Online Appendix

Table A-1: Robustness to Sample Definition by Enrollment in Schools with Breaks Data

VARIABLES	(1) Enrollment 0-100	(2) Enrollment 0-75	(3) Enrollment 0-50	(4) Enrollment 0-25
All Breaks	0.0238***	0.0240**	0.0092**	0.0088
	(0.0083)	(0.0102)	(0.0038)	(0.0054)
Observations	3,178,665	3,115,035	3,051,405	2,987,775
R-squared	0.164	0.170	0.393	0.408
Number of Cities	10,091	9,889	9,687	9,485

Notes: The dependent variable is the number of projects. Column (1) replicates the baseline estimation from Table 3. Columns (2)-(4) gradually exclude cities associated with colleges with the largest number of enrolled students. City and week fixed effects are included in all regressions. Robust standard errors are clustered at the city level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A-2: Length of the Break and Week of the Break

VARIABLES	(1) Projects	(2) Projects	(3) Projects
All Breaks	0.0238***		
	(0.0083)		
1 Week Break		0.0841	
		(0.0530)	
2 Weeks Break		0.0421**	
		(0.0165)	
3 Weeks Break		0.0665*	
		(0.0382)	
$>$ 4 Weeks Break		0.0200**	
		(0.0079)	
1 Week Break			0.0839
			(0.0530)
2 Weeks Break, Week 1			0.0424**
			(0.0188)
2 Weeks Break, Week 2			0.0418**
			(0.0169)
3 Weeks Break, Week 1			0.0697*
			(0.0371)
3 Weeks Break, Week 2+			0.0650
			(0.0404)
$>$ 4 Weeks Break, Week 1			0.0021
			(0.0082)
$>$ 4 Weeks Break, Week 2+			0.0220***
			(0.0083)
Observations	3,178,665	3,178,665	3,178,665
R-squared	0.164	0.164	0.164
Number of Cities	10,091	10,091	10,091

Notes: The dependent variable is the number of projects. Column (1) replicates the baseline estimation in Table 3. Column (2) separates breaks by their length. Column (3) separately investigates the first and the second (or more) week for breaks of different lengths. City and week fixed effects are included in all regressions. Robust standard errors are clustered at the city level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

A1. Proofs for the baseline model

Proof of Prediction 1. The innovator's payoff from developing the project (Equation (3)) is an increasing function of q. Because $\frac{q^2}{2c_w} > 0$ regardless of q, the development decision is determined by $\bar{\pi}_w(q) = 0$. The quality thresholds are thus $q\bar{e} - c_w\frac{\bar{e}^2}{2} = 0 \Leftrightarrow \bar{q}_w = \frac{c_w\bar{e}}{2}$. The probability of developing a project is then $\Pr(q \geq \frac{c_w\bar{e}}{2}) = 1 - F(\frac{c_w\bar{e}}{2})$, where F is the cumulative probability distribution of idea quality q. This probability is a decreasing function of c_w, and therefore the probability of developing a project during a break is higher than that of a work period. ☐

