. In section 2, it has been shown that there is a long-term relation between assets and earnings mobility. Owning wealth is associated with earnings mobility. In section 3, empirical evidence has been presented and discussed according to which wealth is an important determinant of escaping low-wage jobs. Given that blacks and whites are unequal in terms of their pattern of wealth holding, the

black/white earnings gap emerges at least partly from their lower initial endowment of wealth.

Certainly, the disadvantage that blacks face today is the result of their past economic situation. Their economic outcomes are the result of a process of "circular causality" that has made their disadvantage to become persistent. In the past, at the highest of discrimination and during the economic segregation, blacks had almost no opportunities to accumulate wealth. Their earnings were so low that they were at, and even below, the subsistence level (*vid*. Oliver and Shapiro 1995: Chapter 1). As a result, current generations of blacks have inherited modest amounts of wealth from their parents, and have find the buildup of wealth much more difficult than their white counterparts. Since assets ownership and life-chances are related, their economic opportunities have not improved so substantially as to catch up those of whites however the end of (at least the extreme forms of) discrimination.

In the 1940s Gunnar Myrdal (1944) wrote that the nature of the "American Dilemma" was one of a contradiction between the principles of democracy and whites' prejudices and discrimination against blacks. As Arnold Rose wrote in the condensed version of *An American Dilemma*:

> "All through this inquiry we have pointed out that what is important in the Negro problem is what is in the minds of white people, and that changes for good or evil in the Negro problem depend primarily on changes in people's beliefs and values. We have also seen that there is a great struggle in white people's minds –the struggle between the democratic ideals of equality in the American Creed and the obvious lack of equality in the treatment of the American Negro. This struggle we have called "an American dilemma" " (Rose, 1959: 312).

The "American dilemma" has a different nature today. Blacks do not fail to get ahead solely because of legal restrictions and discrimination. The low levels of wealth that blacks have accumulated work against their capacity to *decommodify* their living standards and invest in their personal development.

Appendix 5.1.- Descriptive Statistics

Earnings Mobility Models

	Mean	Std. Dev.
Lagged Earnings Rate (log)	1.358	.548
First Difference Assets (log)	.071	.733
Lagged Assets (log)	6.913	1.605
Age	320.599	26.316
Age squared	108264.3	17015.36
Gini	.427	0
Gini squared	.183	0
Cognitive ability	38.885	29.650
Number years comp. educ.	12.330	2.121
Experience out labor force	107.709	106.483
Experience working	357.920	153.184
Experience unemployed	44.582	51.379
Experience out l. f. squared	29914.6	56788.03
Experience w. squared	214952.4	136657.9
Experience unemp. Squared	6044.891	14069.94

Hazard Rate Models

	Mean	Std. Dev.
Gini	.433	0
Gini squared	.188	0
Experience out labor force	120.127	129.805
Experience working	460.517	165.124
Experience unemployed	51.350	56.169
Experience out l. f. squared	35513.09	71535.85
Experience w. squared	296567.3	158492
Experience unemp. Squared	6933.38	14868.22
Age	345.887	22.575
Age squared	123344.5	15826
Number years complet. edu.	12.62435	2.450
Cognitive Ability	40.565	30.022
Assets (log)	7.661	1.611

Table 5.1 Bis.- Wealth and Earnings Mobility (Models with valid cases in all the covariates and Sample size constant across the 4 specifications).

Variables	Model 1 Coefficient (Standard Error)	Model 2 Coefficient (Standard Error)	Model 3 Coefficient (Standard Error)	Model 4 Coefficient (Standard Error)
Lagged Dependent Variable	-0,557***	-0,562***	-0,582***	-0,613***
	(0,006)	(0,006)	(0,006)	(0,009)
First Difference Assets (log)	0,051***	0,048***	0,045***	0,108***
	(0,003)	(0,003)	(0,003)	(0,006)
Lagged Assets (log)	0,071***	0,065***	0,059***	0,185***
	(0,003)	(0,003)	(0,002)	(0,011)
Age	0,009***	0,009***	0,007***	0,004***
	(0,001)	(0,001)	(0,001)	(0,001)
Age Square	-0,00001***	-0,00001***	-8,80e-06***	-5,69e-06***
	(1,33e-06)	(1,33e-06)	(1,50e-06)	(1,66e-06)
Gini coefficient	-66,825+	-45,154	-69,347+	-132,713***
	(31,838)	(31,810)	(33,196)	(36,763)
Gini square	76,050+	52,502	78,643+	151,894***
	(35,991)	(35,955)	(37,474)	(41,534)
Cognitive Ability	-	0,002***	0,001***	0,00034
		(0,0002)	(0,0002)	(0,00022)
Number of years of completed education	-	-	0,016***	-
			(0,003)	
Experience				
- Experience Out-of the labor force	-	-	0,00005	0,0001
			(0,0001)	(0,0001)
-Experience Employed	-	-	0,0005***	0,00036***
			(0,0001)	(0,0001)
-Experience Unemployed	-	-	-0,00041+	0,0006064*
			(0,00021)	(0,0002275)
Experience squared				
-Experience - square Out-of the labor force	-	-	-1,01e-07	-1,36e-07
			(1,70e-07)	(1,68e-07)
-Experience - square Employed	-	-	-2,14e-07***	-1,64e-07+
			(6,26e-08)	(6,91e-08)
-Experience - square Unemployed	-	-	3,91e-08	1,64e-06++
			(8,56e-07)	(9,17e-07)
Type of industry (Reference: Manufacturing)				
Agriculture, Forestry and Fisheries	-	-	-0,296***	-0,334***
			(0,028)	(0,030)
Mining	-	-	-0,007	-0,0005
			(0,043)	(0,044)

