Inequality of Opportunity and Income Inequality in Côte d'Ivoire

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Abstract
This paper examines the impact of inequality of opportunity on income inequality in Côte d'Ivoire using a methodology developed by Checchi and Peraginewithdata from the 2015 Household Living Standards Survey. We tookthe income of individuals as the result of opportunities and effort, and the socio-occupational category of the head of the household as an opportunity. Our results show that up to 12.18%of the variation in income isthe result ofdifferences in opportunities. These variations are higher for individuals whose head of household is a man (12.48%) than for individuals whose head of household is a woman (9.86%).
Keywords: Income Inequality; Inequality of opportunity; Inequality of effort
JEL Classification: D63 ; D31 ; J62

I.   Introduction
The issue of income inequality has attracted the attention of policymakers and researchers given its importance to any society with social cohesion at heart. Since the 1970s, a surge of literature has documented the adverse effects of inequality on socioeconomic outcomes, including investment, economic growth, health and well-being, crime, conflict, and social cohesion. (Alesina and Perotti, 1996; Luttmer, 2005; Veenstra, 2005; Clark et al., 2008; Wilkinson and Pickett, 2009; Ostry et al., 2014). Inequalities are observed in different domains i.e. access to education, health, land, financial resources, etc. However, income inequality is a significant policy issue in low- and middle-income countries as reflected in Sustainable Development Goal (SDG) number 10. The latter stipulates thatinequalities should be reducedwithin and across countries in terms of opportunity, income, and power.Reducing inequalities requires knowing not only its sources but above all, the link between them. Hence the importance of this study.

However, the search for the sources of this inequality is very controversial, although there seems to be some consensus that inequality has negative effects on development efforts (Alesina and Perotti, 1994; Alesina and Perotti, 1996; Alesina and Rodrik, 1994; Benhabib and Rustichini, 1996; Perotti, 1996; Persson and Tabellini, 1996).

The sources of income inequality may vary from one society to another. However, property rights, the distribution of land or natural resources, redistribution policies, and inequality of opportunity are very often identified as among these sources. Inequality of opportunity characterizes a situation in which opportunities to achieve a certain social status are influenced by family background and social class (Rawls, 1971). According to Ferreira et al. (2008), inequality of opportunity is an important concept as income inequality. Inequality of opportunity can have a significant influence on how individuals perceive income inequality, social inequality, income redistribution policies, and social policies (Alesina and Angeletos, 2005; Bénabou and Tirole, 2006). They are a key measure of the level of economic development, seen from the perspective of distributive justice.

Although Côte d'Ivoire has better prospects in terms of economic development, the gaps in economic inequality are quite observable. The Household Living Standards Survey (HLSS) reported in 2015 revealedthat the richest 10percentof households spend on average 13.7 times more than the poorest 10percent (INS, 2015). There are huge socio-economic gaps between people in different income groups and those living in different

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regions (Aka et al., 2020). Therefore, the analysis of the inequalities of opportunity is important to understand the dynamics of socio-economic inequalities in Côte d'Ivoire.

In line with the above, the main objectiveof this study is to contribute to a better understanding ofthe inequalityof opportunity andincome inequality nexus.

The remaining of this paper is organized as follows. The next section briefly reviews the related empirical literature. Section 3 describes the methodology used in this study and our data set. Section 4 lays out our empirical results and the last section is a summary of the main findings of the study (section 5).

II.   Review Of The Literature

The work of Roemer (1993; 1998a; 1998b; 2002; 2004; 2006, 2013) has contributed to a better understanding of the inequalities of opportunity issue. It draws on the work of Rawls (1971), Arneson (1989), and Cohen (1989). In addition to this pioneering work, there is also the literature on intergenerational mobility which has focused on parental characteristics to determine the income of the next generation (Behrman & Taubman, 1976; Bowles, 1972; Van de Gaer et al., 2001).

Following Roemer, different research has been carried out on the contribution ofthe inequalities of opportunity and the inequalities of effort to income inequalities. Parametric, non-parametric, and semi-parametric approaches have been used in these studies. The contribution of circumstance and effort to income inequality varies from one study to another. Studies on the contribution of the inequalities of opportunityto income inequality focus either on the relationship between opportunities and income or on the role of the inequalities of opportunityin access to education or even health, etc.

Building on Roemer (1998), Bourguignon et al (2007) analyzed inequalities of opportunity in Brazil by decomposing total inequality into inequality of opportunity component and a residual term. To this end, they limited their study to urban areas due to the general imprecision of earnings and income measurement in rural areas. They chose a set of variables such as parental education, intergenerational educational mobility, individual's education level, migration, race, the decision to migrate, father's occupation, a categorical variable for labor market status, etc. The results of their analysis showed that family background (their levels of wealth, education, parents' occupation...) determined 75% of a person's opportunities.

