Notation	Meaning
Model I	
	$D=\int_{p-d}^{1} f(u)\, du$
	$\Pi_{SA}=-\alpha l+e[pD-(1-\alpha)l]-r(C_S+\alpha l)+(1-e)\beta(C_S+\alpha l)-C_S$
	$\Pi_{IC}=r(C_S+\alpha l)-(1-e)\beta(C_S+\alpha l)$
	$\Pi_{VM}=\alpha l+e(1-\alpha)l-(1-e)\theta-ke^2-C_V$
Model IG	
	$D=\int_{p-d}^{1} f(u)\, du$
	$\Pi_{SA}=-\alpha l+e[pD-(1-\alpha)l]-(r-g)(C_S+\alpha l)+(1-e)\beta(C_S+\alpha l)-C_S$
	$\Pi_{IC}=r(C_S+\alpha l)-(1-e)\beta(C_S+\alpha l)$
	$\Pi_{VM}=\alpha l+e(1-\alpha)l-(1-e)\theta-ke^2-C_V$
Model B	
	$D=\int_{p-d-b}^{1} f(u)\, du$
	$\Pi_{SA}=-\alpha l+e[pD-(1-\alpha)l]-r(C_S+\alpha l)+(1-e)\beta(C_S+\alpha l)-C_S-C_{SB}$
	$\Pi_{IC}=r(C_S+\alpha l)-(1-e)\beta(C_S+\alpha l)$
	$\Pi_{VM}=\alpha l+e(1-\alpha)l-(1-e)\theta-k^Be^2-C_V-C_{VB}$
Model BG	$D=\int_{p-d-b}^{1} f(u)\, du$
	$\Pi_{SA}=-\alpha l+e[pD-(1-\alpha)l]-(r-g)(C_S+\alpha l)+(1-e)\beta(C_S+\alpha l)-C_S-C_{SB}$
	$\Pi_{IC}=r(C_S+\alpha l)-(1-e)\beta(C_S+\alpha l)$
	$\Pi_{VM}=\alpha l+e(1-\alpha)l-(1-e)\theta-k^Be^2-C_V-C_{VB}$