Variables	Model 1 Coefficient (Standard Error)	Model 2 Coefficient (Standard Error)	Model 3 Coefficient (Standard Error)	Model 4 Coefficient (Standard Error)
Construction	-	-	-0,0289++ (0,0162)	-0,0307++ (0,0168)
Transportation, Communication and Other Public Utilities	-	-	-0,013 (0,016)	-0,013 (0,017)
Wholesale and Retail Trade	-	-	-0,126*** (0,013)	-0,103*** (0,013)
Finance, Insurance and Real State	-	-	0,023 (0,020)	-0,010 (0,020)
Business and Repair Services	-	-	-0,051*** (0,016)	-0,050** (0,017)
Personal Services	-	-	-0,152*** (0,031)	-0,110*** (0,034)
Entertainment and Recreation Services	-	-	-0,199*** (0,034)	-0,179*** (0,036)
Professional and Related Services	-	-	-0,066*** (0,015)	-0,035+ (0,015)
Public Administration	-	-	-0,013 (0,018)	-0,003 (0,019)
Race (Reference: white)				
- Hispanic	-0,012 (0,013)	0,025++ (0,014)	0,027+ (0,014)	0,030+ (0,013)
- Black	-0,041*** (0,012)	0,015 (0,013)	0,006 (0,014)	0,021 (0,014)
Constant	13,235++ (6,939)	8,284 (6,934)	14,055+ (7,271)	27,717 (8,049)***
R-square	26%	27%	28%	23,7%
N	3171	3171	3171	3171

*** significant at p< 0.001; ** significant at p< 0.005; * significant at p< 0.01
+ significant at p< 0.05; ++ significant at p< 0.10

CHAPTER 6

CONCLUSIONS:
ASSETS, *SELF- DECOMMODIFICATION*, AND EQUALITY OF OPPORTUNITY

The *motto* of this thesis has been to make a contribution to the literature on social stratification and mobility by explaining individual's heterogeneity in life chances. This literature has been focused on empirical and methodological issues, leaving the explanation of the stratification process relatively unattended. I hope that this contribution helps to rebalance the literature by showing the virtues and implications of unpacking the process by which life-chances are generated.

The purpose of this last chapter is twofold. Firstly, I wish to summarize the argument, substantiate how the different chapters of this study have contributed to evaluate its plausibility, discuss the main conclusions of the thesis, and address its limitations. This task will be carried out in the first section of the chapter. Secondly, I wish to draw the implications of the argument. I will point out that the argument developed in the thesis provides the micro-foundations for a Weberian theory of social stratification and mobility, and supplies some behavioral grounds for a growing body of sociological research on the relation between wealth and

social stratification (*vid*. Spilerman, 2000 and Keister, 2002 for a review). Moreover, I will argue that the argument provides the basis for the analysis of the interrelation between market economies and (in)equality of opportunity. These implications are developed in sections two and three of the Chapter.

1.- Opportunities in Imperfect Economies

The argument of this thesis establishes that the economic resources individuals are endowed with have implications for their economic opportunities. The link between the two arises from the institutional underpinnings of market economies. To put it succinctly, the argument goes as follows. As a result of market imperfections, and more particularly the distinctiveness of capital and insurance markets, the variability of individuals' life-chances is related to the initial assets they posses. In Chapter 2, I have explored how the institutional underpinnings of market economies may give rise to divergent mobility opportunities. As a byproduct of the organization of market economies, particularly the imperfect nature of credit markets and the absence of most insurance markets, poor individuals face much more severe trade-offs than the wealthy if they decide to invest in mobility. The trade-off between present sacrifices and future benefits of mobility investments works to their disadvantage.

This argument stands in contrast to other explanations of life-chances *à la* Herrnstein and Murray (1994). Taking into account the institutional underpinnings of markets, I have argued that explanations that attribute opportunities to individuals' intelligence suffer from serious deficiencies. Although intelligence may help individuals to improve their life-chances, it is just one factor among others. Intelligent individuals have to overcome and solve the same kind of trade-offs between future opportunities and present sacrifices that characterize mobility investments. That is not to suggest that intelligence is an irrelevant factor for gaining

access to a successful career. However, intelligence alone is not enough.

Part II conveys a good deal of evidence in support for the argument that assets do indeed matter. I will summarize the empirical evidence presented in the thesis by starting from Chapter 5 and then proceeding backwards. In particular, the empirical evidence presented in Chapter 5 provides us with the final picture in support of the leading story of the thesis. Assets are indeed shown to be associated with the opportunities for earnings acquisition in the labor market in two ways. Both the mobility of earnings as well as the probability of ending up a low-wage-job spell are associated with the initial level of assets. In the context of the error correction models presented in Section 2, a long-term relation between (past or accumulated) wealth and (future) earnings mobility has been found. Similarly, in the context of the hazard rate framework of Section 3, evidence has been shown that starting a low-wage spell job with some accumulated wealth does indeed increase the chances of ending up such a spell by making a transition towards a non-low-wage job.

