Dear Referee,

Thanks for your review on our paper. Since you have several points, we will response them one by one.

Your review on the motivation of our paper:

I am not very convinced by the motivation of the paper. The idea that a certain level of inequality can be considered alarming is far from being shared by scholars and policy makers. The authors indicate a short list of references to support this view. However, assuming that the list of references provided is complete, a reader easily concludes that the literature does not indicate any alarming level for the Gini index.

If, on the one hand there are good reasons to believe that the level of the Gini coefficient can be negatively correlated with a number of socioeconomic phenomena, including growth, substantial freedom, and political stability. On the other, the idea of setting an alarming threshold is hard to follow. The Gini coefficient is an aggregated index which summarizes information on the entire distribution of income in a scalar. Countries with same Gini coefficient can have rather different income distribution and dramatically different socioeconomic condition, g. e. according to the World Bank, France and Egypt have a very similar Gini, but it is unquestionable that they face different risk of socioeconomic instability.

Our reply for the motivation of the paper:

We share your viewpoint that one should not set an alarming level of Gini coefficient. This is just the motivation why we write this paper. In China, there are many textbooks in statistics, which point out that 0.4 is an alarming level of Gini coefficient. Such an alarming level is cited in a large number of government reports in China. We don't know why someone sets such a strange alarming level. Therefore, we seek a large number of references to find the origin of this alarming level. Later, we indeed find some references, which are listed in our paper. However, after studying these references, we note that there is no evidence, regardless of theory or empirics, support the view that 0.4 is an alarming level of Gini coefficient. The main purpose of this paper is just to eliminate the rumor that 0.4 is an alarming level of Gini coefficient.

Furthermore, we hope to prove that, **for free market economies**, the real value of the alarming level of Gini coefficient should be set at least equal or larger than 0.5. Therefore, our result does not mean that 0.5 is an alarming level. For this point, many scholars often misunderstand our result. We will return to this point in the following replies to your questions in technique.

Your technique review 1:

1) The authors claim that that an economic system is both efficient and fair (in the sense of Rawls) if all Pareto optimal equilibria occur with identical probability. This result is derived from a contribution recently published by one of the authors. I wonder whether this result depends on the implicit assumption that a Rawls' fair allocation is necessarily a Pareto optimal allocation. If this is the case, the authors should discuss under what conditions this assumption holds. Moreover, given that the paper is an empirical exercize, the authors should discuss whether such conditions are realistic when dealing with distribution of income in a country.

Our reply 1:

Firstly, we do not agree with the assumption that a Rawls' fair allocation is necessarily a Pareto optimal allocation. Here we do the following explanation for why an economic system is both efficient and fair (in the sense of Rawls) if all Pareto optimal equilibria occur with identical probability.

In fact, Rawls' fairness denotes a pure procedural justice (Rawls, 1999; Page 74) which aims to design the social system (or economic institutions) so that the outcome is just whatever it happens to be, at least so long as it is within a certain range. In this sense, Arrow-Debreu's general equilibrium model, as an ideal social system, just stands for a fair procedure. Such a procedure will translate its fairness to the (equilibrium) outcome, which is also Pareto optimal. Then, if an outcome is allowed to occur with a higher probability, the economic system will be unfair for other outcomes in the sense of Rawls. From this meaning, an economic system is both efficient and fair (in the sense of Rawls) if and only if **it always produces Pareto optimal outcomes and meanwhile all of these outcomes are merely allowed to occur with equal probabilities**. Therefore, a Rawls' fair allocation does not imply a Pareto optimal allocation. Conversely, a Rawls' fair allocation may be inefficient. Likewise, a Pareto optimal allocation may also be unfair.

Secondly, regarding whether such conditions are realistic when dealing with the distribution of income in a country, we have the following explanation. Any real economies always, more or less, deviate from the assumptions of Arrow-Debreu's general equilibrium model. However, we believe that if an economy implements sound private property rights and judicial justice, it prone to (not equal) follow an exponential income distribution. To see if this theoretical result is in accordance with the real world, we should employ datasets from well-developed market economies, which tends to satisfy the assumptions of Arrow-Debreu's general equilibrium model. Our recent empirical investigation for the more than 60 countries, which consists of the well-developed market economies, indeed supports the theoretical result; for this, refer to: arXiv:1612.01624.

