The Misallocation of Talent

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Abstract:
I explain why the market does not provide an efficient allocation of talent to tasks. I also explain why we should expect more social mobility to go in parallel with a more efficient allocation of people to tasks.

According to a popular joke, Heaven is supposed to be a place where cooks are French, policemen are British, mechanics are German, lovers are Italian, and bankers are Swiss. Hell, on the other hand, is supposed to be the place where cooks are British, policemen are German, mechanics are French, lovers are Swiss, and bankers are Italian. The joke clearly reflects stereotypes, but—and this is why I mention it here—also the common view that the allocation of people to tasks makes a difference. I will argue that the allocation of talents to tasks is an important determinant of the level of productive efficiency of a society. Individuals differ in their abilities. Jobs differ in their demand of abilities. It follows that not all allocations of people to tasks are efficient. We would like to know how to match people to jobs, and we would like to know if the market does the sorting in an efficient manner.

It is easy to see that the first best allocation of people to tasks is the one in which each individual specializes in the task over which she has a *relative* advantage and trades with the others, exchanging her production for the production made by others. It is exactly the same as in a traditional Ricardian story of trade between countries, only you should substitute countries for persons. The same logic applies.

An example can be useful. Imagine that Mr. Notbright is the least talented person in society. Poor Mr. Notbright would be the worst carpenter, the worst cook and the worst in every conceivable job. In our example there is no task in which Mr. Notbright has an absolute advantage versus other members of society. But there must be a task where even Mr. Notbright has a *relative* advantage. For instance, perhaps as a carpenter he is just a little bit worse than his peers, whereas in all the other tasks he is much, much worse than they are. Consequently, the optimal allocation is that Mr. Notbright acts as a carpenter, while the others do the rest of the tasks. In the market, they would then exchange carpenter services for other goods and services. He would become a carpenter because he is not a bad carpenter in *relative* terms and he therefore has a relative advantage at being a carpenter. For every person in the

society there exists some profession in which she has a relative advantage.

Talent is optimally allocated whenever everybody works in the sector where she has a relative advantage. Otherwise it would be possible to increase the level of output of society by changing the allocation of people to tasks. Changing the allocation of talent in this case would be the same as using a more efficient technology for the economy as a whole.

So far the issue is perfectly parallel to the one of trade between countries. As it is the case in international trade, if markets were well-functioning the allocation of people to tasks would be efficient. The problem is that we should not expect markets to function properly. From a private point of view Mr. Notbright may have relative, even absolute, advantage to perform certain tasks even if his capabilities are scant. For instance, imagine that there is a task known to be highly remunerated. Mr. Notbright may perform it in spite of his limited abilities because he might inherit from his parents an economic advantage *non related to his ability*: he may inherit lots of money while others may have problems borrowing it; or he may inherit a network of contacts that can turn out to be useful in a business environment. In a more prosaic (even if threatening) world, Mr. Notbright may belong to a favoured ethnic or racial group; or he may not speak a language favoured by the administration; or he might be a male in a country that discriminates against women...

A first reason why the allocation of talent is inefficient is that there can be institutional or social wedges that separate between that which would be optimal and that which can be achieved.

The allocation gets worse when there are externalities associated with talent. Imagine that there is a task where the rewards cannot be perfectly appropriated by the individual with most of the relevant talent. For instance, while the most talented entrepreneur is able to produce important innovations, she gets little of the generated income stream. In this case it would be difficult to achieve the socially optimal allocation as the entrepreneur puts a lower value on her innovating than society. For concreteness, imagine that Mr. Notbright is not good at innovating but is able to extract a large percentage of the social outcome of his entrepreneurial activity because he has inherited skills to do so, while the talented individuals in society would be able to appropriate a much smaller share of the output. In this case aggregate output would be largest if the talented individuals were the innovators. But because the individuals would get little of the reward, it is Mr. Notbright who might have the relative advantage in innovating tasks.

Thus, there are many ways in which Mr. Notbright may cheat his odds, faring better than what his abilities would predict and many ways in which the allocation of talent in society may be inefficient. Some of these inefficiencies are obvious, others are more subtle.

1 Three reasons behind the misallocation of talent; the role of inheritance

Why may the market provide society with an allocation of talent that is inefficient? After all, Mr. Notbright has no intention of hurting himself. He is going to choose *among the career paths that are*

open to him the one that he *perceives* will generate the largest income. Clearly, this is the option that the market *signals* as the one where he has the relative advantage.

Obviously, if talent gets misallocated it must be that those whom the market signals as having the relative advantage to do a task are not those who should have it. Three different types of causes may induce this. They lie in the italics of the market argument above and allow us to make a taxonomy of the reasons behind the misallocation of talent.

First of all, there is the obvious question of freedom. If some people are barred from taking a job due to reasons that have nothing to do with economics, then the first best cannot be achieved. If some people are discriminated, they just cannot do the job that they wish to do. Coercion is seldom a friend of efficiency. We look at this in section 2.

Second, it can be that the profession where he *would get* the highest income is not the sector where he *could generate* the largest income. This can happen for one of two reasons.

(a) It can be that there are failures in the workings of society, so that the person who actually has the advantage cannot use it. For instance, if there are capital market imperfections, an agent who is poor and bright may have to pay a very large cost to set up a firm – perhaps a much larger sum than somebody with less talent but easier access to credit. Thus, market failures may induce agents to choose career paths which are suboptimal from the point of view of the common good. We look at this in section 3.1.

(b) It can also be that the society efficiently exploits the talents that individuals have, but that the process of acquisition of these talents is inefficient. For instance, people who have the *potential* of having a large talent may need to foster it in certain environments (for instance in a nurturing family), and may fail to develop their potential if not exposed to the proper conditions. Thus, individuals with less potential may end up having more talent, as they may be brought up in a more satisfactory background.

Similarly, agents could misperceive where their relative advantage lies. For instance, agents exposed to information signalling to them that private effort and sacrifice does not pay out, would not exercise effort. Their aspirations and goals would necessarily diverge from identical agents who are brought up in an environment inducing them to believe that personal effort pays back.

Notice that this situation does not need to be inefficient, at least in the usual meaning of the word. For instance, a person's utility function may be affected by her background (thus, a female may *choose* to work less). Also, society cannot change which child belongs to whom, and it is not easy to adjust the environment to which children are exposed. Thus it could be more "efficient" to raise the carpenter's son in the butcher's household, but neither the kid, nor the carpenter, nor the butcher would be happy with the arrangement. We look at this in section 3.2.

Finally, the market provides the wrong signals in the presence of externalities. Agents disregard the

value of the externalities (positive or negative) that they induce on everybody else when choosing a career path. An example; take two agents and a certain entrepreneurial job. One agent (Mr. Nicepoorguy) produces a large positive externality on society, because he would induce innovations whose return he cannot enjoy. The second (Mr. Sillyrichman) has no imagination, and is unable to innovate; on the other hand, he is more effective at negotiating with trade unions (Mr. Sillyrichman is tough), thus is able to get a larger entrepreneurial income. Mr Sillyrichman would be in a better position to be an entrepreneur, which is not good for anybody but himself. We look at this in section 4.

Once we have seen the reasons for the misallocation of talent, we will make three important remarks concerning the role of distance, inequality and incentives (section 5.1), the role of competition and international trade (section 5.2) and feedback as well as the possibility of multiple steady states (section 5.3).