Especially revealing of the explanatory power of the argument has been the analysis of the Black/White earnings gap. As discussed in Chapter 5, the explanation of the Black/White Earnings Gap constitutes an *experimentum crucis* for the argument developed in this thesis. If blacks and whites are unequal in terms of their pattern of wealth ownership, as it has been shown in this thesis (Section 4 of Chapter 4) and in Oliver and Shapiro (1995), and if assets do indeed matter, we should expect blacks and whites to display different opportunities for earnings acquisition in the labor market. To put it differently, if the argument of this thesis is correct, given that blacks and whites are unequal in terms of their initial endowment of wealth, blacks should realize less successful earnings careers. In a regression context, for the argument to be accurate, the black-white gap inequality of earnings mobility should be reduced once wealth differences are held constant. If the heterogeneity of opportunities for earnings acquisition among blacks and whites emerges, at least partly, from their different

initial wealth endowment, once this last variable is controlled for, the gap should become substantially reduced. Otherwise, the argument would not have explanatory power and therefore would not be correct.

Incidentally, this explanation of the Black/White Earnings Gap is quite novel. At least to my knowledge, no explanation as such has been proposed in the literature. Following the path-breaking study of Oliver and Shapiro (1995), many empirical analyses have shed light on the racial differences of wealth ownership, particularly the unequal pattern of assets holding of blacks and whites. However, there is no study on the consequences of this unequal pattern of wealth. Wealth inequality among blacks and whites has been the *explanandum* of several empirical investigations, but no study has elaborated it as an *explanans* of the black/white earnings gap. There is a good deal of empirical evidence on the *causes* of the black-white wealth inequality, but the actual as well as the potential *consequences* of such an inequality are yet to be explored.

In this spirit, two pieces of evidence show that the argument stands against this relevant piece of research. Both an analysis of earnings mobility and an analysis of the transition out of low-wage jobs allow concluding beyond reasonable doubt that the gap between blacks and whites in the opportunities for earnings acquisition in the labor market is related to their initial assets. Indeed, after controlling for wealth, the differential between the two groups decreases substantially. These results reinforce our expectations about the relation between assets and individuals' opportunities for earnings acquisition.

In Chapter 5, two outcome variables have been shown to be related with individuals' opportunities for earnings acquisition, i.e. earnings mobility, and transitions out of low-wage jobs. However, these two variables are not randomly assigned to individuals. It remains necessary to analyze the intermediate processes. Chapter 4 was devoted to such task. The empirical evidence it offers has revealed that the accumulation of wealth and the acquisition of education are not the result of a "natural" characteristic such as

cognitive ability, but rather that the process by which they become allocated to individuals is, to some extent, *designed* or shaped by the way assets are both initially distributed and accumulated along the road.

Chapter 4 shows that net of the effect of cognitive ability and the externalities generated by parents' "cultural capital", the income of the family is related with the education that children attain. In addition, an interaction between the parents' income and the child's cognitive ability has been found. This last variable (cognitive ability), it has been argued, may be a good signal from which parents form their beliefs about the probability of success in the educational system of their children. The interaction of the two variables has been aimed to control for the fact that, in the case of non-wealthy parents, the probability of success of their children might be a crucial factor for them to assume financial sacrifices. In other words, only if they have information revealing a high likelihood of ability of their children, will they assume the financial burden associated with educational investments. This variable, the interaction between parents' income and the child's AFQT score, has been found to be significantly associated with the two measures of the maximum education level attained, i.e. maximum educational level attained, and the number of years of completed education. When the process of educational attainment has been disaggregated into two transitions (i.e. drop out from high-school vs. continue to the next educational level, and drop out from regular school before completing university vs. continue in education until obtaining a college degree), such family *calculus* has been found to be crucial for the transition to college, i.e. for obtaining a college degree vs. leaving the educational system once high school has been completed. Since the financial effort that families have to assume in order to meet the costs of a college education are much higher than those involved in completing high-school, these results clearly indicate that the higher the cost of obtaining education, the more salient the calculus highlighted by our theoretical approach.

Chapter 4 has additionally analyzed the process of wealth accumulation. As I wrote above, in principle, individuals may escape borrowing constraints by building up wealth. They may readjust their consumption and savings plans in order to accumulate wealth. However, assets accumulation "does not do the trick". Not all individuals are equally prepared to accumulate wealth. The main conclusion of the analysis of wealth mobility has been that the socioeconomic characteristics of individuals, together with the intergenerational transfers that they receive from their parents, drive largely the process of wealth accumulation. Furthermore, being endowed with cognitive ability does not help much to accumulate assets. Once we take into account the economic context and conditions under which wealth becomes accumulated, the measure of cognitive ability turns out not to be a good predictor of the accumulation of wealth. Achieved characteristics such as education, income, and the size of one's own family, are an important determinant of the accumulation of wealth. In addition, ascribed factors, particularly the intergenerational transfers individuals obtain, become crucial for building wealth up. The Black/White wealth mobility gap has proved to be particularly revealing of the nature underneath the process of wealth accumulation. After estimating models with several specifications, we have seen that the gap arises from two sets of socioeconomic characteristics. Firstly, the lower average income of Blacks, together with a higher average family size, explain part of the gap. Secondly, intergenerational transfers have also given rise to the lower opportunities for wealth accumulation of Blacks in the US.

