Notation followed:

$V =$ all pairs (1)

$V_h =$ pairs from a hospital h (2)

$P =$ set of all pairs, O-A, O-B, ... (3)

$T =$ pairs types , R, S, O , U (4)

$P^t =$ pairs of a specific type $t \in T$ (5)

$e.g. P^U =$ underdemanded pairs, i.e. A-O, B-O ... (6)

$\tau(S, t) = \{u \in S \ \& \ type(u) = t\}$ (7)

$\tau(S, T') = \cup_{t \in T'} \tau(S, t)$ (8)

e.g. $\tau(M_{P^U}^{V_h}, P^U) =$ max set of Underdemanded pairs internally (9)

$M_T^V =$ random allocation in V that maximizes matched T (10)