So, for one reason or another (and there were three[1]), talent gets misallocated when those who have the relative advantage are not those who should have it. We will see that very often this is related with the role of **inheritance**. This is because agents, when confronting the world, do so with an arsenal that consists not only of their "innate" talents and abilities as determined by their genetic mixing. They also use the knowledge acquired in the slow, difficult process of upbringing. They use the financial resources invested in them by their parents, who do so not using accounting principles of maximum return, but rather based on the care for the wellbeing of their offspring.

It is a fact: some people inherit advantages. Insofar as these advantages are correlated with "innate abilities", there should be no problem with the allocation of resources. The problem arises because most often this is not the case. The individuals who inherit capital are not necessarily those who would use it most wisely. Those who are brought up exposed to music and the arts are not necessarily those more inclined to their appreciation. Those who would obtain the largest return to be exposed to a mentally stimulating environment may be brought up in a sad, grey intellectual environment. Those who belong to a dominant ethnic group are not necessarily those most talented. Females are certainly not less capable than men to realize most of the tasks that social constraints place beyond their aspirations.

There are two issues here. The degree of inheritance of "innate talent", and who inherits the advantages. If they move along together, there would be no issue. But they do not. There are several reasons for this: **(1)** Advantages beyond "merit" are overwhelmingly inherited by the children of the rich.[2] **(2)** Those who are rich may be rich for reasons that go well beyond their talent. And **(3)** the complications of genetic mixing and the (noisy) process of mating induce that "innate talent" (whatever that is) is not inherited with great accuracy.

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1 Actually, there is another reason, but we choose not to deal with it in this opuscle. The additional reason lies in search frictions. If people find that is hard to find a suitable job, you are not going to spend a long time doing so. You get to the first you find, even if it is relatively inefficient. This has been heavily explored in the labour literature, but we choose to abstract from it as it is not related to intergenerational mobility nor to inheritance.

2 There are a few exceptions, gender discrimination being the most prominent. One is born male or female irrespectively of background. Nevertheless, even in here there is an inheritance issue – more on this later.

Thus, we get to one of the encompassing points of this opuscle: *intergenerational mobility is a signal of health for a society*. It signals a good allocation of resources. The smaller the degree of intergenerational mobility (that is, the lower the probability that children of the poor may become the rich of their generation), the more likely for there to be a bad allocation of talent in society. This relationship (mobility is good) arises in the measure that "advantages" are inherited from the rich, while "talent" pops up among the offspring of the poor with more likelihood than "advantages" do. We will look at the theory and empirics of this in section 6.

In the remainder of this opuscle we develop these points (the causes of misallocation and the role of inheritance), and end up by looking at how much we actually know about mobility, and what it tells us about the allocation of talent.

2 Discrimination misallocates talent

A person is *discriminated* against if he or she (vis-à-vis another person) has a disadvantage in being assigned a task *for reasons that have nothing to do with his/her ability to perform the task*. In the most obvious of cases the discrimination may take the form of barring them from the possibility of performing the task. The key is that discrimination affects the relative advantages of people not because of their abilities but because of exogenous and non-economic reasons. The economic consequences cannot be good.

The Discrimination of Females.

> *"Our women are now seen as serving no useful purpose to mankind other than having children; they are considered simply as serving for pleasure, like musical instruments or jewels. But they constitute half and perhaps more than half of our species. Preventing them from contributing to the sustenance and improvement of others by means of their efforts infringes on the basic rules of public cooperation to such a degree that our national society is stricken like a human body that is paralyzed on one side. Yet women are not inferior to men in their intellectual and physical capacities. [...] The reason why women among us are thus deprived is the perception that they are totally ignorant and know nothing of right and duty, benefit and harm. Many evil consequences result from this position of women, the first being that it leads to a bad upbringing of their children."*

The previous quote does not belong to a radical feminist and it is not recent either. It was written by Nanık Kemal (poet and journalist; prophet and forerunner of the Young Ottomans[3]) and it appeared in the Turkish newspaper *Tarvish-i Efkâr* in 1867.[4]

Across time and societies it has been impossible for women to aspire to an equal footing in the

3 The Young Ottomans tried to regenerate the Ottoman state, with not much success.
4 Cited in Lewis (2002)

competition for jobs. Arguably this is so in our own society and in our own time. In many societies they are simply barred from certain professions, particularly from the ones in which they could exercise some type of power. Instead they have been secluded at home, investing their time mostly in the bringing and upbringing of children, the up-keep of the home and perhaps acting as a complementary manual working force in farming activities. They are just barred from other activities, independently of their value or inclinations. Most obviously, the outcome must be grossly inefficient: half of the population cannot contribute freely to trade. The market of talents is not working.

The condition of being a woman is *not* inheritable,[5] as all women have both a mother *and* a father. Thus, the aforementioned story about mobility and the allocation of talent does not apply here. Well, at least not directly. There is nevertheless a sense whereby the degree in which women are treated by society is an inheritable trait.

In the case of female labour market participation the problem of efficiency goes beyond discrimination. One can talk about gender discrimination whenever women are bared from professions in spite of their **(1)** talents and **(2)** inclinations. Imagine for a moment that we are talking of a society in which women are brought up in such a manner that their desire is to be away from the labour market. Conditional on this "utility function" it would perhaps not be efficient to use their talents in the labour force. If there was no impeding force the market would establish prices for their talents so that their degree of involvement in the market would be the optimal one. In this case there would not be discrimination in any sensible way. It would nevertheless not be efficient because, at least in our example, the fact that women "dislike" labour market activities is not exogenous; it depends upon their upbringing. It is a fact that women participate in the labour market less than males do. Even in a context without discrimination, in which women *like* to participate less than males do, it is an empirical (and unresolved) question whether this is efficient or not. It is efficient in the measure that women like to participate less because of their inherent condition of being women (motherhood, etc.). It is inefficient in the measure that they like to participate less because they are brought up in certain ways; in the measure that by education we can improve the "supply of talent" in the labour market. This is the debate of "nature" versus "nurture" translated into economic meaning. Insofar as the tendency of women to participate less were due to "nature", the problem is less critical than if it was "nurture" leading to such supply patterns. Notice that this is a different issue than that of discrimination. Discrimination is inefficient, full stop. The more discrimination there is, the worse the outcome. The point is that *even if there were no discrimination* an outcome where female participation is scarce would be inefficient insofar as the preferences and outlook on life that women have are a consequence of "nurture" and not "nature".

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5 There are possibly other conditions in which people are discriminated because of non-inheritable traits. One could conceive a society that discriminates against people being born on Mondays, and favours people born on Sundays; there would be discrimination, there would not be inheritance. In any case, gender discrimination seems by far the most important non-inheritable discrimination that affects the allocation of talent. Others might be, discrimination toward homosexuals, disabled people, etc. Given demands of space, we will not discuss them in this opuscle. This does not mean that they are not important, they are.

Notice also that even if the condition of being a woman is not inheritable, the way in which children are brought up might be inheritable, and in this sense the degree of inefficiency of the economy might be a function of the past. Women who are brought up in environments where the female labour market activity is valued and appreciated, are more likely to be prone to market activity.