For example, Bourguignon et al (2007) analyzedthe inequalities of opportunity in Brazil using a parametric approach. Their results suggested that 25 to 30percentof the variation in income of individuals in Brazil wasdue to differences in parental occupation. However, this share may be higher if some other indicators related to circumstances such as parental wealth and income status werealso taken into account. Parental education explains a 30to 40percent variation in their children's years of schooling.

In sub-Saharan Africa, Cogneau and Mesplé-Somps (2008) analyzedinequalities of opportunity in five countries (Côte d'Ivoire, Ghana, Guinea, Madagascar, and Uganda). They use a decomposition method that distinguished the respective impacts of intergenerational mobility between origins and social positions, education and occupations, and income. They concluded that these countries were relatively similar with respect to income inequality but differed more with respect to inequality of opportunity. A particularly interesting finding is that the two former British colonies (Ghana and Uganda) have much higher educational and occupational mobility than the three former French colonies.

In the same vein, Checchi and Peragine (2010), using household surveys and a non-parametric approach, analyzedinequalities of opportunity in Italy. They found that parental education as an opportunity beyondan individual's control affected income inequality, especially when considering population subgroups (by gender and by region of residence). Thus, individuals from lower social backgrounds were more disadvantaged in the South than in the North, and more so when differentiation by gender was taken into account.

In China, Zhang and Eriksson (2010) used data from health and nutrition surveys in nine provinces from 1989 to 2006. Using the method proposed by Bourguignon et al. (2007), they concluded that parental earnings and occupation were the most important variables in explaining income inequality, while parental education played a minor role. Their results were contrary to that of Bourguignon et al. (2007), and Palomino et al. (2019) in which differences in parental education played the most important role in determining income inequality.

In contrast, Bjorklund et al. (2012) studied the relationship between opportunities and long-term income distribution in Sweden. They found that 30%of income inequality was due to opportunitiesand 70percentto differences in effort.

In India, Singh (2010, 2012) studied the relationship between inequality of opportunity, consumption, and income of individuals. Social background (parental education, parental occupation, caste, religion, and place of birth) was found to be a determinant of consumption and income differences. The results showed that parental education was an important factor in urban areas. In rural areas, caste and geographical region were found to be determinants of income inequality.

Marrero and Rodriguez (2012) studied the phenomenon of inequality of opportunity using a homogeneous database of 23 European countries. They found that wages were largely influenced by effort and merit rather than by opportunities. Subsequently, the same authors (Marrero and Rodriguez, 2013, 2014) confirmed that meritocracy (people are rewarded for their efforts) was an important factor in determining income in the US.

However, Calo-Blanco and Garcia-Perez (2014), argued that the difference in income between European countries was largely due to differences in the living conditions of individuals. The same kind of results was reported by Hufe et al. (2017) who found that, in the case of the US and the UK, opportunities(parental socio-economic background, region, and ethnicity) had a significant impact on income inequality.

Hassine and Zeufack (2015) studied the contribution of opportunitiesto income determination in Tanzania. Using aparametric approach, different factors such as gender, age, education of fathers and mothers, age at which the father and/or mother died and region of birth were found to be important determinants of income.

In a similar vein, Checchi et al. (2015) argued that differences in the opportunitiespeople face at the household and institutional levels are crucial for income differences.

On the other hand, Martinez et al. (2017) useddifferent personal and parental characteristics such as gender, country of birth, race ,and ethnicity as variables reflecting circumstances, as well as gross income and net income as outcome variablesin their study, found that opportunitiesare critical in determining income differences between individuals.

Ultimately, the various studies showed that inequality of opportunity contributed to income differences. However, it should be noted that opportunitiesdiffered by region and by the methods used in each study. The present study is in line with studies that usednon-parametric methods. Thus, we followed Checchi and Peragine's (2010) to assess the share of inequality of opportunity in income inequality in Côte d'Ivoire.

III.   Method of analysis and data

In line with the theoretical framework proposed by Roemer (1998a; 2006) and the method proposed by Checchi and Peragine (2010), we usedanon-parametric approach for our analysis. The non-parametric approach was deemed appropriate for our analysis due to its flexible nature, as it does not require a well-defined functional form (Singh, 2010).

3.1 Measuring and decomposing inequalities of opportunity

The non-parametric approach suggested by Checchi and Peragine (2010), is based on two alternative partitions of the population. The first partition is opportunity-based. This involves grouping individuals by categories of opportunitiesand each group is named "type" with similar opportunities. The second partition is effort-based. The population is divided into subsets of individuals providing the same degree of effort. Since effort cannot be observed, personal effort is measured by its income quantile for the individual in the subgroup. Then all individuals belonging to the same income distributions are considered to provide the same effort.

