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An ex-post view of inequality of opportunity in France and its regions*

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Abstract

This paper proposes an ex-post measure of inequality of opportunity in France and its regions by assessing the inequality between individuals exerting the same effort. To this end, we define a fair income that fulfils ex-post equality of opportunity requirements. Unfairness is measured by an unfair Gini based on the distance between the actual income and the fair income. Our findings reveal that the measures of ex-post inequality of opportunity largely vary across regions, and that this is due to differences in reward schemes and in the impact of the non responsibility factors of income. We find that most regions have actual incomes closer to fair incomes than to average income, excepted Ile de France where the actual income looks poorly related to effort variables. Finally, we find that income inequality and inequality of opportunity are positively correlated among regions.

Keywords: Inequality of Opportunity, Fairness, Regional Inequalities

JEL Codes: D31, D63, J62

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1 Research Question

In the literature on redistributive justice, growing attention has been paid to the concept of equality of opportunity. This defends a responsibility-sensitive egalitarianism. In an nutshell, individuals' advantage is decomposed into two kinds of determinants and these ones determine if inequality among individuals' advantages is fair or unfair. Unfair inequalities are due to factors for which the individual is not responsible, called circumstances. As a consequence we should remove these inequalities. On the contrary, the factors for which the individual is responsible, called effort, generate fair inequalities and this does not give room to redistribution.

The division between responsibility and non responsibility factors is far from straightforward. Nevertheless, a consensus prevails concerning certain variables. For instance in the literature, it is often accepted that education is a responsibility factor and father's education a non-responsibility factor. But, does education remain an effort variable if the father's education has an impact on the education of the offsprings? This question illustrates the difficult task of drawing a clear cut betwwen circumstances and effort variables.

Another question concerns the measurement of inequality of opportunity. Even though the concept of equality of opportunity is unambiguous, two strategies of measurement have emerged. On the one hand, the ex-ante approach consists in studying the contribution of non-responsibility factors in shaping inequalities. Effort is not a key variable in this kind of analysis because we do not need to observe it to measure inequality of opportunity. On the other hand, the ex-post approach consists in determining if individuals who exert the same effort actually obtain the same outcome, in other words, if outcome is a function of effort only. These two measures are equally valid but may lead to distinct conclusions because they measure inequality among distinct groups. The ex-ante approach measures the inequality between individuals who share distinct circumstances and the second perspective focuses on inequalities between individuals exerting the same effort.

These two measures of inequality of opportunity have been conducted in many developed (Italy [7] , Belgium [14], France [20, 21], Norway [1] US [26] among others), and developing countries (for instance in Brazil [6], Latin America [15], India [23] , Africa [9]). In France, inequality of opportunity has been recently studied for income and for health [21, 18, 13] with the ex-ante approach.

In the case of income, Lefranc et al. [21] have applied first and second stochastic dominance tools to compare the income distribution conditional on the social origin. They establish a clear hierarchy between groups of distinct social origins, this ranking has been quite constant over time (1979-2000) but the income distributions have become closer to each other, this indicates the presence of inequality of opportunity but a reduction of its magnitude. They also find that, when using the variance of incomes as an indicator of inequality, social origin explains only 5% of the overall income inequality. This reveals how difficult it is to explain income and this is true for most developed countries.

Regarding health unfair inequalities, Jusot et al. [18] and Devaux et al. [13] analyze the channels through which health inequalities are transmitted across generations. The first study investigates by how much the correlation between circumstance and effort impacts on the magnitude of inequality of opportunity. They show that circumstances affect health inequalities through their impact on effort measured by obesity, vegetable consumption, smoking habits. Whether we should or not compensate for this indirect effect, the results do not change in a large extent and in any case, the parental background explains the largest part of inequalities of opportunities. The second study scrutinizes more on the mechanisms that are at the origin of inequality of opportunity in health. They show that mother's education has a direct impact on offsprings' health whereas father's education has only an indirect impact through the education and profession of the offsprings. In total, unfair health inequalities could be considerably reduced when assigning the best circumstances to all, as the standard Gini index would decrease by 57%.

The studies on income and health cited above [21, 18, 13] correspond to the ex-ante approach for inequality of opportunity to the extent that they study the contribution of circumstances in shaping income and health inequalities. Nevertheless, it could be of main interest to change the perspective such as to include indicators of effort in order to implement an ex-post approach. To our knowledge, this has not been studied for France. Instead this approach has been implemented in Norway [1] where direct indicators of effort have been used (education, profession, working hours). Several observations concerning the relationship between effort and income indicate that an ex-post approach with a direct measure of effort may be relevant for France:

First, disparities across regions of France are found to be determined more by individuals' characteristics [22, 11], mainly human capital, rather than by spatial determinants such as density and potential markets. More pre-

cisely, differences in human capital and in the sector of activity have played a major role in explaining inequalities between individuals: Godechot [17] found that the increasing inequalities in the last years are due to a rise in the salary of workers working in specific sectors: entertainment and mostly finance. Human capital and the sector are variables of effort mainly used in the literature on equality of opportunity [1, 13, 6] and they are related to income acquisition. An ex-post approach would thus allow to measure directly the contribution of the effort variables to inequality of opportunity.

Secondly, when we turn to the perceptions of individuals with respect to inequality in France [16], we observe that individuals, whatever their professions, legitimate income inequalities when they are due to differences in the number of working hours, the type of job, the dedication of the employees. This also gives a strong appeal to the analysis of ex-post inequality of opportunity because this theory justifies inequalities due to effort variables and precisely states that income inequalities are fair if income is a function of effort only.

Finally, the European Survey on Income and Life Conditions for France provides for 2005 most variables required for such ex-post analysis, with indicators of income, effort and circumstance.

In addition to develop an original ex-post analysis of inequality of opportunity for France, our paper explores unfair inequalities across regions. Indeed, French regions are old and homogeneous entities in terms of culture and economy. This influences the way that effort and circumstance affect income. In addition, the uneven distribution of circumstances across regions (age and father's education for example) affects the regional labor markets and the determination of the wage. This is also the case for effort variables such as sectors or education.

The regional analysis provides a more precise understanding of the unfair inequalities in France. In a context where income inequalities has been found to be rather low between regions, except Ile de France [11], we check whether the same is true for unfair income inequalities. In addition, even when there is no correlation a priori between income inequality and inequality of opportunity, empirical studies have shown a positive correlation between both terms in European countries and the US [20], in Italy [7] and in India [23]. In this way, our study may give new evidence on this correlation by comparing the ex-post inequality of opportunity and the income inequality across regions.

In terms of contribution, this paper is the first to provide an ex-post measure of inequality of opportunity for France and its regions. Our main findings are that inequality of opportunity is highly heterogeneous among regions in the sense that the regions do not reward effort equally, that income inequality and inequality of opportunity are positively correlated and that some regions (Ile de France and Rhône-Alpes in particular) have incomes nearly not correlated with effort variables.

The rest of the paper is organized as follows: Section 2 presents the methodology for measuring ex-post inequality of opportunity. Section 3 introduces the data, Section 4 summarizes the results and Section 5 is the conclusion.

2 Methodology

The ex-post approach checks whether effort is the only determinant of income, therefore effort is the core input in this view. A first method proposed by Roemer [28] following the ex-post approach considers that effort can be captured indirectly through the Roemer Identification Axiom: assuming the outcome is a monotonous increasing function of effort, once we partition the population into types, that is to say into groups of individuals sharing the same non-responsibility factors, the individuals who locate at the same quantile of their income distribution per type are supposed to exert the same effort. The fact we first partition individuals into types permits to correct for the effect of the type on effort. This means that we measure net effort, that is to say, effort once it is cleaned from its correlation with circumstances.

In this case, because everything that is not a circumstance is effort, this method is often said to provide a lower bound for inequality of opportunity. However, though difficult to delimit, effort could be partially, but directly, captured by some responsibility factors. This restricts the power of residuals to proxy effort. In addition, there is no guarantee that residual distributions conditional on types are equal, and no guarantee that residuals precisely capture effort, since they also capture omitted circumstances.

For all these reasons, we propose to take into account effort variables explicitly, rather than implicitly through the residuals. The cut is not always clear between circumstances and effort. Following Arneson [2], Cohen [10] and Roemer [27, 28], our cut is strictly based on control. If the agent has, even partially, control on the determination of the variable at some moment of his

life, then it is a responsibility factor. The residual still inevitably includes some unobserved effort and circumstance. Nevertheless, as shown in Section 4, the responsibility and non-responsibility factors explain about half of income inequality.

We thus estimate a classical Mincerian wage (y_i) equation, where the regressors are split into two categories, X_i^E and X_i^C, where E and C stand for effort (responsibility factors) and circumstances (non responsibility factors), respectively:

$$log(y_i) = \beta_0 + \beta^E X_i^E + \beta^C X_i^C + \epsilon_i \quad (1)$$

We do not consider residuals as part of the effort variables set[1]. Since the residuals potentially include some omitted circumstances we follow the method proposed by Bjorklund et al. [4] which consists in splitting the residuals in a term which is standardized by standard error conditional on circumstances, and an heteroskedastic term depending on circumstances[2]. Since the dependence of the heteroskedastic term on circumstances is close to zero, we do not include this additional term in our specification for the rest of the paper.

As regards the potential correlation of effort and circumstance variables, it is common to distinguish the direct effect of circumstances on the income and the indirect effect of circumstances, exerted through the correlation with the effort variables. We thus propose to measure ex-post inequality of opportunity according to the two views, one where effort is included as such (gross effort) and the other where effort is cleaned from its correlation with the circumstances (net effort).

[1]Obviously, this residual includes effort as well as circumstance variables and it is impossible to disentangle between both determinants. Like other papers that use earnings equations, we include the residual into the circumstance set [1, 6]. We think this is also more appropriate in the context of our study because we study to which extent individuals who exert the same effort obtain the same outcome with a direct measure of effort.

[2]Bjorklund et al.'s decomposition is based on the following formulas:

$$\begin{aligned} Var(\epsilon_i|X^C) &= \sigma_c^2 \\ \epsilon_i &= \epsilon_i - \epsilon_i/\sigma_c + \epsilon_i/\sigma_c \\ \epsilon_i &= \tilde{\epsilon}_i^c + u_i \\ u_i &= \epsilon_i/\sigma_c \\ log(y_i) &= f(X_i^E, X_i^C) + \tilde{\epsilon}_i^c + u_i \end{aligned}$$

We find no significant effects in our data.

