Exploding Offers, Risk Aversion and Welfare

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Exploding Offers are Prevalent...

24 September 2011

The New York Times

Judges Compete for Law Clerks on a Lawless Terrain

The San Diego Union-Tribune

Competition for tech talent is fierce. Is the trend temporary?

BY JENNIFER VAN GROVE

JULY 23, 2021 4:45 AM PT

Now, to win over a top engineer, companies are offering things like flexible hours, sign-on bonuses and permanent remote work. And employers are using "exploding offers" that self-detonate at a set date and time to force an immediate decision.

Bankers with exploding offers are battling for private equity jobs

by Sarah Butcher • 8 February 2023 • 3 minute read

efinancialcareers

an exploding offer forces a worker to make a decision before she has complete information on what her alternatives are

...But Discouraged

OSCAR
Online System for Clerkship Application and Review

PERB
California Public Employment Relations Board

606.20000 – Exploding Offers

Making a time-limited, i.e., exploding offer without a legitimate basis is an indicator of bad faith.

For students who entered law school in 2021:

Judges will not accept formal or informal clerkship applications, or seek or accept formal or informal recommendations, before **12:00 pm EDT on June 12, 2023**. Judges also will not directly or indirectly contact applicants, or schedule or conduct formal or informal interviews, or make formal or informal offers, before **12:00 pm EDT on June 13, 2023**.

A judge who makes a clerkship offer will keep it open for at least **24 hours**, during which time the applicant will be free to interview with other judges.

Exploding Offers

Stanford | Career Education

- Stanford Career Education defines an exploding offer as any offer which does not conform with the offer guidelines listed above.
- Students should not be pressured to accept offers “on the spot” or "early." This means that students should not be given less than two weeks to consider the offer, nor should an offer include incentives which diminish with time, such as tiered or expiring bonuses or reduced options for location preferences.
- Employers are expected to refrain from such practices when recruiting at Stanford.

THE AMERICAN FINANCE ASSOCIATION

Publishers of the Journal of Finance

Timing of job offers:

In order to facilitate the best matching between candidates and positions, the AFA Board believes strongly that job offers should remain open until at least February 20. The AFA Board also encourages employers to abstain from giving exploding offers with too short of a time frame, since they are unfair to the candidates. Consequently, the AFA promotes the following professional norm: If a job candidate receives and accepts a coercive exploding offer (i.e., one that expires before February 20), the AFA does not consider such an acceptance to be binding.

This Paper

dynamic model with one strategic firm making offers to multiple strategic workers

1. workers' risk aversion makes exploding offers ubiquitous even w/o strategic complements
2. if exploding offers are prevalent, market frictions make workers fall through the cracks
3. utilitarian welfare of risk-averse workers is maximized iff exploding offers are banned

Economic Environment

A Game in a Large Dynamic Matching Market

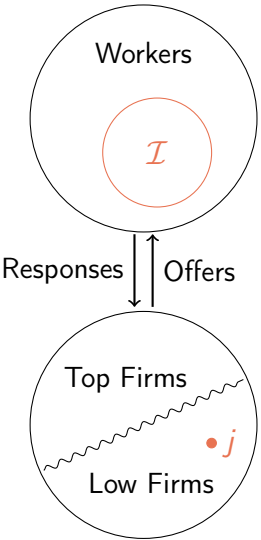
large matching market, open on $[0, T]$, with two types of firms

no bargaining over wage

strategic low firm j makes offers to set of strategic workers $i \in \mathcal{I}$

worker-specific top offer exogenous arrival processes

- top-offer conditional arrival distribution is continuous and has full support on $[0, T]$