Optimal decisions

MODEL	Decisions				Note
	e^*	r^*	l^*	p^*	
constraint	*When* $Cv < H(\alpha) \mid \alpha \in (\underline{\alpha}, \alpha_0)$, $l = l^*$ $H(\alpha)=\frac{(1+d)^4(1-\alpha)^2+(1+d)^2 * 8(1-\alpha)[2\alpha k+\theta(1-\alpha)]+16\theta^2(1-\alpha)^2-192\alpha^2k^2-64\theta k(1-\alpha)(4-\alpha)}{256k(-1+\alpha)^2}$， the Hessian matrix determination is $4[(1-\alpha)l+\theta] > (1-d-2p)^2$				$H(\alpha)=\frac{(1+d)^4(1-\alpha)^2+(1+d)^2 * 8(1-\alpha)[2\alpha k+\theta(1-\alpha)]+16\theta^2(1-\alpha)^2-192\alpha^2k^2-64}{256k(-1+\alpha)^2}$ $\underline{\alpha}=\frac{(1+d)^2+4\theta-16k}{(1+d)^2+4\theta-8k}$, $\alpha_0=\frac{(1+d)^4+8(1+d)^2(\theta-k)+16\theta(\theta-10k)+16k\sqrt{(1+d)^2+48\theta(\theta-4k)}}{(1+d)^4+8(1+d)^2(\theta-2k)+16\theta(\theta-4k)-192k^2}$
I	$\frac{\varnothing}{16k(1-\alpha)}$	$\beta(1-\frac{\varnothing}{16k(1-\alpha)})$	$\frac{\varnothing-8\theta(1-\alpha)}{8(1-\alpha)^2}$	$\frac{1+d}{2}$	$\varnothing=(1-\alpha)(1+d)^2+(1-\alpha)4\theta-8\alpha k$
IG	$\frac{\varphi}{16k(1-\alpha)}$	$\beta(1-\frac{\varphi}{16k(1-\alpha)})$	$\frac{\varphi-8\theta(1-\alpha)}{8(1-\alpha)^2}$	$\frac{1+d}{2}$	$\varphi=(1-\alpha)(1+d)^2+(1-\alpha)4\theta-8\alpha k(1-g)$
B	$\frac{\eta}{16k^B(1-\alpha)}$	$\beta(1-\frac{\eta}{16k^B(1-\alpha)})$	$\frac{\eta-8\theta(1-\alpha)}{8(1-\alpha)^2}$	$\frac{1+d+b}{2}$	$\eta=(1-\alpha)(1+d+b)^2+(1-\alpha)4\theta-8\alpha k^B$
BG	$\frac{\lambda}{16k^B(1-\alpha)}$	$\beta(1-\frac{\lambda}{16k^B(1-\alpha)})$	$\frac{\lambda-8\theta(1-\alpha)}{8(1-\alpha)^2}$	$\frac{1+d+b}{2}$	$\lambda=(1-\alpha)(1+d+b)^2+(1-\alpha)4\theta-8\alpha k^B(1\text{-}g)$
	When $Cv > H(\alpha) \mid \alpha \in (\underline{\alpha}, \alpha_0)$, $l = l^{VA}$				$l^{VA}=\frac{-2k\alpha+(-1+\alpha)\theta+2\sqrt{k}\sqrt{cv(-1+\alpha)^2+k\alpha^2+\theta-\alpha\theta}}{(-1+\alpha)^2}$
I	$\frac{w-\alpha k}{k(1-\alpha)}$	$\frac{\beta(k-w)}{k(1-\alpha)}$	$\frac{2w-2\alpha k-(1-\alpha)\theta}{(1-\alpha)^2}$	$\frac{1+d}{2}$	$w=\sqrt{(1-\alpha)^2kCv+k^2\alpha^2-(1-\alpha)k\theta}$ $(1+\alpha)k+(1-\alpha)\theta > (1-\alpha)Cv > \theta$ $W > \alpha k$
IG	$\frac{w-\alpha k}{k(1-\alpha)}$	$\frac{\beta(k-w)}{k(1-\alpha)}$	$\frac{2w-2\alpha k-(1-\alpha)\theta}{(1-\alpha)^2}$	$\frac{1+d}{2}$	与 Model I 的决策变量相同，在这种情况下，政府进行补贴，对制定合同方面效果不明显
B	$\frac{\mu-\alpha k^B}{k^B(1-\alpha)}$	$\frac{\beta(k^B-\mu)}{k^B(1-\alpha)}$	$\frac{2\mu-2\alpha k^B-(1-\alpha)\theta}{(1-\alpha)^2}$	$\frac{1+d+b}{2}$	$\mu=\sqrt{(1-\alpha)^2k^BCv+k^{B^2}\alpha^2-(1-\alpha)k^B\theta} > w$ $(1+\alpha)k^B+(1-\alpha)\theta > (1-\alpha)Cv > \theta$ $\mu > \alpha k^B$
BG	$\frac{\mu-\alpha k^B}{k^B(1-\alpha)}$	$\frac{\beta(k^B-\mu)}{k^B(1-\alpha)}$	$\frac{2\mu-2\alpha k^B-(1-\alpha)\theta}{(1-\alpha)^2}$	$\frac{1+d+b}{2}$	同 B

The lowest acceptable launch price for VM is $\frac{2\sqrt{k}\sqrt{(1-\alpha)^2C_V+k\alpha^2+(1-\alpha)\theta}-(1-\alpha)\theta-2\alpha}{(1-\alpha)^2}$.