Proof of Prediction 2. At the low end, no projects are developed in either period if $v < \frac{c_0\bar{e}^2}{2}$. However, when $\frac{c_0\bar{e}^2}{2} < v < \frac{c_1\bar{e}^2}{2}$, no projects are developed during a work period but they are developed during a break. Thus, $\Pr(v < \hat{v}|\text{developed; break}) \geq \Pr(v \leq \hat{v}|\text{developed; work})$ for any $\hat{v} \leq \frac{c_1\bar{e}^2}{2}$, because the latter is always zero in this range while the former is positive or zero. At the high end, ignoring the minimum effort requirement for the moment, the project's value takes the form $q \cdot e_w^*(q) = q \cdot \frac{q}{c_w}$. Thus, given project value $\hat{v}$, the corresponding idea quality is $\sqrt{\hat{v}c_w}$ and the corresponding effort level is $\frac{\sqrt{\hat{v}}}{\sqrt{c_w}}$. The conditional probability of projects with value greater than $\hat{v}$ is therefore $\Pr(v \geq \hat{v}|\text{developed}) = \frac{1-F(\sqrt{c_w\hat{v}})}{1-F(\frac{c_w\bar{e}}{2})}$. With an exponential distribution, the above conditional probability can be written as $\frac{e^{-\lambda\sqrt{c_w\hat{v}}}}{e^{-\lambda(\frac{c_w\bar{e}}{2})}}$, where $1/\lambda$ is the mean of the distribution. $\frac{e^{-\lambda\sqrt{c_0\hat{v}}}}{e^{-\lambda(\frac{c_0\bar{e}}{2})}} > \frac{e^{-\lambda\sqrt{c_1\hat{v}}}}{e^{-\lambda(\frac{c_1\bar{e}}{2})}}$ when $\hat{v} \geq \frac{\bar{e}^2(\sqrt{c_1}+\sqrt{c_0})^2}{4}$. Notice that $c_1\bar{e}^2$ is the project value at which the desired effort level for a work week equals $\bar{e}$. So the projects's value derives from $q \cdot \frac{q}{c_w}$ when v is greater than this value for both break and work periods (and thus the previous analysis holds even after taking into consideration the minimum effort requirement). Furthermore, $\max\{\frac{\bar{e}^2(\sqrt{c_1}+\sqrt{c_0})^2}{4}, c_1\bar{e}^2\} = c_1\bar{e}^2$ because $c_0 < c_1$. Therefore, we can conclude that $\Pr(v \geq \hat{v}|\text{developed; break}) \geq \Pr(v \geq \hat{v}|\text{developed; work})$ for any $\hat{v} \geq c_1\bar{e}^2$. ☐

Proof of Prediction 3. We have three scenarios. First, for any $\hat{v} \geq (c_1\bar{e})\bar{e}$, the project's value takes the form $q \cdot e_w^*(q) = q \cdot \frac{q}{c_w}$ for both periods. Thus, the corresponding idea quality is $\sqrt{\hat{v}c_w}$ and the corresponding effort level is $\frac{\sqrt{\hat{v}}}{\sqrt{c_w}}$. Because $c_1 > c_0$, the effort level during the break is higher. The difference in effort level is $\sqrt{\hat{v}}(\frac{\sqrt{c_1}-\sqrt{c_0}}{\sqrt{c_0c_1}})$, and is a positive function of $\hat{v}$. Second, for $\frac{c_1\bar{e}^2}{2} \leq \hat{v} < (c_1\bar{e})\bar{e}$, the effort level for projects developed during a work week is $\bar{e}$, while that for the break is $\max\{\frac{\sqrt{\hat{v}}}{\sqrt{c_0}}, \bar{e}\}$. Thus, the effort level during a break is weakly higher, and the difference in effort level is weakly increasing in $\hat{v}$. Third, for $\hat{v} < \frac{c_1\bar{e}^2}{2}$, we cannot make such a comparison because no projects are developed during a work week. ☐

Proof of Prediction 4. The probability of developing an idea is $\Pr(q \geq \bar{q}_w = \frac{c_w\bar{e}}{2}) = 1 - F(\frac{c_w\bar{e}}{2})$. The change in this probability due to an increase in $\bar{e}$ is $-f(\frac{c_w\bar{e}}{2})\frac{c_w}{2}$, which is negative. In order for the reduction to be smaller for breaks, we need to have $\partial(-f(\frac{c_w\bar{e}}{2})\frac{c_w}{2})/\partial c_w < 0$. With an exponential distribution, the secondary derivative is:

$$\partial(-f(\frac{c_w\bar{e}}{2})\frac{c_w}{2})/\partial c_w = \partial(-\lambda e^{-\lambda\frac{c_w\bar{e}}{2}}\frac{c_w}{2})/\partial c_w = -\lambda e^{-\lambda\frac{c_w\bar{e}}{2}}(\frac{1}{2} - \frac{\lambda c_w\bar{e}}{4})$$

Thus, for the above equation to be negative, we need to have $\lambda < \frac{2}{c_w\bar{e}}$ and thus the mean of the exponential distribution (i.e., $1/\lambda$) needs to be greater than $\frac{c_w \bar{e}}{2}$. Given that we have two discrete values of c_w, it is sufficient (though not necessary) to take the greater of the two (i.e., $\frac{c_1 \bar{e}}{2}$) for the above condition to hold. ☐