Two approaches, namely the income bracket approach and the opportunitytype approach, are presented in this sub-section.

- The income bracket approach

In this section we focus on the following representation of an opportunity-responsibility-income distribution. We have the following income profile:

$X = \left\{ \chi_1, \ldots \chi_p, \ldots \chi_m \right\}$ Where the slice vector p is defined as:

$$\chi_p = \left\{ \chi_{1,p}, \ldots \chi_{n,p} \right\} \in R_+^{\frac{N}{m}} \tag{1}$$

Consider the set of incomes in a given quantile p of any type i , denoted by $\chi_{i,p}$. Within , $\chi_{i,p}$, there will be different income levels. However, since we take the quantile as a proxy for unobservable responsibility, all individuals with income $\chi_{i,p}$ are considered to have exercised the same degree of responsibility; no matter how small the differences in their incomes. Thus, any income inequality within $\chi_{i,p}$ is not explained by our model and is considered normatively irrelevant. Therefore, from a profile of incomes $X = \left\{ \chi_1, \ldots, \chi_p, \ldots \chi_m \right\} \in R_+^N$, an artificial distribution $X^S \in R_+^N$ can be generated by substituting each income $x \in \chi_{i,p}$ for all $i \in \left\{ 1, \ldots, n \right\}$ and for all $p \in \left\{ 1, \ldots, m \right\}$ the arithmetic mean of the vector $\chi_{i,p}$, is denoted $\mu_{i,p}^X$.

Therefore, with this transformation, denoted by $1_{i,m}$ the unit vector of length $\dfrac{N_i^X}{m}$, we obtain the new "smoothed" vector[1] :

$$\chi_{i,p}^S = \left\{\mu_{i,p}^X 1_{i,m}\right\} \in R_+^{\frac{N_i^X}{m}} \tag{2}$$

Consequently, the vector p of the "smoothed" slice, for all $p \in \{1,\dots,m\}$, can now be defined as :

$$\chi_p^S = \left\{\chi_{1,p}^S,\dots,\chi_{i,p}^S,\dots,\chi_{n,p}^S\right\} \in R_+^{\frac{N}{m}} \tag{3}$$

and the smoothed income profile X^S can be defined as follows:

$$X^S = \left(\chi_1^S,\dots,\chi_p^S,\dots,\chi_m^S\right) \in R_+^N \tag{4}$$

We now need to define a criteria to classify the distributions to which the smoothing transformation defined above has been applied. Therefore, for any $X,Y \in R_+^N$, we denote the relevant smoothed vectors by χ_p^S, v_p^S and X^S, Y^S. For simplicity, we will simply refer to them as the slice and population vectors, respectively.

With this transformation, all unexplained inequalities in our model are erased. All observed inequalities can only be attributed to opportunities O_i or level of effort w. Clearly, an empirical question arises here: how important is the transformation $X \rightarrow X^S$? As we will see in the empirical part of this study, this smoothing transformation has a fairly acceptable impact on the original distribution.

We want to distinguish the overall inequality observed in the income vector $X^S \in D^N$ into inequality due to inequality of opportunity and inequality due to individual effort. Now, according to the assumptions presented in section 2, we can say that the inequalities within the bands should be interpreted as income inequalities due to inequalities of opportunity and the inequalities between the bands certainly reflect inequalities due to individual responsibility.

Consider the following three vectors:

$$X^S = \left(\chi_1^S,\dots,\chi_p^S,\dots,\chi_m^S\right) \in R_+^R \tag{5}$$

$$X_B^S = \left(\mu_{\chi_1^S} 1_{\frac{N}{m}},\dots,\mu_{\chi_p^S} 1_{\frac{N}{m}},\dots,\mu_{\chi_m^S} 1_{\frac{N}{m}}\right) \in R_+^N \tag{6}$$

$$X_W^S = \left(\tilde{X}_1^S,\dots,\tilde{X}_P^S,\dots,\tilde{X}_m^S\right) \in R_+^N \tag{7}$$

Where $\mu_{\chi_p^S}$ is the mean of the income vector p, $1_{\frac{N}{m}}$ is the unit vector of length $\dfrac{N}{m}$,

$\tilde{X}, \forall p \in \{1,\dots m\}$ and is obtained by rescaling each income $\mu_{i,p}^X$ as follows:

$$\forall i \in \{1,\dots n\}, \forall p \in \{1,\dots m\}, \mu_{i,p}^X \rightarrow \frac{\mu_X}{\mu_{\chi_p^S}}\mu_{i,p}^X$$

The distribution X^S is the vector of aggregate income; X_B^S is a hypothetical smoothed distribution in which each person's income is replaced by the average income of the bracket to which he or she belongs. This smoothing process removes any inequality within the bands; X_W^S is a standardised distribution obtained by scaling each band distribution proportionally until it has the same mean as the overall distribution. Standardization removes inequality between slices while leaving the inequality levels of the slices unchanged.