Profits

Model	Profits				
	π_S	π_V	CS	SW	
S.t.	$When\ Cv < H(\alpha) \mid \alpha \in (\underline{\alpha}, \alpha_0),\ I = I^*$				
I	$\frac{\varnothing^2}{128k(1-\alpha)^2} + \frac{\alpha\theta}{1-\alpha} - Cs$	$\frac{\varnothing^2+32\alpha k\varnothing}{256k(1-\alpha)^2} - \frac{\theta}{(1-\alpha)} - Cv$	$\frac{(1+d)^2}{8}$	$\frac{3\varnothing^2+32\alpha k\varnothing}{256k(1-\alpha)^2} + \frac{(1+d)^2}{8} - \theta - Cs - Cv$	
IG	$\frac{\varphi^2}{128k(1-\alpha)^2} + \frac{(1-g)\alpha\theta}{1-\alpha} - (1-g)Cs$	$\frac{\varphi^2+32\alpha k\varphi}{256k(1-\alpha)^2} - \frac{\theta}{(1-\alpha)} - Cv$	$\frac{(1+d)^2}{8}$	$\frac{3\varphi^2+32\alpha k\varphi}{256k(1-\alpha)^2} + \frac{(1+d)^2}{8} - \frac{\theta[1-\alpha(1-g)]}{(1-\alpha)} - (1-g)Cs - Cv$	
B	$\frac{\eta^2}{128k^B(1-\alpha)^2} + \frac{\alpha\theta}{1-\alpha} - Cs - C_{SB}$	$\frac{\eta^2+32\alpha k^B\eta}{256k^B(1-\alpha)^2} - \frac{\theta}{(1-\alpha)} - Cv\text{-}C_{VB}$	$\frac{(1+d+b)^2}{8}$	$\frac{3\eta^2+32\alpha k^B\eta}{256k^B(1-\alpha)^2} + \frac{(1+d+b)^2}{8} - \theta - Cs - Cv - C_{VB}\text{-}C_{SB}$	
BG	$\frac{\lambda^2}{128k^B(1-\alpha)^2} + \frac{(1-g)\alpha\theta}{1-\alpha} - (1-g)Cs - C_{SB}$	$\frac{\lambda^2+32\alpha k^B\lambda}{256k^B(1-\alpha)^2} - \frac{\theta}{(1-\alpha)} - Cv\text{-}C_{VB}$	$\frac{(1+d+b)^2}{8}$	$\frac{3\lambda^2+32\alpha k^B\lambda}{256k^B(1-\alpha)^2} + \frac{(1+d+b)^2}{8} - \frac{\theta[1-\alpha(1-g)]}{(1-\alpha)} - (1-g)Cs - Cv - C_{VB} - C_{SB}$	
S.t.	$When\ Cv > H(\alpha) \mid \alpha \in (\underline{\alpha}, \alpha_0),\ I = I^{VA}$				
I	$\frac{(w-\alpha k)(\varnothing+8\alpha k-8w)}{4k(1-\alpha)^2} + \frac{\alpha\theta}{1-\alpha} - Cs$	0	$\frac{(1+d)^2}{8}$	$\frac{(w-\alpha k)(\varnothing+8\alpha k-8w)}{4k(1-\alpha)^2} + \frac{\alpha\theta}{1-\alpha} - Cs + \frac{(1+d)^2}{8}$	
IG	$\frac{(w-\alpha k)(\varphi+8\alpha k-8w)}{4k(1-\alpha)^2} + \frac{(1-g)\alpha\theta}{1-\alpha} - (1-g)Cs$	0	$\frac{(1+d)^2}{8}$	$\frac{(w-\alpha k)(\varphi+8\alpha k-8w)}{4k(1-\alpha)^2} + \frac{(1-g)\alpha\theta}{1-\alpha} - (1-g)Cs + \frac{(1+d)^2}{8}$	
B	$\frac{(u-\alpha k^B)(\eta+8\alpha k^B-8u)}{4k^B(1-\alpha)^2} +$	0	$\frac{(1+d+b)^2}{8}$	$\frac{(u-\alpha k^B)(\eta+8\alpha k^B-8u)}{4k^B(1-\alpha)^2} +$	

