A small open economy facing a constant rate of return and subject to foreign demand shocks.

Two sectors of production: basic goods - $b$, and consumption goods - $s$.

A competitive search friction in the consumption goods market and idle resources in the production of basic goods.

Question: Can government expenditure alleviate recession caused by a decrease in a foreign demand?

Moreover, Can the multiplier be higher than 1?
Preferences and Technology

\[ u(c, d, n, G) + \beta \ldots \]

- Assumption about preferences: \( c \) and \( n \) are complements.

\[ F^{b}(K^{b}, N^{b}), \quad K^{b} \text{ is a fixed factor.} \]

- Basic goods can be used for export or public good purposes,

\[ F^{s}(K^{s}, N^{s}, M), \quad K^{s} \text{ is a fixed factor, } M \text{ is imports.} \]

- Services require search. The basic good no.

\[ P^{b}[N^{b}(z), \theta^{*}, G] \]

- Foreign and domestic demand (public) for Basic good.
Households


- Individual state: individual asset position $a$.

- Numeraire: price of imported intermediate good $m$.

$$V(z, a) = \max_{c, n, d, a'} u(c, d, n, G) + \beta \mathbb{E}[v(z', a')] \quad \text{s.t.}$$

$$P^s(z)c + a' = Ra + w(z)n + \Pi^s(z) + \Pi^b(z) - T(z)$$

$$c = d \Psi_d [D(z)] \quad F^s(N^s, M)$$

$$A' = H(\theta^*, A).$$

- Solution: $c(z, a), d(z, a), n(z, a), a'(z, a)$. 
Managers of unit of $K^b$ solve:

$$\pi^b(z) = \max_{n^b} F^b(1, n^b) P^b[N^b(z), \theta^*, G] - w(z) n^b$$

where $n^b$ is a labor input.

Aggregation yields

$$\Pi^b(z) = K^b \pi^b(z)$$
 Owners of one unit of $K^s$ solve:

$$\pi^s(z) = \max_{n^s, m} F^s(1, n^s, m) P^s(z) \Psi[D(z)] - w(z)n^s - m$$  \hspace{1cm} (1)

- $n^s$ is labor,
- $m$ is an imported intermediate good,
- $P^s(z)$ is the price of the good,
- $\Psi[Ds(z)]$ is the probability that the firm will sell given the market tightness.

Agregation yields

$$\Pi^s(z) = K^s \pi^s(z)$$
An Equilibrium is

(i) Aggregate allocations \( \{N^b, N^s, M, A', D, C, T\} \), function \( H \) and prices \( \{P^s, P^b, w\} \) as functions of \( z \)

(ii) \( \{c, d, n, a', v\} \) as functions of \( z, a \)

(iii) \( \{n^b, \Pi^b\} \) and \( \{n^s, m, \Pi^s\} \) as functions of \( z \) such that

(1) Households and producers solve their problems.
(2) Representative agents conditions hold.
(3) Market clearing

\[
C(z) = D(z) \Psi[D(z)] F^s[N^s(z), M(z)]
\]

\[
G + \theta^* = F^b[N^b(z)]
\]

\[
N(z) = N^b(z) + N^s(z)
\]

(5) Government budget is balanced: \( G = T(z) \)
Recession and fiscal policy

- Suppose there is a drop in a foreign demand: $\theta^* \downarrow$.

- Adjustment of both: price and quantity produced in sector $b$. In particular $N^b \downarrow$. By complementarity $C \downarrow$ and economy goes into recession (GDP decreases).

- Government can increase $G$ to boost the demand for a good $b$. Two effects: direct increase in a utility from public good and an increase in GDP through increase in $N^b$ and complementarity with $C$.

- The effect of higher tax $T$ is partially offset (depending on the elasticity of demand in sector $b$) by increase in $\Pi^b$. 