To this end, we regress each effort variable on the set of circumstances and the residual of each of these equations corresponds to the net effort. For continuous variables, we proceed as follows:

$$X_i^E = bX_i^C + \tilde{X}_i^E \quad (2)$$

The net effort is simply $\tilde{X}_i^E$. For binary variables such as education or gender[3], the latent variables underlying the binary outcomes are unobservable. By consequence, the residuals of the probit cannot be obtained. We thus replace it by their best predictions, called the generalised residuals, whose formula (see Jusot et al. [18] for details) is the following:

$$E(\tilde{X}^E|E) = \frac{\phi(bX^C)}{\Phi(bX^C)(1-\Phi(bX^C)}(E - \Phi(bX^C)) \quad (3)$$

where $E(.|E)$ is the expectation conditional on gross effort, $\phi(.)$ and $\Phi(.)$ are the normal density and cumulative density function of a $N(0,1)$ (the residuals are assumed to be normally distributed). Therefore, we estimate two wage equations. The first wage equation is the one given by Equation 1 and the second one replaces the gross effort by the net effort as follows:

$$log(y_i) = \beta_0^{'} + \beta_E^{'}\tilde{X}_i^E + \beta_C^{'}X_i^C + \epsilon_i \quad (4)$$

Where $\tilde{X}_i^E$ is the net effort (the residual of the effort variables regressed on circumstances).

Once we obtain the estimates, we define a situation of ex-post equality of opportunity by following the methodology developed by Almas et al. [1]. There is ex-post equality of opportunity if the individual receives a fair income, which is the income due to the sole responsibility factors (and not to non-responsibility factors). This definition fulfils the conditions of ex-post equality of opportunity as income is a function of effort only. So, the fair income based on gross effort is:

$$log(y_i^F) = f(X_i^E) \quad (5)$$

$$y_i^F = exp(\beta_0 + \beta X_i^E) \quad (6)$$

We replicate all our results for net effort by replacing X^E in the coming formulas by $\tilde{X}^E$. The individual fair income y_i^F is then standardized so as to have the same average as the actual income.

$$y_i^F = \frac{exp(\beta_0 + \beta X_i^E)}{\sum_j exp(\beta_0 + \beta X_j^E)} \sum_j y_j \quad (7)$$

[3]All the categorical variables are binary in this research paper, since we transformed the multicategorial ones into dummy variables.

As a result, the standardized fair income (onwards it stands for the fair income) depends on the non-responsibility factors of the whole population and on the own individual's responsibility factors. This fair income is based on the general proportionality principle[4] and proportional to the effort exerted by the individual.

Many statistics, such as the Gini, Theil and General Entropy indexes, are quite standard to summarize and measure inequality of opportunity. Here, we now use a new version of the Gini Index, as generalized by Almas et al. [1] to capture unfair income inequality. The standard Gini, based on Lorenz curves implicitly compares actual incomes to average income. Here, the reference income is not the average income but the fair income and this fair income is not necessarily an equal income because differences in effort justify income inequality. Almas et al. [1] thus propose an unfair Gini where the actual incomes are compared to fair incomes [5]. The distance between the actual income and the fair income is a measure of unfairness in the distribution of the individuals' income. They formulate the unfair Gini as follows:

$$G^u(A) = \frac{2}{n(n-1)\mu(A)} \sum_i i(y_i - y_i^F) \quad (8)$$

$$\mu(A) = n^{-1} \sum_i y_i \quad (9)$$

$$A = \left[(y_1, y_1^F), ..., (y_n, y_n^F)\right] \quad (10)$$

The unfair Gini is not derived from the standard Gini (based on actual incomes). Indeed, incomes are sorted according to an ascending order to compute the standard Gini. Instead, the unfair Gini orders the individuals according to the distance between the own actual income and the own fair income (from negative values to positive values). This gives no guarantee that individuals are ordered identically under both statistics. As a consequence, we do not obtain here a decomposition of the standard Gini between an unfair Gini and a residual part. Instead, we have an original measure of inequality where the reference income to asses inequality is not anymore the mean income but the fair income.

The same methodology developed above is applied first for France, then for each region separately. Estimates for fair income are obtained for each region

[4]The generalized proportionality allocation has been characterized as a compromise solution in the first best by Bossert [5]

[5]The properties of the index are available in the paper by Almas et al. [1]. It is worth noting that while the Gini index satisfies full symmetry, the unfair Gini satisfies partial symmetry.

separately, then compared through unfair Gini measures.

Finally, we propose an Oaxaca decomposition [24] of income across regions in order to understand better what drives our results on the unfair Gini. To this end, we compare the average income in one region, say region j, with the average income in the rest of the regions, say regions $-j$, and explain these differences by the contribution due to "magnitude", "effects" and the interaction between magnitude and effect. The decomposition is formalized as follows:

$$\begin{aligned} log(y^j) - log(y^{-j}) &= \Delta X^E \beta^E_{-j} + \Delta X^C \beta^C_{-j} \\ &\quad + \Delta\beta^E X^E_{-j} + \Delta\beta^C X^C_{-j} \\ &\quad + \Delta X^E \Delta\beta^E + \Delta X^C \Delta\beta^C \\ \Delta X^k &= X^k_j - X^k_{-j} \\ \Delta\beta^k &= \beta^k_j - \beta^k_{-j} \\ k &= E, C \end{aligned} \tag{11}$$

With this decomposition, we can explain if differences in the mean income are driven by differences in circumstances or effort. And for each of these two kinds of variables, we decompose the difference between what is due to the distribution of the variables in the region with respect to the other ones and what is due to the impact of the variable on income. This decomposition does not provide a decomposition of the unfair Gini. Nevertheless, it gives a better understanding of the role of circumstances and effort in explaining differences between regions. In this way, it provides complementary conclusions concerning ex-post inequality of opportunity.

3 Data

The data come from the 2005 EU-SILC (European Survey on Income and Life Conditions) data set from France. This data set has been designed at the European level and implemented by INSEE for France. We take the year 2005 because this module contains detailed information about indicators of effort, family background and income.

The dataset contains two parts, the first one contains information on households, the second one concerns individuals. For our purpose, we take the module of the survey that is addressed to individuals, since inequality of opportunity refers to inequality between individuals and not between groups.

Moreover, it would be much more challenging to define the concept of effort and circumstance for households.

Concerning the sample, we select individuals who are between 25 and 65 years-old, were wage earners, worked full-time during the 12 months in 2004 and did not change their jobs between 2004 and 2005. These restrictions are partly imposed by the data set: questions about the sector of activity refer to the year 2005 but incomes refer to 2004. Therefore, we select people who did not change their profesional situation to keep the information about the sector of activity. [6] We restrict our sample to individuals between 25 and 65 years-old to focus on individuals who are more likely to be active and we avoid people being at the very begining and very end of their profesional career. Finally, because the income of self-employed is not clearly identifiable, we select wage earners only. We obtain in total 4279 observations. Details on the variables and on the sample are provided in Tables 3 and 1.

INSERT TABLE 3 HERE

INSERT TABLE 1 HERE

We split our sample into 21 regions. The actual number of regions in France is 27 but the survey does not separate Corse and Provence-Alpes-Cotes-d'Azur (PACA) such that we have to proceed in the same way and no data is available for the 5 overseas regions.

The dependent variable is the gross labor income. We do not include capital income in order not to mix two dimensions of equality of opportunity and we take the gross earnings to measure by how much the labor market on its own generates ex-post inequality of opportunity. As a consequence, our analysis is restricted to ex-post inequality of opportunity among employed individuals before the state operates any redistribution.

For the circumstance variables, we take father's education, financial problems during adolescence, gender and age. Parental education is often used in empirical analysis as a circumstance [6, 15, 20, 7]. Here, father's education takes 4 values according to the highest diploma obtained by the father (see

[6] This constraint could bias our result if job mobility is correlated with effort but the sign of the correlation is not clear. On the one hand, individuals, the youngest in particular often progress by changing jobs. On the other hand, those who exert less effort are more likely to change jobs in order to benefit from unemployment benefits and are more likely to lose their job. Therefore, to the extent that the sign of the bias is not clearly identifiable, we maintain this choice.

Table 1). Financial problems during adolescence is a dummy that indicates whether or not the individual's family faced financial difficulties when he was between 12 and 16 years old. We include this variable in order to complement the information on family background as we consider this may measure the economic capital whereas father's education indicates human capital. Gender is included as a circumstance because we control for working hours. So, even if women may tend to prefer more leisure [12] and so tend to work less hours, because we control for this, gender should not be a determinant of inequalities. We adopt the same view for age: we consider that two individuals with the same working experience should not obtain a distinct income whatever their age. Because we control for experience, age is included as a circumstance variable.

Effort is defined by a set of variables: individual's education, years of experience, sector of activity and weekly working hours (see Table 1 for complementary information). Individual's education is a categorical variable. It takes 6 values that depend on the highest level of education attained by the individual. This variable, although correlated with father's education is in general considered as an effort variable [1, 6] because the individual is at least partly responsible for it. Moreover, we will clean for this correlation when using the net measure of effort.

Years of experience corresponds to the years the individual spent in paid jobs. As a result, this is an indicator of generic professional capital. The number of years spent in the sector of activity where the individuals works at the time is not known.

Sector of activity takes 5 values and corresponds to the sector in which the individual works. Considering this variable as being an effort variable is disputable: labor market restrictions may impose constraint on individual's choice concerning the sector of activity. But to the extent that individuals have at least a partial control on their sector of activity, we consider this is an effort variable.

Lastly, the weekly working hours correspond to the hours per week an individual worked in his job. In the survey, the individuals are not asked to declare the official weekly working hours but the number of effective working hours they usually spend working in a week. This variable should be an indicator of dedication at work. But in this way, we do not account for the fact that working hours, and specially part-time jobs can be imposed.