	$\frac{\alpha\theta}{1-\alpha} - Cs - c_{SB}$			$\frac{\alpha\theta}{1-\alpha} - Cs - c_{SB} + \frac{(1+d+b)^2}{8}$	
B G	$\frac{(u-\alpha k^B)(\lambda+8\alpha k^B-8u)}{4k^B(1-\alpha)^2} + \frac{(1-g)\alpha\theta}{1-\alpha} - (1-g)Cs - C_{SB}$	0	$\frac{(1+d+b)^2}{8}$	$\frac{(u-\alpha k^B)(\lambda+8\alpha k^B-8u)}{4k^B(1-\alpha)^2} + \frac{(1-g)\alpha\theta}{1-\alpha} - (1-g)Cs - C_{SB} + \frac{(1+d+b)^2}{8}$	

Sensitivity analyses of decisions

	MODEL	Sensitivity analyses				Note
		$\frac{\partial e^*}{\partial x}$	$\frac{\partial r^*}{\partial x}$	$\frac{\partial l^*}{\partial x}$	$\frac{\partial p^*}{\partial x}$	
		When $Cv < H(\alpha) \mid \alpha \in (\underline{\alpha}, \alpha_0), l = l^*$				
d↑	I	$\frac{1+d}{8k} > 0$	$\frac{-(1+d)\beta}{8k} < 0$	$\frac{1+d}{4(1-\alpha)} > 0$, if and only if $\underline{\alpha} < \alpha < \overline{\alpha}$	$\frac{1}{2} > 0$	$\underline{\alpha} = \frac{(1+d)^2 - 16k + 4\theta}{(1+d)^2 - 8k + 4\theta}$ $\overline{\alpha} = \frac{(1+d)^2 + 4\theta}{(1+d)^2 + 8k + 4\theta}$ $(1+d)^2 > 8k - 4\theta$
	IG	$\frac{1+d}{8k} > 0$	$\frac{-(1+d)\beta}{8k} < 0$	$\frac{1+d}{4(1-\alpha)} > 0$, if and only if $\underline{\alpha} < \alpha < \overline{\alpha}$	$\frac{1}{2} > 0$	
	B	$\frac{1+d+b}{8k^B} > 0$	$\frac{-(1+d+b)\beta}{8k^B} < 0$	$\frac{1+d+b}{4(1-\alpha)} > 0$	$\frac{1}{2} > 0$	
	BG	$\frac{1+d+b}{8k^B} > 0$	$\frac{-(1+d+b)\beta}{8k^B} < 0$	$\frac{1+d+b}{4(1-\alpha)} > 0$	$\frac{1}{2} > 0$	
k↑	I	$-\frac{(1+d)^2+4\theta}{16k^2} < 0$	$\frac{[(1+d)^2+4\theta]\beta}{16k^2} > 0$	$\frac{-\alpha}{(1-\alpha)^2} < 0$	0	
	IG	$-\frac{(1+d)^2+4\theta}{16k^2} < 0$	$\frac{[(1+d)^2+4\theta]\beta}{16k^2} > 0$	$\frac{(-1+g)\alpha}{(1-\alpha)^2} < 0$	0	
	B	$-\frac{(1+d+b)^2+4\theta}{16k^{B^2}}$ < 0	$\frac{[(1+d+b)^2+4\theta]\beta}{16k^{B^2}} > 0$	$\frac{-\alpha}{(1-\alpha)^2} < 0$	0	
	BG	$-\frac{(1+d+b)^2+4\theta}{16k^{B^2}}$ < 0	$\frac{[(1+d+b)^2+4\theta]\beta}{16k^{B^2}} > 0$	$\frac{(-1+g)\alpha}{(1-\alpha)^2} < 0$	0	
θ↑	I	$\frac{1}{4k} > 0$	$\frac{-\beta}{4k} < 0$	$\frac{-1}{2(1-\alpha)} < 0$ 如何解释	0	随着失败惩罚的增加，火箭制造商更有动力提高发射成功的概率，对各个参与者来说都是利好的，（两个反馈，增加发射成功概率，降低了失败成本；制造一个高质量的火箭，成本要求更高）
	IG	$\frac{1}{4k} > 0$	$\frac{-\beta}{4k} < 0$	$\frac{-1}{2(1-\alpha)} < 0$	0	
	B	$\frac{1}{4k^B} > 0$	$\frac{-\beta}{4k^B} < 0$	$\frac{-1}{2(1-\alpha)} < 0$	0	
	BG	$\frac{1}{4k^B} > 0$	$\frac{-\beta}{4k^B} < 0$	$\frac{-1}{2(1-\alpha)} < 0$	0	
g↑	IG	$\frac{\alpha}{2(1-\alpha)} > 0$	$-\frac{\alpha\beta}{2(1-\alpha)} < 0$	$\frac{\alpha k}{(1-\alpha)^2} > 0$	0	政府补贴有利于提高发射成功概率，究其原因主要是卫星拥有