Proof of Prediction 5. First, consider a generic ratio $r = a/c$, where $0 < a < c$. The difference resulting from reducing the denominator from c to c' is $\frac{a}{c'} - \frac{a}{c} = \frac{a(c-c')}{cc'}$. This difference is positive and increases with the numerator a. From Prediction 2, we know that there are more projects with $v \geq c_1 \bar{e}^2$ during a break than a work period. Then, the share of top projects developed during a break relative to the total number of projects (break and work periods combined) is greater than the share of top projects developed during work periods relative to the same total number of projects. Thus, following the relationships derived from a generic ratio stated above, since the denominator (the total number of projects) decreases after the posting requirement becomes more stringent, the relative share of top-value projects developed during the break increases. ☐

A2. Extension of the baseline model: allowing teams

In this section, we extend the baseline model to allow for team projects. Either one or two people can work on the project. If solo, the individual innovator's payoff is the same as in the baseline model. If with a team, each team member's payoff consists of half of the value of the project, minus her own time cost and a coordination cost. We separate projects into two types: $d \in \{0 = \text{simple}; 1 = \text{complex}\}$, and let the unconditional probability of a complex project be ρ and that for a simple project be $1 - \rho$. For simplicity, we assume that project complexity is independent of the distribution of an idea's intrinsic quality q. We normalize the coordination cost to be zero for simple projects. For complex projects, teaming up incurs a positive coordination cost and such a cost is smaller during a break than a work period; that is, $\delta_0 < \delta_1$. Finally, for simple projects, teaming up per se generates no direct benefit to the project's value, while for complex projects, teaming up brings direct benefit to the project (e.g., from complementary skills and perspectives), and this benefit is more pronounced for ideas with greater quality. Thus, the innovator's payoff from developing a project at effort level e is:

$$\pi_w = \begin{cases} qe - c_w \frac{e^2}{2} & \text{if solo} \\ \frac{1}{2} q(1 + d\gamma) \cdot 2e - c_w \frac{e^2}{2} - \delta_w d & \text{if team} \end{cases},$$

where $w \in \{0 = \text{break}; 1 = \text{work}\}$, $d \in \{0 = \text{simple}; 1 = \text{complex}\}$, and γ indicates the direct benefit to a project's value. We assume that the direct benefit from using teams is not too high (i.e., $\gamma < \sqrt{\frac{c_w \bar{e}^2}{c_w \bar{e}^2 - 2\delta_w}} - 1$) to rule out the scenario in which using a team dominates developing the project solo regardless of idea quality. Taking into account the minimum effort requirement $\bar{e}$, we can write the innovator's payoff functions as follows (analogous to Equation (3) in the baseline model):

$$\tilde{\pi}_w(q) = \begin{cases} \mathbb{1}_{\{q \geq c_w \bar{e}\}} \frac{q^2}{2c_w} + \mathbb{1}_{\{q < c_w \bar{e}\}} (q\bar{e} - c_w \frac{\bar{e}^2}{2}) & \text{if solo} \\ \mathbb{1}_{\{q \geq \frac{c_w \bar{e}}{2(1+d\gamma)}\}} (\frac{q^2(1+d\gamma)^2}{2c_w} - \delta_w d) + \mathbb{1}_{\{q < \frac{c_w \bar{e}}{2(1+d\gamma)}\}} (\frac{1}{2} q(1 + d\gamma)\bar{e} - c_w \frac{\bar{e}^2}{8} - \delta_w d) & \text{if team} \\ 0 & \text{if drop} \end{cases}. \tag{5}$$

Consider only simple projects for the moment. Using a team does not incur any coordination costs. As there is no direct benefit to the project's value, the benefit from using a team comes from sharing the workload. In our simple setup, this benefit matters only for ideas of relatively low quality (for which the minimum effort requirement is too high relative to the idea's quality). The following result shows that for both break and work periods, a simple project is developed solo if the idea's quality q is sufficiently high, by a team if q is in an intermediate range, and dropped if q is sufficiently low. Notice that allowing a team to share the workload lowers the quality threshold of developing a project relative to that in the baseline model ($\frac{c_w\bar{e}}{4}$ versus $\frac{c_w\bar{e}}{2}$).