Discrimination of Inheritable Traits: Racial or Ethnic Origin

It is a fact that some people, in some societies, are discriminated because of their race, or their ethnic group. There are powerful arguments to believe that people of African ancestry have been (and most likely *still are*) discriminated in most (if not all) countries of mainly European origin and descent. Leaving aside the shameful business of slavery, the most notorious case would be South Africa during the apartheid era. The allocation is not only unfair, it is also enormously inefficient because the amount of talent wasted takes preposterous proportions (not to say anything about the resources that need to be devoted to sustain such an irrational settlement).

What I want to draw attention to here is that the main qualitative difference between racial and gender discrimination is one of inheritance. The trait that is discriminated is not inheritable when we talk about gender discrimination, while it is very much inherited when we talk about racial or ethnic discrimination. The consequence of this is that the degree of racial discrimination in a society will show up in the level of intergenerational mobility, while the degree of gender discrimination will not (at least not in an obvious manner). We will spend section 6 looking at this fact, but some intuition might be useful here.

Talent might be inheritable – most certainly it is so to some degree. Parents and their offspring share genetic traits that correlate their talents and abilities. Nevertheless this correlation is far from perfect. Indeed, the fact that you need both father and mother in order to procreate means that children have characteristics of both, but are identical to none. Intelligence and talent are highly multidimensional, and in any of these dimensions the child might be more or less "talented" than either parent.

Racial characteristics are an interesting example because they are very one-dimensional and very much obviously inheritable. Children may be more or less talented than their parents, but they are certainly of the same racial group.[6]

As an example consider two societies, call them Niceland and Badland. In both of them there are people belonging to two different "races", call them "*w*" and "*b*". For our purposes "race" is just a perfectly inheritable trait that does not have any effect on the productive characteristics of the individual, but which is observable. It could be that "*w*" people have green skin, while "*b*" people have blue skin. Assume for the sake of simplicity that both countries have the same racial compositions.

Consider that in Badland people who belong to race *b* get discriminated against in a manner that impels them to be on average substantially poorer than they would be in absence of discrimination (any discrimination would do so). In Niceland on the other hand people are allocated tasks based exclusively

on their abilities.

What needs to be noticed is that insofar as talent is not *perfectly* inherited, the degree of intergenerational mobility will be larger in Niceland than in Badland . In Badland not only talent, but also race, has economic content; and both are inherited to some extent. The larger the amount of economically meaningful traits that are inherited, the smaller the degree of intergenerational mobility in the society. Because talent and race are not correlated[7], in Badland inheriting the racial trait has economic value, it helps predict where an individual will end up in society. Badland would have less intergenerational mobility.

Because of this we will see that in many respects we can look at the degree of intergenerational mobility as an indicator of the health of an economy, of how well it is allocating talent. Notice that the caveat is that this refers only to traits that are inherited, and thus it does not cover the degree of misallocation caused by gender discrimination. Nevertheless it is the focus of this opuscle.

There are other forms of discrimination that can be associated with inheritable traits. Imagine a society that discriminates positively in favour of handsome people (they get better jobs for the same talent), the reason of this discrimination being completely exogenous and non-economic. Imagine that talent and beauty are both inherited but with some degree of noise. The greater the inheritance of advantages, the less mobility. Thus, the more society discriminates favouring the beautiful, the less mobility and the less efficient allocation of talent. In general, ethnic discrimination is the most interesting because it the most prevalent, and because of its large degree of inheritability.

3 The wrong person for the wrong job

Remember our definition of discrimination: the situation in which people are compelled to take (or not to take) jobs because of non-economic reasons. The allocation of talent would be inefficient even in societies where there was no room for discrimination in the previous sense. Most evidently this is because in all societies there are individuals who are *relatively* rich and others who are *relatively* poor, and in both cases they get endowments from their parents - obviously, with the rich getting more.

The most blatant way in which this produces inefficiencies is that people born in wealthier families have access to more and easier financial resources than people born in poorer families. When determining whether or not to make an investment they need no access to external funds. In a world with capital market imperfections the access to the capital might be limited. You may be very talented, but you need to prove it in order to get funds from a third party that would finance your idea. In the same manner people who inherit a firm may end up managing it even if they are not the best person for the job. It may be better to hire a manager, who has more talent than me, but I may distrust his behaviour,

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6 Or of a convex combination if it were a mixed couple.

7 They are not, but it would be enough if they were not *perfectly* correlated.

and he may not have funds enough to buy the firm.[8]

But being born into well–off families gives more than just financial advantages. One acquires knowledge of things that make you rich. After all, rich parents must know more than poor parents about what to do in order to be rich. This second type of advantage is more subtle, as it makes the rich "better" in an inherent manner, but is still the source of large inefficiencies. We now explore both types.

3.1 Capital Market Imperfections

We understand "talent" as the ability to solve problems, to imagine new ways of doing things, to be good at organizing production and taking decisions. Under this definition it seems clear that talent and entrepreneurial activities are interlinked. More talented people are good at being entrepreneurs almost by definition.

Now, capital market imperfections misallocate talent due to two reasons: **(1)** in order to perform entrepreneurial activities there are other important inputs, specifically capital. The access to these inputs does not correlate perfectly with talent. **(2)** How much "talent" an agent has is (partly) associated to the investment in her human capital. Rich parents invest more in their kids, even if this investment would generate less proceeds than to educate very clever but poor kids. We examine these two points separately.

Entrepreneurs and firms

Informational problems make the access to funds in the capital markets limited. If a person has a great idea on how to set up a firm but lacks the funds to finance it, she needs to convince a capitalist (or a bank, or the stock market) that the business is going to produce profits. This might be difficult, perhaps impossible without a collateral.

Alternatively another individual might have a much less venturous idea (because she is less talented) but she might have easy access to funds because she has inherited them. Her idea (the bad idea) is the one that would be implemented, and it is quite obvious that the first best would not be achieved.

The less efficient the capital market, the more wealth affects people's capacity to be an entrepreneur and consequently the less efficient firms are. This has been realized for a long time, papers that model this line of argument are for instance Banerjee and Newman (1993), Erosa (2001), Erosa and Hidalgo (2004), or Caselli and Gennaioli (2002).

A particularly striking visualization of this problem runs in family firms: that is, firms whose control is inherited by the children of the management. Most typically, they are small to medium size firms where the owner is a child of the previous owner. Assume that the founder of the firm was very talented (which is probably the case if the firm is going to survive for some generations). This does not mean

8 For the sake of realism we should not forget another possibility: the person who inherits the firm may be unaware of his

that the child is talented to run the firm as well as the father.[9] If the child happens to be not very good as an entrepreneur, she might consider to sell the firm, but perhaps it is difficult to find a buyer at the right price (the value of the firm being private information, impossible to verify). It could also be that a firm managed by a not very talented child may survive if it is placed in a not very competitive environment, as described in Pica and Rodríguez Mora (2005). In either case, the allocation of talent would be inefficient.

All together, this suggests that societies where there exists difficult or restricted access to capital markets, and/or with a large incidence of family firms, will be societies with a bad allocation of talents and low levels of intergenerational mobility, as parents pass onto children much more than just genes and education: they also pass on their financial wealth.