More descriptive statistics concerning the frequencies of the variable per region for categorical variables, the mean and variance for continuous variables are reported in Tables 3 and 2. In a nutshell, all the variables cited above have been commonly used in the literature on equality of opportunity. Almas et al. [1] as well Bourguignon et al. [6] for instance also use indicators of working hours, level of education, gender and sector of activity (public vs private). For France, mainly Lefranc et al. [19, 20, 21] have worked on inequality of opportunity from the ex-ante perspective using stochastic dominance tools. Therefore they use only one circumstance, the occupation of the father. Also, because they adopt a long term perspective, they use the Household Budget Survey that is available from the seventies whereas the EU-SILC has been launched since 2004. This is a reason why our data are not directly comparable. The advantage of the EU-SILC survey is the fact that many indicators of effort are available and this is not the case for the Household Budget Survey. Moreover, Lefranc et al. have focused on the gross and disposable income, by including labour and asset income, and we focus on the gross labour income only.

INSERT TABLE 2 HERE

4 Results

4.1 Preliminary results

4.1.1 An overview of wage determinants in France

Since effort variables are partially determined by circumstances, we first estimate net effort (effort cleaned from its correlation with circumstances) for France from Equations 2 and 3. Results are reported in Table 4[7]. Though not central to our research question, some results are noteworthy. Father's education has a significant impact on offspring's education when the offspring has achieved at least upper secondary school. In this case, more educated fathers grow more educated children. Also, education depends on financial problems: if the family faced financial problems during the adolescence, it increases the probability of having a low level of education. Instead, having financial problems during adolescence has a positive effect on experience. An explanation is that the years of experience is negatively correlated with

[7]The regression estimated to purge the effort variables from their correlation with circumstances is made on a national, instead of regional, basis due to data limitations.

education, since individuals stop studying and enter the labour market. Concerning working hours, it depends significatively on father's education and on gender. As expected, men tend to work more hours than women do and more educated people tend to work more.

INSERT TABLE 4 HERE

We can then estimate the wage equation by using successively the gross and net version of effort, Equations 1 and 4 respectively. As reported in Table 5, the results vary whether we consider the gross or net effort. As expected, the significance and the magnitude of the parameters of circumstance and effort respectively increase and decrease when effort is estimated in its net version. We find that the explanatory variables explain around 41% of income inequality. And if we decompose the R squared, we obtain that 32% of income inequality is explained by the effort variables and 9% by circumstances. Our indicators of effort provide a good explanation of income inequality. Also, almost all the coefficients are significant and of expected sign. Only the fact of having accomplished primary school or not having any diploma does not make any difference and financial problem becomes significant only when using the net measure of effort. When turning to the rest of the variables, we observe that father's education and age have a positive impact on income as well as being a man and working in a sector that is not agriculture. Also education is highly significant and has a increasing impact on income as the level of education increases. Experience does not present non linearity but still has a positive impact on earnings as well as the number of working hours. This national regression is consistent with classical results in the literature and confirms the hypothesis of the presence of inequality of opportunity in France. At a national level, inequality of opportunity is mainly due to the impact of gender and father's education and, to a lower extent, to age and financial problems.

INSERT TABLE 5 HERE

4.1.2 Regional analysis

Our point to compare regions is related to the possible heterogeneity characterizing the French regions. A first result is that regional dummies added to the wage Equation 1 are strongly significant. Moreover,we also find that these regional differences are not due to different sectoral profiles of the regions because interaction terms relating sectors and regions do not remove the significance of regional specific dummies[8]. This confirms a first intuition

[8]Results are not reported but available upon request.

according to which there is heterogeneity in income inequality across regions in France.

We thus estimate the wage Equation 1 for each region in its net and gross versions of effort. Results are reported in Tables 6, 7, 8 and 9.

INSERT TABLE 6 HERE

INSERT TABLE 7 HERE

INSERT TABLE 8 HERE

INSERT TABLE 9 HERE

Regarding the circumstances, we find that they affect income inequality differently across regions. Firstly, the variables "age", "gender" and "having a father who went to the university" are circumstances that remain in (almost) all cases significant and that affect positively the earnings. However, the size of the impact is now very different from one region to another. Indeed, when taking into account only the significant coefficients, the coefficient "gender" varies between 0.094 for Lorraine and 0.285 for Auvergne. The effect of gender in Auvergne is three times as large as in Lorraine, once all the other sources of income inequality are controlled for. The Figure 1 shows the variation in the coefficients across regions. The same difference is observed for the effect of father's education. By comparing only significant coefficients, the effect of having a father who went to the university with respect to a father with no diploma is the smallest in PACA-Corse with a coefficient equal to 0.366 and the effect is the largest for Limousin with a coefficient equal to 0.832. The Tables 6, 7, 8 and 9 order the region in increasing order of income level (the first table contains the "poorest" regions), and the smallest and largest effects have been found for the half poorest regions, therefore we cannot conclude that income level might explain the variation in the impact of unfair sources of inequalities. Finally, financial problem has a very small impact on earnings, even in Ile de France, which implies that the explanation cannot be related to the sample size. As a conclusion for circumstances, the transmission of advantages seem to be better captured by the human capital rather than the economic capital of the family.

INSERT FIGURE 1 HERE

Looking at the effect of effort variables, we first observe that regions do not reward equally effort. Working in a sector or another does not appear to

have a significant impact on earnings[9]. Indeed for half of the regions, not even one coefficient is significantly different from zero. On the contrary, the other effort variables are often significant, especially "working hours", "experience" and "education" (precisely the dummy that indicates that the individual achieved at least upper secondary education). This shows how much our indicators of effort are relevant, given the smaller sample size in the regional analysis, for explaining income inequality. In addition, we also obtain a great variation in the reward schemes across regions. The Figure 1 displays the effect of education and working hours on the earnings. The impact of having lower tertiary education varies between 0.073 in Nord-Pas-de-Calais and 0.314 in Limousin. The same large difference is observed for "working hours" whose impact goes from 0.07 in Nord-Pas-de-Calais to 0.036 in Champagne-Ardenne.

As a conclusion for these first results, we obtain that circumstances have in France a direct and also an indirect effect on effort. Even though the sources of unfair inequalities are in general the same across regions, the size of the impact of each source is very distinct from one region to the other. This would justify a regional approach for the design of redistribution policies. In order to analyse to which extent regions differ in terms of ex post inequality of opportunity, we turn to the comparison of the unfair Gini.

4.2 Standard Gini versus unfair Gini

By using the fair income Equation 7 and computing the unfair Gini formula presented in Equation 9, following Almas et al. [1] methodology, we find that in most cases the unfair Gini is smaller than the standard Gini (see Table 10 and Figure 2). It decreases for example at the national level from 0.27 to 0.22. This means that the distribution of actual income is closer to the distribution of fair income rather than to the egalitarian distribution. As second result, we note that the gross and net versions of the unfair Gini measures, respectively 0.23 and 0.22 at the national level, are quite close, compared to the standard Gini, 0.27. It indicates that the indirect effect is relatively small with respect to the direct effect of circumstances or, in other words, even tough the circumstances affect the effort variables, the contribution of this correlation to the inequality of opportunity is rather limited.

INSERT TABLE 10 HERE

[9]Changing the sector of reference does not change the empirical results.

In addition, when we focus on the analysis per region, we note that the Unfair Gini (in its gross and net versions of effort) is lower than the Standard Gini for 19 of the 21 regions. The actual distribution of income is therefore less egalitarian than fair at the regional level as well. It even decreases below 0.1 in 7 regions (Centre, Bourgogne, Lorraine, Franche-Comté, Pays de la Loire, Bretagne and Auvergne). According to the theory of equality of opportunity, unfair inequalities are so small in such regions that (nearly) no redistribution is required. Notwithstanding, the heterogeneity remains quite substantial across regions. In many regions, the unfair Gini remains relatively high around 0.2 (Alsace, Haute/Basse-Normandie, Midi-Pyrénées, Languedoc-Roussillon).

Quite interestingly, the Unfair Gini remains respectively as high and higher than the standard Gini in Rhône-Alpes and Ile de France. It means that the income distribution is closer in these regions to the equal distribution than to the fair income distribution. The relationship between effort and income thus appears to be quite weak. Such results are quite unexpected. First, their respective sample sizes are the largest of our dataset, so that measurement uncertainty should not be the core worry. Second, these regions both have a major city (Paris and Lyon) where education (an effort variable) was expected to play a central role. According to the theory of equality of opportunity, more redistribution should occur in these two regions than elsewhere in France. These specificities of Ile de France and Rhône-Alpes will be further explored and discussed in next Section where we decompose the wage differences across regions into magnitude and effect (coefficient) factors for both circumstance and effort variables.

We finally consider the relationship between income inequality and inequality of opportunity. There are three remarkable changes in terms of rankings: Auvergne and Bourgogne that display high level of income inequality perform much better in terms of equality of opportunity. On the contrary, Alsace, which has a quite low level of income inequality, displays high level of inequality of opportunity. For the other regions, the two first maps of France illustrated in Figure 2 illustrate a strong correlation between income inequality and inequality of opportunity. To explore further our case, we also show in Figure 2 the rankings of regions in terms of gross labour income: the correlation between income level and inequality of opportunity appears to be much weaker among the French regions.

INSERT FIGURE 2 HERE

4.3 Decomposing income inequalities across regions

We finally provide an Oaxaca decomposition (Equation 11) to explain and explore whether differences in the regional mean income are driven by differences in circumstances or effort and for each of these variables what is due to differences in their magnitude ($\Delta X^i \beta^i_{-j}$ where $i = E, C$) and what is due to differences in their effect ($\Delta \beta^i X^i_{-j}$). The results are reported in Table 11 for the net version of effort.

INSERT TABLE 11 HERE

Contrary to the approach of the precedent sections, the Oaxaca Decomposition has an interregional approach, and is silent about intra-regional unfairness. This decomposition shows that effort variables can contribute to differences in regional wage equations by two channels: magnitude and effect. It first appears from Table 11 that the variability of magnitude channel is larger than the coefficient channel, reflecting that effort variables (working hours, education, sector, experience) differ from one region to the other and that their respective contribution to the income are highly heterogeneous. This result tends to confirm previous results reported in the penultimate paragraph of Subsection 4.1.

