In a pure exchange economy under uncertainty the traders are willing to trade of the amounts of state-contingent commodities and they know their expectations. Common-knowledge about these conditions among all traders can preclude trade if the initial endowments allocation is a rational expectations equilibrium, even when the traders have the non-partition structure of information without the common prior assumption. In the proof it plays essential role to extend the notion of a rational expectations equilibrium and to characterize ex-ante Pareto optimal endowments as the equilibrium. From the epistemic point of view it is emphasized that the partition structure of information for the traders plays no roles in the no trade theorem.

In their paper Milgrom and Stokey [1982, Journal of Economic Theory 26, 17–27] show the no trade theorem as follows:

Let us consider a pure exchange economy with traders in uncertain environment. Let $\Omega = \Theta \times X$ and the state of $\Omega$ consists of a pair $(\theta, x)$ where $\theta$ ranging over the contingencies on which commodities are defined. The set $\Theta$ is interpreted as the set of payoff-relevant events; endowments and utility functions may depend on $\theta$. The set $X$ is interpreted as consisting of payoff-irrelevant events; these events do not affect endowments or taste directly. It is assumed here that the contingent commodities are ex-ante Pareto-optimally allocated, and the traders receive information about the state of $\Omega$ representable by information partition, and it is assumed that the traders’ beliefs are a common prior distribution; we call it the common prior assumption. Now, a trading process takes place where traders try to maximize their expected utilities. We assume that in any equilibrium of this process traders’ intended trades are both jointly feasible and common knowledge among them. In this set-up Milgrom and Stokey show that if traders are strictly risk-averse, equilibrium trade is null.

The serious limitations of the analysis in a pure exchange economy under uncertainty such as Milgrom and Stokey’s are its use of the information partition structure by which the traders receive information and of the common prior assumption. From the epistemic point of view the information partition structure represents the trades’ knowledge: Precisely, the structure is equivalent to the standard model of knowledge that includes the ‘factivity’ of knowledge $T$ (what is known is true) and the ‘introspection’ properties Axioms 4 and 5 that we know what we do and do not know). The postulate 5 is indeed
so strong that describe the hyper-rationality of traders, and thus it is partic-
ularly objectionable. Also is the common-knowledge assumption because the
common-knowledge operator is defined by an infinite recursion of the knowl-
dge operators. The recent idea of ‘bounded rationality’ suggests dropping such
assumptions since real people are not complete reasoners. The common prior
assumption also seems to be problematic.

This raises the question to what extent results as the no trade theorem de-
pend on both common-knowledge and the information partition structure (or
the equivalent postulates of knowledge.) The answer is that results strengthen
the Milgrom and Stokey’s theorem can be obtained in two ways: First, Tanaka
(2000) investigates the theorem on the information partition by iterated elim-
ination reasoning instead of common-knowledge. Secondly, in this paper we
drop the hypothesis that the initial endowments are ex-ante Pareto optimal
and we extend the no trade theorem to the reflexive and transitive information
structure without the traders being risk-aversion and having the common prior
assumption. We show the results as follows: In a pure exchange economy under
reflexive and transitive information structure, the traders are assumed to have
their subjective priors not common and to have strictly monotone preferences.

Then

**Theorem 1.** Any price system for which the initial endowments allocation is a
rational expectations equilibrium allocation can preclude trade if all the traders
commonly know that they are willing to trade of the amounts of state-contingent
commodities and if they know their expectations everywhere with respect to the
price.

To prove it we extend the notion of rational expectations equilibrium for
economy under uncertainty to that of economy under reflexive and transitive
information structure, and we establish the the existence theorem for the equi-
librium: The traders are further assumed to be strictly risk-averse.

**Theorem 2.** There exists a rational expectations equilibrium allocation relative
to a price with respect to which the traders know their expectations everywhere.

Moreover, we show a generalized version of fundamental theorem of welfare
economics, a part of which plays essential role in proving Theorem 1:

**Theorem 3.** The initial endowments allocation is ex-ante Pareto optimal if
and only if it is a rational expectations equilibrium allocation relative to a price
with respect to which the traders are rational everywhere about their expecta-
tions.