Capital Market Imperfections and Human Capital Accumulation

To have rich parents is an advantage whenever one is thinking about making investments. Be it for setting up a firm or for getting an education. In a world with capital market imperfections the acquisition of human capital depends crucially on the amount of wealth that parents may spend on their kids. This has been heavily explored by economic literature, and it has been shown to have an impact on efficiency and growth, the seminal work being that of Galor and Zeira (1993).

Insofar as capital market imperfections affect human capital acquisition, educational policies affect the efficiency of the allocation of talent. One would think that free access to education would positively affect intergenerational mobility and the allocation of talent (the first by linking less the children with their parents via their financial resources, the second by equalling the opportunities of all agents). Nevertheless, informational problems, inheritable differences in will and desire across agents, and the different capacities to make use of the free access to education for the rich and poor, translate into the possibility that freer access to education may actually decrease mobility and worsen the allocation of talent. In a nutshell, the rich not only inherit more money, they also grow up in a household where they receive more incentives to make use of public education. This is the effect whereby in Checchi, Ichino, and Rustichini (1999) it is induced that public education can be associated to less (not more) mobility. It is also prominent in Hassler, Rodrìguez Mora, and Zeira (2004).

Capital Market Imperfections as discrimination against the poor

Capital market imperfections work in a manner similar to that of discrimination against an inheritable trait. In one case there is an inheritable trait (to be of a certain race) that induces you to be poor, the children of the poor remaining so. In the other the children of the poor remain poor because they have no possibility (or the possibilities are reduced) of climbing up the social ladder.

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limited capabilities... wealth seems to breed self-esteem independently of performance or facts.

9 Interestingly the amount of talent of the child is an endogenous variable, as in Hassler and Rodríguez Mora (2000). We will see this in section 5.3.

Notice that both cases are "social constructs". One could imagine a society where people have no racial bias, perhaps in the same manner that one can imagine a society where capital markets work fine. Actually even if it were impossible to get rid of capital market imperfections, it could be possible to get rid of its negative effects: wealth differences could be erased through redistributive policies, placing everybody in the same starting line. Not all differences at the starting line are like that. We will see next that in addition to talent there are starting differences of the individuals that are not "social constructs", that cannot be dissolved by social conventions or actions.

3.2 Upbringing

The issue here is that the final outcome of "*who an individual is"* comes from mixing the innate abilities of the individual with the parental upbringing that she may have.

Individuals are brought up in families, where a large share of the educative process takes place. But parents differ in their knowledge, in what they can pass to their children, and children differ in their abilities to use their upbringing. A simple example may help us understand some of the implications.

It would be fantastic if musicians were going to have the children with the most musical talent, but the complexities of genetic mixing make that unlikely. Children who grow up in a family of musicians will probably become good musicians not because they were **born** with a particular musical talent, but because their parents were musicians, and taught them the tricks of the trade. That could give them a relative advantage as musicians even if the baker's son was born with innate abilities to be a magnificent musician.

The relative advantage of the musician's son is to be a musician because in adulthood he will be a better musician than the baker's son, and that is exactly what would happen in the market. Here there is no issue about market failure, nevertheless the outcome would have been better if the baker could have been brought up in the musician's home. Probably in this example there is not much to do, and we should consider ability as the joint endowment of talent and upbringing. There are other cases, though, where these types of stories have consequences that are of more interest.

Suppose now that people can be entrepreneurs or workers. Agents are born with more or less talent, but only agents with entrepreneurial parents learn how to run a firm. Children of workers can become entrepreneurs only if their talent is so large that they can overcome the starting advantage that children of entrepreneurs have. Notice that again there are no markets failing, the people who become entrepreneurs are the best entrepreneurs, but the world could have been better if it were the most talented children who got transmitted the skills from entrepreneurs. Notice that I say that the world "could have been better", not that we can improve upon it. Barring the possibility of changing who educates, there is nothing we can do about it. Nevertheless we should care.

We should care because **(1)** it could be the case that there are externalities, and **(2)** the extent to which wealth brings advantage is endogenous to the workings of the economy. We shall develop these

points below, for now just notice that the larger the positive externality induced by the talented working as entrepreneurs, the more inefficient the outcome. *The outcome is inefficient because talent and advantage are not aligned due to the starting advantage of the children of the rich*. The more starting advantage the children of the rich have, the worse the allocation of talent. The larger the starting advantage, the larger the effects of the externality. In the next sections we will deal with these issues, here I just want to stress the source of the inefficiency. Nevertheless it is worth noting at this point that these effects may feed back to each other, inducing multiplicity of steady states.

The point is that people pass to their children much more than their genes and their income. They pass along their knowledge of the world, their contacts, their desires, their view of life, their aspirations and goals. People who are raised in a relatively wealthy family where both parents have been educated are prone to have a different outlook on life than those brought up in a working class family. Their expectations about how to behave will be very different. Piketty (1995) presents a model where the perceptions that rich and poor kids have on the returns of effort differ because they are exposed to different experiences. Hassler and Rodríguez Mora (2000) present a model in which the amount of economically useful information that kids receive from their parents depends upon the parents' professions. In Checchi, Ichino, and Rustichini (1999) and Hassler, Rodríguez Mora, and Zeira (2004) the effects of public education are different among the children of the rich and the poor as a consequence of the parents' education.

The encompassing fact is that insofar as the children of the rich learn things that will help them stay rich, and the children of the poor do so to a smaller degree, both **(1)** the allocation of talent will be inefficient and **(2)** the degree of intergenerational mobility would be lower than if they were brought up in more similar environments.

Notice that we are talking about the slow process of upbringing; growing up, learning and acquiring a set of values and goals in the home of your parents. To be exposed to very specific experiences that depend critically on who your parents are. These experiences (both when positive and when negative) cannot be compensated for by formal education, at least not in its totality. As with the baker and the musician, we cannot switch the homes where the talented child of the poor and the untalented child of the rich are brought up, but this does not mean that the outcome is irrelevant. It affects, for instance, the outlook that we should give to formal education, particularly to public education. Perhaps a larger emphasis should be given to "motivate" and not only to "inform" the children of the poor. Also, it may make sense to introduce special measures to support the children of the poor in higher education, like some sort of positive discrimination.

I want to emphasize a critical difference between this mechanism and the inheritance of capital. In both cases we are talking about inheritance. In both cases we are talking about some people starting life with an advantage, but:

1. Differences in capital would have no effect on efficiency if there were no capital market imperfections. Differences in upbringing have an effect on efficiency *even if there are perfect capital markets and no*

discrimination.

2. Differences in capital can be reduced by redistribution. Differences in upbringing can hardly be reduced in this way; they are much more subtle.

Finally I would like to remark that this story is not irrelevant to the differential in performance between genders. Returning to the story presented in section 2, if females participate less in the market because they are brought up in families that induce them to believe that it is best not to participate, then they will willingly not participate. But this would be inefficient in the sense that the output society can produce would be larger if they were brought up in different manner.[10]

4 Externalities distort the relative advantage that agents perceive

Externalities help to misallocate talent, because agents do not get the social "return" that their activities produce, their value from a social point of view. Externalities make the private and social returns of working in a task different. As a result, they end up inducing career decisions that, although correct from a private point of view, are inefficient from a social one.

