# Are Equity and Inequality Incompatible? A graphical response

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***Abstract*** – **It is generally assumed that equity and inequality evolve in different directions. This assumption is the target of analysis in this short-paper, for this considering the particular case of two agents (e.g., landowners), which allows a graphical approach to the subject.**

***Keywords*** - *Equity, Gini index, Inequality, Rawlsian welfare.*

*Those who have much,*
*may well share with those who have little,*
*The rich would stay rich,*
*and the poor would become better off.*
[loose translation of a poem from the Alentejo folklore]

## 1. Introduction

In Welfare Economics, equity is a fundamental aspect, which is obviously related with inequality issues (Lambert, 1985; Pyatt, 1984; Schwartz & Winship, 1980; Sheshinski, 1972). As is known, in the utilitarianism à la Bentham, a better situation from a social point of view, i.e. representing a Pareto movement, can (easily) be less fair, i.e. more unequal (than the starting position). In the egalitarianism à la Rawls, such a possibility seems to be, by nature, excluded from the outset. See Sen (1974) for an examination of those two major perspectives.

Assuming the Rawlsian perspective, our aim is to assess the possibility of equity and inequality being compatible, in a land reform context (Rocha de Sousa, 2016). The particular case of two agents (e.g., landowners), which allows a graphical approach to the issue, will be considered.

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## 2. Equity and Inequality in a Rawlsian perspective

As is well-known, from a Rawlsian perspective what matters is to maximize the welfare level of the individual who is in the worst situation, i.e. the, so-called 'underdog'. This means that the maximization of social welfare is to be associated with a situation characterized by (the largest possible) equity, as a synonymous of social justice. In principle, this should also be the situation where social inequalities are minimized. Thus, it is generally assumed that equity and inequality evolve in different directions. In turn, inequality is measured by indicators such as the Gini indicator (Atkinson, 1970; Chakravarty & Satya, 1999).[1]

As we consider the case of two agents (e.g., landowners), it is pertinent to start by presenting the calculation formula of the Gini index for this case, which is:

$$G = \frac{l_1+2l_2}{l_1+l_2} - \frac{3}{2}, \quad (1)$$

where $l_1$ and $l_2$ ($\geq l_1$) represent, respectively, the amount of land allocated to farmer 1 and 2.[2]

Before proceeding, it should be immediately noted that if the farmer 1 does not own land, i.e. $l_1 = 0$, whatever the (positive) amount of land owned by the farmer 2, i.e. $\forall$ $l_2 > 0$, the Gini index, G, is always 0.5, which indicates that the inequality is the same.

In fact, that situation will be perfectly compatible with the usual configuration of Rawlsian indifference curves, i.e. as the agent in the worst situation, in this case farmer 1, always has the same allocation of resources (such resulting in the same level of utility, that we admit to be lower than that to whom are allocated more resources, in this case farmer 2), then even if agent 2 improves her situation, by possessing (increasingly) more land, this means an equally preferable situation from a social point of view, i.e. the same indifference curve will apply.