We also note that the magnitude channel affects quite negatively Franche-Comté, Basse-Normandie, Picardie among others, which reflect the relatively lower magnitude of the sectors and education effort variables for these regions (see Table 3), and that the effect channel affects quite negatively Bourgogne, Franche-comté and PACA-Corse, which reflects different effort reward schemes.

As noted in Section 4.2, Ile de France and Rhône-Alpes differ from other regions in terms of fairness, with an unfair Gini larger than, or close to, the standard Gini, which indicates that effort and income are weakly related. This result relied on intra-regional measures. The Oaxaca decomposition indirectly confirms for Ile de France the weak role of effort (less than 20% of contribution) in explaining the inter-regional differences of income. The circumstance coefficient factor is the main contributor to explain the large inter-regional income differences for Ile de France, meaning that father's education or age for example have a larger impact on income than in other regions.

The Oaxaca decomposition presented in this Subsection confirms, with its ex-ante flavour, that effort is not the sole contributor to the income distri-

bution, and that a redistribution policy could also occur on an inter-regional basis (national policy), and not only intra-regional basis (regional policy) as discussed in the precedent sections.

5 Conclusions

In this paper, we aim to analyze inequality of opportunity by following an ex-post approach designed to consider more directly the effort and to provide an interregional comparison of inequality of opportunity. To this end, we use a French data set that includes several indicators of effort and explain income inequalities by differences in responsibility and non-responsibility factors. We define the fair income by using Almas et al. methodology [1] and measure the magnitude of ex post inequality of opportunity in each region by the distance between the actual income and the fair income. Finally, we use Oaxaca decomposition to further explore the sources of regional wage differences and the heterogeneity in unfair inequalities across regions.

We first find that the national unfair Gini is lower than standard Gini, which indicates that the actual income distribution is closer to the fair income distribution than to the average income. We find that this result also holds for most regions. The actual income are so close to fair income in some regions (unfair Gini lower than 0.1) that nearly no redistribution is required according to the theory of equality of opportunity. We also note that the unfair Gini is larger than the standard Gini in Ile de France, which quite surprisingly indicates that the actual incomes are more egalitarian than fair, or in other words that effort variables are poorly related to the actual income distribution. This result is somehow corroborated by the Oaxaca decomposition which emphasizes the small contribution of effort variables in explaining the wage difference with other French regions. Our regional approach allows different reward schemes of effort across regions. The empirical estimates indeed confirm a large heterogeneity for the effects of education and even working hours.

We then find that the ranking of regions in terms of ex-post inequality of opportunity is quite similar to the ranking in terms of income inequality (which confirms previous results in the literature), but that no similar correlation arises between inequality of opportunity and income level.

The large heterogeneity found in the effort contribution to the wage equation reveals important differences in intra-regional unfairness, justifies a regional

approach and indicates that policies aiming to reduce inequality of opportunity should be optimally designed at a decentralized level.

Finally, the regional approach raises a new question related to the choice of the region. The choice of the region is certainly at the crossroad of circumstance and effort definition. As developed in Baccaini [3], the inter-regional mobility rates increase over time. An extension of this analysis would be to explicitly consider migration as an effort variable, controlling for its endogeneity and assessing to which extent it contributes in reducing interregional unfairness differences.

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Tables and Figures

Table 1: Description of the variables

Name	**Format**	**Values**	**Category**
Gross labour income	Numerical	[3,055;271,962]	Dep. variable
Age	Numerical	[25;65]	Circumstance
Gender	Dummy	0: Woman 1: Man	Circumstance
Father's education	Categorical	1: lower than 1ary education 2: 1ary education 3: 2ary education 4: 3ary education	Circumstance
Financial problems during adolescence	Categorical	0: Never or few 1: More than few	Circumstance
Weekly working hours	Numerical	[11,97]	Effort
Years of experience	Numerical	[0,49]	Effort
Individual's education	Categorical	1: Uncomplete 1ary 2: Complete 1ary 3: Complete lower 2ary 4: Complete upper 2ary 5: Complete lower 3ary 6: Ms.C, Ph.D.	Effort
Sector of activity	Categorical	1: Agriculture 2: Energy and Industry 3: Construction 4: Services 5: Public sector	Effort

Table 2: Summary Statistics

Variable	**Mean**	**Std. Dev.**
Gross labour income	29,852	18,357
Worked hours	39.7	8.1
Age	42.6	9.3
Years of experience	21.5	10.5
Years of experience squared	573.7	470.5
Observations	4279	

Table 3: Regional Summary Statistics

	Education						Father's education				Gender		Sector					Financ probl		**Total**
Region	No	1	Lower 2	Upper 2	3	PhD	No	1	2	Above	Women	Men	Agri	Indust	Constr	Serv	Public	Never	More	
Ile de Fr	82	49	78	309	386	54	75	402	304	177	445	513	2	137	58	385	376	520	438	958
	8.6%	5.1%	8.1%	32.3%	40.3%	5.6%	7.8%	42.0%	31.7%	18.5%	46.5%	53.5%	0.2%	14.3%	6.1%	40.2%	39.2%	54.3%	45.7%	100.0%
Champ-Ardenne	9	6	11	48	25	2	2	59	34	6	39	62	1	33	8	24	35	57	44	101
	8.9%	5.9%	10.9%	47.5%	24.8%	2.0%	2.0%	58.4%	33.7%	5.9%	38.6%	61.4%	1.0%	32.7%	7.9%	23.8%	34.7%	56.4%	43.6%	100.0%
Picardie	26	8	12	71	17	1	3	104	24	4	49	86	3	38	19	41	34	63	72	135
	19.3%	5.9%	8.9%	52.6%	12.6%	0.7%	2.2%	77.0%	17.8%	3.0%	36.3%	63.7%	2.2%	28.1%	14.1%	30.4%	25.2%	46.7%	53.3%	100.0%
Haute-Norm	9	3	4	36	37	3	2	60	23	7	31	61	2	21	4	27	38	51	41	92
	9.8%	3.3%	4.3%	39.1%	40.2%	3.3%	2.2%	65.2%	25.0%	7.6%	33.7%	66.3%	2.2%	22.8%	4.3%	29.3%	41.3%	55.4%	44.6%	100.0%
Centre	19	25	13	78	51	2	7	131	43	7	72	116	3	45	10	45	85	101	87	188
	10.1%	13.3%	6.9%	41.5%	27.1%	1.1%	3.7%	69.7%	22.9%	3.7%	38.3%	61.7%	1.6%	23.9%	5.3%	23.9%	45.2%	53.7%	46.3%	100.0%
Basse-Norm	10	13	6	42	21	1	0	68	23	2	42	51	3	35	4	14	37	52	41	93
	10.8%	14.0%	6.5%	45.2%	22.6%	1.1%	0.0%	73.1%	24.7%	2.2%	45.2%	54.8%	3.2%	37.6%	4.3%	15.1%	39.8%	55.9%	44.1%	100.0%
Bourgogne	11	4	5	55	38	3	5	61	44	6	47	69	3	31	10	33	39	68	48	116
	9.5%	3.4%	4.3%	47.4%	32.8%	2.6%	4.3%	52.6%	37.9%	5.2%	40.5%	59.5%	2.6%	26.7%	8.6%	28.4%	33.6%	58.6%	41.4%	100.0%
Nrd-P-d-Calais	24	18	24	141	92	12	9	199	84	19	107	204	3	87	19	89	113	173	138	311
	7.7%	5.8%	7.7%	45.3%	29.6%	3.9%	2.9%	64.0%	27.0%	6.1%	34.4%	65.6%	1.0%	28.0%	6.1%	28.6%	36.3%	55.6%	44.4%	100.0%
Lorraine	15	11	7	76	40	4	12	83	42	16	42	111	2	40	13	41	57	85	68	153
	9.8%	7.2%	4.6%	49.7%	26.1%	2.6%	7.8%	54.2%	27.5%	10.5%	27.5%	72.5%	1.3%	26.1%	8.5%	26.8%	37.3%	55.6%	44.4%	100.0%
Alsace	16	4	4	76	46	2	7	56	75	10	51	97	0	56	18	36	38	90	58	148
	10.8%	2.7%	2.7%	51.4%	31.1%	1.4%	4.7%	37.8%	50.7%	6.8%	34.5%	65.5%	0.0%	37.8%	12.2%	24.3%	25.7%	60.8%	39.2%	100.0%
Franche-Comté	15	8	3	59	28	0	4	80	26	3	42	71	2	47	8	23	33	53	60	113
	13.3%	7.1%	2.7%	52.2%	24.8%	0.0%	3.5%	70.8%	23.0%	2.7%	37.2%	62.8%	1.8%	41.6%	7.1%	20.4%	29.2%	46.9%	53.1%	100.0%
Pays de la Loire	19	17	20	141	81	7	6	184	77	18	114	171	5	78	32	75	95	152	133	285
	6.7%	6.0%	7.0%	49.5%	28.4%	2.5%	2.1%	64.6%	27.0%	6.3%	40.0%	60.0%	1.8%	27.4%	11.2%	26.3%	33.3%	53.3%	46.7%	100.0%
Bretagne	2	5	10	92	68	2	2	89	77	11	73	106	1	45	11	48	74	103	76	179
	1.1%	2.8%	5.6%	51.4%	38.0%	1.1%	1.1%	49.7%	43.0%	6.1%	40.8%	59.2%	0.6%	25.1%	6.1%	26.8%	41.3%	57.5%	42.5%	100.0%
Poit-Charentes	12	3	13	75	43	2	0	97	45	6	65	83	1	22	17	37	71	84	64	148
	8.1%	2.0%	8.8%	50.7%	29.1%	1.4%	0.0%	65.5%	30.4%	4.1%	43.9%	56.1%	0.7%	14.9%	11.5%	25.0%	48.0%	56.8%	43.2%	100.0%
Aquitaine	7	6	15	99	56	3	14	90	65	17	72	114	6	39	8	39	94	109	77	186
	3.8%	3.2%	8.1%	53.2%	30.1%	1.6%	7.5%	48.4%	34.9%	9.1%	38.7%	61.3%	3.2%	21.0%	4.3%	21.0%	50.5%	58.6%	41.4%	100.0%
Midi-Pyrénées	4	9	15	65	56	8	11	75	57	14	67	90	2	25	9	40	81	90	67	157
	2.5%	5.7%	9.6%	41.4%	35.7%	5.1%	7.0%	47.8%	36.3%	8.9%	42.7%	57.3%	1.3%	15.9%	5.7%	25.5%	51.6%	57.3%	42.7%	100.0%
Limousin	5	2	6	26	16	1	3	34	14	5	27	29	2	11	3	12	28	27	29	56
	8.9%	3.6%	10.7%	46.4%	28.6%	1.8%	5.4%	60.7%	25.0%	8.9%	48.2%	51.8%	3.6%	19.6%	5.4%	21.4%	50.0%	48.2%	51.8%	100.0%
Rhône-Alpes	42	11	20	177	105	20	18	212	108	37	145	230	0	110	27	94	144	202	173	375
	11.2%	2.9%	5.3%	47.2%	28.0%	5.3%	4.8%	56.5%	28.8%	9.9%	38.7%	61.3%	0.0%	29.3%	7.2%	25.1%	38.4%	53.9%	46.1%	100.0%
Auvergne	3	5	4	44	26	6	1	54	30	3	32	56	4	17	9	27	31	38	50	88
	3.4%	5.7%	4.5%	50.0%	29.5%	6.8%	1.1%	61.4%	34.1%	3.4%	36.4%	63.6%	4.5%	19.3%	10.2%	30.7%	35.2%	43.2%	56.8%	100.0%
Langued-Rouss	9	8	6	56	31	7	7	62	36	12	53	64	3	15	13	28	58	69	48	117
	7.7%	6.8%	5.1%	47.9%	26.5%	6.0%	6.0%	53.0%	30.8%	10.3%	45.3%	54.7%	2.6%	12.8%	11.1%	23.9%	49.6%	59.0%	41.0%	100.0%
PACA Corse	24	11	20	117	99	9	20	141	84	35	122	158	5	38	16	93	128	158	122	280
	8.6%	3.9%	7.1%	41.8%	35.4%	3.2%	7.1%	50.4%	30.0%	12.5%	43.6%	56.4%	1.8%	13.6%	5.7%	33.2%	45.7%	56.4%	43.6%	100.0%
France	363	226	296	1,883	1,362	149	208	2,341	1,315	415	1,737	2,542	53	970	316	1,251	1,689	2,345	1,934	4,279
	8.5%	5.3%	6.9%	44.0%	31.8%	3.5%	4.9%	54.7%	30.7%	9.7%	40.6%	59.4%	1.2%	22.7%	7.4%	29.2%	39.5%	54.8%	45.2%	100.0%