The artificial vector X_B^S is the distribution obtained by removing inequalities of opportunity. An inequality index applied to this distribution captures only the inequalities due to individual responsibility. By rescaling all bracket distributions until all brackets have the same average income, we end up with an income vector X_W^S in

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[1]Smoothing transformations similar to the one presented here could be formulated using any other 'representative income', such as the geometric or harmonic mean or the equally distributed equivalent income (see Foster and Shneyerov 2000). Here we use the arithmetic mean because we want to keep the total income the same.

which the only inequalities present are intra-bracket inequalities. An inequality index applied to this distribution captures only income inequalities due to inequalities of opportunity.

Therefore, if we consider two income distributions $X, Y \in R_+^N$ and a given inequality measure $I : R_+^N \to R_+$, we can say that the distribution X has a lower degree of inequality of opportunity than the distribution Y if and only if $I\left(X_W^S\right) < I\left(Y_W^S\right)$.

Furthermore, we can use a decomposable inequality measure[2] and have the following decomposition:

$$I\left(X^S\right) = I\left(X_B^S\right) + I\left(X_W^S\right) \tag{8}$$

Expressing $I\left(X_W^S\right)$ as a residual, we obtain the following decomposition:

$$I\left(X_W^S\right) = I\left(X^S\right) - I\left(X_B^S\right) \tag{9}$$

It can be interpreted as :

$$\text{Inequality of Opportunity} = \text{Income Inequality} - \text{Inequality of Effort} \quad .$$

Thus, for any given income distribution $X \in R_+^N$, and considering a given inequality measure $I : R_+^N \to R_+$, the share of inequality attributed to opportunitiesis given by $I\left(X_W^S\right)$ in relative terms, this is given by:

$$OI_W^e = \frac{I\left(X_W^S\right)}{I\left(X^S\right)} \tag{10}$$

Alternatively, the inequalities of opportunity can be considered as residuals obtained as follows:

$$OI_B^e = 1 - \frac{I\left(X_B^S\right)}{I\left(X^S\right)} \tag{11}$$

Where OI_B^e is the share of overall inequalities that cannot be attributed to individual effort. Therefore, in a deterministic model, this is a measure of inequality of opportunity.

- The type of opportunitiesapproach

In this section, inequalities of opportunity are given by the inequalities between types of opportunities. Here, we present an analysis similar to the one presented in the previous section, but with a focuson the approach by type. We have :

$$X = \left(x_1, \ldots, x_i, \ldots, x_n\right) \in R_+^N \tag{12}$$

$$X_B = \left(\mu_{x_1} 1_{N_1}, \ldots, \mu_{x_i} 1_{N_i}, \ldots, \mu_{x_n} 1_{N_n}\right) \in R_+^N \tag{13}$$

$$X_W = \left(\tilde{x}_1, \ldots, \tilde{x}_i, \ldots, \tilde{x}_1\right) \in R_+^N \tag{14}$$

Where μ_{x_i} is the mean of the "type" revenue vector i and $\tilde{x}_i, \forall i \in \{1, \ldots n\}$ is obtained by rescaling each "type" revenue i as follows:

$$\tilde{x}_i, \forall i \in \{1, \ldots n\}, \forall h \in \{1, \ldots, N_i\}, x_i^h \to \frac{\mu_x}{\mu_{x_i}} x_i^h \tag{15}$$

In this case, equation (15) is the overall income vector, equation (16) eliminates intra-type inequalities and equation (17) eliminates inter-type inequalities. The interpretation is as follows:By measuring the inequalities in the artificial vector X_B, obtained by replacing the income of each type by its average income μ_{x_i}. We only fully capture inequalities between types, which in turn reflect inequalities of opportunity.

By rescaling all "types" distributions until all "types" have the same average income, we end up with an income vector (X_W) in which the only inequalities present are inequalities within "types". These inequalities are

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[2] To obtain a decomposition like the one proposed in the text - which holds for a general class of representative incomes, not just the arithmetic mean - one has to use a "path-independent" inequality measure as defined and characterised by Foster and Shneyrov (2000).

