

(Form 1)

Kyoto University	Doctor of Economics	Name	李 晨
Thesis Title	Essays on Robust Social Preferences under Uncertainty (不確実性下の頑健性を持つ社会選好に関する小論)		
(Thesis Summary)			
<p>This dissertation concerns social decision making which respects all individuals' preferences. The Pareto principle is a basic criterion in this context. Namely, a social planner should not choose an allocation when some other feasible allocation is preferred to this allocation by every individual. This is a compelling principle when the individuals face only risk, so that objective probabilities can be assigned to outcomes. However, when they also face uncertainty to which they may only assign subjective probabilities, the Pareto principle is sometimes questionable. The literature thus presents various modifications of the principle, and this dissertation also contributes to this literature.</p> <p>The dissertation has three chapters, and Chapter 1 is an introductory part and contains surveys of related literature.</p> <p>Chapter 2 considers a social planner who knows all individuals' risk preferences (namely, their vNM utility functions) but is not sure about the probability distribution over the states. More concretely, the social planner has multiple probability distributions over the states and does not have any further information about the true distribution (such as a belief over those distributions). The author introduces a new criterion which is in a similar spirit to the Pareto principle, called the obvious belief-free Pareto criterion. The criterion prescribes the social planner to rank one social alternative over the other alternative if the second alternative evaluated under one of the possible state distributions is Pareto dominated by the first one evaluated under any possible state distribution.</p> <p>A major contribution of this chapter is to verify that this single criterion provides various implications on the planner's social preference. First, in general environments, the preference respecting the obvious belief-free Pareto criterion is shown to be ambiguity averse. Second, the author focuses on the environments in which the social planner is a maximin expected utility maximizer and the individuals are subjective expected utility maximizers with heterogeneous beliefs about states. Then it is shown that the planner's social preference respects the obvious belief-free Pareto criterion if and only if her preference is represented by a vNM utility function which is a nonnegative weighted sum of all individuals' vNM utility functions. Further, the set of all individuals' beliefs can be selected as the set of possible probability distributions over states under the planner's preference. Such aggregation results on the individual preferences are first proved by Harsanyi (1955) for the standard Pareto principle, and by Alon and Gayer (2016) for the same environments as this chapter. Thus, the result in this chapter implies that Alon and Gayer's axioms in their aggregation theorem can be simply replaced with one axiom: the obvious belief-free Pareto criterion.</p>			

Chapter 3 analyzes an economy with externalities where the preference aggregation theorem in Chapter 2 holds. This chapter first gives a characterization of the allocations which satisfy the obvious belief-free Pareto efficiency. Next, limiting attention to the exchange economy without externalities, the author compares the obvious belief-free Pareto efficiency with other known efficiency concepts. In particular, this chapter shows that the obvious belief-free Pareto efficiency coincides with ex ante efficiency if and only if the consumers have a common belief, and that the obvious belief-free Pareto efficiency coincides with interim efficiency if and only if the consumers have a common posterior belief, derived from some prior beliefs. These relationships, together with no-trade theorems associated with ex ante efficiency and interim efficiency, imply that a new version of the no-trade theorem holds, where the initial allocation is obvious belief-free Pareto efficient.

(Form 2)

(Thesis Evaluation Summary)

This dissertation examines issues on the aggregation of individual preferences into a social decision. The Pareto principle is a standard criterion which guides a social planner to make a decision respecting all individual preferences. However, the literature has pointed out that the Pareto principle is problematic when there is uncertainty about the underlying state variable, so that one cannot assign an objective probability to each state. The literature thus proposes several modifications of the principle for the environments with uncertainty, and this dissertation also contributes to this strand of literature.

The overall contribution of this dissertation is clear. The author proposes a novel criterion, the obvious belief-free Pareto criterion. Considering a planner who faces uncertainty and has multiple priors over the states, the criterion ranks one alternative over the other if the second alternative evaluated under one of the possible state distributions is Pareto dominated by the first one evaluated under any possible state distribution. This notion is reasonable, easy to understand and, as is shown later, helpful in understanding social preferences under uncertainty.

The analysis is clean. The above definition bears similarity to maximin preferences, and the literature associates those preferences with ambiguity aversion. Chapter 2 of this dissertation starts with a result which formalizes this link. In general environments, a planner respecting the obvious belief-free Pareto criterion is ambiguity averse. This result nicely relates the author's new criterion to a well-known concept. Further, the obvious belief-free Pareto criterion is a necessary and sufficient condition for a preference aggregation theorem under uncertainty. This result is striking and demonstrates that the author's new criterion is a key concept to preference aggregation results. In Chapter 3, the author shows a new version of no-trade theorem, as an application of the author's new Pareto criterion. Again, the author demonstrates that the obvious belief-free Pareto criterion is a useful notion.

The dissertation has considerable substance but is also subject to some criticism. In particular, many possible implications of the obvious belief-free Pareto criterion have not been extensively explored. For instance, except for the general result about the relationship between the obvious belief-free Pareto criterion and ambiguity aversion, the analysis in Chapter 2 is limited to the issue of preference aggregation. Further, while Chapter 3 starts with a characterization of the obvious belief-free Pareto efficient allocation in the economy with externalities, the rest of the analysis is limited to the pure exchange economy without externalities and to comparison with some known efficiency criteria. A more extensive investigation which further explores implications of the author's

new criterion would be meaningful.

However, the author can address these issues in her future research, and the overall quality of this dissertation is unquestionable.

Due to those evaluations, this dissertation is recognized as worthy of a doctoral degree in economics. This decision has been made after the thesis defense on February 2, 2023.