Table 4: Regression of effort on circumstances

Circ	Probit	Probit	Probit	Probit	Probit	Probit	Probit	Probit	Probit	OLS	OLS
	Ind	Constr	Serv	Public	Edu1ary	Low2ary	Up2ary	Low3ary	PhD	Exprc	Wrk hrs
fathed1ary	0.088	-0.196	-0.109	0.125	0.402***	0.266*	0.44***	0.042	-0.221	-0.411	1.063*
	[0.869]	[1.632]	[1.135]	[1.267]	[3.410]	[1.784]	[4.716]	[0.395]	[1.091]	[0.563]	[1.848]
fathed2ary	-0.095	-0.36***	-0.013	0.261**	-0.031	0.104	0.26***	0.50***	0.243	-5.50***	1.78***
	[0.893]	[2.755]	[0.132]	[2.553]	[0.219]	[0.665]	[2.601]	[4.524]	[1.196]	[7.268]	[2.962]
fathed3ary	-0.21*	-0.61***	-0.033	0.436***		-0.133	-0.44***	1.00***	1.00***	-7.87***	4.31***
	[1.660]	[3.594]	[0.290]	[3.768]		[0.698]	[3.791]	[8.184]	[4.806]	[9.082]	[6.275]
Fin prob	-0.006	0.111*	-0.081*	0.023	0.187***	0.098	0.10***	-0.25***	-0.081	1.42***	0.131
	[0.136]	[1.808]	[1.942]	[0.547]	[2.642]	[1.634]	[2.603]	[5.871]	[0.972]	[4.503]	[0.527]
Gender	0.51***	0.875***	0.120***	-0.77***	0.079	-0.083	0.19***	-0.26***	-0.021	1.15***	3.22***
	[11.077]	[10.948]	[2.873]	[18.879]	[1.098]	[1.391]	[4.864]	[6.244]	[0.268]	[3.675]	[13.012]
Age	-0.001*	-0.004	-0.01***	0.02***	0.06***	0.01***	-0.01***	-0.02***	0.01***		0.04***
	[1.732]	[1.287]	[5.073]	[7.197]	[12.196]	[4.294]	[2.904]	[6.686]	[3.124]		[3.192]
Constant	-0.90***	-1.70***	-0.033	-0.72***	-4.76***	-2.29***	-0.33**	0.135	-2.5***	22.9***	34.4***
	[5.863]	[8.255]	[0.233]	[5.007]	[17.279]	[10.354]	[2.401]	[0.909]	[8.894]	[29.913]	[40.252]
Obs.	4279	4279	4279	4279	4279	4279	4279	4279	4279	4279	4279
R-squared										0.089	0.05

Notes. Absolute value of t statistics in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 5: Wage Equation - National level

Variables	**Gross effort**		**Net effort**	
Father's education: 1ary	0.083***	[3.187]	0.132***	[5.066]
Father's education: 2ary	0.131***	[4.796]	0.242***	[8.646]
Father's education: 3ary	0.198***	[6.226]	0.464***	[14.569]
Financial problems during adolescence	0.001	[0.109]	-0.034***	[2.982]
Gender	0.165***	[13.747]	0.195***	[17.525]
Age	0.008***	[5.294]	0.006***	[4.224]
Industry	0.258***	[5.150]	0.126***	[4.580]
Construction	0.158***	[3.000]	0.059**	[2.359]
Services	0.233***	[4.680]	0.114***	[4.017]
Public sector	0.124**	[2.481]	0.049*	[1.704]
Education: 1ary	0.003	[0.092]	0.006	[0.399]
Education: low 2ary	0.169***	[6.019]	0.088***	[6.442]
Education: up 2ary	0.197***	[9.491]	0.128***	[10.145]
Education: low 3ary	0.566***	[25.141]	0.339***	[25.594]
Education: Ph.D	0.867***	[23.622]	0.394***	[23.628]
Experience	0.028***	[11.137]	0.007***	[5.197]
Experience squared	-0.000***	[9.709]	-0.000***	[6.169]
Weekly working hours	0.011***	[16.140]	0.011***	[15.854]
Constant	8.381***	[110.046]	9.665***	[136.676]
Observations	4279		4279	
R-squared	0.415		0.408	

Notes. Absolute value of t statistics in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 6: Wage Equation - Regions 1/4

	Langued-Rouss		**Nrd-P-d-Calais**		**Picardie**		**Limousin**		**Lorraine**		**Basse-Norm.**	
	Gross	Net	Gross	Net	Gross	Net	Gross	Net	Gross	Net	Gross	Net
Fathed1ary	0.263	0.324	-0.052	0.001	-0.284	-0.234	-0.059	0.092	0.158*	0.217**	-0.122	-0.183**
	[1.237]	[1.551]	[0.490]	[0.006]	[1.364]	[1.126]	[0.301]	[0.500]	[1.918]	[2.607]	[1.391]	[2.020]
Fathed2ary	0.285	0.368*	-0.02	0.11	-0.194	-0.126	0.061	0.367*	0.129	0.243**		
	[1.279]	[1.743]	[0.182]	[0.998]	[0.888]	[0.561]	[0.301]	[1.763]	[1.390]	[2.287]		
Fathed3ary	0.546**	0.693***	-0.123	0.208	-0.012	0.182	0.383	0.832***	0.142	0.366***	0.085	0.308
	[2.158]	[3.000]	[0.967]	[1.619]	[0.044]	[0.663]	[1.609]	[3.352]	[1.303]	[3.161]	[0.330]	[1.161]
Fin prb ad	0.001	-0.032	-0.009	-0.044	0.001	-0.015	0.016	-0.05	0.065	0.03	-0.056	-0.091
	[0.008]	[0.352]	[0.253]	[1.227]	[0.023]	[0.234]	[0.202]	[0.592]	[1.547]	[0.690]	[0.756]	[1.185]
Gender	0.227**	0.262***	0.176***	0.200***	0.234***	0.262***	0.055	0.108	0.058	0.094*	0.161**	0.141*
	[2.552]	[3.057]	[4.217]	[5.404]	[3.290]	[4.048]	[0.712]	[1.406]	[1.077]	[1.948]	[1.998]	[1.905]
Age	0.002	0.003	0.007	0.006	-0.001	-0.002	0.031*	0.038**	0.01	0.005	0.013*	0.009
	[0.251]	[0.393]	[1.508]	[1.295]	[0.092]	[0.243]	[1.986]	[2.305]	[1.127]	[0.613]	[1.677]	[1.063]
Industry	0.548*	0.231	0.141	0.022	0.29	0.15	0.370*	0.227*	0.118	0.12	0.097	0.037
	[1.834]	[1.310]	[0.789]	[0.226]	[1.419]	[1.280]	[1.759]	[1.841]	[0.646]	[1.192]	[0.444]	[0.288]
Constr	0.107	0.009	0.065	-0.019	0.065	0.023	0.787**	0.384**	-0.093	-0.001	-0.076	-0.059
	[0.349]	[0.055]	[0.347]	[0.215]	[0.303]	[0.217]	[2.533]	[2.423]	[0.491]	[0.015]	[0.291]	[0.428]
Services	0.16	0.018	0.144	0.026	0.355*	0.198	0.316	0.182	0.108	0.115	0.213	0.098
	[0.548]	[0.099]	[0.796]	[0.252]	[1.698]	[1.613]	[1.483]	[1.404]	[0.593]	[1.124]	[0.950]	[0.718]
Public	0.205	0.049	0.084	-0.011	0.187	0.098	0.277	0.182	-0.064	0.013	0.037	-0.005
	[0.700]	[0.261]	[0.461]	[0.110]	[0.875]	[0.767]	[1.343]	[1.432]	[0.356]	[0.127]	[0.168]	[0.033]
Edu1ary	-0.036	0.031	-0.026	-0.024	0.159	0.112	0.371	0.165	-0.045	-0.035	-0.164	-0.09
	[0.150]	[0.248]	[0.255]	[0.484]	[1.117]	[1.628]	[1.523]	[1.396]	[0.407]	[0.700]	[1.082]	[1.141]
Lower2ary	0.089	0.084	0.163*	0.075*	0.164	0.091	0.501**	0.240**	0.299**	0.134**	0.163	0.088
	[0.356]	[0.638]	[1.805]	[1.765]	[1.338]	[1.539]	[2.502]	[2.449]	[2.527]	[2.364]	[0.917]	[0.961]
Upper2ary	0.178	0.16	0.123*	0.073*	0.192**	0.132**	0.534***	0.314***	0.291***	0.171***	0.286**	0.185**
	[1.005]	[1.445]	[1.765]	[1.719]	[2.324]	[2.602]	[3.099]	[2.840]	[4.011]	[3.855]	[2.309]	[2.324]
Lower3ary	0.393**	0.269**	0.556***	0.324***	0.479***	0.306***	0.772***	0.425***	0.676***	0.400***	0.723***	0.441***
	[2.017]	[2.343]	[7.139]	[7.184]	[3.609]	[3.877]	[4.013]	[3.667]	[7.815]	[7.716]	[5.283]	[5.228]
PhD	0.799***	0.424***	0.911***	0.401***	1.202***	0.449***	1.991***	0.707***	0.462***	0.199***	1.197***	0.506***
	[3.151]	[3.551]	[7.600]	[7.832]	[3.396]	[3.445]	[6.048]	[5.636]	[2.904]	[2.781]	[3.257]	[3.119]
Experience	0.051***	-0.002	0.011	0.017***	0.032**	0.012	0.037	0.015**	0.005	0.008	0.041**	0.009
	[3.105]	[0.540]	[1.282]	[6.112]	[2.140]	[2.013]	[1.659]	[1.175]	[0.500]	[0.971]	[2.498]	[1.306]
Experience2	-0.001***	-0.001*	0	0	0	0	-0.001***	-0.001**	0	0	-0.001**	0
	[2.898]	[1.686]	[0.502]	[0.419]	[1.630]	[1.615]	[3.008]	[2.029]	[0.171]	[0.116]	[2.103]	[1.065]
Wrkng hours	-0.001	0.006	0.016***	0.007*	0.007*	0.007**	0.012	-0.017	0.012***	0.012***	0.007**	0.007*
	[0.145]	[0.710]	[5.965]	[1.684]	[1.968]	[1.382]	[1.657]	[2.036]	[3.123]	[3.126]	[2.014]	[1.864]
Constant	8.605***	9.520***	8.596***	9.755***	9.034***	10.333***	7.207***	8.368***	8.561***	9.678***	8.372***	9.897***
	[20.560]	[22.699]	[31.455]	[40.292]	[21.024]	[20.934]	[12.030]	[11.291]	[24.553]	[23.753]	[20.029]	[29.396]
Observ.	117	117	311	311	135	135	56	56	153	153	93	93
R-squared	0.409	0.374	0.525	0.529	0.411	0.42	0.741	0.724	0.544	0.542	0.574	0.552