We can think of agents as endowed with different types of "assets". For simplicity, in a first example, let us imagine that these "assets" are musical talent and baking talent. Imagine that there are two professions, baker and musician, and that the optimal allocation is that people who have more musical talent *relatively to others*, should work as musicians. Imagine also that musicians cannot get all the value of their output: the value of the musical talent of a musician is larger than the reward that he gets from it. The amount of musical talent involved in musical activities is going to be inefficiently low. In general the people who are going to opt for a career as musicians are people who have relatively[11] very little baking talent, not necessarily people that have lots of musical talent. This is because a person with lots of talent in both professions is going to value more the baking activity. They get their real value from it, while if they were to become musicians they would not get what their production is worth.

There are externalities in many other professions and many other talents in addition to music. Perhaps the most important externalities are those associated with innovations that are produced, induced, and/or developed by entrepreneurs. There are several talents that make you a good entrepreneur. One is the ability to innovate, and to confront new problems. Another is the knowledge of how to organize production, how to deal with standard technologies and production processes already in place. The difference between the two talents is that the first induces an externality: where you innovate others may follow for free.

Consider two possible jobs: entrepreneur or worker. The agents who will become entrepreneurs are the

10 In this context it is meaningless to use the traditional economic definition of efficiency, which takes for granted exogenous preferences. Here "utility functions" (values, goals, aspirations) are inherited and thus affect the values, goals and aspirations of other individuals (the children), determining their actions. It is hard to talk about efficiency, but it is still possible to talk about material well–being.

11 Here "*relative"* refers to the optimal allocation.

ones who would get more reward managing a firm than working in it. Thus, if the economy were to reward generously the innovative ability of entrepreneurs, the entrepreneurial pool would be formed by agents that are innovative. If, on the other hand, entrepreneurs were rewarded mostly because of their purely managerial ability, their innovative talent would be relatively scarce.

Now, if growth were a consequence of entrepreneurs being innovative, the economy would grow more, the more it rewards innovative talent applied to managerial activities. But given that there is an externality in the innovative but not in the managerial talent of entrepreneurs, it follows that the rate of growth would be inefficiently low. This has been pointed out in Hassler and Rodríguez Mora (2000) and Galor and Tsiddon (1997).

There are two additional interesting features of this example. First, the degree to which the economy rewards the two different types of talent is actually endogenous in a highly interesting manner, we will delay the discussion on this until section 5.3. Second, it is easier to have good managerial abilities if your parents were managers, in the same manner that was described in the previous section. Innovative ability is something that you do not learn, or that you learn to a much lesser extent. You either have it or you do not. Thus, if there is inheritance of innovative ability it will be mostly genetic, and not depending upon your parents' job.[12] It follows that the degree of intergenerational mobility will be a good indication of the degree of efficiency of the allocation of talent.

What is important to us is the degree in which the talent that produces the externality is aligned with other talents. If they were perfectly aligned there would not be much of an issue, as the relative advantages would not depend on the degree of the externality. The issue arises because the correlation between the different talents does not equal one.

Externalities compound with all the issues that we have discussed before. The negative effects of the externalities for the allocation of talent are stronger the more advantages some individuals have, insofar as these advantages do not relate to their talents but arise from discrimination or some form of inheritance of capital or knowledge.

5 Three Remarks

5.1 Distance and Incentives

It is clear from our discussion that the smaller the distance between rich and the poor, the more efficient the allocation of talent is going to be. Less economically meaningful differences unrelated to talent translate into more economic efficiency.

This is true in all the dimensions we have discussed, but it is useful to concentrate on the effects of capital market imperfections and the inheritance of financial capital. Clearly here, *conditional on a given*

12 Moreover, because of the peculiarities of genetic mixing, innovative ability is probably not very correlated across generations.

level of imperfections in the capital markets, the larger the distance between rich and the poor, the more difficult it is for a poor person's talented child to compete with the child of a rich person. This is because in an unequal society the children of the rich tend to invest more (as they have more capital) and the children of the poor have more problems to overcome with talent the difference in capital, as they start out with less (and have to obtain more) than they would in a more equal society. Thus, this mechanism translates inequality into lack of mobility and inefficient allocation of talent.

Following Hassler, Rodríguez Mora, and Zeira (2004) we can call this the "*distance effect"*: the more inequality there is, the more difficult it becomes to make up for the disadvantage of being born poor. Under this light inequality is bad. Redistribution would level-off the playing field and improve efficiency.[13]

But this is not the end of the story. Equality (small differences, small distance) also has an effect on incentives. If the rich and the poor do not have many differences, then it does not matter much the things that I am going to do in life... there is not much point in improving myself, in "trying hard" to succeed. Personal effort would be hampered by the levelling of the playing field, people would be less prone to engage in investments if they knew that the final result does not depend upon it. Much more perversely: the effect of this decrease of incentives is in all likelihood stronger among the poor than among the rich. This is because the rich have non-pecuniary advantages associated to their status. I am referring to the kind of non-financial inheritance that we have talked about in section 3.2. The children of the rich need to make less of an effort to "succeed" in life, and consequently the decrease of incentives affects them less. The consequence of all this is that because of this "*incentive effect"* more inequality translates into more intergenerational mobility and into a more efficient allocation of talent.

This discussion and the distinction between "distance" and "incentive" effects are relevant for policy. Consider the effects of having had a generous redistributive policy during the last couple of generations: the distance between rich and poor is small. Thus, *past* redistribution contributes to mobility and efficiency. Consider on the other hand the effects of *future* redistribution. If people expect future differences between rich and poor to be small, the "incentive" effects will be pernicious for the allocation of talent. Clearly, the effects of "permanent redistribution" (if such a concept makes sense) are ambiguous. Clearly we want a levelled playing field. We want equality "of opportunity", but we would like to introduce that without hampering the incentive that individuals have in order to invest, strive, and try to "succeed". Redistribution has the aforementioned effects, and other policies may have problems along those lines.

In particular, inheritance tax certainly levels the playing field, but it may induce incentive problems if agents decide to accumulate less as a consequence of the impossibility to pass on their wealth. In the last few years there has been a tendency in the USA and Spain to eliminate inheritance taxation arguing, along "incentive effect" lines, that it is a highly inefficient form of taxation. But, given that

13 Not everyday do you hear that redistribution can *improve* efficiency, let me just emphasize that.

there is a positive and a negative effect, the question on its effect on efficiency should be basically empirical. I know of no clear study specific to the issue that takes into consideration both effects of inheritance taxes. Nevertheless, given that the empirical literature has found that how much inheritance a person leaves to their children is quite inelastic to taxation, I would be surprised if the negative effects of inheritance taxes amounted to much. If that is correct, then the present popularity of eliminating inheritance taxation must have much more to do with the distribution of power (between those who have and those who have not) than with a policy striving to achieve an efficient allocation of resources.

5.2 Competition improves the allocation of talent

One of the critical aspects that determine the efficiency in the allocation of talent is the starting disadvantage of the children of the poor. Either because they belong to a discriminated group, or because they lack funds to finance the investments that they should optimally make, or because they lack the knowledge that people raised in wealthier families have, they cannot make full use of their talent.

Nevertheless talent is always a good thing to have. It always has some use, and it can substitute other advantages. There is always some degree of social mobility, and the story of the self-made man is revealing: talent can overcome adversity.

The point for us is that the more talent comes to matter, the less adversity counts, and the more efficient the allocation of people to tasks. So, we would be interested in answering the following question: under which circumstances is talent more valuable? The answer is that more competition pushes up the price of talent, improving the allocation of talent. There are several reasons for this.