At this point, let me emphasize that the conclusions summarized above do not require that economic resources are the only source of individuals' different economic opportunities. The evidence presented in Chapter 4 shows that the externalities generated by social contexts are extremely important. Furthermore, as shown in Chapter 3, if we do not take into account *externalities*, since they are correlated with assets, we would attribute all the variability of mobility opportunities to the former

and therefore obtain biased results about the relation between assets and opportunities. Indeed, the externalities generated by parents' education have been proved to be extremely important for children's educational attainment. Children with educated parents enjoy a "home advantage" which facilitates their educational attainment. Similarly, from a life-course perspective, it has been shown that the human capital that is obtained at one stage of the life-course has *externalities* over later stages. The education acquired in previous stages of individuals' life courses is related to the human capital that is obtained later in life. Evidence has been presented in Chapter 4 that illustrates the process whereby those more educated obtain more on-the-job training.

Although *externalities* matter, we should not throw the baby out with the bath water. They do not rule out the effect of assets. For this matter, substantive evidence has been produced in Chapter 4 to prove that, after controlling for parents' education and cognitive ability, parents' economic resources remain an important determinant of educational attainment.

Therefore, assets ownership does indeed matter. In addition, the effect of assets may give rise to a cumulative process. The influence of the economic resources is not limited to its implications at one point in time in peoples' lives. Its effect becomes spread from previous to latter stages in individuals' life-courses, linking, and sometimes amplifying, the effect of scarce economic resources at one stage of the life-course over the subsequent ones. In other words, the effect of the initial assets is not the relation of economic resources at a point in time, but its cumulative effect over time. Evidence in support of this point has been presented in Chapters 4 and 5. In particular, a clear instance of such a cumulative process is to be found the intergenerational dimension of wealth accumulation and the persistent disadvantage of blacks in the US.

The very same nature of the life-course, which, in Mayer's (2003) words, is a *self-referential* process, contains tendencies that work in such a way as to perpetuate the effect of the initial conditions that individuals face. In addition, the working of

markets, under some conditions, not only perpetuates but also amplifies the effect of former conditions in peoples' histories. Viewed from a life-course perspective, the effect of the initial assets bears a resemblance to what Gunnar Myrdal (1957: Chapter 2) called a process of *circular cumulative causation*. The persistent disadvantage of Blacks is an example of the working of such a process. Current generations of Blacks face an Earnings Gap as compared to Whites. This inequality has its roots in the social history of former generations of blacks in the US. A (cumulative) process links the economic conditions faced by generations of Blacks. The concatenation of factors giving rise to such a process is as follows. Former generations of Blacks faced discrimination, economic segregation and other economic conditions that worked against their capacity to build up wealth. As a result, current generations have received at best modest intergenerational transfers and, consequently, have been less prepared to accumulate wealth. This, in turn, has had implications for their opportunities for earnings acquisition in the labor market. Since wealth, by providing a safety net, allows individuals to undertake actions to invest in their personal development and improve their socio-economic status, Blacks have been relegated to insufficient opportunities.

<div align="center">***</div>

Before I conclude the summary of the main findings of the dissertation, let me address a few issues regarding the scope and limitations of the thesis. This research has aimed at uncovering the *social fabric* of opportunities. In order to do so, its research design required the *institutional fabric* to be held constant. Institutions have been frozen in order to improve our understanding of the *socioeconomic fabric* of opportunities. Therefore, in a strict sense, these conclusions cannot be extended beyond the institutional setting within which they have been established. Although the following comment is more speculative than scientific, *a priori* there is no reason to expect such a relation to vary across countries. If the results that I have found parallel

those established in the intergenerational mobility research, the existence of such association between the initial endowment of assets and the future opportunities individuals enjoy should be different across countries with different institutional settings only with regard to the strength of the association, but not in its very existence. In any case, this question should be the matter of a future research agenda, in which the unit of analysis should not be the individual *within* a particular institutional arrangement, but countries displaying different institutional settings[78]. To be sure, new research endeavors are necessary in order to unravel the *institutional fabric* of opportunities, i.e., to explain how institutions such as welfare systems, (re)distribution, educational systems, etc. are related to the opportunities individuals gain access to. A recent paper by Roemer *et al.* (2003) is one example of an approach to dealing with how taxes and transfers regimes equalize opportunities for income acquisition across countries. Unfreezing the assumption of a "given set of institutions" opens up a new avenue of research.

Secondly, I would like to draw attention to one limitation of this study that requires further research. This thesis has shown that the accumulated assets are related to lifetime economic opportunities, namely earnings mobility and the likelihood of escaping low-wage jobs. Two main mechanisms have been identified as the drivers of such association. The first one is that wealth allows individuals to invest in what I have called "Mobility Enhancing Assets". The second one is that, once individuals are equipped with a safety net, which wealth provides them with, they become prepared to exert risk-taking behavior. In the thesis, I have not provided direct empirical evidence that this is actually happening. I have shown that one type of MEA is related to the stock of economic resources that individuals posses, namely education. But I have not studied the relation between wealth and risk-taking behavior. Needless to say, this is especially difficult

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[78] V*id.* Mayer (1997) for a discussion on the design of comparative life-course research.

since risk attitudes are not directly observable and cannot be captured in large-scale surveys. Rather, they require a different strategy, namely the design of small scale and in-depth experiments –which also have limitations of their own (*vid*. Heckman and Smith, 1995).