Notes. Absolute value of t statistics in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. Gross and Net refer to gross and net versions of effort.

Table 7: Wage Equation - Regions 2/4

	Auvergne		**Poit-Charente**		**PACAC**		**Franche-Comté**		**Bourgogne**	
	Gross	Net	Gross	Net	Gross	Net	Gross	Net	Gross	Net
Fathed1ary	0.209	0.164	-0.07	-0.170**	0.009	0.052	0.111	0.063	-0.293	-0.228
	[0.446]	[0.354]	[1.091]	[2.455]	[0.110]	[0.645]	[0.640]	[0.321]	[1.522]	[1.281]
Fathed2ary	0.121	0.097			0.056	0.164*	0.112	0.205	-0.244	-0.068
	[0.255]	[0.199]			[0.654]	[1.848]	[0.620]	[0.851]	[1.219]	[0.365]
Fathed3ary	0.27	0.347	0.096	0.259	-0.003	0.268***	0.353	1.248	-0.255	0.05
	[0.503]	[0.631]	[0.567]	[1.649]	[0.035]	[2.725]	[1.361]	[1.003]	[1.017]	[0.211]
Fin prb ado	0.091	0.049	-0.004	-0.053	-0.019	-0.06	0.001	-0.032	0.120*	0.076
	[0.927]	[0.501]	[0.071]	[0.947]	[0.456]	[1.456]	[0.017]	[0.421]	[1.663]	[1.111]
Gender	0.285***	0.257***	0.018	0.085	0.183***	0.184***	0.240***	0.229***	0.039	0.038
	[2.762]	[2.653]	[0.294]	[1.523]	[4.230]	[4.640]	[3.387]	[3.214]	[0.530]	[0.569]
Age	-0.006	-0.006	0.018**	0.019**	0.008*	0.008*	-0.01	-0.009	0.011	0.012
	[0.356]	[0.351]	[2.420]	[2.525]	[1.692]	[1.710]	[1.125]	[0.731]	[0.933]	[0.997]
Industry	0.479*	0.267*	0.393	0.241	0.428***	0.217**	-0.906***	-0.418**	0.205	0.078
	[1.881]	[1.810]	[1.184]	[1.340]	[2.709]	[2.424]	[3.155]	[2.601]	[0.867]	[0.611]
Constr	0.138	0.071	0.377	0.206	0.12	0.024	-0.927***	-0.386**	-0.015	-0.034
	[0.534]	[0.547]	[1.131]	[1.323]	[0.709]	[0.293]	[3.102]	[2.515]	[0.057]	[0.278]
Services	0.424*	0.248*	0.385	0.239	0.22	0.093	-0.834***	-0.386**	0.073	0.007
	[1.836]	[1.819]	[1.177]	[1.333]	[1.450]	[1.050]	[2.945]	[2.353]	[0.322]	[0.055]
Public	0.381	0.22	0.322	0.213	0.171	0.066	-0.957***	-0.464***	0.007	-0.032
	[1.625]	[1.541]	[0.981]	[1.150]	[1.135]	[0.742]	[3.377]	[2.800]	[0.030]	[0.236]
Edu1ary	-0.028	0.045	0.102	0.08	0.121	0.05	0.111	0.08	0.411*	0.199*
	[0.085]	[0.288]	[0.477]	[0.687]	[0.950]	[0.761]	[0.756]	[0.995]	[1.821]	[1.711]
Lower2ary	0.47	0.285*	0.227	0.143**	0.141	0.069	0.087	0.064	0.209	0.106
	[1.433]	[1.781]	[1.639]	[2.110]	[1.380]	[1.410]	[0.418]	[0.618]	[1.038]	[1.091]
Upper2ary	0.228	0.208	0.197*	0.150**	0.185**	0.114**	0.196**	0.139**	0.227*	0.147*
	[0.850]	[1.233]	[1.886]	[2.259]	[2.442]	[2.503]	[2.054]	[2.296]	[1.769]	[1.935]
Lower3ary	0.573**	0.406**	0.469***	0.299***	0.537***	0.316***	0.593***	0.376***	0.597***	0.367***
	[2.120]	[2.495]	[4.106]	[4.302]	[6.729]	[6.761]	[4.978]	[5.179]	[4.464]	[4.666]
PhD	1.114***	0.494***	0.578*	0.413**	1.056***	0.474***			0.803***	0.323***
	[3.522]	[3.774]	[1.906]	[2.309]	[7.826]	[7.733]			[3.170]	[3.133]
Experience	0.021	0.006	0.038***	-0.005	0.028***	0.004*	0.036**	0.023***	0.033	-0.006
	[0.823]	[1.335]	[2.851]	[4.729]	[3.193]	[0.792]	[2.471]	[0.045]	[1.591]	[1.772]
Experience2	0	0	-0.001***	-0.001**	-0.001***	-0.001***	0	0	-0.001**	-0.001***
	[0.154]	[0.128]	[3.594]	[1.994]	[2.998]	[3.120]	[1.068]	[0.863]	[2.332]	[3.045]
Wrkng hours	0.007	0.016	0.023***	0.023***	0.004*	0.003	-0.001	0	0.010*	0.009*
	[1.510]	[1.063]	[4.976]	[0.706]	[1.775]	[1.837]	[0.386]	[2.637]	[1.840]	[0.535]
Constant	8.487***	9.972***	7.523***	9.386***	8.728***	9.713***	10.327***	10.451***	8.785***	9.788***
	[10.178]	[11.087]	[15.844]	[29.669]	[35.543]	[42.229]	[20.876]	[23.183]	[18.646]	[17.527]
Observ.	88	88	148	148	280	280	113	113	116	116
R-squared	0.499	0.5	0.482	0.452	0.457	0.458	0.403	0.389	0.408	0.426

Notes. Absolute value of t statistics in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. Gross and Net refer to gross and net versions of effort.