Result 1 (Decision rules on "solo" versus "team" for a simple project)**.** *A simple project is developed solo if* $q \geq c_w\bar{e}$*, by a team if* $\frac{c_w\bar{e}}{4} \leq q < c_w\bar{e}$*, and dropped otherwise.*

Proof. For a simple project, $d = 0$. Both payoffs (solo or team) are monotone increasing functions of q. When $q > c_w\bar{e}$, developing a project alone generates the same payoff as developing it with a team. We let the innovator choose solo because there may still be a small coordination cost in working with a team. When $q < c_w\bar{e}$, the innovator is better off working in a team as multiple people share the workload, resulting in a smaller time cost for each individual member. The payoff from developing a project using a team is greater than zero if and only if $q > \frac{c_w\bar{e}}{4}$, which is the solution of $(\frac{1}{2}q\bar{e} - c_w\frac{\bar{e}^2}{8}) = 0$ □

For complex projects, while coordination costs for teams are non-zero, teaming up introduces two benefits: sharing the workload, and an increase in project value. This second, direct benefit becomes more relevant as the idea quality q increases. Similar to simple projects, teams may also help share the workload when the minimum effort requirement is too high relative to the quality of the idea. However, for complex projects we may not see the use of teams for this range of ideas if coordination costs are too high. Formally, we have the following decision rule for complex projects:

Result 2 (Decision rules on "solo" versus "team" for a complex project)**.** *For a complex project,*

(a) when the coordination cost is sufficiently high (i.e., $\delta_w > \frac{c_w\bar{e}^2}{8}(1+\gamma)^2$*), the project is developed by a team if* $q \geq \hat{q}_w$ *(all thresholds are defined below), solo if* $\frac{c_w\bar{e}}{2} \leq q < \hat{q}_w$*, and dropped otherwise.*

(b) when the coordination cost is not too high (i.e., $\delta_w < \frac{c_w\bar{e}^2}{8}(1+\gamma)^2$*), the project is developed by a team if* $q \geq \hat{q}_w$*, solo if* $\check{q}_w \leq q < \hat{q}_w$*, team again if* $\bar{q}_w^{team} \leq q < \check{q}_w$*, and dropped otherwise.*

Proof. For a complex project, $d = 1$. Again, both payoffs (solo or team) are monotone increasing functions of q. First, define the following thresholds:

- The value of q that makes the innovator indifferent between using a team or not at the higher end of the quality distribution: $\hat{q}_w = \mathbb{1}_{\{\delta_w > \frac{(\gamma^2+2\gamma)c_w\bar{e}^2}{2}\}}(\sqrt{\frac{2\delta_w c_w}{\gamma^2+2\gamma}}) + \mathbb{1}_{\{\delta_w < \frac{(\gamma^2+2\gamma)c_w\bar{e}^2}{2}\}}(\tilde{q}_{w,1})$, where $\tilde{q}_{w,1} = \frac{1}{(1+\gamma)^2}(c_w\bar{e} + \sqrt{2c_w\delta_w(1+\gamma)^2 - c_w^2\bar{e}^2(\gamma^2+2\gamma)})$ is the greater of the two solutions that make $q\bar{e} - c_w\frac{\bar{e}^2}{2} = \frac{q^2(1+\gamma)^2}{2c_w} - \delta_w$. When $\delta_w > \frac{(\gamma^2+2\gamma)c_w\bar{e}^2}{2}$, the payoff from using a team and the payoff from developing the project solo intersect when the desired effort levels for both are above the minimum requirement ($\bar{e}$). When $\delta_w < \frac{(\gamma^2+2\gamma)c_w\bar{e}^2}{2}$, the two payoffs intersect when the desired effort level for a team is above $\bar{e}$ while that for solo is below $\bar{e}$.

- The value of q that makes the innovator indifferent between using a team or not at the low end of the quality distribution: define $\check{q}_w = \frac{1}{(1+\gamma)^2}(c_w\bar{e} - \sqrt{2c_w\delta_w(1+\gamma)^2 - c_w^2\bar{e}^2(\gamma^2+2\gamma)})$, which is the smaller of the two solutions that equate $q\bar{e} - c_w\frac{\bar{e}^2}{2} = \frac{q^2(1+\gamma)^2}{2c_w} - \delta_w$.

