Problem Set on the Walras-Cassel Model

Recall the Walras-Cassel model

- Primary factors of production R_m in quantities r_m.
- Goods S_n.
- a_{mn} production coefficient.
- Input prices ρ_m.
- Output prices σ_n.
- Inverse demand functions $f_n : s \mapsto \sigma_n$.

An equilibrium is a triple $s^*, \rho^*, \sigma^* \geq 0$ such that

1. $As^* \leq r$,
2. $\rho^*(As^* - r) = 0$,
3. $\rho^* A \geq \sigma^*$,
4. $(\rho^* A - \sigma^*)s^* = 0$.
5. $\sigma^* = f(s^*)$.

(This is slightly different from class.) You are going to prove existence. The clever idea, which we saw in class, is that for a given σ there is a linear programming characterization of most of the equilibrium conditions.

1. Write down the lp characterization for s and ρ given σ.
2. Construct a correspondence from feasible s vectors to into feasible s vectors making use of the lp's.
3. Show that a fp is an equilibrium.
4. Write a short essay explaining how this model is classical and/or neoclassical. Feel free to do a little reading on this.

Aside from stuff you learned in 6090, the other thing you need to know is that if g is a continuous function and Γ is uhc, then $g(\Gamma(s))$ is also uhc.

One problem with this analysis is that inverse demand is defined at the boundary. A better assumption is to define inverse demand on the interior of the feasible set and have it blow up in some way as some demand gets small. You might enjoy figuring that out. What sharper statement can you make about equilibrium in this case. One thing you might need to know (but not necessarily) is the relationship between a correspondence being uhc and having a closed graph. You can find this in lots of places. When I need a review my goto source is the math chapter of Hildenbrand's *Core and Equilibria of a Large Economy*.