Think first about the information that parents pass on as part of the process of bringing up their children. This information is different for kids that are brought up in households where the parents are entrepreneurs than in households where the parents are workers. As in Hassler and Rodríguez Mora (2000) the kids have two assets: their talent and the information about the world. The allocation of talent is efficient insofar as talent is more productive than the informational advantage of kids of entrepreneurs.

To be an entrepreneur in a very competitive world is a "difficult" task. "Difficult" in the sense that you have to react fast to events *that you have not confronted before*. This is in essence the definition of "intelligence": the ability to confront problems not seen before. Thus, when there is much competition the relevance of acquired information (as different from intelligence) decreases.

The not-so-talented children of the entrepreneurs (meaning children who are not very intelligent, not very capable of solving *new* problems) can still do a very good job as entrepreneurs if the level of competition is low. The information that they "inherit" from their parents gives them a competitive advantage vis-à-vis the talented children of workers. The market would make them entrepreneurs

(mobility being low), because they would be the best possible entrepreneurs. Nevertheless the allocation would be efficient *only if there are no externalities*. If talent produces an externality, competition would help decrease its negative effects.

In general, lack of competition allows the creation of rents even if unrelated to talent. Thus it is quite straightforward that if a firm is very monopolistic you can get good profits even if you are not very talented. The value of inheritance (financial or embodied in your outlook of the world) is larger the less competition there is. Consequently, less competition translates into more inefficient allocations of talent.

There is another way in which lack of competition hampers the allocation of talent. Pica and Rodríguez Mora (2005) show that there is a general equilibrium effect whereby more competition induces an increase in wages, which makes it harder for untalented people to be entrepreneurs. Remarkably this effect exists even in the absence of inheritance.[14] The reason is straightforward: when they become entrepreneurs, talented people impose a negative pecuniary externality on other entrepreneurs as they increase productivity and therefore raise wages all entrepreneurs have to pay. This induces some entrepreneurs (the less talented ones) to leave the market. Thus when wondering who is in favour and who is against the barriers to the introduction of foreign direct investment, we notice that **(1)** the very talented are against such barriers, as they can profit from working in a larger market; **(2)** the very untalented (the poor) also oppose them, as they benefit from higher wages that competition induces; and finally, **(3)** there are a group of individuals of intermediate talent who oppose free trade and favour barriers. These are the people who in the absence of competition would be entrepreneurs (and enjoy monopoly rents), but as a consequence of competition see their entrepreneurial income depleted to the point where they prefer to be workers.

In either of both cases the morale is the same: competition improves the allocation of talent.

5.3 Feedback

We have seen that more competition induces a better allocation of talent. The opposite causality also holds: a better allocation of talent induces more competition. In the rest of this section I reproduce the arguments of Hassler and Rodríguez Mora (2000).

Talented agents have an easier time innovating. It is part of what we normally call "talent", perhaps more specifically we should call it "intelligence". In any case, entrepreneurs who are innovative (they are good at dealing with *new* problems) are the ones that produce an externality: They innovate, others follow. The larger the number of intelligent managers, the more innovation in the economy, and the greater the difficulties for those managers who struggle to cope with innovation. The larger the pool of talented managers, the greater the generated growth and the smaller the value of the "inheritance" received by the children of entrepreneurs in the form of information.

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14 And in this respect it differs from the rest of this opuscle.

The feedback effect is then evident: a better allocation of talent fosters a competitive environment in which talent is very valuable and inheritance is not. This generates a good allocation of talent. Thus, multiple equilibria are possible, and we can visualize the outcome with the tale of two societies. Richland and Poorland are two ex-ante identical societies, they have access to the same resources (both human and physical), but for historical reasons, they have different social structures.

Take Poorland. Her entrepreneurial class consists mainly of the children of previous entrepreneurs. From an intellectual point of view, they are a random sample of society's entire population, and consequently, average. Thus, they are not very innovative, and do not change the world substantially. Nevertheless, they confront economic challenges, and learn from these. They can explain to their children what were the best actions taken during their working life. This is sufficient to give the children of the entrepreneurs the upper hand – they will become the entrepreneurs of the next generation. Consequently, the intelligence of the entrepreneurial class of Poorland will remain on an average level. Poorlandians will have little or no growth for generations to come.

In Richland, the situation is different; the entrepreneurs are the most intelligent individuals in society and they innovate, generating growth. They thus make the world change rapidly, and the information that they can pass on to their children depreciates so quickly that it is of no or little value. The next generation of entrepreneurs will thus be formed by the intellectually gifted and the people of Richland will enjoy consistent high growth.

6 Intergenerational Mobility and the Allocation of Talent

As we have already seen, intergenerational mobility is a sign of the degree of efficiency in the allocation of talent.[15] This is because **(1)** genetic mixing and the fact that mating is a complicated, multidimensional, issue insure that innate talent pops up both among the children of the poor and among the children of the rich, while **(2)** non-talent related advantages are received overwhelmingly by the children of the rich. If mobility is high, it must be because a considerable number of (presumably talented) children of the poor are able to overcome the disadvantages of their upbringing. Thus, relatively high intergenerational mobility is a signal that talent (and not advantage) determines who is at the top. Low mobility, on the other hand, signals a sick society, where the individuals in the top have been sheltered from (healthy) competition. Many of them are unfit for the tasks that they develop, but nevertheless enjoy economic success (relative to others) thanks to the advantages that they inherit from their (successful) parents.

A society with low intergenerational mobility is not only unfair, it is inefficient. There is no trade-off between fairness and efficiency when increasing mobility: the more there is, the fairer and more

15 By "a sign" I mean that it is a signal. It does not ensure anything, but strongly suggests. One can conceive of spaces where institutions that produce lack of mobility appear as a consequence of other economic failures in a society. For instance, certain inheritance institutions, like primogeniture, may be the response to the lack of capital markets and the need to insure a certain minimum firm size. Also, hereditary kingship, and aristocracy in general, may be an efficient response to tumultuous processes involved in the deciding of who should be the king: it might be better to assume some talent misallocation if this

efficient society. In this respect intergenerational mobility (signalling "equality of opportunity") is conceptually very different from income or wealth inequality, where there is a possibility for trade-off to exist. We can not measure "equality of opportunity", but we can do our best to measure intergenerational mobility.

My focus here is not on the link between intergenerational mobility (equality of opportunity) and fairness. Instead, I want to stress that intergenerational mobility is an indication of the level of *efficiency* in society. Obviously, if there is more mobility, society becomes fairer, as everybody has access to the same opportunities independently from their background. This is almost an obvious statement, a statement that few people would contradict. Still, our main point is that a society becomes more *efficient* as the relation between the children's future and their parents' present becomes less prominent. I find this much more powerful than saying that low mobility is unfair. It is hard to think about fairness, since what is fair for some is unfair for others. Efficiency is a much more powerful concept; if an allocation is inefficient, it is so for everybody. Society (as a whole) could do better.

Thus, the empirical study of intergenerational mobility provides us with a window from which to look at the misallocation of talent of a society. Unfortunately, it does not come problem-free.

Obviously, a caveat must be made for the things that affect the allocation of talent and are not inheritable, gender discrimination being the foremost. All that I can say is that this is an important problem that deserves to be looked at directly, and for the same reasons: not *only* because it is unfair, but because it is inefficient. First we deal with mobility, and later we also look at the evolution of female discrimination.