- The value of q that makes the innovator indifferent between developing the project using a team and dropping it: $\bar{q}_w^{\text{team}} = \mathbb{1}_{\{\delta_w < \frac{c_w \bar{e}^2}{8}\}}(\frac{c_w \bar{e}}{(1+\gamma)4} + \frac{2\delta_w}{(1+\gamma)\bar{e}}) + \mathbb{1}_{\{\delta_w \geq \frac{c_w \bar{e}^2}{8}\}}(\frac{\sqrt{2c_w \delta_w}}{1+\gamma})$. When $\delta_w < \frac{c_w \bar{e}^2}{8}$, the payoff from using a team equals zero when the desired effort level is below $\bar{e}$; otherwise, the payoff equals zero when the desired effort level is above $\bar{e}$.

We have two scenarios. First, when the coordination cost is sufficiently high (i.e., $\delta_w > \frac{c_w \bar{e}^2}{8}(1+\gamma)^2$, see the derivation of this threshold value in the last paragraph of this proof), sharing the workload alone is not sufficient to justify the use of teams. The only cases in which teams are worth the high coordination cost are when the direct benefits are high enough, which is when the idea quality is sufficiently high. Thus, the project is developed by a team if $q \geq \hat{q}_w$, solo if $\frac{c_w \bar{e}}{2} \leq q < \hat{q}_w$, and dropped otherwise (the thresholds are defined as above). Second, when coordination costs are not too high (i.e., $\delta_w < \frac{c_w \bar{e}^2}{8}(1+\gamma)^2$), it may also be worthwhile to use a team to share the workload. Thus, a project is developed by a team if $q \geq \hat{q}_w$; solo if $\check{q}_w \leq q < \hat{q}_w$; team again if $\bar{q}_w^{team} \leq q < \check{q}_w$; and dropped otherwise. Finally, to derive the separating threshold for these two scenarios, note that the value of q at which the desired effort level for a team equals the minimum required effort level is smaller than the value of q at which the innovator is indifferent between dropping the project and developing it solo (that is, $\frac{c_w \bar{e}}{2(1+\gamma)} < \frac{c_w \bar{e}}{2}$). Thus, the threshold value of coordination cost δ_w that separates the two scenarios of whether a team is used again at the relatively low end of the quality distribution is when the optimal payoff from using a team at $q = \frac{c_w \bar{e}}{2}$ is equal to zero. This yields the threshold value of $\frac{c_w \bar{e}^2}{8}(1+\gamma)^2$. □

A key insight from the above results is that complex projects are likely to benefit more from breaks because coordination is easier than during work weeks. In contrast, for simple projects, the relative advantage of breaks is not relevant since no coordination is required. The probability of complex projects conditional on development is however not necessarily higher for breaks because the low-opportunity cost of time during breaks alone would also allow a greater number of simple projects to be developed. The following prediction in the paper provides a sufficient condition under which the likelihood of complex projects is greater during breaks. This sufficient condition is satisfied when the coordination cost for a complex project is sufficiently high during a work week but sufficiently low during breaks.

Prediction 6 (Difference in project complexity, conditional on development)**.** *When the coordination cost for complex projects is sufficiently low during breaks but sufficiently high during work periods, the probability of complex projects, conditional on development, is higher during a break than a work period.*

Proof. When $\delta_1 > \frac{c_1 \bar{e}^2}{8}(1+\gamma)^2$ and $\delta_0 < \frac{c_0 \bar{e}^2}{8}$, the probabilities of complex projects (conditional on development) during a work and a break week are (recall that ρ is the unconditional probability that an idea is complex):

$$\Pr(\text{Complex}|\text{work; developed}) = \frac{\rho(1 - F(\frac{c_1 \bar{e}}{2}))}{(1-\rho)(1 - F(\frac{c_1 \bar{e}}{4})) + \rho(1 - F(\frac{c_1 \bar{e}}{2}))},$$

$$\Pr(\text{Complex}|\text{break; developed}) = \frac{\rho(1 - F(\bar{q}_w^{\text{team}})}{(1-\rho)(1 - F(\frac{c_0 \bar{e}}{4})) + \rho(1 - F(\bar{q}_0^{\text{team}})},$$

where $\bar{q}_0^{\text{team}} = \frac{c_0 \bar{e}}{(1+\gamma)4} + \frac{2\delta_0}{(1+\gamma)\bar{e}}$ (defined in Result 2).