In the empirical application, we will use the log mean deviation (LDM), which is the only index to have a path-independent decomposition using the arithmetic mean as the representative income.

interpreted as inequalities due to individual responsibilities[3]. Therefore, considering two income distributions $X, Y \in R_+^N$ and a given inequality measure I, the distribution X is said to have a lower degree of inequality of opportunity than the distribution Y if and only if :

$$I(X_B) < I(Y_B) \tag{16}$$

As in the previous section, we can use a "path-independent" inequality measure I and we obtain the following decomposition:

$$I(X_B) = I(X) - I(X_W) \tag{17}$$

This equality can be interpreted as :

Inequality of Opportunity = Income Inequality - Inequality of Effort

Thus, the impact of inequality of opportunity on overall inequality can be calculated as follows:

$$OI_B^c = \frac{I(X_B)}{I(X)} \tag{18}$$

Where OI_B^c is the share of overall inequality attributed to inequalities of opportunity according to the type of opportunitiesapproach.

Alternatively, we can express inequality of opportunity as a residual, hence obtaining :

$$OI_W^c = 1 - \frac{I(X_W)}{I(X)} \tag{19}$$

OI_W^c is the part of the overall inequality that cannot be attributed to individual effort. Therefore, in our deterministic model, this is an indirect measure of inequality of opportunity.

To obtain a decomposition that respects the conditions of the proposed one, we use a "decomposition path-independent" inequality measure as defined and characterised by Foster and Shneyrov (2000). In the empirical application, we use the mean log deviation (MLD) which is the only index to have a path-independent decomposition using the arithmetic mean as representative income. For a distribution X of mean μ_X and size N, the MLD is defined as follows:

$$MLD(X) = \frac{1}{N} \sum_{i=1}^{N} \ln \frac{\mu_X}{x_i} \tag{20}$$

3.2.   Data used for the study

The data used in this study came from the 2015 Household Living Standard Survey (LSS). These data was provided by the National Institute of Statistics (INS),it traced the evolution and living conditions of households in Côte d'Ivoire. The main objective of the survey wasto improve the evaluation and planning of economic and social policies in Côte d'Ivoire. The survey contains information on place of residence, socio-professional category[4], level of education, income and expenditure of individuals and households. The income of individuals in our study is approximated by expenditure. The sample for our analysis is limited to individuals aged 15 to 65.

IV.   Empirical analysis

In our analysis, we hypothesized that there is one opportunitythat is beyond the control of children. It is measured by the socio-professional category of the head of household in each sub-population (defined by gender and stratum). The region of residence is not totally exogenous as one could choose to migrate from one region to another.

4.1.   Descriptive analysis

The distribution of income according to the socio-professional category of the head of household and the stratum is presented in Table 1. Individuals whose head of household is a public or private employee have the

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[3]The interpretation of inequality in the *XW* vector as inequality of opportunity could however be criticized. In fact, the inequality in *XW* also reflects the possibly different slopes of the income distributions in different types, which are a characteristic of the types, not of individual effort. Therefore, part of the inequality in XW is due to the difference between types. This observation simply indicates that with the type approach we are not able to track inequality ex post as well as with the slice approach. This could be interpreted as a weakness of the ex ante approach compared to the ex post approach. We owe this observation to Marc Fleurbaey.

[4]Public employee, Private employee, Self-employed, Farmer, Agricultural employee, Family helper, Not working

highest income, but those whose head of household is a farmer or agricultural employee have the lowest income. Individuals living in Abidjan have the highest income regardless of the socio-professional category of the head of household. Individuals living in the North with a male head of household have the lowest income, as do those living in the North-East in a female-headed household.