Strategic Workers $i \in \mathcal{I}$

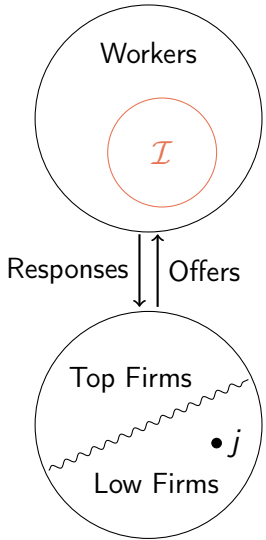
can accept only one offer

private monetary value $\theta_i \in [\underline{\theta}, \overline{\theta}]$ for strategic low firm j

monetary value $\overline{\theta}$ for top firms, $\underline{\theta}$ for outside option

Bernoulli utility function $u_i : [\underline{\theta}, \overline{\theta}] \to [0, 1]$

- increasing, concave, absolutely continuous
- such that $u_i(\underline{\theta}) = 0$ and $u_i(\overline{\theta}) = 1$



The Strategic Low Firm j

one vacancy to fill with a worker from set $\mathcal{I}$

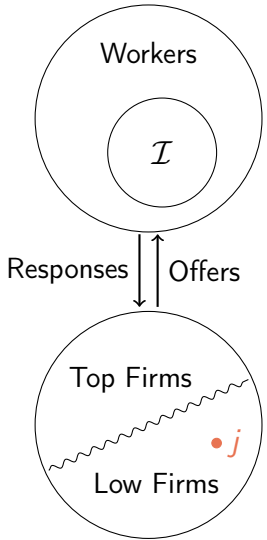
has private value $v_i > 0$ for worker $i \in \mathcal{I}$

knows u_i, but only knows $\theta_i \sim F_i[\underline{\theta}, \overline{\theta}]$

- positive and continuously differentiable density f_i

makes offers sequentially and commits to expiration date

- after a rejection, $\epsilon \geq 0$ time is wasted
- offers must last at least $\delta \geq 0$



Exploding Offers

an offer (t_O, t_D) specifies an offer communication date t_O and a deadline $t_D \geq t_O + \delta$

an offer is exploding if it expires before all information about top offers is revealed, i.e. $t_D < T$

an exploding offer is detonating if it expires as soon as possible, i.e. $t_D = t_O + \delta < T$

Equilibrium

Workers' Sequentially-Rational Strategies

What is sequentially-rational for worker i receiving an offer (t_O, t_D) from strategic firm j ?

1. never accept before the deadline
2. reject iff top offer arrives before t_D or the utility $u_i(\theta_i)$ from accepting is below the continuation value $p_i(t_D) := \mathrm{P}(\text{top offer by } T \mid \text{no top offer by } t_D)$

a sequentially-rational worker strategy induces a family of distributions $\mu_i(\tau \mid t_O, t_D)$ describing probability of rejection by date τ conditional on rejecting offer (t_O, t_D)

workers' sequentially-rational strategy profile identified by $\mu := (\mu_i)_i$

The Firm's Best Response

firm's infoset specifies current date t and not-yet-approached set $I \subset \mathcal{I}$

for any sequentially rational μ, worker i's acceptance probability for offer (t_O, t_D) is

$$A_i(t_D) \coloneqq \mathrm{P}(i \text{ has no top offer by } t_D)\mathrm{P}(\text{continuation value } p_i(t_D) < u_i(\theta_i))$$

firm's strategy σ is sequentially rational given μ if, for all $t \geq 0$ and $I \subset \mathcal{I}$, $\sigma(I, t)$ solves

$$\sup_{i \in I} \left\{ \sup_{\substack{t_O \geq t \\ t_D \geq t_O + \delta}} \left\{ A_i(t_D) v_i + (1 - A_i(t_D)) \underbrace{\int C_\mu(I_{-i}, \tau + \epsilon) d\mu_i(\tau \mid t_O, t_D)}_{\text{expected continuation value conditional on rejection}} \right\} \right\}$$

Equilibrium Existence

a pair (μ, σ) is an equilibrium if μ is sequentially rational and σ is sequentially rational given μ

μ is monotone if $(t_O, t_D) \mapsto \mu_i(\cdot \mid t_O, t_D)$ is non-decreasing in FOSD sense

- e.g., if workers reply as soon as they know they will reject
- e.g., if workers always reply at the expiration date

a monotone equilibrium is an equilibrium (μ, σ) such that μ is monotone

Proposition. A monotone equilibrium always exists.