Pr(Complex|break; developed) > Pr(Complex|work; developed) when the following holds:

$$\frac{(1-F(\frac{c_1\bar{e}}{2}))}{(1-F(\frac{c_1\bar{e}}{4}))} < \frac{(1-F(\frac{c_0\bar{e}}{(1+\gamma)4}+\frac{2\delta_0}{(1+\gamma)\bar{e}})}{(1-F(\frac{c_0\bar{e}}{4}))}. \tag{6}$$

With q following an exponential distribution, Equation (6) holds as long as $\delta_0 < \frac{1}{8}((1+\gamma)\bar{e}^2c_1 + \gamma c_0\bar{e}^2)$. This latter condition is satisfied when $\delta_0 < \frac{c_0\bar{e}^2}{8}$ as $\frac{c_0\bar{e}^2}{8} < \frac{c_1\bar{e}^2}{8} < \frac{1}{8}((1+\gamma)c_1\bar{e}^2 + \gamma c_0\bar{e}^2)$. ☐

An important variable observable in the data is whether a project is carried out by a team. It is ambiguous whether the likelihood of team projects (conditional on development) should be higher during breaks, because teaming up also helps share the workload and that is particularly useful for work periods when the opportunity cost of time is higher. Given that the relative advantage of breaks in easier coordination among multiple people is more salient for complex projects, we should observe that compared to simple projects that require no coordination, complex projects are relatively more likely to be developed by a team during a break than during a work period. Prediction 7 shows that this statement is true when the coordination cost for a complex project is sufficiently high during a work week but sufficiently low during breaks.

Prediction 7 (Difference in probability of team projects, conditional on development)**.** *When the coordination cost for complex projects is sufficiently low during breaks but sufficiently high during work periods compared to simple projects that require little coordination, complex projects are relatively more likely to be developed by a team during a break than a work period.*

Proof. For simple projects, the difference in the probability of using a team between break and work weeks is:

$$\begin{aligned}&\text{Pr(Team|break; simple \& developed)} - \text{Pr(Team|work; simple \& developed)}\\ =\ &\frac{F(c_0\bar{e})-F(\frac{c_0\bar{e}}{4})}{1-F(\frac{c_0\bar{e}}{4})} - \frac{F(c_1\bar{e})-F(\frac{c_1\bar{e}}{4})}{1-F(\frac{c_1\bar{e}}{4})}\end{aligned}\quad. \tag{7}$$

With q following an exponential distribution, $\frac{F(c_0\bar{e})-F(\frac{c_0\bar{e}}{4})}{1-F(\frac{c_0\bar{e}}{4})}$ increases with c. Thus, Equation (7) is negative; i.e., the probability of team projects is smaller during breaks. For complex projects, consider the scenario when $\delta_1 > \frac{c_1\bar{e}^2}{8}(1+\gamma)^2$ and $\delta_0 < \frac{c_0\bar{e}^2}{8}$. The difference in the probability of using a team between break and work weeks is:

$$\begin{aligned}&\text{Pr(Team|break; complex \& developed)} - \text{Pr(Team|work; complex \& developed)}\\ =\ &\frac{1-F(\hat{q}_0)+(F(\check{q}_0)-F(\bar{q}_0^{\text{team, d=1}})}{1-F(\bar{q}_0^{\text{team, d=1}})} - \frac{1-F(\hat{q}_1))}{1-F(\frac{c_1\bar{e}}{2})}\end{aligned}\quad, \tag{8}$$

where the thresholds are all defined in Result 2. During work periods, because coordination cost is too high, teams are used only at the high end of the quality distribution to take advantage of the direct benefit to project value. During break periods, because the coordination cost is sufficiently small, teams are used both at the high end and at the relatively low end in order to take advantage of workload sharing. We can show that the second term in Equation (8), Pr(Team|work; complex & developed) $= \frac{1-F(\hat{q}_1))}{1-F(\frac{c_1\bar{e}}{2})}$, is a decreasing function of δ_1. That is, the higher the coordination cost, the smaller the likelihood of using a team during a work period. At the limit, this likelihood goes to zero. Thus, given any value of δ_0 (thus, fixing

Pr(Team|break; complex & developed)), there exists a $\hat{\delta}_1$ such that Equation (8) is positive for all $\delta_1 > \hat{\delta}_1$; that is, the probability of team projects is greater during breaks than work periods. $\square$