[Table 1 here]
4.2.   Inequalities of opportunity and their impact
In Table 2, inequalities of opportunity with respectto the income bracket and type of circumstance approach are presented.
- The income bracket approach
At the aggregate level, inequality of opportunity is 0.003, which represents about 1.15 percent of income inequality. At the strata level, inequality of opportunity is 0.005 for individuals living in Abidjan with a higher incidence of 2.76 percent, while it is lower for individuals living in the North-East (0.001), with an incidence of 0.44 percentof total income inequality.
Considering individuals with a male head of household, It is found that at the national level, inequality of opportunity is 0.003 and has an incidence of 1.13%ontotal income inequality. At the strata level, inequality of opportunity has a higher incidence (2.98%) for individuals living in Abidjan than for those living in the North East (0.36%). Moreover, inequalities of opportunity are much higher among individuals living in the North Central(0.005), i.e. an incidence of 2.17%ofincome inequalities, and low among those living in the North West (0.002), i.e. an incidence of 0.64percent.
- The type of opportunityapproach.
At the National level, inequalities of opportunity stood at0.265, with an incidence of 12.18%in total income inequalities and inequalities of opportunity are 0.013 for individuals living in Abidjan, with a low incidence of 4.84%and higher in the North Central(0.041), i.e. an incidence of 16.77%in income inequalities
For individuals with a male head, the incidence of inequality of opportunity in income inequality stood at12.48%. At the disaggregated level, inequality of opportunity is 0.012 for individuals living in Abidjan with a low incidence of 4.68%and higher (0.043) for those living in the Centre-North with an incidence of 18.25%.
For households headed by women, the inequality of opportunity is 0.027, which represents an incidence of 9.86%in income inequality. At the disaggregated level, inequalities of opportunity are higher (0.036) for individuals living in the Centre with an incidence of 13.42%in income inequalities and lower for those living in Abidjan (0.011) which explains about 4.49%of income inequalities. Inequality of opportunity is highest at the extreme ends of the income distribution.
These results show that opportunitiesplay an important role in income differences. People whose parents have better socio-economic characteristics are more likely of earning a higher income.
[Table 2 here]
4.3.   Comparative analysis of results
We note that the incidence of inequalities of opportunity generated by family origins differs according to the gender of the head of household and the location. Thus, it couldbe seen that opportunitieshave a greater impact on income inequalities for households headed by a man. At the level of the strata, they have a greater impact in Abidjan than in the other strata. The income bracket approach systematically ledto an underestimation of inequalities of opportunity compared to the type of opportunitiesapproach, which is consistent with that of Checchi and Peragine (2010). Our results are alsoconsistent with the findingsof Hufe et al. (2017) and Hassine and Zeufack (2015). Indeed, they found that opportunities in the US and the UK. (parental socio-economic background, region, and ethnicity) have a significant impact on income inequality. However, our results differ from that of Zhang and Eriksson (2010) and Marrero and Rodriguez (2012). These authors who that parental education level plays a minor role in income differences.

V.   Conclusion
        The objective of this paper was toanalyzethe impact of inequality of opportunity in Côte d'Ivoire on income differences using the non-parametric method developed by Checchi and Peragine (2010) together with data from 2015 ENV. Our results showed that part of the income inequalities observed in the countrywasexplained by theinequalities of opportunity. Thus, part of the economic advantage or disadvantage is transmitted from one generation to another, within families. The inequalities of opportunity explain more than 12%of income inequalities. Therefore, parental ties remain an important intergenerational transmission mechanism of income inequality.
        Inequalities of opportunity couldlead to sub-optimal functioning of the economy as there are under-exploited or even unexploited potentials among the citizenry. Also, the results showed that the socio-economic characteristics of parents have a lower incidence in the income of individuals living in Abidjan than in the

country-side. This is justified by the fact that Abidjan, being the economic hub of the country, offers more employment opportunities than othercities.

A possible solution could be for the country authorities to invest in infrastructure outside Abidjan so as to encourage the establishment of companies in those regions. This could be a great support to the development of the private sector which needed to be boosted through incentives such as a conducive environment for business. It is also necessary to encourage and facilitate the development of economic hubs outside the metropolis that is Abidjan.

Emphasis couldbe placed on developing the agricultural sector to make it more productive and capable of employing more people with high incomes allowing them to live a decent life. Ir could be inthis way that inequalities due to inequalityofopportuniesbeyond the control of individuals couldbe corrected.

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Table 1: descriptive statistics