Finally, I would like to qualify a second aspect of the research design. In order to avoid the interaction of mobility and fertility choices, with the subsequent complexity that it would introduce in the analysis, I have restricted the statistical analyses to the investigation of men's opportunities for earnings acquisition. The application of the argument of the thesis to women's economic opportunities may open an important line of research on how assets ownership may help women to gain access to a successful economic life. One example of the possibilities of the application of this argument is the case of low-wage women who are single-mothers. There is substantial empirical evidence on the difficulties that single mothers in the US have in order to "make ends meet". Indeed, Edin and Lein (1997) have shown evidence from in-depth interviews revealing that the consumption requirements that supporting a family on their own entail, together with the lack of affordable health insurance and child care for single mothers at work, trap them in an economic position that is at best just on the subsistence level. Obviously, these women cannot undertake investments in MEA that would improve their life-chances. Should they have access to a stock of economic resources, namely assets or wealth, they could rely on it in order to undertake those investments in their personal development. If they do not own any, they will be relegated to an economic life around the subsistence level, sometimes above, more often below.

2.- Wealth and Social Stratification and Mobility: Making Social Strata and Opportunities Endogenous

As far as the process of stratification is concerned, this thesis conveys a clear message that can be summarized as follows.

Wealth provides individuals with a safety net that in turn stimulates their risk-taking behavior. Individuals, in the absence of market mechanisms, rely on their stock of accumulated resources, their wealth, in order to *tailor* their opportunities. Needless to say that, in order to do so, they need to have wealth. If they have none, their living standards remain *commodified*. And such a status, in turn, has implications for the future opportunities that they enjoy. Since wealth is associated with future economic opportunities, assets or wealth have *stratifying* effects. The stock of economic resources an individual possesses is related with the opportunities she enjoys. This finding has both positive and normative implications. I develop them in this and the following sections.

Let me start with the implications for a positive theory of social stratification. The argument summarized above lays down the micro-foundations through which wealth ownership gives rise to economic opportunities.

As emphasized in a growing body of sociological literature (*vid*. Oliver and Shapiro, 1995; Keister, 2000, 2002; Spilerman, 2000; Shapiro, 2001; Edin, 2001), wealth is particularly relevant for an understanding of the stratification processes and the origin in the heterogeneity in people's life-chances. As Spilerman (2000: 518) has put it "a consideration of wealth becomes relevant once the agenda of the field is enlarged, from a focus narrowly on labor market success and its rewards to a concern with living standards and economic security".

This point has not been fully developed in the literature yet. In this perspective, a major implication of this thesis is that the argument provides some basis for the elaboration of a theory of class emergence. More particularly, the argument provides some behavioral foundations for a (Weberian) theory of social class emergence by explaining it as the result of individual action (Elster, 1989).

For Weber (1978 [1921]), a social class is a group of individuals who hold common *life chances* generated in the market. More precisely, an aggregate of individuals constitutes a social class when "(1) a number of people have in common a

specific causal component of their life chances, insofar as (2) this component is represented exclusively by economic interests in the possession of goods and opportunities for income, and (3) is represented under the conditions of the commodity or labor markets" (p. 927). In other words, a social class is, firstly, a group of individuals who hold common *life chances* generated in the commodity and labor markets. And secondly, the enjoyment of those life chances is not the outcome of a random process, but a consequence of the resources that the individual is *endowed* with. Hence, those individuals who obtain the same *life chances*, that are a consequence of their *endowments*, configure a social class.

By establishing a causal link between individuals' endowments and their life-chances, the argument of this dissertation provides us with the basis from which to develop theory of the emergence of *social classes* –in a conception of *classes* as *life conditions* in the sense of Sorensen (2000). Moreover, this thesis is in itself an example of the benefits from developing explanations based on rational action theory, combined with the analysis of large-scale statistical analyses (Goldthorpe, 1996b). The formal model developed in Chapter 2 was necessary to establish the mechanisms through which individuals' initial assets are related to their life-chances. It established a causal link between individuals' life chances and their initial wealth, between "the possession of goods and opportunities for income […] under the conditions of the commodity or labor markets" (Weber, 1978: 927). As a result, it lays down the behavioral foundations for a Weberian theory of class emergence.

3.- Assets, *(Self)Decommodification* and Equality of Opportunity

In establishing a relation between the institutional underpinnings of markets and the opportunities for earnings acquisition, this dissertation has also provided the basis from which to evaluate the determinants of equality of opportunity. It

has departed from a focus on *outcomes* towards one in which the *process* that generates them is at the core of the analysis. This analysis is crucial in order to determine one of the questions that opened up this dissertation, namely why *formal* and *effective* equality are not equivalent: why all individuals do not take advantage of the legal openness of societies in order to improve their economic status. Furthermore, an understanding of the process generating mobility outcomes becomes crucial for evaluating how *fair* such result is. If we do not know the process, the *fabric* underneath those associations, we cannot discern whether it is (un)fair. This brings me to the second, more normative, set of implications of the thesis.

