Economics 8723
Macroeconomic Theory
Problem Set 1 – Suggested Solutions (Sketch)
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Perfect Risk-Sharing in GE Search and Matching. Both Hansen (1985 *JME*) and Rogerson (1988 *JME*) prove that the general equilibrium that emerges from an economy in which individuals have identical utility functions, have non-convex choice sets, and in which **labor markets are Walrasian** are **identical** to the general equilibrium that emerges from a representative-household economy in which the household utility function is quasi-linear in labor.

Following a similar approach as Hansen and Rogerson, **prove** that the general equilibrium that emerges from an economy in which individuals have identical utility functions, have non-convex choice sets, and in which **labor markets are based on search and matching** are **identical** to the general equilibrium that emerges from a representative-household economy in which the household utility function is quasi-linear in labor.

For the sake of simplicity in your proof:

1. Omit physical capital k.
2. The intensive margin is $h = 1$ for those who are employed.
3. Omit endogenous LFP (i.e., the only two pools of individuals are those that have a job, n, and those that are unemployed and actively searching for a job, u, with $n + u = 1$).
4. The aggregate law of motion for employment is

$$n_{t+1} = (1 - \rho_x)n_t + m(u_t, v_t).$$

Other than the "usual" variables, define clearly any new variables introduced in the proof.

The following two pages provide a sketch of the representative household in which a continuum [0, 1] of individual family members live. A measure n of these individuals are employed, and a measure u of these individuals are unemployed and are actively seeking a job opportunity. Regardless of whether an individual is employed or unemployment, the "large-family" household that pools all individuals' earnings ends up giving each member the same quantity of consumption (i.e., "risk sharing" occurs).

Solution: The proof proceeds **exactly** in the same way as in Hansen (1985), Rogerson (1988), and the simplified version in our in-class discussion; the only difference is that for "long-term employment relationships," it does not matter which atomistic person in the "large family" one focuses on. All of the family members are identical given the within-

period complete set of state-contingent Arrow assets. The employment lottery arises within the "large family" at the beginning of every period, so having long-term employment relationships does not really make a difference in a context of complete markets. And, just like Hansen and Rogerson, there is only one insurance asset required to complete the asset markets. (Appendix A in Andolfatto (1996 *AER*) provides a version of the proof that includes physical capital k in the goods production function.)