Parent Socio-ProfessionalCategories		Abidjan		South-West		South		West		North-West		North-East	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Public Employee	Mean	1 021 095.50	1 847 204.10	576 957.67	464 708.62	517 305.94	440 438.30	546 154.01	510 138.81	572 336.84	378 884.47	460 758.03	
	Std.Dev.	848 179.70	623 951.97	264 131.49	290 713.25	298 728.84	266 223.01	633 363.58	492 278.43	528 273.58	224 622.40	465 595.55	
	Obs	225.00	21.00	84.00	22.00	218.00	40.00	92.00	10.00	98.00	21.00	100.00	
PrivateEmployee	Mean	641 505.80	604 299.62	519 060.33	567 808.24	394 762.08	500 415.36	464 822.41	376 659.65	346 890.23	480 952.78	374 499.00	565 554.69
	Std.Dev.	608 003.32	544 865.24	391 438.74	378 006.12	321 358.65	647 214.50	638 264.58	194 341.07	372 967.11	339 971.51	335 492.11	391 572.07
	Obs	1 515.00	122.00	297.00	12.00	910.00	120.00	283.00	37.00	261.00	26.00	92.00	18.00
Self Employed	Mean	577 059.15	431 499.05	450 037.68	309 139.22	385 051.78	352 971.00	464 087.75	421 606.75	299 221.04	279 344.93	392 312.43	281 163.85
	Std.Dev.	578 559.17	287 935.92	306 959.95	194 788.76	359 331.76	261 555.17	424 521.16	284 293.94	156 972.71	162 222.78	278 721.25	149 145.32
	Obs	864.00	401.00	470.00	200.00	615.00	416.00	208.00	95.00	408.00	87.00	209.00	147.00
Farmer	Mean	551 470.42	-	387 901.46	380 757.80	275 024.16	284 277.08	295 030.24	330 463.11	251 379.90	236 693.97	274 625.56	261 644.39
	Std.Dev.	495 497.50	-	286 829.25	212 353.95	237 473.35	170 822.95	249 182.75	305 589.05	173 351.83	154 736.41	161 659.70	158 640.48
	Obs	35.00	-	1 584.00	63.00	1 473.00	151.00	1 440.00	112.00	3 100.00	191.00	1 199.00	116.00
Agricultural Employee	Mean	392 261.57	-	404 931.45	1 456 167.30	277 794.80	114 524.82	345 798.73	397 315.43	344 168.20	394 488.34	392 961.27	
	Std.Dev.	49 746 725.00	-	328 089.95	-	287 125.46	128 716.02	397 979.71	588 626.82	185 745.80	249 045.89	229 244.23	
	Obs	9.00	-	244.00	1.00	360.00	20.00	167.00	11.00	421.00	20.00	28.00	-
Family helper	Mean	582 923.23	725 690.23	534 490.77	394 616.89	232 267.67	327 265.60	306 140.82	254 048.36	301 797.93	209 563.51	306 769.45	289 836.32
	Std.Dev.	302 058.89	422 565.50	287 795.92	193 050.70	202 035.64	289 636.49	235 661.65	272 191.07	258 752.58	152 410.78	194 043.61	207 249.35
	Obs	23.00	39.00	63.00	15.00	110.00	26.00	50.00	15.00	54.00	49.00	17.00	20.00
Not working	Mean	495 438.55	535 034.56	490 196.37	175 062.20	428 253.81	485 665.55	620 487.91	466 396.47	734 621.64	386 896.63	334 878.95	
	Std.Dev.	364 681.77	-	157 685.20	-	204 629.47	131 601.66	373 531.38	-	512 777.63	275 884.67	124 349.26	
	Obs	47.00	1.00	24.00	2.00	24.00	6.00	4.00	1.00	15.00	5.00	8.00	-
Overall	Mean	608 822	591 961	480 510	535 465	358 637	357 936	434 645	393 804	407 202	338 117	362 401	199 743
	Std.Dev.	463 818	268 474	288 990	181 273	272 954	270 824	421 786	305 331	312 691	222 699	255 587	129 515
	Obs	2 718	584	2 766	315	3 710	779	2 244	281	4 357	399	1 653	301

Source: Author based on ENV 2015 data

Table 1:descriptive statistics (continuous)

Parent Socio-ProfessionalCategories		North Man	North woman	West-Central Man	West-Central Woman	North-Central Man	North-Central woman	East-Central Man	East-Central Woman	Central Man	Central Femme	TOTAL
Public Employee	Mean	624 166	525 472	554 351	530 234	509 977	508 966	349 609	724 940	570 550	670 581	614 516
	Std Dev.	558 483	221 562	351 308	92 331	296 740	394 539	372 913	43 689	602 814	374 782	392 630
	Obs	91	50	141	11	64	22	64	6	289	50	1 544
PrivateEmployee	Mean	284 048	343 516	373 253	521 912	328 510	413 504	418 171	453 140	444 133	489 744	450 326
	Std Dev.	217 032	356 974	306 431	450 128	235 055	340 607	590 684	133 279	542 729	575 835	405 102
	Obs	419	46	429	40	247	26	516	73			4 317
Self Employed	Mean	279 973	367 085	381 538	325 412	375 063	353 474	424 958	433 106	383 935	338 901	377 588
	Std Dev.	195 139	183 521	327 234	240 960	261 450	203 799	268 347	284 445	284 648	225 883	269 111
	Obs	634	139	688	244	410	208	97	59	443	234	6 412
Farmer	Mean	234 981	309 294	244 777	293 169	269 152	352 425	304 718	556 361	289 981	253 442	301 708
	Std Dev.	161 620	204 159	213 510	175 972	190 026	422 898	197 653	197 939	217 842	157 714	215 703
	Obs	1 217	48	1 389	102	669	67	307	15	1 696	496	15 435
Agricultural Employee	Mean	132 347	202 988	265 603	185 313	264 737	263 163	248 509	141 032	340 637	233 216	323 712
	Std Dev.	145 493	105 909	218 499	165 200	156 634	145 720	193 335	-	198 567	190 560	188 773
	Obs	493	28	243	10	267	59	157	6	143	51	2 729
Family helper	Mean	378 533	212 113	288 381	306 305	271 720	237 056	239 763	287 035	263 632	277 225	328 508
	Std Dev.	312 031	127 372	320 944	252 385	163 917	94 343	135 717	-	236 142	169 609	219 541
	Obs	43	22	58	20	30	12	20	8	84	24	779
Not working	Mean	325 169	979 121	380 921		457 272	488 903	473 424		378 606	617 848	487 063
	Std Dev.	366 395		303 459		434 158	155 043	574 305		143 216	187 698	239 412
	Obs	21	1	45	-	14	6	10	-	15	2	204
Overall	Mean	322 745	419 941	355 546	308 906	353 776	373 927	351 307	370 802	381 639	411 565	411 917
	Std Dev.	279 456	171 357	291 627	196 711	248 283	250 993	333 279	94 193	317 994	268 868	275 753
	Obs	2 918	295	2 993	420	1 840	427	902	120	3 186	930	31 420

