

costs due to the time needed to transport intermediate goods. Transportation by ship to a foreign country takes much longer than delivery within the same country. According to Amiti and Weinstein (2011), overseas shipping could take two months. To formalize this in a simplest way, we assume that if an intermediate good is transported to another country, transport takes one unit of time, which is the same as the time needed for production of an intermediate good. Within the same country, we assume that transport happens instantaneously.

As in the benchmark model, wages cannot be deferred and firms that engage in intermediate good production or overseas transport need working capital to pay wages. Assume wage for each stage of intermediate good and transportation service is paid at the beginning of the production stage. Wage per unit of time is  $w$ . We maintain the assumption that firms have no equity so that working capital is financed with debt at borrowing rate  $r$ .

The financing requirement depends on the extent of offshoring, as offshoring lengthens the production process. If all production happens within a country, the production process consists of  $\bar{n}$  stages and takes  $\bar{n}$  periods. If intermediate goods are always transported across borders to the next stage, and the final product returns to the home country, the production process takes  $2\bar{n}$  periods in total. If offshoring takes place  $s$  times, the production process takes  $\bar{n} + s$  periods. Total financing requirement for the world economy, denoted by  $K$ , is then

$$\begin{aligned} K &= \frac{1}{2}(\bar{n} + s)(\bar{n} + s + 1)w \times \frac{L}{(\bar{n} + s)} \\ &= \frac{\bar{n} + s + 1}{2}wL \end{aligned} \tag{24}$$

where  $L$  is the world labor force. The per period interest cost for the world economy is

$$r \frac{\bar{n} + s + 1}{2}wL \tag{25}$$

The profit of a multinational firm is given by