A3. Extension of the baseline model: allowing for shelving

In this section, we extend the basic setup to allow projects to be shelved with a discount factor on the project's value. The trade-off is that if a project is delayed until a break, the time cost to implement it is eventually smaller but at the same time the project may lose some of its value (e.g., due to competing ideas, lack of patience, forgetfulness, loss of momentum). The only situation in which there is some real tension is when the discount factor is in an intermediate range. In this range, the entrepreneur would choose to immediately develop very good ideas and delay relatively poor ones (as ideas of the lowest value are dropped). This is because when the idea quality is high, the entrepreneur would not want to sacrifice its potential by delaying it, and the potential is likely to be large compared to the benefit from the time cost savings. This behavior would push against us finding that a substantial amount of the additional projects posted during breaks are better, high-value projects. In the alternative two scenarios, one choice always dominates the other regardless of the intrinsic quality of ideas. Formally, for an idea arriving during a work week, the innovator can choose to develop it, to shelve and develop it during the break, or to drop the idea. If the idea is developed, the innovator faces the same payoff as in the baseline model. If the innovator waits until the break, then the value of the project is discounted to $v = \beta q e$, where $0 < \beta \leq 1$, perhaps due to obsolescence of ideas, competing ideas that emerge during the waiting period, etc. However, the cost of time during a break is lower. Note that for ideas arriving during a break week, the innovator's problem stays the same as the baseline model as immediate development dominates shelving. This is because the cost of time is higher later while the value of the project is discounted. Thus, we focus on the innovator's decision during a work week. The innovator's payoff from developing a project at effort level e is:

$$\pi_1 = \begin{cases} qe - c_1\frac{e^2}{2} & \text{if developed immediately} \\ \beta qe - c_0\frac{e^2}{2} & \text{if shelved and developed later during a break} \end{cases}.$$

Relative to immediate development, the benefit from a delay is that time is less costly during a break, while the downside is that the project may lose some of its value. Taking into account the minimum effort requirement $\bar{e}$, we can write the innovator's payoff as follows (analogous to Equation (3) in the baseline model):

$$\tilde{\pi}_1(q) = \begin{cases} \mathbb{1}_{\{q \geq c_1\bar{e}\}}\frac{q^2}{2c_1} + \mathbb{1}_{\{q < c_1\bar{e}\}}(q\bar{e} - c_1\frac{\bar{e}^2}{2}) & \text{if developed immediately} \\ \mathbb{1}_{\{q \geq \frac{c_0\bar{e}}{\beta}\}}\frac{\beta^2 q^2}{2c_0} + \mathbb{1}_{\{q < \frac{c_0\bar{e}}{\beta}\}}(\beta q\bar{e} - c_0\frac{\bar{e}^2}{2}) & \text{if shelved and developed later during a break} \\ 0 & \text{if drop} \end{cases}$$

The following results shows that when the project does not lose too much of its value by waiting (that is, β is sufficiently large), shelving the project dominates immediate development regardless of the idea's intrinsic quality q. In contrast, when the project loses too much value if delayed (that is, β is sufficiently low), immediate development dominates shelving. Only when β is in an intermediate range does the innovator face a meaningful trade-off between the two choices. The innovator is better off by immediately developing very good ideas and shelving projects when the idea quality is not too high. This is because when the idea quality is high, the innovator would not want to sacrifice its potential, which is high compared to the benefit from saving time costs. When the idea's quality is at an intermediate range, the benefit from saving time costs would outweigh the cost of discounting the value of the idea.

Result 3 (Decision rules on shelving)**.** *For ideas arriving during a work week:*

- *When $\beta > \sqrt{\frac{c_0}{c_1}}$, shelving dominates immediate development regardless of the idea's quality q. Thus, the innovator shelves the project if $q \geq \frac{c_0\bar{e}}{2\beta}$ and drops it otherwise.*
- *When $\frac{c_0}{c_1} < \beta < \sqrt{\frac{c_0}{c_1}}$, define $\tilde{q} = \min\{\frac{\bar{e}}{\beta^2}(c_0 + \sqrt{c_0(c_0 - \beta^2 c_1)}), (c_1 - c_0)\frac{\bar{e}}{2(1-\beta)}\}$. The innovator develops the idea immediately if $q \geq \tilde{q}$, shelves the idea if $\frac{c_0\bar{e}}{2\beta} < q < \tilde{q}$, and drops it otherwise.*
- *When $\beta < \frac{c_0}{c_1}$, immediate development dominates shelving for values of q with positive payoffs. Thus, the innovator develops the idea immediately if $q \geq \frac{c_1\bar{e}}{2}$ and drops it otherwise.*