						者得到补贴后，情愿支付更高的发射费，从而激励发射商提高成功率，相应的随着发射概率的增加，发射保险费率也有所松动，得以下调。
	BG	$\frac{\alpha}{2(1-\alpha)} > 0$	$-\frac{\alpha\beta}{2(1-\alpha)} < 0$	$\frac{\alpha k^B}{(1-\alpha)^2} > 0$	0	

		$\frac{\partial e^*}{\partial x}$	$\frac{\partial r^*}{\partial x}$	$\frac{\partial l^*}{\partial x}$	$\frac{\partial p^*}{\partial x}$	
		$When\ Cv > H(\alpha) \mid \alpha \in (\underline{\alpha}, \alpha_0),\ l = l^{VA}$				
d↑	I	0	0	0	$\frac{1}{2}$	
	IG	0	0	0	$\frac{1}{2}$	
	B	0	0	0	$\frac{1}{2}$	
	BG	0	0	0	$\frac{1}{2}$	
k↑	I	$\frac{-(1-\alpha)Cv-\theta}{2kw} < 0$	$\beta\frac{(1-\alpha)Cv+\theta}{2kw} > 0$	$\frac{(w-\alpha k)^2}{(1-\alpha)^2 kw} > 0$	0	
	IG	$\frac{-(1-\alpha)Cv-\theta}{2kw} < 0$	$\beta\frac{(1-\alpha)Cv+\theta}{2kw} > 0$	$\frac{(w-\alpha k)^2}{(1-\alpha)^2 kw} > 0$	0	
	B	$\frac{-(1-\alpha)(Cv+CVB)-\theta}{2k^B u} < 0$	$\beta\frac{(1-\alpha)(Cv+CVB)+\theta}{2k^B u}$ > 0	$\frac{(u-\alpha k^B)^2}{(1-\alpha)^2 k^B u}$ > 0	0	

	BG	$\frac{-(1-\alpha)(Cv+CVB)-\theta}{2k^B u} < 0$	$\beta\frac{(1-\alpha)(Cv+CVB)+\theta}{2k^B u}$ > 0	$\frac{(u-\alpha k^B)^2}{(1-\alpha)^2 k^B u}$ > 0	0	
θ↑	I	$\frac{1}{2w} > 0$	$\frac{-\beta}{2w} < 0$	$\frac{k-1}{w(1-\alpha)} > 0$	0	
	IG	$\frac{1}{2w} > 0$	$\frac{-\beta}{2w} < 0$	$\frac{k-1}{w(1-\alpha)} > 0$	0	
	B	$\frac{1}{2u} > 0$	$\frac{-\beta}{2u} < 0$	$\frac{k^B-1}{u(1-\alpha)} > 0$	0	
	BG	$\frac{1}{2u} > 0$	$\frac{-\beta}{2u} < 0$	$\frac{k^B-1}{u(1-\alpha)} > 0$	0	
g↑	IG	0	0	0	0	
	BG	0	0	0	0	

