

There is a “time to build” element in the production. Each step of the production process takes precisely one period of time, where time is indexed by $t \in \{0, 1, 2, \dots\}$. Firm i incurs a production cost of w_i , which must draw on the firm’s cash holdings, and cannot be deferred. We may interpret w_i as the wage costs of firm i .

One unit of the final good can be sold every period indefinitely into the future for the price $q > 0$, but there is a probability that the product becomes obsolete. When the product becomes obsolete, the cash flow ceases and all firms in the chain have liquidation value of zero.

The probability of obsolescence depends on the effort exerted by the firms in the production chain. If all firms exert high effort, then the probability of obsolescence is π^H , but if one or more firms exert low effort, the probability increases to π^L , where $\pi^L > \pi^H$. Conditional on the product not being obsolete, the cash flows of the firms (before any transfers take place) can be depicted as follows.

		Firms				
		0	1	\dots	$N - 1$	N
date t	0					$-w_N$
	1				$-w_{N-1}$	$-w_N$
	\vdots			\dots	$-w_{N-1}$	$-w_N$
	$N - 1$		$-w_1$	\dots	$-w_{N-1}$	$-w_N$
	N	$-w_0$	$-w_1$	\dots	$-w_{N-1}$	$-w_N$
	$N + 1$	$q - w_0$	$-w_1$	\dots	$-w_{N-1}$	$-w_N$
	$N + 2$	$q - w_0$	$-w_1$	\dots	$-w_{N-1}$	$-w_N$
	\vdots	\vdots	\vdots		\vdots	\vdots

Table 1. Cashflows before transfers

We examine two related issues. The first is the financing of the working capital necessary to pay for the initial “triangle” of costs from date 0 to date