THEOREM A Pareto optimal allocation can be supported by some $p \in R^\ell \setminus \{0\}$ if one of the following is satisfied.

(1) $\succeq_i$ is semi-strictly convex for every i and $\succeq_1$ is nonsatiated.

(2) $\succeq_i$ is transitive and convex for every i and $\succeq_1$ is locally nonsatiated.

COROLLARY If $\succeq_i$ is transitive, convex, and continuous for every i, and $\succ_1$ is locally nonsatiated, a Pareto optimal allocation x^* with $x_i^* \in intX_i$ for every i is a Walrasian equilibrium allocation for some $p^* \in R^\ell \setminus \{0\}$ in the economy $\mathcal{E}^* = \{(X_i, \succeq_i, e_i^*) : i \in I\}$ with $e_i^* = x_i^*$ for every i.

THEOREM A weakly Pareto optimal allocation can be supported by some $p \in R^\ell \setminus \{0\}$ if one of the following is satisfied.

(1) $\succeq_i$ is semi-strictly convex and nonsatiated for every i.

(2) $\succeq_i$ is transitive, convex, and locally nonsatiated for every i.

COROLLARY If $\succeq_i$ is transitive, convex, continuous, locally nonsatiated for every i, a weakly Pareto optimal allocation x^* with $x_i^* \in intX_i$ for every i is a Walrasian equilibrium allocation for some $p^* \in R^\ell \setminus \{0\}$ in the economy $\mathcal{E}^* = \{(X_i, \succeq_i, e_i^*) : i \in I\}$ with $e_i^* = x_i^*$ for every i.