1 Box 1: Theory as Guide to the Empirical Model

Assume that there are N domestic entrepreneurs, who are single mindfully engaged in wealth accumulation (save only), and N foreign creditors, who supply the credit necessary for domestic investment by the domestic entrepreneurs. Let I_t^a denote investment in capacity by an individual entrepreneur, and let the leverage in finance be specified as λ times the entrepreneur's net worth, W. Denote by y_t, F_{t-1}, and p_t, the domestic output (produced by a standard Cobb-Douglas technology with a capital input income share α), the initial debt, indexed to foreign goods, and the *real exchange rate* (the relative price of foreign goods in terms of domestic goods), respectively.A foreign lender imposes a limit on the entrepreneur borrowings, so that the investment, I_t^a, is constrained by the entrepreneur net worth and the leverage fraction:

$I_t^a \leq (1+\lambda)W_t$,

where, $W_t = \alpha y_t - p_t F_{t-1}$, is the entrepreneur's net worth.

The market clearing real exchange rate is a function of *aggregate* investment and aggregate output:

$p_t = \frac{[1-(1-\alpha)(1-\upsilon)]Y_t - (1-\upsilon)I_t}{\tilde{X}_t}$,

where, I=NI^a,$Y = Ny$,denote the aggregate domestic investment and aggregate output, respectively; the coefficient υ denotes the marginal propensity to import, and $\tilde{X}_t$ denotes the stochastic volume of exports, expressed in terms of foreign goods. Thus, an increase the aggregate investment spending triggers real appreciation through a "transfer problem" mechanism (see Krugman (2000).

International differences in rates of return which induce foreign creditors to extend loans to domestic entrepreneurs are given by the interest parity condition:

$(1+\mathrm{r}_t)\frac{p_t}{p_{t+1}} \geq (1 + r*)$,

where, r and r* denote the marginal productivity of capital and the foreign interest rate, respectively. We start with perfect public information. Figure B.1 shows the existence of at most three equilibrium outcomes depending on the realization of exports, $\tilde{X}_t$. With high exports, a unique equilibrium investment is governed by the standard rate of return conditions. With low exports,because the entrepreneur is insolvent and the credit constraint is binding, there exists a unique equilibrium with zero investment . In an intermediate case there are however multiple equilibrium- investment outcomes, due to a expectations-coordination failure.

Now turn to the case of private information. A foreign creditor i receives a private signal θ_i regarding $\tilde{X}_t$;

$\theta_i = \tilde{X}_t + \varepsilon_{ti}$.

The error term ε_{ti} is assumed to be i.i.d. and uniformly distributed over [-ε, ε].

An individual foreign creditor's decision whether or not to extend credit to the domestic entrepreneur crucially depends on her signal.

There exists a cut-off signal $\theta_i^* = \tilde{X}_t^* + \varepsilon_{ti}^*$, so that

$$\underset{\tilde{N} U[0,1]}{E}[(1+r_t)\frac{p_(\tilde{N}_t^*, \tilde{X}_t^*)}{p_{t+1}}] - (1+r*) = 0.$$

The marginal individual creditor, who receives a threshold signal

$\theta_i^* = \tilde{X}_t^* + \varepsilon_{ti}^*$,

must be indifferent between withholding, or extending the credit to the domestic entrepreneur counterpart.

Observe that in the global game the market clearing real exchange rate, p_t ,is a decreasing function of $\tilde{N}$, the number of foreign creditors who decide to lend to the domestic entrepreneurs, and a decreasing function of the fundamental which drives the equilibrium outcome, $\tilde{X}_t$.

The export threshold, $\tilde{X}_t^*$, therefore determines a *unique* equilibrium outcome which is a solution to the global game. Below the threshold $\tilde{X}_t^*$ investment is equal to zero, because all foreign investors tend to withold credit. Above the threshold $\tilde{X}_t^*$, domestic investment is driven by the *stndard* rate-of-return consideration reaching a *unique* level $\bar{I}_t$, because all foreign investors extend credit and interest parity prevails. This means that there is also a unique *probability* of a sudden stop in capital flow, denoted by G(X), where $G(.)$ is the exogenous cummulative distribution function of export volumes:

Prob $\{I_t = 0\} = G(\tilde{X}_t^*)$.

Furthermore, the associated (expected) level of aggregate investment is given by

$(\bar{I})(1 - G(\tilde{X}_t^*))$.