The Measurement of Social Mobility

To measure intergenerational mobility is notoriously difficult. The reason for this is that to do it directly, and in a manner that is comparable across time and across countries, demands ridiculously large and extensive panels of data. In general these data are not, and will not be, available.

The classic approach looks at the correlation between the incomes of parents and children using panel data. The typical regression runs the logarithm of the income of sons on the logarithm of the income of their fathers. The estimated parameter determines the elasticity of the income of the children with respect to that of the parents. Most often the "degree" of mobility is understood to be equal to one minus this correlation.

Even this simple approach is often difficult to implement. The first problem is that you need a panel covering a period of at least 30 years. Even such a panel would only be long enough to approximate the lifetime income of one of the two generations involved. To be able to measure the lifetime income of both fathers and sons, one would need a panel that spans around 85 years. This panel does not exist anywhere.

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avoids the transaction costs of choosing new leadership.

Thus, if you want to measure intergenerational mobility, you compromise. With the traditional method you look for a panel of any available time length. Once you have found it, you then need to deal with a battery of well known problems widely recognized in the literature, at least since Solon (1992):

1. Current income is a noisy representation of lifetime income. This is true for both parents and children. This establishes an upward bias in the mobility measures: solely due to noise the correlation of parents and children's measured income will be smaller than the one with real lifetime income.

2. The income of children tends to be measured at the starting of their career. This tends to produce a bias, as the lifetime income of the educated can be very badly measured by the income of their first years.[16]

3. Samples are biased, as the attrition rate is different for different population groups. The middle class tends to be overrepresented in the final sample, while the poor and the rich (where mobility could be lowest) are underrepresented.

4. Obviously it takes time to construct a panel data base. This hinders the possibility of looking at the dynamics of intergenerational mobility.

Consequently the measures of intergenerational mobility obtained using traditional methods **(1)** are scarce, due to the difficulty of getting data **(2)** are difficult to compare between countries (Solon (2002)), and **(3)** are difficult (or impossible) to compare across time.

This sorry state of our empirical knowledge on the matter contrasts with its acknowledged importance. Thus, economists have been trying to do their best with the traditional method (and, surprisingly, they have done many things), and at the same time they have been looking for a way of escaping the lack of comprehensive longitudinal data.

So, what do we know? We know that the degree of mobility is smaller than what most people thought in the past. Its measurement can be characterized before and after Solon (1992). Before his paper the estimations available on income mobility (few and only for the USA) indicated almost always that the correlation between parents' and children's income was low (high social mobility). For example, Behrman and Taubman (1985, 1990) or the work of Becker (e.g., 1967, 1979, 1986) found correlations of around 0.2. The article of Solon (1992) showed that the previous estimations were biased and misleading, and that the access to long data panel could somehow reduce this bias, diminishing the noise in the estimation of both parents' and children's incomes. Subsequent estimations by other authors, using Solon's methodology, obtained correlations of around 0.4. In terms of degree of mobility this translates into a much lower figure than previously thought. This autocorrelation has been obtained with diverse data bases and somehow it has become the consensus correlation in the United States for the last third of the past century.

16 See for instance Haider and Solon (2006), Hertz (2007).

We also know that, contrary to a widely held belief, the degree of mobility is probably not larger in the USA than in Europe, and certainly it is lower in the USA than in Nordic countries. Following Solon's methodology, estimates are available for several European countries. In Nordic countries it is relatively easy to collect the data panel of the required type. Consequently, we have better estimates for Nordic countries: Björklund and Jäntti (1997) and Osterberg (2000) provide estimates for Sweden, Osterbacka (2001) measures mobility for Finland, and Björklund et al. (2002) for other Nordic countries (and they try to compare their results with results for the USA). In addition we have estimates for Great Britain (Dearden et al. (1997)), Germany (Wiegand (1999); Couch and Dunn (1997)), and for Italy (Checchi et al. (1999)). Recently Comi (2003) has provided estimates for 12 European economies using the European Community Household Panel. Unfortunately these estimates are comparable across countries only insofar as the biases that the panel implies (particularly the ones induced by the young age of the children) are similar (which is doubtful, even with the same questionnaire). Still it is the most comprehensive international comparison available, but it only relates to European countries.

For the rest of the world we hardly know anything: there are some estimates for South Africa (Hertz (2001)), Brazil (Dunn (2004) and Ferreira and Veloso (2004)), Singapore (Ng (2007)) and Malaysia (Lillard and Kilburn (1995)) and for another handful of countries in Grawe (2004). These estimates are typically done with retrospective information about the parents.[17] Unfortunately it is very difficult to compare these estimations across countries, as it is shown in Solon (2002). The reason is that the panels used are different, they have different levels of noise, and the problems of selective disappearance of the sample are different. Thus, we can compare the degree of income inequality across countries, but not intergenerational income mobility. This makes it difficult to establish how different redistributive policies affect welfare.

The problem has become more serious in the last decades as there has been a well documented increase in the dispersion of income. Unfortunately, we do not know whether this went hand in hand with a decrease in intergenerational income mobility.[18] For the USA, recent papers (Lee and Solon (2006) and Hertz (2007)) show that existing, widely divergent results suffer from small samples as well as the aforementioned age-related bias and sample attrition (for instance, Mayer and Lopoo (2005) and Fertig (2007)). Taking this into account results in inconclusive trends in intergenerational mobility. For Great Britain, Blanden et al. (2004) suggest a decrease in the mobility between two cohorts (born in 1958 and 1970, respectively). In any case, estimates of the temporal evolution of the degree of intergenerational income mobility are often difficult to interpret, because they suffer from many of the problems of cross-country comparisons: for example, they use panels that are different for each cohort. So far, there is no data base covering the full span of three generations (more than 100 years) that would allow us to look at trends in mobility. Even if there were to be one, the problems of selective disappearance of the sample would make it of doubtful utility.

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17 There are some measurements for South America based on siblings, see below.

18 See Solon (2004) for a proposed frame to study the temporary evolution.

Given these problems, economists have been looking for alternative methods with a smaller dependency on panel data. For example, there is a literature that studies siblings. Since they share the same family, the similarity in economic success when they are adults is indicative of the importance of family background. A representative study using this approach is Solon et al. (1991). An alternative is to study neighbours instead of siblings, because neighbours tend to share a similar socioeconomic background. See for example Page and Solon (2003). Dahan and Gaviria (2001) compare the correlation of incomes across siblings for a series of American countries; and Levine and Mazumder (2007) estimate the correlations in several measures of economic wellbeing between brothers in the USA for two cohorts and find that this correlation is greater for men who entered the labour market during the 1980s than men who entered during the 1970s. In spite of the apparent attractiveness of these methods they have two problems that make their use difficult. **(1)** They demand data with family information, which is not simple and would make the comparison between samples difficult (for the same reasons as with panel data). **(2)** Additionally,[19] the methods do not allow making inferences on the direct incidence of the economic position of the parents, but only on the effect of family background. Another way of escaping from panel data is to approximate parents' income based on available information. For example, Aaronson and Mazumder (2007) employ large samples available in the USA decennial Censuses and use each child's state of birth to assign parental incomes equal to past average income levels in the child's state of birth. They then employ a two-sample estimator to develop a consistent time series on intergenerational mobility. Interestingly, they find that mobility increased from 1950 to 1980 but has declined sharply since 1980.