Sensitivity analyses of profits

	MODEL	Sensitivity analyses				Note
		π_S	π_V	CS	SW	
		When $Cv < H(\alpha) \mid \alpha \in (\underline{\alpha}, \alpha_0)$, $I = I^*$				
d↑	I	$\frac{(1+d)\varnothing}{32k(1-\alpha)}$	$\frac{(1+d)(\varnothing+16\alpha k)}{64k(1-\alpha)}$	$\frac{1+d}{4}$	$\frac{(1+d)(3\varnothing+16\alpha k)}{64k(1-\alpha)}++$ $\frac{1+d}{4}$	$\underline{\alpha}=\frac{(1+d)^2-16k+4\theta}{(1+d)^2-8k+4\theta}$ $\overline{\alpha}$ $=\frac{(1+d)^2+4\theta}{(1+d)^2+8k+4\theta}$ $(1+d)^2>8k-4\theta$
	IG	$\frac{(1+d)\varphi}{32k(1-\alpha)}$	$\frac{(1+d)(\varphi+16\alpha k)}{64k(1-\alpha)}$	$\frac{1+d}{4}$	$\frac{(1+d)(3\varphi+16\alpha k)}{64k(1-\alpha)}$ $+\frac{1+d}{4}$	
	B	$\frac{(1+d+b)\eta}{32k^B(1-\alpha)}$	$\frac{(1+d+b)(\eta+16\alpha k^B)}{64k^B(1-\alpha)}$	$\frac{1+b+d}{4}$	$\frac{(1+d+b)(3\eta+16\alpha k^B)}{64k^B(1-\alpha)}+$ $+\frac{1+b+d}{4}$	
	BG	$\frac{(1+d+b)\lambda}{32k^B(1-\alpha)}$	$\frac{(1+d+b)(\lambda+16\alpha k^B)}{64k^B(1-\alpha)}$	$\frac{1+b+d}{4}$	$\frac{(1+d+b)(\lambda+16\alpha k^B)}{64k^B(1-\alpha)}+$ $+\frac{1+b+d}{4}$	
k↑	I	$-\frac{\varnothing^2+16\alpha k\varnothing}{128k^2(1-\alpha)^2}$ 讨论	$-\frac{\varnothing^2+16\alpha k(\varnothing+16\alpha k)}{256k^2(1-\alpha)^2}$	0	$-\frac{3\varnothing^2+16\alpha k(3\varnothing+16\alpha k)}{256k^2(1-\alpha)^2}$	
	IG	$-\frac{\varphi^2+16\alpha k(1-g)\varphi}{128k^2(1-\alpha)^2}$	$-\frac{\varphi^2+16\alpha k(1-g)(\varphi+1}{256k^2(1-\alpha)^2}$	0	$-\frac{3\varphi^2+16\alpha k(1-g)(\varphi+1}{256k^2(1-\alpha)^2}$	
	B	$-\frac{\eta^2+16\alpha k^B\eta}{128k^{B^2}(1-\alpha)^2}$	$-\frac{\eta^2+16\alpha k^B(\eta+16\alpha k}{256k^{B^2}(1-\alpha)^2}$		$-\frac{3\eta^2+16\alpha k^B(\eta+16\alpha k}{256k^{B^2}(1-\alpha)^2}$	
	BG	$-\frac{\lambda^2+16\alpha k^B(1-g}{128k^{B^2}(1-\alpha)^2}$	$-\frac{\lambda^2+16\alpha k^B(1-g)(\lambda}{256k^{B^2}(1-\alpha)}$		$\frac{3\lambda^2+16\alpha k^B(1-g)(\lambda+1}{256k^{B^2}(1-\alpha)^2}$	
θ↑	I	$\frac{\varnothing+16\alpha k}{16k(1-\alpha)}$	$\frac{\varnothing+16\alpha k-32k}{32k(1-\alpha)}$	0	$\frac{3\varnothing+48\alpha k-32k}{32k(1-\alpha)}$	随着失败惩罚的增加，火箭制造商更有动力提高发射成功的概率，对各个参与者来说都是利好的，（两个反馈，增加发射成功概率，降低