Your technique review 2:

2) Then the authors claim that an exponential income distribution will emerge spontaneously when many possible general equilibria can occur with same probability. This statement is based on previous contributions by one of the authors. Then they conclude that, if one observes an exponential distribution of income it must be the case that this is the result of a fair and efficient general economic equilibrium. However, they are providing a sufficient condition and not a necessary condition. Can the authors rule out the possibility to observe an exponential income distribution which is not the result of a fair and efficient general equilibrium?

Our reply 2:

As you have pointed out, we cannot rule out the possibility of observing an exponential income distribution which is not the result of a fair and efficient general equilibrium. Our theoretical result is only suitable for well-developed market economies, which tends to follow the assumptions of Arrow-Debreu's general equilibrium model. This is a key point. We have highlighted this point in the last sentence of this paper, which states that "Although our model fits the reality very well, a caveat also needs to be applied to the empirics: The alarming level we proposed only suits for the free market system, which ensures the free competition and equal opportunity in a large part.".

Your technique review 3:

3) Then, based on restriction derived in previous contributions of one of the authors, the paper suggests that an exponential distribution of income must necessarily translate into a Gini index no larger than 0.5. The authors suggest that this proves that, provided that the distribution of income is exponential, a Gini below 0.5 is not to be considered alarming. Although not explicitly stated in the text, this must necessarily come from what claimed in point 2).

Our reply 3:

We have clarified this point in reply 2.

Your technique review 4:

4) Then the authors test whether the distribution of Gini coefficients around the World follows an approximately normal distribution. They cannot reject the null hypothesis of normal distribution based on World Bank's data in three years.

5) Finally, the alarming level of Gini is empirically determined assuming that, in peaceful times, political instability is a rare event. A rare event for the authors is an event occurring with a small probability (p about 0.003). Then the authors use the normal approximation of the worldwide Gini coefficient distribution in each year to find the level of Gini that has a probability to occur lower than p. The corresponding level of Gini is above 0.5 in all years. The authors claim that this suggests that the

alarming level of Gini is above 0.5. Here I have some doubts about the correctness of the syllogism. I see the interest of looking at correlation between Gini and the probability of political instability to occur. However, comparing how unlikely are two events does not provide any evidence of an alarming threshold for the Gini index. In order to prove anything about a causal correlation between the Gini and political instability the authors should pursue a different empirical strategy.

Our reply 4:

We mean that a small probability p is about 0.04 (two-sigma rule) rather than 0.003.

In fact, our main purpose is to eliminate the rumor that 0.4 is an alarming level of Gini coefficient. Furthermore, we hope to prove that, for free market economies, the real value of the alarming level of Gini coefficient should be set at least equal or larger than 0.5, provided that there is indeed an alarming level of Gini coefficient. Regarding the theoretical model of exponential income distribution, we only employ it to theoretically demonstrate that the alarming level of the well-developed market economies should be above 0.5.

There may be no causal relationship between the Gini coefficient and political instability. Therefore, we only discuss that if there is a causal relationship, then how social instability will be affected by Gini coefficient. Our idea is intuitive: in peaceful times, social instability is obviously a rare event (occurring probability is less than 0.04); that is, there are only less than 8 unstable countries among 200 countries in peaceful times. If there is a possible relationship between Gini coefficient and political instability, the Gini coefficient of unstable countries should be also a small probable event (since unstable countries are small probable events in peaceful times). Then, our paper attempts to find these Gini coefficients by using negligible outliers (by our empirical result which are indeed larger than 0.5).

Conversely, if there is not a relationship between Gini coefficient and political instability, then 0.4 is not an alarming level. This is just what we want to justify.

We appreciate that you give these excellent suggestions, and we will attempt to seek other empirical strategy for a causal relationship between the Gini and political instability in another work.

Xiangjun Wu, on behalf of all the authors.