Therefore, in this model the probability of sudden stops affects directly the level of economic activity of the domestic economy.

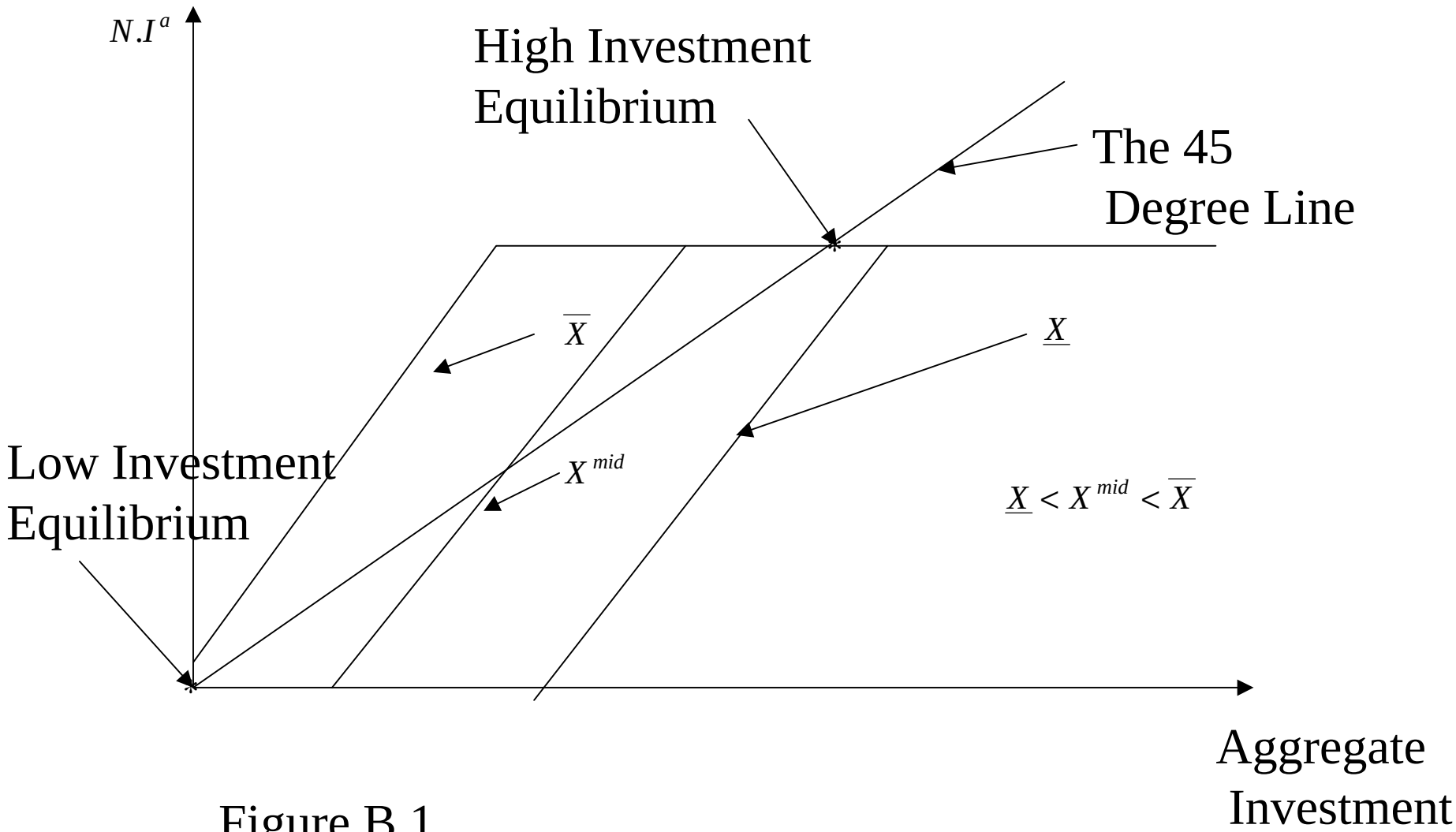
$N.I^a$
High Investment Equilibrium
The 45 Degree Line
$\overline{X}$
$\underline{X}$
Low Investment Equilibrium
X^{mid}
$\underline{X} < X^{mid} < \overline{X}$
Aggregate Investment

Figure B.1