Proof. When comparing only the innovator's optimal payoffs (without considering the minimum effort requirement), shelving is better than immediate development regardless of q if and only if $\beta > \sqrt{\frac{c_0}{c_1}}$ (i.e., the project does not lose too much of its value by waiting). This is because $\frac{\beta^2 q^2}{2c_0} > \frac{q^2}{2c_1} \Rightarrow \beta > \sqrt{\frac{c_0}{c_1}}$. Taking into consideration the requirement $\bar{e}$, we have the following three scenarios. The first scenario is when $\beta > \sqrt{\frac{c_0}{c_1}}$. From above, we know that the innovator's optimal payoff from shelving is always higher than that from immediate development. At the same time, in this case, the slope of the innovator's payoff from shelving and exerting $\bar{e}$ is smaller (i.e., flatter) than that from immediately developing the project at $\bar{e}$. This is true because the intersection point of these two payoffs, $\frac{(c_1-c_0)\bar{e}}{2(1-\beta)}$, is to the right of $\frac{c_0\bar{e}}{\beta}$, which is the value of q at which the optimal level of effort with shelving is the same as $\bar{e}$.[29] As a result, shelving is better than immediate development regardless of q, and the decision rule is to shelve the idea if $q \geq \frac{c_0\bar{e}}{2\beta}$ and drop it otherwise. The second scenario is when $\frac{c_0}{c_1} < \beta < \sqrt{\frac{c_0}{c_1}}$. From above, we know that the innovator's optimal payoff from immediate development is always higher than that from shelving the project. However, in this case, we can show that the slope of the innovator's payoff from shelving and exerting $\bar{e}$ is smaller (i.e., flatter) than that from immediately developing the project at $\bar{e}$, and the value of q at which they intersect generates a positive payoff for shelving. This implies that there is a range of values of q for which shelving generates a higher payoff than immediate development. Denote $\tilde{q} = \min\{\frac{\bar{e}}{\beta^2}(c_0 + \sqrt{c_0(c_0 - \beta^2 c_1)}), (c_1 - c_0)\frac{\bar{e}}{2(1-\beta)}\}$, where the former is the value of q at which the payoff from shelving and optimal effort level is the same as that from immediately developing the project at $\bar{e}$,[30] and the latter is the intersecting point for the innovator's payoff from shelving and exerting $\bar{e}$ and that from immediately developing the project at $\bar{e}$. The decision rule in this case is to develop the project immediately if $q \geq \tilde{q}$, shelve the project if $\frac{c_0\bar{e}}{2\beta} < q < \tilde{q}$, and drop the idea otherwise. The final scenario is when $\beta < \frac{c_0}{c_1}$. In this case, developing the project immediately dominates shelving for all values of q that generate a positive payoff for the former. Thus, the innovator chooses to develop the idea immediately if $q \geq \frac{c_1\bar{e}}{2}$ and drops the idea otherwise. □

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[29] For $(c_1 - c_0)\frac{\bar{e}}{2(1-\beta)} > \frac{c_0\bar{e}}{\beta}$) to hold, we need $\beta > \frac{2c_0}{c_0+c_1}$, which is satisfied when $\beta > \sqrt{\frac{c_0}{c_1}}$ because $\sqrt{\frac{c_0}{c_1}} > \frac{2c_0}{c_0+c_1}$. The last condition holds because $\sqrt{\frac{c_0}{c_1}} > \frac{2c_0}{c_0+c_1} \Leftrightarrow \frac{c_0}{c_1} > \frac{4c_0^2}{c_0^2+c_1^2+2c_0c_1} \Leftrightarrow (c_1 - c_0)^2 > 0$.

[30] $\frac{\beta^2 q^2}{2c_0} = q\bar{e} - c_1\frac{\bar{e}^2}{2} \Rightarrow (\beta q - \frac{c_0\bar{e}}{\beta})^2 = \frac{\bar{e}^2}{\beta^2}c_0(c_0 - \beta^2 c_1) \Rightarrow q = \frac{\bar{e}}{\beta^2}(c_0 + \sqrt{c_0(c_0 - \beta^2 c_1)})$.