						了失败成本：制造一个高质量的火箭，成本要求更高）
	IG	$\frac{\varphi+16\alpha k(1-g)}{16k(1-\alpha)}$	$\frac{\varphi+16\alpha k(1-g)-32k}{32k(1-\alpha)}$	0	$\frac{3\varphi+48\alpha k(1-g)-32k}{32k(1-\alpha)}$	
	B	$\frac{\eta+16\alpha k^B}{16k^B(1-\alpha)}$	$\frac{\varphi+16\alpha k^B-32k^B}{32k^B(1-\alpha)}$	0	$\frac{3\varphi+48\alpha k^B-32k^B}{32k^B(1-\alpha)}$	
	BG	$\frac{\lambda+16\alpha k^B(1-g)}{16k^B(1-\alpha)}$	$\frac{\lambda+16\alpha k^B(1-g)-32k^B}{32k^B(1-\alpha)}$	0	$\frac{3\lambda+48\alpha k^B(1-g)-32k^B}{32k^B(1-\alpha)}$	
g↑	IG	$Cs+$ $\frac{\alpha[\varphi-8\theta(1-\alpha)]}{8(1-\alpha)^2}=$ $Cs+\alpha I>0$	$\frac{\alpha(\varphi+16\alpha k)}{16(1-\alpha)^2}>0$	0	>0	政府补贴有利于提高发射成功概率，究其原因主要是卫星拥有者得到补贴后，情愿支付更高的发射费，从而激励发射商提高成功率，相应的随着发射概率的增加，发射保险费率也有所松动，得以下调。
	BG	$Cs+\alpha I>0$	$\frac{\alpha(\lambda+16\alpha kB)}{16(1-\alpha)2}>0$	0	>0	

		When $Cv>H(\alpha)\mid\alpha\in(\underline{\alpha},\alpha_0),\ I=I^{VA}$				
d↑	I	$\frac{(1+d)(w-\alpha k)}{2k(1-\alpha)}>0$	0	$\frac{1+d}{4}$	$\frac{(1+d)(2w-3\alpha k+k)}{2k(1-\alpha)}>$ 0	
	IG	$\frac{(1+d)(w-\alpha k)}{2k(1-\alpha)}>0$	0	$\frac{1+d}{4}$	$\frac{(1+d)(2w-3\alpha k+k)}{2k(1-\alpha)}>0$	
	B	$\frac{(1+d+b)(u-\alpha k^B)}{2k^B(1-\alpha)}>0$	0	$\frac{1+d+b}{4}$	$\frac{(1+d+b)(2u-3\alpha kB+kB)}{2kB(1-\alpha)}>$ 0	
	BG	$\frac{(1+d+b)(u-\alpha k^B)}{2k^B(1-\alpha)}>0$	0	$\frac{1+d+b}{4}$	$\frac{(1+d+b)(2u-3\alpha kB+kB)}{2kB(1-\alpha)}>$ 0	
k↑	I	$\frac{-16\alpha^2k(w-\alpha k)+8\alpha k\theta(1-\alpha)-\theta(1-\alpha)^2[(1+d)^2+4\theta]-\varnothing(1-\alpha)^2Cv}{8kw(1-\alpha)^2}$ 讨论	0	0	$\frac{-16\alpha 2k(w-\alpha k)+8\alpha k\theta -\theta(1-\alpha)2[(1+d)2+4\theta]-\varnothing}{8kw(1-\alpha)2}$ 讨论	