Table 8: Wage Equation - Regions 3/4

	Bretagne		**Midi-Pyrénées**		**Centre**		**Aquitaine**		**Haute-Normandie**	
	Gross	Net	Gross	Net	Gross	Net	Gross	Net	Gross	Net
Fathed1ary	-0.027	0.062	0.136	0.155	0.119	0.133	0.201**	0.262**	-0.063	-0.017
	[0.109]	[0.288]	[1.076]	[1.178]	[0.950]	[1.108]	[1.987]	[2.502]	[0.230]	[0.061]
Fathed2ary	0.051	0.197	0.043	0.149	0.135	0.203	0.179*	0.318***	0.004	0.115
	[0.206]	[0.907]	[0.318]	[1.033]	[0.986]	[1.540]	[1.729]	[2.912]	[0.014]	[0.386]
Fathed3ary	0.225	0.493**	-0.012	0.307*	-0.042	0.139	0.331**	0.577***	0.132	0.418
	[0.858]	[2.098]	[0.073]	[1.721]	[0.237]	[0.819]	[2.552]	[4.392]	[0.424]	[1.340]
Fin prb ado	-0.03	-0.054	0.103	0.062	-0.005	-0.035	-0.028	-0.065	-0.033	-0.086
	[0.644]	[1.170]	[1.496]	[0.907]	[0.109]	[0.736]	[0.542]	[1.270]	[0.367]	[0.958]
Gender	0.269***	0.278***	0.228***	0.231***	0.267***	0.243***	0.094*	0.160***	0.131	0.150*
	[5.624]	[5.925]	[2.950]	[3.576]	[5.210]	[5.132]	[1.680]	[3.035]	[1.347]	[1.669]
Age	0.010*	0.011*	0.005	0.004	-0.002	-0.003	0.021***	0.018***	0.023**	0.016
	[1.735]	[1.777]	[0.807]	[0.676]	[0.368]	[0.556]	[2.976]	[2.611]	[2.255]	[1.538]
Industry	-0.159	-0.114	0.087	0.058	0.054	0.031	0.236	0.119	0.19	0.04
	[0.543]	[0.725]	[0.313]	[0.359]	[0.277]	[0.282]	[1.583]	[1.378]	[0.647]	[0.238]
Constr	-0.306	-0.177	0.195	0.102	-0.07	-0.03	0.165	0.059	0.054	-0.026
	[1.007]	[1.183]	[0.651]	[0.658]	[0.323]	[0.293]	[0.902]	[0.641]	[0.156]	[0.150]
Services	-0.346	-0.23	0.153	0.086	0.107	0.066	0.029	-0.001	0.213	0.073
	[1.184]	[1.432]	[0.552]	[0.532]	[0.548]	[0.593]	[0.193]	[0.010]	[0.701]	[0.413]
Public	-0.224	-0.156	-0.004	-0.007	0.026	0.017	-0.008	-0.025	0.047	-0.026
	[0.770]	[0.958]	[0.014]	[0.047]	[0.131]	[0.145]	[0.056]	[0.286]	[0.162]	[0.150]
Edu1ary	0.148	0.116	0.007	-0.046	0.094	0.05	0.039	0.039	-0.573**	-0.295**
	[0.535]	[0.780]	[0.029]	[0.380]	[0.871]	[0.977]	[0.203]	[0.416]	[1.999]	[2.010]
Lower2ary	0.199	0.136	0.309	0.09	0.089	0.052	0.11	0.065	0.074	0.04
	[0.781]	[1.141]	[1.444]	[0.901]	[0.739]	[0.908]	[0.707]	[0.885]	[0.309]	[0.328]
Upper2ary	0.117	0.119	0.23	0.088	0.177**	0.117**	0.238*	0.160*	0.188	0.119
	[0.490]	[0.898]	[1.194]	[0.766]	[2.039]	[2.243]	[1.788]	[1.963]	[1.281]	[1.291]
Lower3ary	0.430*	0.300**	0.694***	0.352***	0.545***	0.322***	0.558***	0.347***	0.473***	0.282***
	[1.809]	[2.370]	[3.537]	[3.150]	[5.688]	[5.835]	[3.999]	[4.200]	[2.964]	[2.983]
PhD	0.779**	0.359***	1.457***	0.664***	1.305***	0.600***	0.337	0.143	0.676**	0.272**
	[2.496]	[2.851]	[6.107]	[6.063]	[5.344]	[5.420]	[1.372]	[1.349]	[2.425]	[2.225]
Experience	0.019**	0.003	0.030*	0.007	0.039***	0.009*	0.007	-0.001	0.009	0.002
	[1.976]	[0.608]	[1.871]	[1.955]	[3.334]	[0.063]	[0.454]	[4.100]	[0.518]	[1.601]
Experience2	-0.000*	0	-0.001	0	-0.001***	-0.001***	0	0	0	0
	[1.667]	[1.331]	[1.622]	[1.345]	[3.034]	[2.959]	[0.642]	[0.203]	[0.521]	[0.528]
Wrkng hrs	0.012***	0.012***	0.007	0.009*	0	0	0.016***	0.016***	0.009	0.009
	[3.803]	[3.752]	[1.592]	[1.073]	[0.015]	[1.683]	[4.003]	[0.223]	[1.632]	[0.255]
Constant	8.856***	9.406***	8.540***	9.688***	9.122***	10.039***	7.966***	8.975***	8.311***	9.340***
	[20.523]	[27.761]	[19.103]	[28.767]	[29.541]	[34.682]	[24.852]	[28.086]	[15.936]	[17.203]
Observ.	179	179	157	157	188	188	186	186	92	92
R-squared	0.474	0.478	0.495	0.495	0.44	0.45	0.477	0.477	0.573	0.568

Notes. Absolute value of t statistics in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. Gross and Net refer to gross and net versions of effort.

Table 9: Wage Equation - Regions 4/4

	Pays Loire		**Champ-Ardenne**		**Alsace**		**Rhône-Alpes**		**Ile de Fr.**	
	Gross	Net	Gross	Net	Gross	Net	Gross	Net	Gross	Net
Fathed1ary	0.019	0.082	-0.11	-0.053	0.230*	0.264**	0.365***	0.438***	0.150***	0.200***
	[0.148]	[0.641]	[0.401]	[0.181]	[1.863]	[2.173]	[3.889]	[4.696]	[3.015]	[4.007]
Fathed2ary	0.048	0.230*	0	-0.002	0.282**	0.368***	0.402***	0.542***	0.169***	0.277***
	[0.370]	[1.734]	[0.000]	[0.006]	[2.255]	[2.731]	[4.031]	[5.411]	[3.258]	[5.092]
Fathed3ary	0.023	0.363**	0.083	0.147	0.077	0.288*	0.390***	0.705***	0.232***	0.473***
	[0.156]	[2.465]	[0.254]	[0.422]	[0.505]	[1.839]	[3.393]	[6.171]	[4.028]	[7.965]
Fin prb ado	-0.018	-0.057	0.036	0.014	-0.031	-0.057	0.007	-0.022	-0.019	-0.053**
	[0.472]	[1.489]	[0.389]	[0.147]	[0.561]	[1.044]	[0.167]	[0.521]	[0.726]	[2.014]
Gender	0.210***	0.244***	0.037	0.118	0.195***	0.266***	0.239***	0.276***	0.131***	0.198***
	[5.024]	[6.486]	[0.436]	[1.383]	[3.531]	[4.906]	[5.472]	[6.762]	[4.953]	[7.647]
Age	0.019***	0.017***	-0.025**	-0.026**	0.013	0.013	0.005	0.004	0.011***	0.009**
	[3.374]	[3.082]	[2.531]	[2.430]	[1.578]	[1.546]	[0.991]	[0.777]	[3.331]	[2.580]
Industry	0.284**	0.150*	0.049	-0.025	0.07	-0.123	0.008	0.087	0.329	0.181
	[2.002]	[1.900]	[0.126]	[0.117]	[1.069]	[0.467]	[0.097]	[0.308]	[1.203]	[1.569]
Constr	0.143	0.059	0.002	-0.055	-0.064	-0.171		0.064	0.25	0.121
	[0.969]	[0.833]	[0.006]	[0.308]	[0.713]	[0.769]		[0.263]	[0.907]	[1.181]
Services	0.207	0.114	-0.018	-0.081		-0.177	0.015	0.086	0.265	0.15
	[1.450]	[1.378]	[0.045]	[0.370]		[0.627]	[0.172]	[0.299]	[0.974]	[1.238]
Public	0.146	0.078	-0.065	-0.106	-0.167**	-0.274	-0.022	0.065	0.112	0.062
	[1.023]	[0.923]	[0.168]	[0.470]	[2.211]	[0.969]	[0.253]	[0.221]	[0.413]	[0.497]
Edu1ary	0.119	0.083*	-0.056	-0.019	0.022	0.02	0.038	0.022	-0.073	-0.037
	[1.131]	[1.690]	[0.258]	[0.174]	[0.129]	[0.267]	[0.290]	[0.355]	[1.034]	[1.061]
Lower2ary	0.024	0.029	0.384**	0.207**	0.045	0.024	0.214**	0.108**	0.134**	0.063**
	[0.237]	[0.595]	[2.151]	[2.304]	[0.278]	[0.298]	[2.055]	[2.177]	[2.168]	[2.101]
Upper2ary	0.213***	0.150***	0.237*	0.155*	0.079	0.052	0.288***	0.183***	0.238***	0.148***
	[2.843]	[3.330]	[1.726]	[1.785]	[0.959]	[1.024]	[4.330]	[4.506]	[4.870]	[5.015]
Lower3ary	0.485***	0.307***	0.679***	0.387***	0.306***	0.185***	0.625***	0.370***	0.545***	0.324***
	[5.689]	[6.145]	[4.461]	[4.194]	[3.125]	[3.145]	[8.322]	[8.397]	[10.989]	[11.093]
PhD	0.655***	0.309***	0.841***	0.368***	0.435*	0.215*	0.840***	0.366***	0.720***	0.336***
	[4.583]	[4.920]	[2.878]	[2.680]	[1.858]	[1.820]	[7.422]	[7.343]	[9.926]	[9.719]
Experience	0.014	-0.008	0.074***	0.023***	0.017	0	0.026***	0.018***	0.029***	0.007**
	[1.493]	[1.611]	[4.184]	[3.781]	[1.395]	[3.458]	[2.742]	[6.219]	[5.372]	[10.052]
Experience2	-0.000***	-0.000***	-0.001***	-0.001*	-0.000*	-0.000*	-0.000**	0	-0.001***	-0.000***
	[3.005]	[2.698]	[2.666]	[1.925]	[1.750]	[1.829]	[2.246]	[1.209]	[4.883]	[2.984]
Wrkng hours	0.014***	0.014***	0.022***	0.036***	0.017***	0.018***	0.018***	0.007	0.015***	0.015***
	[5.180]	[5.099]	[3.687]	[3.855]	[3.413]	[0.028]	[6.121]	[1.560]	[10.140]	[2.291]
Constant	8.098***	9.132***	8.941***	11.256***	8.410***	9.308***	8.101***	9.442***	8.152***	9.642***
	[29.991]	[33.302]	[14.116]	[18.282]	[26.455]	[22.898]	[36.320]	[38.608]	[27.161]	[58.729]
Observ.	285	285	101	101	148	148	375	375	958	958
R-squared	0.469	0.473	0.564	0.536	0.497	0.498	0.47	0.466	0.457	0.448

Notes. Absolute value of t statistics in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. Gross and Net refer to gross and net versions of effort.