Source: Author based on ENV 2015 data

Table 2: Inequalities of opportunity in Côte d'Ivoire (Mean log deviation) according to the socio-professional category of the household head

	Incomebracketapproach				Circumstance type approach			
	Inequalities of opportunity	Incidence % of inequalities of opportunity	Inequality of Effort	Total inequality mean gross earning	Inequality of Effort	Inequalities of opportunity	Incidence % of inequalities of opportunity	Total inequality (real gross earnings)
Total Population	**0.003**	**1.15**	**0.248**	**0.251**	**0.265**	**0.0368**	**12.18**	**0.302**
Strate								
Abidjan	0.005	2.760	0.193	0.198	0.256	0.013	4.840	0.269
Western South	0.002	0.950	0.218	0.220	0.206	0.031	12.920	0.237
South	0.003	1.260	0.253	0.256	0.266	0.037	12.130	0.303
West	0.002	0.760	0.255	0.257	0.278	0.033	10.640	0.311
Western North	0.002	0.980	0.203	0.205	0.194	0.027	12.230	0.221
Northern East	0.001	0.440	0.179	0.180	0.166	0.029	15.020	0.196
North	0.004	1.480	0.243	0.247	0.270	0.034	11.340	0.304
Western - Center	0.003	0.980	0.258	0.261	0.272	0.033	10.930	0.305
Northern -Center	0.004	1.860	0.213	0.217	0.202	0.041	16.770	0.242
Eastern - Center	0.002	0.710	0.222	0.223	0.232	0.038	14.010	0.269
Center	0.003	1.300	0.212	0.215	0.214	0.042	16.360	0.256
Sex of Household Head = Man								
Overall	**0.003**	**1.130**	**0.250**	**0.253**	**0.268**	**0.038**	**12.480**	**0.306**
Abidjan	0.006	2.980	0.189	0.195	0.257	0.013	4.680	0.269
Western South	0.002	0.960	0.220	0.222	0.207	0.030	12.830	0.238
South	0.003	1.250	0.253	0.256	0.259	0.039	13.120	0.299
West	0.002	0.660	0.255	0.256	0.282	0.032	10.320	0.314
Western North	0.002	1.020	0.200	0.202	0.191	0.027	12.200	0.218
Northern East	0.001	0.360	0.180	0.181	0.167	0.031	15.620	0.198
North	0.004	1.550	0.241	0.245	0.275	0.035	11.380	0.310

Western - Center	0.002	0.930	0.262	0.265	0.276	0.035	11.240	0.311
Northern -Center	0.004	1.780	0.210	0.213	0.192	0.043	18.250	0.235
Eastern - Center	0.002	0.700	0.219	0.221	0.240	0.040	14.170	0.280
Center	0.003	1.310	0.204	0.206	0.208	0.043	17.300	0.251
Sex of Household Head = Woman								
Overall	**0.003**	**1.280**	**0.239**	**0.242**	**0.250**	**0.027**	**9.860**	**0.278**
Abidjan	0.004	1.850	0.200	0.204	0.244	0.011	4.490	0.256
Western South	0.002	0.970	0.187	0.189	0.185	0.022	10.670	0.207
South	0.003	1.310	0.253	0.256	0.295	0.024	7.450	0.319
West	0.004	1.540	0.251	0.255	0.246	0.033	11.810	0.278
Western North	0.002	0.640	0.246	0.247	0.219	0.028	11.460	0.248
Northern East	0.002	0.940	0.173	0.175	0.162	0.019	10.350	0.181
North	0.002	1.070	0.212	0.214	0.175	0.024	11.970	0.199
Western - Center	0.003	1.420	0.229	0.233	0.241	0.021	8.050	0.262
Northern -Center	0.005	2.170	0.224	0.228	0.241	0.031	11.290	0.272
Eastern - Center	0.002	1.050	0.185	0.187	0.141	0.022	13.250	0.163
Center	0.003	1.280	0.237	0.240	0.232	0.036	13.420	0.268

Source: Author based on ENV 2015 data