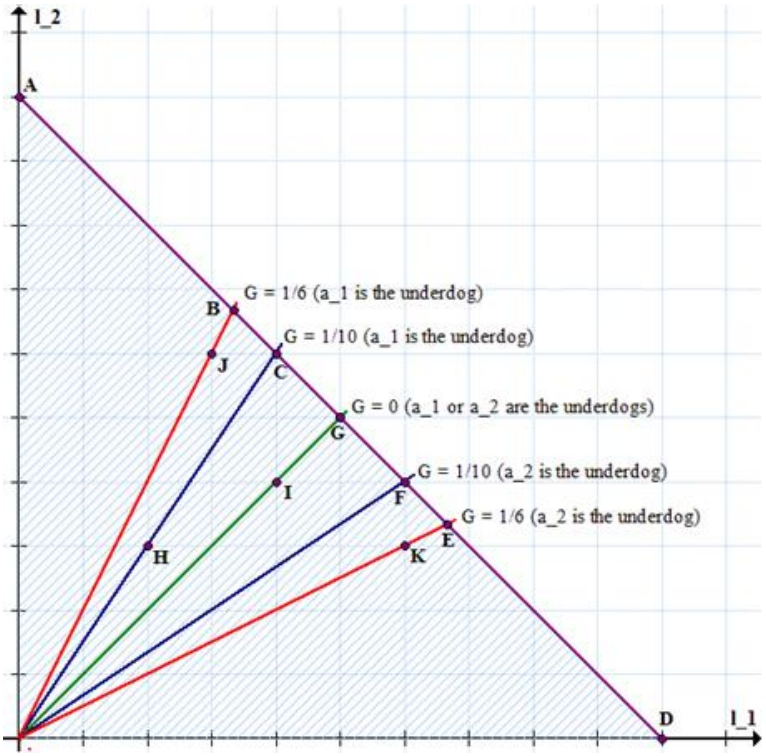
[1] In fact, the measure of inequality in income distribution is an issue that attracted the attention of literature (from) a long time ago (Dalton, 1920) and is still current (Atkinson & Brandolini, 2015).

[2] It is to be noted that expression (1) is for the case where farmer 1 is the 'underdog'. In case of the 'underdog' being farmer 2, then the correct formula for the Gini index is $G = \frac{l_2+2l_1}{l_1+l_2} - \frac{3}{2}$.

However, this will not necessarily be the case if $l_1 > 0$. In this case, it is necessary to distinguish two cases:[3]

1. All the available land, say $\bar{l}$, is distributed by the two farmers, i.e. $l_1 + l_2 = \bar{l}$. This equality is shown if Figure 1 by the straight line connecting the points **A** and **D**. Plainly, a better situation, from a Rawlsian perspective, i.e. going from point **A** downwards until point **G**, i.e. when agent 1 (a_1) is the 'underdog', or going from point **D** upwards until point **G**, i.e. when agent 2 (a_2) is the 'underdog', will also mean a decrease in the value assumed by the Gini index, by that meaning a less unequal situation.
2. Not all the available land, $\bar{l}$, is distributed by the two farmers, i.e. $l_1 + l_2 < \bar{l}$. This inequality is shown if Figure 1 by the shadowed triangle defined by the origin and points **A** and **D**. In this situation it is, indeed, possible to consider a Pareto movement à la Rawls – for instance going from point **H** to point **I** –, i.e. achieving a better result from the equity point of view, and also a better result from the inequality point of view (G = 1/10 to G = 0). On the other hand, it is also possible to consider a Pareto movement à la Rawls – for instance going from point **H** to point **J** –, i.e. achieving a better result from the equity point of view, but also a worse result from the inequality point of view (G = 1/10 to G = 1/6). It is even possible to consider two situations that, from the Rawlsian perspective, should be equally preferable, i.e. points **H** and **K**, but meaning an increase in inequality (**H** to **K**) or a decrease in inequality (**K** to **H**).

**Figure 1.** Gini and/or Rawls




## 3. Concluding Remarks

This (short) paper has shown that when all the land is allocated to farmers, equity (à la Rawls) and inequality are incompatible. On the other hand, when not all the land is allocated to farmers, a better situation from the perspective of equity does not necessarily mean a better situation from the perspective of inequality.

As a direction for future improvements we would like to proceed in the expected way, i.e. by questioning the way equity and/or inequality are measured (as it was considered in this paper).

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I would like to thank the motivation provided by all those for whom equity is, in fact, incompatible with inequality.

[3] Clearly, in equity issues what matters is the level of utility of individuals, which depends on the level of resources (e.g. income or land) that are available to them. In order to make the case (minimally) interesting, we will consider that the utility functions of the two farmers are the same and are a linear transformation of the land level owned by each of them.

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