

receivable. For now, we note that the payments $\{p_i\}$ that maximize the discounted expected profit for firm 0 subject only to the incentive compatibility constraints are given by

$$p_i = \sum_{k=i}^N (1 + b_k) w_k \quad (6)$$

The prices $\{p_i\}$ incorporate rents $\{b_k w_k\}$ for all the upstream firms k along the production chain. Production of the final good is feasible only when $(1 - \pi^H) q \geq p_1 + w_0$, and the optimal contract minimizes p_1 subject to the constraints. Equation (6) suggests that long production chains are difficult to sustain, not only because of the technological/logistical concerns⁶ but also because of the viability of production in the face of incentive problems. Interlocking balance sheets through accounts receivable can improve the allocation, as we now show.

2.2 Accounts Receivable

Suppose that firm i begins to receive payments from its customer firm (firm $i - 1$) after a delay of d_i periods after first incurring costs of production for the first batch of the intermediate good. Suppose also that the customer firm amortizes its accounts payable by means of a perpetuity with constant payment $a_i p_i$. In this way, the expected present value of firm i 's accounts payable is kept constant over time, as long as the final product continues to generate cash. The per-period payment from $i - 1$ to i gross of the underlying sale price is:

$$(1 + a_i) p_i \quad (7)$$

⁶The fragility of long production chains has received much attention from development economists (see Kremer (1993) and Jones (2006)).