Certainly, just as it is not possible to understand the significance of people's actions until we know the state of affairs which influences them, so we cannot evaluate the *fairness* of social arrangements until we know the circumstances which brought them into existence. In other words, an understanding of the process generating individuals' heterogeneity of mobility opportunities is a *sine qua non* to the study of the social (in)justice of the inequality of mobility outcomes. In this thesis, by making explicit the imperfections of markets in which economic decisions are undertaken, together with the elaboration of the choices individuals can embark on in such a context, a relation has been established between individuals initial assets and their future opportunities.

Indeed, the ethical insight at the core of the current debates of the theories of distributive justice is that society should care about those inequalities that arise from circumstances individuals are not *responsible* for. All the theories of distributive justice produced since Rawls (1971) share the conception that justice requires some kind of egalitarianism. The divergence among them stems, to paraphrase Sen (1980), from their answers to the question "Equality of what?". Since the publication of Dworkin (1981a, 1981b), the debate has concluded that the notion of *responsibility* is crucial for the determination of equality of opportunity. This insight is at the center of the contributions of Dworkin (1981a,

1981b) Arneson (1989) and Cohen (1989). Society should correct those inequalities which arise from those circumstances that individuals face but are not responsible for. To put it in Roemer's words (1998: 2): "there is in the notion of equality of opportunity a "before" and an "after": before the competition starts, opportunities must be equal". Society should equalize the playing field. Once such task has been carried out, individuals are on their own and are responsible for the attainment of a successful economic life.

The plurality of theories of distributive justice arise from the existence of different conceptions of where to draw the "frontier" that establishes the border between those factors that are under a person's control from those outside her command. This thesis, by establishing a relation between the initial endowment of wealth and the future ability to generate income in the labor market has helped out to visualize such a "frontier". Given the market imperfections described in this thesis, wealth provides individuals with a safety net which, in turn, helps them to undertake investments in their personal development. In other words, in the absence of a welfare state providing complete insurance against lifetime income risks and the randomness of opportunities, wealth allows its owners to *(self)decommodify* their living standards, stimulates their risk-taking, and makes their lifetime careers safer and more successful.

The obvious implications of this finding is that, if we want to hold individuals to be responsible for the risk-taking behavior that they exert, an insurance device protecting individuals from lifetime income risks should be established. Otherwise, if, given the institutional underpinnings of markets, wealth inequality matters for the opportunities individuals enjoy, and if their endowment of wealth is the result of circumstances to a large extent beyond their control, e.g. inheritance, the rich and the poor will not enjoy the same access to advantage and consequently equality of opportunity may not be achieved.

This idea, namely that some sort of insurance device is needed in order to provide individuals with a safety net which in turn

stimulates individuals risk-taking behavior and results in the enhancement of their economic life-chances, has important policy implications. Certainly, this is the idea behind debates on the welfare state, and more particularly Sinn (1995)'s theory of the welfare state as an insurance device that, by producing safety and making lifetime careers safer, increases individuals' risk-taking behavior. Sinn's proposal consists of developing redistributive taxation on wealth with the aim of providing individuals with lifetime insurance.

A similar principle underlies the current debates and proposals on assets building in the US as a way to improve people's opportunities to escape poverty. This literature has been developed to a large extent after Sherraden (1991)'s *Assets and the Poor*. Oliver (2001: xi) has summarized the bottom line of this perspective as follows:

> "antipoverty policy […] has tended to emphasize efforts to increase income to some predetermined minimum level as the "magic bullet" that will solve poverty problems. But that approach builds on the common misconception that poverty is simply a matter of low income or low levels of consumption. Several critiques of this approach to poverty alleviation have pointed out that its emphasis on income ignores key causes of inequity, overlooks the consequences of low asset accumulation, and fails to address long-term stability and security".

The conventional wisdom in poverty research and policy is that poverty is a question of low-income. In Shapiro and Wolff (2001: 2) words "the traditional assumption that governs our thinking [in poverty evaluation] is that income and labor markets constitute virtually the entire poverty story". This thesis has provided the grounds that justify the importance of assets or wealth as a source of *decommodification* of individuals' living standards. Assets provide individuals with opportunities to protect their living standards, smooth their consumption streams, obtain income security, and invest in their economic future. A growing literature is emerging in the US that focuses both in theoretical

issues regarding the determinants of the accumulation of assets by the poor (Beverly and Sherraden, 1999; Edin, 2001; Carney and Gale, 2001), as well as on the design of institutional mechanisms aiming at encouraging assets accumulation for the poor (Seidman, 2001; Sherraden, 2001; Stern, 2001). This thesis has made explicit the reasons on the basis of which these policies and proposals are to be taken as sound.

<center>***</center>

As a final point, I would like to conclude the discussion of the two implications of the argument of this thesis, namely a Weberian theory of stratification and the normative implications, by arguing that they are not isolated. On the contrary, a link between the two may be established. In other words, social stratification and mobility research is called to become relevant from a normative perspective, from the point of view of the theories of distributive justice. As Swift (2000) has argued, mobility research has been focused on the (in)equality of position. However, for those inequalities to be relevant from a normative point of view, a relation must be established between such an (in)equality of position and (in)equality of opportunity. This is mainly because the process behind stratification and mobility outcomes is not well understood. If we do not know how these associations come about, if the underlying process behind the inequality of position remains unknown, then the extent to which social arrangements are *fair* or *unfair* cannot be evaluated. However, if a theory of social stratification is to be formulated such as to establish a link between a set of dimensions of individuals' socioeconomic circumstances that are beyond their control and their life-chances, social strata would reflect not simply inequalities of position, but also those of opportunity. If the emergence of social classes, in the Weberian perspective developed in Section 2, is related to circumstances that individuals face but are not responsible for, namely the initial endowment of assets, then the very existence of social classes suggests that inequality of opportunity is actually at work.