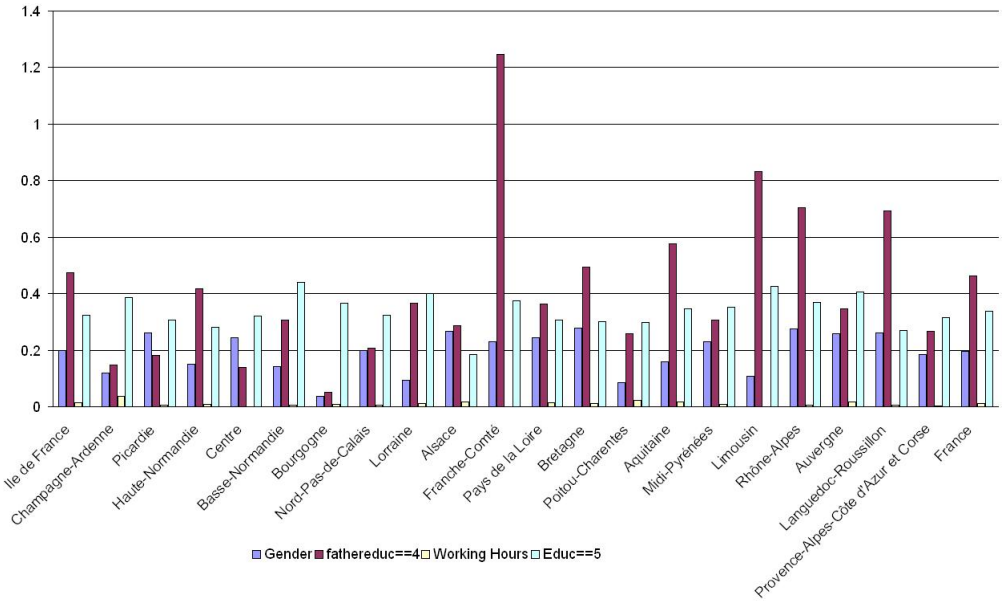
Table 10: Inequality of Opportunity in the Regions - Gini measures

Region	**Gini**	**Unfair Gini (gross)**	**Unfair Gini (net)**	**Annual Earnings**
Ile de France	0.299	0.399	0.377	36,558
Champagne-Ardenne	0.271	0.157	0.147	28,779
Picardie	0.238	0.141	0.160	25,705
Haute-Normandie	0.294	0.227	0.253	30,773
Centre	0.212	0.066	0.097	26,360
Basse-Normandie	0.280	0.211	0.236	26,724
Bourgogne	0.222	0.046	0.053	26,824
Nord-Pas-de-Calais	0.248	0.153	0.158	28,352
Lorraine	0.190	0.100	0.086	26,215
Alsace	0.215	0.191	0.158	29,199
Franche-Comté	0.200	0.050	0.035	25,483
Pays de la Loire	0.236	0.082	0.099	26,233
Bretagne	0.218	0.064	0.069	26,856
Poitou-Charentes	0.236	0.130	0.114	25,940
Aquitaine	0.248	0.149	0.138	27,308
Midi-Pyrénées	0.277	0.186	0.173	29,750
Limousin	0.241	0.096	0.147	25,433
Rhône-Alpes	0.288	0.288	0.282	31,942
Auvergne	0.266	0.043	0.083	27,369
Languedoc-Roussillon	0.288	0.192	0.197	27,365
PACA and Corse	0.250	0.180	0.174	28,714
France	0.269	0.228	0.219	29,852

Table 11: Oaxaca decomposition of income differences into effort and circumstance factors - region j against all other regions (net effort)

Region j	Wage region j	Wage France less region j	dlog wage	Total		Magnitude		Effect		Interaction	
				Circ	Effort	Circ	Effort	Circ	Effort	Circ	Effort
Ile de France	36,558	27,918	0.227	0.183	0.043	0.011	0.045	0.170	0.002	0.002	-0.004
Champagne-Ardenne	28,779	29,878	-0.046	-0.055	0.009	-0.068	0.047	-0.071	0.028	0.084	-0.066
Picardie	25,705	29,988	-0.122	-0.024	-0.098	-0.040	-0.083	0.003	-0.018	0.013	0.003
Haute-Normandie	30,773	29,832	0.012	-0.090	0.102	-0.007	0.053	-0.094	0.079	0.011	-0.030
Centre	26,360	30,013	-0.087	-0.045	-0.042	-0.005	-0.005	-0.034	-0.030	-0.006	-0.007
Basse-Normandie	26,724	29,922	-0.132	-0.040	-0.091	-0.060	-0.085	-0.009	-0.057	0.029	0.051
Bourgogne	26,824	29,937	-0.069	-0.011	-0.058	-0.013	0.020	-0.003	-0.074	0.004	-0.004
Nord-Pas-de-Calais	28,352	29,970	-0.034	-0.058	0.024	-0.005	-0.017	-0.051	0.035	-0.003	0.007
Lorraine	26,215	29,987	-0.071	-0.022	-0.050	-0.010	-0.085	-0.025	0.030	0.014	0.005
Alsace	29,199	29,876	0.026	0.057	-0.030	0.007	-0.019	0.048	0.007	0.002	-0.018
Franche-Comté	25,483	29,971	-0.107	0.121	-0.229	-0.090	-0.240	0.149	-0.208	0.062	0.219
Pays de la Loire	26,233	30,111	-0.108	-0.095	-0.013	-0.019	0.004	-0.082	-0.014	0.006	-0.003
Bretagne	26,856	29,983	-0.062	-0.079	0.017	-0.003	0.015	-0.083	-0.001	0.006	0.003
Poitou-Charentes	25,940	29,993	-0.118	-0.062	-0.056	-0.033	-0.034	-0.048	-0.033	0.019	0.010
Aquitaine	27,308	29,968	-0.073	-0.096	0.023	0.001	-0.015	-0.102	0.040	0.005	-0.002
Midi-Pyrénées	29,750	29,856	-0.009	-0.019	0.010	-0.006	0.028	-0.025	-0.005	0.012	-0.014
Limousin	25,433	29,911	-0.133	-0.071	-0.062	-0.120	-0.007	-0.031	0.000	0.080	-0.054
Rhône-Alpes	31,942	29,652	0.054	0.029	0.025	0.006	0.017	0.023	0.006	-0.001	0.003
Auvergne	27,369	29,905	-0.092	-0.145	0.052	0.012	0.027	-0.134	0.000	-0.023	0.025
Languedoc-Roussillon	27,365	29,922	-0.111	-0.057	-0.054	-0.007	-0.021	-0.061	-0.027	0.011	-0.005
PACA and Corse	28,714	29,932	-0.021	0.027	-0.048	0.003	-0.020	0.025	-0.038	0.000	0.010

Figure 1: Impact of gender, father's education, education and working hours on (log) earnings across regions



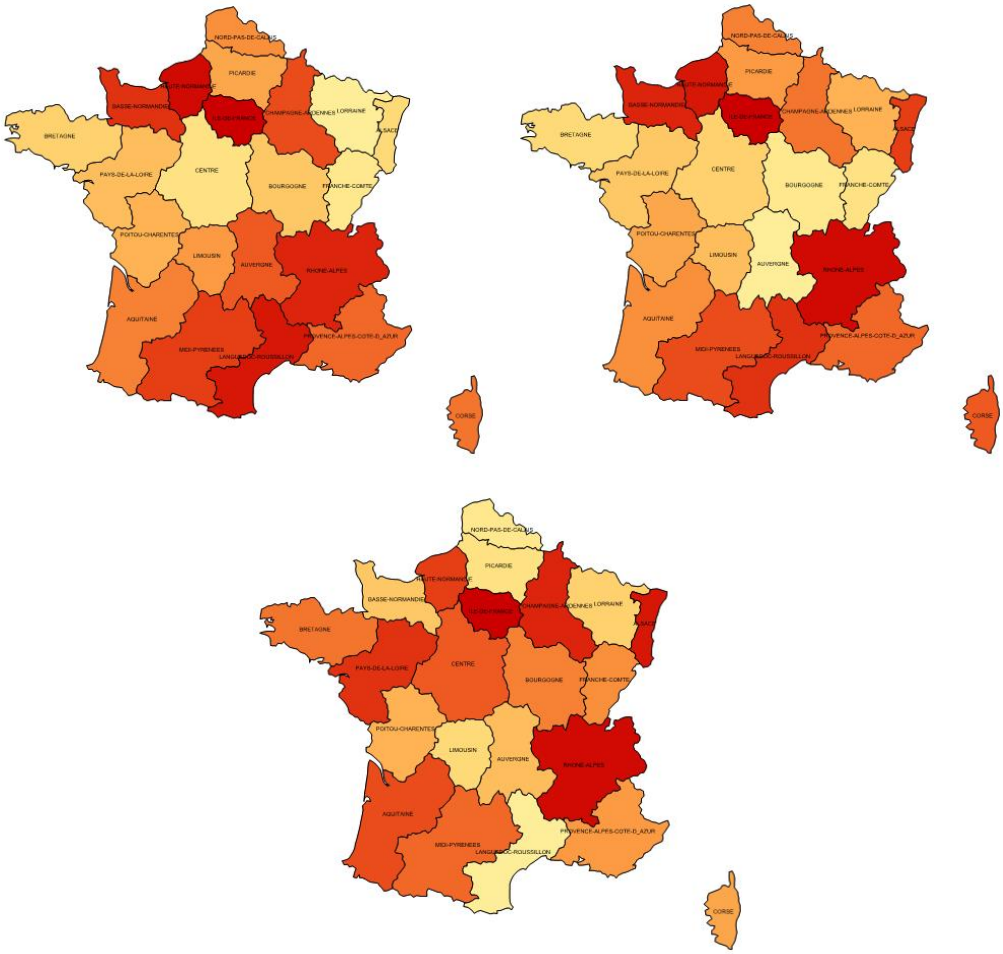


Figure 2: Standard Gini (upper left), unfair (net) Gini (upper right) and GDP (down) - the darker the filling, the larger the Gini or GDP

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