Denote by E the *commodity space*, where E is an ordered separable Banach space whose positive cone E_+ has an *interior point* u. An *economy* $\mathcal{E}$ is a quadruple $[(T,\tau,\mu),X,\succsim,e]$ where

(1) (T,τ,μ) is a measure *space of agents*;
(2) $X : T \to 2^{E_+}$ is the *consumption correspondence*,
(3) $\succsim_t \subset X(t) \times X(t)$ is the *preference relation* of agent t,
(4) $e : T \to E_+$ is the *initial endowment* where for all $t \in T$, $e(t) \in X(t)$ and for all $t \in T$, $e(t)$ belongs to a norm compact subset of $X(t)$.

Denote the *budget set* of agent t at prices p by $B(t,p) = \{x \in X(t) : p \cdot x \leq p \cdot e(t)\}$. The *demand set* of agent t at prices p is defined as $D(t,p) = \{x \in B(t,p) : \text{for all } y \in B(t,p), x \succsim_t y\}$.

A *competitive equilibrium* for $\mathcal{E}$ is a price-consumption pair (p,f), $p \in E^*_+/\{0\}$, $f \in L_1(\mu,E_+)$ such that:

(i) $f(t) \in D(t,p)$ for almost all t in T, and
(ii) $\int_T f(t)d\mu(t) \leq \int_T e(t)d\mu(t)$.

3.2 Assumptions. The following assumptions which are standard in equilibrium analysis will be needed to prove our Main Theorem.

(3.1) (T,τ,μ) is a complete finite measure space.
(3.2) The correspondence $X : T \to 2^{E_+}$ is integrably bounded, closed, convex, nonempty, weakly compact valued, and it has a measurable graph, i.e., $G_X \in \tau \otimes \beta(E_+)$.
(3.2′) The correspondence $X : T \to 2^{E_+}$ is closed, convex, nonempty, norm compact valued and it has a measurable graph.
(3.3) (a) For each $t \in T$ and each $x \in X(t)$ the set $R(t,x) = \{y \in X(t) : y \succsim_t x\}$ is convex, and norm closed and the set $R^{-1}(t,x) = \{y \in X(t) : x \succsim_y\}$ is norm closed, (b) $\succsim_t$ is measurable in the sense that the set $\{(t,x,y) \in T \times E_+ \times E_+ : y \succsim_t x\}$ belongs to $\tau \otimes \beta(E_+) \otimes \beta(E_+)$.
(3.4) For all $t \in T$, there exists $z(t) \in X(t)$ such that $e(t) - z(t)$ belongs to the norm interior of E_+.

3.3 The Main Result. We are now ready to state our main result:

Main Theorem. *Let $\mathcal{E}$ be an economy satisfying (3.1)–(3.4). Then a competitive equilibrium exists in $\mathcal{E}$.*