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In establishing a relation between assets ownership and economic life-chances, this thesis reveals that the "playing field" is far from level, and this is because of market imperfections. In other words, not all individuals enjoy the same *opportunities* - in the sense of Cohen (1989) as "access to *advantage*". This insight, which has been revealed after the process of stratification has been analyzed, has implications for the emergence of social strata in market economies, as well as for the size of the gap between *formal* and *effective* equality. For these reasons, I would like to close this dissertation with a *plea* for a growing focus on the analysis of processes and mechanisms in stratification research.

DATA APPENDIX

In these pages, I present a description of the data base, the sample, and the variables used in the statistical analyses in Chapters 4 and 5.

1.- Original Data Set

The data set used in the statistical analyses in this dissertation is the *National Longitudinal Survey of Youth*. This data set is conducted at Ohio State University under the sponsorship of the U.S. Department of Labor. This data set collects information regarding labor market experiences, investments in education, family structure, family background, and other variables, for individuals aged 14 to 21 in 1979. This is an ongoing panel that collects information for a sample of 12686 young men and women from January 1978 to December 1998 on a yearly basis. The interviews have taken place yearly from 1979 until 1994 , and every two years from then on (1996 and 1998), collecting information retrospectively.

The original data set includes three sub-samples: i) a random sample of 6111 young people, ii) a set of supplemental samples designed to over-sample civilian Hispanic, Black, and non-Hispanic non-Black population covering 5295 youth, and iii) a military sample of 1280 individuals designed to represent the population serving in the military.

I have not included in the data sets that I have generated neither the military sample, nor the over-sample of disadvantaged Whites due to some drawbacks and statistical problems in those samples. As discussed in the main text of the dissertation, in order to avoid the interaction between mobility and fertility choices, I

have restricted the analyses to the labor market experiences of males. This brings the sample size to 4837 males. As in any longitudinal survey, individuals do not respond to all interviews. I have included in the analyses those individuals who have missed only three or fewer of the interviews in the period 1978 to 1997. This entails a 15% reduction of the sample, which includes 4138 males.

2.- Constructed Data Sets

I have reorganized the original data in a form that is conductive to statistical analyses. The raw data has the following format. For every interview year, the substantive variables (e.g. education, labor market status) are accompanied by a set of variables regarding i) whether, with respect to the previous interview year, the individual has experienced any change in her status (e.g. has completed college education), and ii) the starting and ending dates (month and year) of those changes. For some variables, it is possible to determine their value at the month level. For some others, only yearly information is available.

From these data, I have generated three data sets. These correspond to the type of analyses that I carry out in the dissertation: event-history models, time-series cross-sectional or panel data analyses, and analyses of educational attainment using a cross-section of the panel.

2.1) Monthly time-series cross sectional data set

I have created monthly time-series for each individual. I have used this data set in the statistical analyses on transitions from low- to high-wage jobs in Chapter 5. From this dataset, spells in the various positions in the labor market has been generated for every individual in the sample.

2.2) Yearly time-series cross sectional data set

Using the summary yearly information produced by the staff of the Center for Human Resources of Ohio State University, I have generated a panel database in with the time unit is the year. I have used this data set in the econometric analyses on earnings mobility presented in Chapter 5, as well as in some of the analyses of Chapter 4 (Section 2 on earnings mobility and Section 4 on assets accumulation).

2.3) Cross-section with the last year's information

Using the information available in the last wave of the panel, a cross-section has been obtained. It records, among other variables, the maximum educational level achieved, and it provides the data for the analyses on educational attainment in Chapter 4. In addition, it includes independent variables that are time-invariant and were measured previously: parents' income, number of siblings, parents' education, a measure of cognitive ability and race. In order to have information on parents' income, I have limited the analysis to individuals who were aged 13 to 16 as of January 1978.

3.- Information about the variables

The NLSY provides with a wide array of variables that can be grouped as follows:

- Demographics: race (Black, Hispanic, non-Black and non-Hispanic (hereafter Whites)), age.
- Education.
- Family of origin: parents' income; number of siblings; parents' educational level.

- information regarding the current family of the individual: assets holding, family income, family size.

- Labor market experiences: labor market status (out-of-the labor force, unemployed, low-wage, high-wage), total annual earnings, total number of hours worked every year, type of industry.

The variables that I have used in the analyses in this dissertation are detailed below. A note applicable to all the economic variables is the following one. Unless otherwise specified, all the economic variables are adjusted for inflation and measured in constant 1978 US Dollars.

- **Earnings rate**. Measured yearly. This variable is the result of dividing the total earnings obtained by the individual in the year at which it is measured into the total number of hours worked in that year.

- **Age**. It is a time-varying variable that measures the age in months since birth.