Exploding Offers & Risk Aversion

Theorem 1

For all distributions for θ_i, there is a concave $\underline{u}_i$ s.t., if worker i's utility function u_i is more risk-averse than $\underline{u}_i$, then for all exogenous top-offer arrival processes for worker i

- if $\delta = 0$, then in all equilibria the firm only makes detonating offers to i
- in all monotone equilibria, before $T - \delta$, the firm only makes detonating offers to i.

u_i is more risk averse than $\underline{u}_i$ if u_i is an increasing and strictly concave transformation of $\underline{u}_i$

the market is pervasively risk averse if u_i is more risk averse than $\underline{u}_i$ for all workers i

Proof Outline and Main Takeaway

Step 1: if probability of acceptance A_i is decreasing, detonating offer is optimal

Step 2: probability of acceptance can be written as function of continuation value only,

$$A_i \equiv \mathrm{P}(i \text{ never receives a top offer}) \frac{\mathrm{P}(u_i(\theta_i) \geq p_i)}{1 - p_i}$$

Step 3: if u_i is concave enough, then A_i is increasing in p_i

Step 4: for all top-offer arrival processes, continuation value p_i is always decreasing in time

> *when workers are sufficiently risk averse, firms can "entice applicants into ending the anxiety and uncertainty by accepting early" (Roth & Xing, 1994)*

Welfare

Falling Through the Cracks

worker i falls through the cracks if she does not receive a top offer and would have accepted an offer from the strategic low firm, which instead proposed to some worker k with $v_k < v_i$

Proposition. Consider a pervasively risk-averse market. If $\delta + \epsilon > 0$ and $\delta < T$, there exist exogenous top-offer arrival processes such that, in all monotone equilibria, workers fall through the cracks with positive probability.

firm may skip a preferred worker who is likely to reject due to risk of losing others

potential side-effect of minimal offer lengths that do not ban exploding offers

Workers' Ex-Ante Aggregate Welfare

given a pair (μ, σ), workers' welfare is the sum of workers expected payoffs

a pair (μ, σ) is worker-optimal if it maximizes workers' welfare

exploding offers have opposing effects on workers' welfare

- may induce unstable matches and workers falling through the cracks $\rightarrow$ reduces welfare
- yet, screening of worker's private value for the firm, $u_i(\theta_i) \rightarrow$ increases welfare

Theorem 2

In a pervasively risk-averse market s.t. expectations $\mathrm{E}[u_i(\theta_i)]$ have same weak order as firm's values v_i, all equilibria are worker-optimal iff exploding offers are banned, $\delta \geq T$.

step 1: for each individual worker, a longer deadline implies higher expected payoff

step 2: given any order of offers, non-exploding offers maximize insurance for all workers

step 3: if exploding offers are banned, the firm always proposes according to a truthful order

Conclusion

Conclusion

workers' risk aversion alone can make exploding offers ubiquitous

in pervasively risk-averse markets, workers can fall through the cracks

in pervasively risk-averse markets, banning exploding offers is worker-optimal

Appendix

Sufficiently Risk-Averse Utility Function

Proof sketch. Drop subscript and let $v = \underline{u}^{-1}$ so that $F \circ \underline{u}^{-1} = F(v)$. If F is convex, then identity map works. Otherwise,

$$(F(v))'' = f'(v)(v')^2 + f(v)v'' \geq 0 \iff -\frac{v''}{(v')^2} \leq \frac{f'(v)}{f(v)}$$

Then, defining $c := \min_{[\underline{\theta},\overline{\theta}]} f'(v)/f(v) < 0$, we have that $F(v)$ is convex if

$$-\frac{v''}{(v')^2} = c$$

Then, solve differential equation and show inverse of v is concave utility function

back