List of References


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APPENDIX 1: Theoretical framework for Chapter 2

The representative migrant therefore solves the problem

\[
\text{Max } U_t = \sum_{t=1}^{T} \beta^t (y_t \ln A_t + \theta_t \ln C_t^m + \phi_t \ln C_t^h) \tag{1}
\]

Subject to the following constraints

\[
P_t^m C_t^m + R_t^m + F_t^m - F_{t-1}^m = Y_t^m + i_t^m F_{t-1}^m \tag{2}
\]

\[
P_t^h = P_{t-1}^h (1 + i_t^h) + e_t R_t^m - P_t^h (A_t - A_{t-1}) - e_t r_t^m \tag{3}
\]

\[
A_t > 0 \tag{4}
\]

\[
P_t^h C_t^h = P_t^h y_t^h + e_t r_t^m \tag{5}
\]

Let \(\lambda_{1,t}\), \(\lambda_{2,t}\) and \(\lambda_{3,t}\) be the Lagrangian multipliers for constraints (2), (3) and (5). The Lagrangian for optimizing equation (1) is given by

\[
L = \sum_{t=1}^{T} \beta^t \left[ (y_t \ln A_t + \theta_t \ln C_t^m + \phi_t \ln C_t^h) + \lambda_{1,t} (Y_t^m + i_t^m F_{t-1}^m - P_t^m C_t^m - R_t^m - F_{t-1}^m) + \lambda_{2,t} (-P_t^h + F_{t-1}^h (1 + i_t^h) + e_t R_t^m - P_t^h (A_t - A_{t-1}) - e_t r_t^m) + \lambda_{3,t} (P_t^h y_t^h + e_t r_t^m - P_t^h C_t^h) \right] \tag{6}
\]
From first order conditions

\[
\frac{\partial L}{\partial A_t} = \frac{y_t}{A_t} - \beta [\lambda_{2,t} P^h_t - \lambda_{2,t+1} P^h_{t+1} ] = 0 \tag{7}
\]

\[
\frac{\partial L}{\partial c^m_t} = \left( \frac{\theta_t}{c^m_t} - \lambda_{1,t} P^m_t \right) = 0 \tag{8}
\]

\[
\frac{\partial L}{\partial c^h_t} = \left( \frac{\phi_t}{c^h_t} - \lambda_{3,t} P^h_t \right) = 0 \tag{9}
\]

\[
\frac{\partial L}{\partial \lambda_{1,t}} = Y^m_t + i^m_t P^m_{t-1} - P^m_t c^m_t - R^m_t - F^m_t + P^m_{t-1} = 0 \tag{10}
\]

\[
\frac{\partial L}{\partial \lambda_{2,t}} = -P^h_t + F^h_{t-1} (1 + i^h_t) + e_t R^m_t + P^h_t (A_t - A_{t-1}) - e_t r^m_t = 0 \tag{11}
\]

\[
\frac{\partial L}{\partial \lambda_{3,t}} = P^h_t y^h_t + e_t r^m_t - P^h_t c^h_t = 0 \tag{12}
\]

\[
\frac{\partial L}{\partial R^m_t} = [ -\lambda_{1,t} + e_t \lambda_{2,t} ] = 0 \tag{13}
\]

\[
\frac{\partial L}{\partial r^m_t} = [ -\lambda_{2,t} e_t + \lambda_{3,t} e_t ] = 0 \tag{14}
\]

From equations (8), (13) and (14)

\[
\lambda_{3,t} = e_t \lambda_{2,t} = e_t \lambda_{3,t} = \frac{\theta_t}{\rho^m_t c^m_t}. \tag{15}
\]

Into equation (9)

\[
\frac{\phi_t}{c^h_t} = \lambda_{3,t} P^h_t = \frac{\theta_t \rho^h_t}{e_t \rho^m_t c^h_t} \tag{16}
\]

From equation (10)

\[
R^m_t = Y^m_t + F^m_{t-1} (1 + i^m_t) - F^m_t - P^m_t c^m_t \tag{17}
\]
Equation (16) into (17) \[ R_t^m = Y_t^m + F_{t-1}^m (1 + i_t^m) - F_t^m - \frac{\theta_t}{e_t \phi_t} p_h^h C_t^h \] (18)

From equation (18) \[ \frac{\partial R_t^m}{\partial c_t^h} = - \frac{\theta_t}{e_t \phi_t} p_h^h \] (19)

Equation (12) into (18) \[ R_t^m = Y_t^m + F_{t-1}^m (1 + i_t^m) - F_t^m - \frac{\theta_t}{e_t \phi_t} (p_h^h Y_t^h + e_t r_t^m) \] (20)

From (20) \[ r_t^m = \frac{\phi_t}{\theta_t} [Y_t^m - F_t^m + F_{t-1}^m (1 + i_t^m) - R_t^m] - \frac{p_h^h Y_t^h}{e_t} \] (21)

\[ \frac{\partial r_t^m}{\partial y_t^m} = - \frac{p_h^h}{e_t} \] (22)

Again from equation (20) \[ \frac{\partial r_t^m}{\partial y_t^m} = \frac{\phi_t}{\theta_t} \] (23)

From equation (11) \[ R_t^m = \frac{1}{e_t} [F_t^h - F_{t-1}^h (1 + i_t^h)] + p_h^h (A_t - A_{t-1}) + r_t^m \] (24)

\[ \frac{\partial R_t^m}{\partial A_t} = \frac{p_h^h}{e_t} - \beta \frac{p_h^{h+1}}{e_t^{t+1}} \] (25)

\[ \frac{\partial R_t^m}{\partial i_t^m} = F_t^m - F_{t-1}^m \] (26)

From equation (24) \[ \frac{\partial R_t^m}{\partial i_t^h} = \frac{1}{e_t} [-F_t^h] \] (27)