Outside economics the tradition is to measure intergenerational social mobility not based on income, but on the "social prestige" associated to the professions of parents and children (Duncan, Featherman, and Duncan (1972)). Problems of this approach are that it is difficult (at least for economists, apparently not for sociologists) to judge the social prestige of professions, and especially how it evolves through time. Even if we knew how to do it, it would still be difficult to interpret its meaning. The child of a very famous doctor who becomes a country doctor would be assumed to produce persistence.

Thus, in summary: we know very, very little.

A possibility to go ahead is a recent proposal in which I am involved (Güell, Rodríguez Mora, and Telmer (2007)) of an alternative method for measuring intergenerational mobility. The method proposed consists in measuring the informational content of surnames. The more information the surname provides on the income of an individual, the more important her family (her background) in determining where she ends up in the social scale. Thus, the more informative the content of surnames, the less mobility.

The reason for this is that surnames are a very good approximation to family linkages for a very large percentage of the population because the distribution of surnames is necessarily highly skewed. That is

19 See Solon (1992).

to say, some surnames are quite frequent, but the huge majority of surnames are very infrequent, in such a manner that a large percentage of the population is bound to have a very infrequent surname. For them the partition generated by surnames is very informative on family linkages.

We first show in a model that the joint distribution of surnames and income is such that the smaller the degree of intergenerational mobility, the more informative surnames are. We do this in a dynamic model where surnames die and are born while income is transmitted from parents to sons via an exogenous income transmission process (which takes as parametric the amount of intergenerational mobility). In the model we also show that an increase in the degree of assortative mating is akin to an increase in the correlation between the income of fathers (not mothers) and sons (not daughters), which is the measure of intergenerational mobility usually estimated in the literature. An increase in the degree of assortative mating would be observationally equivalent to a decrease in the degree of mobility (and an increase of the informational content of surnames).

We use our methodology to show that in Catalonia the informational content of surnames is large, and it has the characteristics expected in the model. We show that surnames are also a good proxy of ethnic (regional) origin within Spain, and use the methodology for controlling for ethnic effects.

More interestingly, we show that the informational content of surnames has increased over time, indicating a substantial drop in the degree of mobility. It has increased because of two reasons. **(1)** The value of having a very Catalan surname (being always high) has increased over time; thus, Catalan surnames are better predictors of outcomes for people born after 1950 than for those born before. But **(2)** even controlling for ethnicity (regional origin of ancestry) of the individuals, surnames have become more informative. This indicates that immediate surroundings, like family background, have become stronger determinants of one's fate: a decrease of intergenerational mobility.

This result turns out to be extremely robust, and relatively easy to explain. The peculiarities of the Spanish surname convention allow us to measure the evolution of assortative mating among the parents of the individuals of any given cohort. We show that assortative mating has increased over time (decades ahead of the increase in information of surnames) both in the ethnic and in the educational dimension.

People are often surprised by the decrease of mobility that we report, probably because it is easy to overestimate mobility subjectively. In a society where there is economic growth almost everybody lives better than their parents did, so everyone tends to think that they have moved up the social ladder. It does not help that one's self-esteem gets a boost from thinking that one has beaten the odds. The mistake, of course, is that comparisons should be relative to others and not in absolute terms. Our evidence shows that an increase in the degree of assortative mating has led to a decrease in mobility and thus to a worsening in the allocation of people to talent.

Our intention is to use this methodology to measure intergenerational mobility across time and societies. In this way we hope to be able to give an empirical appraisal of the degree and the evolution

of the misallocation of talent.

7 Is the allocation of talent improving? The positive role of the decrease of female discrimination versus the negative role of the increase in the importance of background

Is the allocation of talent improving? We do not know, and it is difficult to say at this stage, as there are forces working in different directions.

There has been an evident decrease in the degree of discrimination against females. They are now freer to determine what to do with their lives, which paths to take; if, how and in which role to work. They may now expect to be appraised for their productive value. Perhaps with a bias, but still with a much fairer evaluation that would have been available a few decades back. It is not all perfect, as it is obvious that women are still discriminated against, but they may now at least aspire to any position, and to play any role in society. This must have resulted in a substantial increase in the efficiency of the allocation of talent.

Also, in some countries (most clearly the USA) there has been a reduction of racial discrimination. As with female discrimination, it is not that the problem has disappeared; but it is clear that it has decreased enormously and this must have had a positive impact on the workings of the economy. In Europe there has been an increase of migration that has made the racial/ethnic composition of European regions and countries more diverse. But we are lacking the data to assess the consequences for economic growth.

Finally, as we have seen, it appears to be likely that the impact of family background has increased. Our measurements for Catalonia point in this direction and are in line with what other people have found in the UK using traditional estimations of intergenerational mobility – this is bad news for the efficiency in the allocation of talent.

In our work on surnames, we also show that being female has gone from being a key predictor of low education levels to a variable that is irrelevant in predicting educational outcomes. At the same time, we show that the importance of ethnic and family background has increased. Thus, it is difficult to say whether overall efficiency has decreased or increased. The positive developments, consequence of smaller female discrimination, are a welcome development and may well be more important than the negative effects due to less intergenerational mobility. Still, even if this were the case, we should refrain from celebrating. Even if the improvement in the condition of women is large enough to more than make up for the increase in the incidence of family background, the problems associated with lower intergenerational mobility remain there: we would do better if we had a more dynamic society.

Thus, our final point. After having read all these pages, you may be surprised at the following statement: the question *"is the allocation of talent improving?"* is misleading. The relevant issue is whether our society is doing the best it can so as to improve it. Thankfully in some areas we are doing better than in the past: women are freer and in some places ethnicity is less determinant. Still, in other

areas it is not the case, as mobility seems to be decreasing and, at least in Catalonia, ethnicity seems to have become more relevant.

A critical point is that guaranteeing equality of opportunity involves no trade-off. It is plainly obvious that more mobility does not imply more discrimination against women. We should rejoice at the improvement of the situation of women, and society should work hard to improve it even further (as, unfortunately, there is still a long way to go). But our victories in this dimension should not decrease our concern about the negative developments regarding the importance of family background. In this second front we seem to be losing. We need to re-evaluate our educative policies facilitating access to education among the poor but taking care not to worsen their *relative* position (i.e., not benefiting the rich *more* than we benefit the poor). We should make sure that the children of the poor feel as attracted to education as the children of the rich; an important part of public education should be to *motivate* the interest in studying, reading, and the general intellectual curiosity of those children who grow up in a home lacking the right incentives.

We should also try to have efficient capital markets, so that talent, and not inherited capital, is what determines who ends up being an entrepreneur. We should try to decrease local advantages obtained not from inherent talent, but from being an insider in the right circle. In general we should make the work environment more sensitive to talent, promoting competition and decreasing the value of advantage.

Some recent developments go exactly in the wrong direction: **(a)** Performance in school is much more dependent on income than seems reasonable. **(b)** The tendency to decrease, or even eliminate, inheritance taxes will certainly not help to improve the allocation of talent. Overall, there are plenty of reasons not to be optimistic; it seems that for the time being Mr. Notbright will continue to beat his odds.

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