	IG	$\frac{-16\alpha^2 k(1+g)(w-\alpha k)+8\alpha k\theta(1+g)(1-\alpha) -\theta(1-\alpha)^2[(1+d)^2+4\theta] -(\varphi-16g\alpha k)(1-\alpha)^2 Cv}{8kw(1-\alpha)^2}$	0	0	$-16\alpha 2k(1+g)(w-\alpha k)+8\alpha$ $-\theta(1-\alpha)2[(1+d)$ $-(\varphi-16g\alpha k)(1-$ / $8kw(1-\alpha)$	k 增加时，e 降低，l 增加，r 增加，p 不变，讨论 SO 的收益变化（预计降低）
	B	$\frac{-16\alpha^2 k^B(u-\alpha k^B)+8\alpha k^B\theta(1-\alpha) -\theta(1-\alpha)^2[(1+d+b)^2+4\theta]-\eta(1-\alpha)^2(Cv+CvB)}{8k^B u(1-\alpha)^2}$	0	0	$-16\alpha 2kB(u-\alpha kB)$ $-\theta(1-\alpha)2[(1+d+b)2+4\theta$ / $8kBu(1-$	
	BG	$\frac{-16\alpha^2 k^B(1+g)(u-\alpha k^B)+8\alpha k^B\theta(1+g)(1-\alpha) -\theta(1-\alpha)^2[(1+d+b)^2+4\theta] -(\lambda-16g\alpha k^B)(1-\alpha)^2(Cv+CvB)}{8k^B u(1-\alpha)^2}$	0	0	$-16\alpha 2kB(1+g)(u-\alpha kB)+$ $-\theta(1-\alpha)2[(1+d$ $-(\lambda-16g\alpha kB)(1-\alpha$ / $8kBu(1-\alpha$	
θ↑	I	$\frac{\emptyset-16(w-\alpha k)+8\alpha^2 k+8\theta(1-\alpha) +8(1-\alpha)^2 Cv}{8w(1-\alpha)}$	0	0	$\emptyset-16(w-\alpha k)+8\alpha 2k+8\theta($ $+8(1-\alpha)2Cv$ / $8w(1-\alpha)$	讨论
	IG	$\frac{\varphi+16\alpha k+8\alpha^2 k+8\theta(1-\alpha) -16w-8\alpha gw+8(1-\alpha)^2 Cv}{8w(1-\alpha)}$	0	0	$\varphi+16\alpha k+8\alpha 2k+8\theta(1-\alpha)$ $-16w-8\alpha gw+8(1-\alpha)2C$ / $8w(1-\alpha)$	
	B	$\frac{\eta+16\alpha k^B+8\alpha^2 k^B+8\theta(1-\alpha) -16u+8(1-\alpha)^2(Cv+CvB)}{8u(1-\alpha)}$	0	0	$\eta+16\alpha kB+8\alpha 2kB+8\theta(1-$ $-16u+8(1-\alpha)2(Cv+CvB$ / $8u(1-\alpha)$	
	BG	$\frac{\lambda+16\alpha k^B+8\alpha^2 k^B+8\theta(1-\alpha) -16u-8\alpha gu+8(1-\alpha)^2(Cv+CvB)}{8u(1-\alpha)}$	0	0	$\lambda+16\alpha kB+8\alpha 2kB+8\theta($ $-16u-8\alpha gu+8(1-\alpha)2(Cv$ / $8u(1-\alpha)$	
g↑	IG	$\frac{\alpha[2(w-\alpha k)-(1-\alpha)\theta]}{(1-\alpha)^2}+Cs$	0	0	$\alpha[2(w-\alpha k)-(1-\alpha)\theta]+$ / $(1-\alpha)2$ Cs	
	BG	$\frac{\alpha[2(u-\alpha k^B)-(1-\alpha)\theta]}{(1-\alpha)^2}+Cs$	0	0	$\alpha[2(u-\alpha kB)-(1-\alpha)\theta]+$ / $(1-\alpha)2$ Cs	