- **Race**. Time-invariant variable. The categories are: Hispanic, Black, non-Hispanic and non-Black (I refer to this last category as White).

- **Parents' income**. Time-invariant variable. It is a time invariant variable. Measured at the first wave of the panel. It is a variable that measures all the income received in the parents household at a point in time (1978).

- **Number of siblings**. Time-invariant variable. This variable was measured in 1979 and measures the respondent's number of brothers and sisters.

- **Mother's educational level**. Time-invariant variable. It is a categorical variable with three categories: high-school dropout, high-school graduate, college graduate.

- **Father's educational level**. Time-invariant variable. It is a categorical variable with three categories: high-school dropout, high-school graduate, college graduate.

- **Individuals' number of years of completed education**. Measured yearly. It is a continuous variable whose name is fully self-explanatory.

- **Educational level**. Measured yearly. Categorical variable. The categories are the same as in the variables mother's and father's educational level: high-school dropout, high-school graduate, college graduate.

- **Armed Forces Qualifying Test (AFQT)**. Measured at one interview (1980). This is a variable created from the raw scores of a battery of questions included in a more general test, the *Armed Services Vocational Aptitude Battery (ASVAB)*. More particularly, this is the AFQT80 generated by the staff of the Center for Human Resources at Ohio State University. It consists of percentile scores obtained from the combination of the following sections of the ASVAB: Section 2 (arithmetic reasoning), Section 3 (word knowledge), Section 4 (paragraph comprehension), and one half of the score from Section 5 (numerical operations).

- **Assets**. Measured yearly. The variables measuring assets ownership have not been asked every year. The most complete variable is the one named "Amount of Money Assets". This variable is a measure of the total value of money assets owned by individual. This variable is measured from the 1985 interview onwards, with the exception of the year 1991. As I wrote in the text, this is the only variable of assets that I have used in the analyses in the dissertation. Two are the reasons for doing so. The first one has to do with data availability. The series are far more complete for this variable than for the rest variables on assets holding. And secondly, it is a measure of the amount of *liquid* assets that individuals own. Since the argument of this thesis is concerned with the protection that assets may provide against unexpected , liquid assets seem to be better at providing consumption smoothing than non-liquid assets because they can be immediately used.

- **Family income**. Measured yearly. This variable is provided by the NLSY staff. It is a summary variable of all the income

received in the household. Do note that no items are subtracted from this variable to account for tax adjustments.

- **Family size**. Measured yearly. It is the total size of the family. It is measured as the number of individuals living in the household qualifying relations by blood, marriage, and adoption.

- **Off-the-job training**. The dependent variable is the accumulated time (measured in years) that the individual has spent in off-the-job training programs in the year at which it is measured. For the time spent in those training programs to be included in the variable, such program needs to have been completed. The activities included in the category off-the-job training consist of the courses received in business colleges, barber or beauty schools, nursing schools, vocational and technical institutes, and correspondence programs.

- **On-the-job training**. The dependent variable is the accumulated time (measured in years) that the individual has spent in training classified as "on-the-job training" in the year at which it is measured. For the time spent in those training programs to be included in the variable, such program needs to have been completed. The activities considered as on-the-job training consist of company-provided training.

- **Gini coefficient**. Measured yearly. This variable is not an individual- but an aggregate-level variable. It is the Gini coefficient of the distribution of household income in the US. The time-series are the following ones:

Year	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*
Gini	.402	.404	.403	.406	.412	.414	.415	.419	.425

Year	*1987*	*1988*	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*
Gini	.426	.427	.431	.428	.428	.434	.454	.456	.450	.455	.459

Source: US Census Bureau, *Current Population Survey, Annual Demographic Supplements*, (several years).

- **Experience out of the labor force**. Measured yearly. It is the cumulative number of weeks that the individual has spent out of the labor force until the date of the interview at which this variable is measured.

- **Experience unemployed**. Measured yearly. It is the cumulative number of weeks that the individual has spent in the labor force and unemployed until the date of the interview at which this variable is measured.

- **Experience employed**. Measured yearly. It is the cumulative number of weeks that the individual has spent in the labor force and employed until the date of the interview at which this variable is measured.

- **Type of industry**. Measured monthly. It is the type of industry in which the responded worked. The original variable is coded according to the 3-digit classification of industries. Following the 1970 *Census of Population*, the industries have been grouped into the following categories:

- Agriculture, Forestry and Fisheries.
- Mining.
- Construction.
- Manufacturing.
- Transportation, Communication and Other Public Utilities.
- Wholesale and Retail Trade.
- Finance, Insurance and Real State.
- Business and Repair Services.
- Personal Services.
- Entertainment and Recreation Services.
- Professional and Related Services.
- Public Administration.

- **Labor market status**. Measured monthly. As explained in Chapter 5, the NLSY provides data that allow us to track individual's labor market status every month: out-of the labor force, unemployed, and employed. Besides, from the information on the wage rate the individual is paid in his current job, at each

month, it is possible to determine whether the individual is employed in a low- or in a non-low-wage job. Low-wage jobs have been defined as those in which the wage rate is lower than two thirds of the median of the distribution of male earnings working full-time. To sum up, every month, individuals occupy one, and only one, of the following states:

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  o Out-of-the labor force
  o Unemployed.
  o Employed in low-wage job.
  o Employed in a non-low-wage job.

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