on $\{d_i\}$, we can approximate the participation constraint for firm i by setting the net present value (10) of firm i to zero. That is, by setting

$$V_i = 0 \tag{12}$$

Rearranging (12), we have:

$$\begin{aligned} a_i p_i &= a_{i+1} p_{i+1} + \gamma_i \left(d_i, d_{i+1}\right) w_i - \left(p_i - p_{i+1} - w_i\right) \\ &= a_{i+1} p_{i+1} + b_i w_i - \left(p_i - p_{i+1} - w_i\right) \end{aligned} \tag{13}$$

where the second line follows from (11) when the IR constraint binds with equality. Equation (13) has the following interpretation. In the optimal contract, the flow payment from the net accounts receivable (given by $a_i p_i - a_{i+1} p_{i+1}$) plus the premium $p_i - p_{i+1} - w_i$ is just large enough to overcome the moral hazard temptation $b_i w_i$. We can write (13) more succintly by defining δ_i as

$$\delta_i w_i \equiv p_i - p_{i+1} - w_i \tag{14}$$

Then (13) can be written as

$$a_i p_i = a_{i+1} p_{i+1} + \beta_i w_i \tag{15}$$

where β_i is defined as

$$\beta_i \equiv b_i - \delta_i \tag{16}$$

Equation (15) shows that our model passes two key tests. First, the model predicts a positive relationship between accounts receivable and payable, as seen in the data. The larger is accounts payable (i.e. the larger is $a_{i+1} p_{i+1}$) the larger is accounts receivable. Second, when the β_i coefficients are positive for all upstream firms, then these firms have positive net receivables. So, our model accommodates the possibility that most firms are net lenders. Recall that our scatter chart for Japan suggested that most manufacturing firms are, indeed, net lenders.