Simple Business Games

		Firm B B	
		1	2
Firm A	1	π_B =18 π_A = 18	π_B = 20 π_A = 10
π	2	π_B = 10 π_A = 20	π_B = 11 π_A = 11

How much to Produce

Dominant Strategy Nash Equilibrium

		Firm B B	
		1	2
Firm A	1	π_B =18 π_A = 18	π_B = 20 π_A = 10
π	2	π_B = 10 π_A = 20	π_B = 11 π_A = 11

Do all Games Have Dominant Strategies?

Automotive Firm 1 has great engineering skills. Firm 2 has good designers and does great styling.

		Firm 2's choices	
		Technical model change	Styling model change
Firm 1's choices	Technical Model Change	π_2 =20 π_1 = 40	π_2 = 15 π_1 = 60
	Styling Model Change	π_2 = 16 π_1 = 8	π_2 = 18 π_1 = 12

Do all Games Have Dominant Strategies?

Firm 1 has a dominant strategy: technical change.

		Firm 2's choices	
		Technical model change	Styling model change
Firm 1's choices	Technical Model Change	π_2 =20 **π_1 = 40**	π_2 = 15 **π_1 = 60**
	Styling Model Change	π_2 = 16 π_1 = 8	π_2 = 18 π_1 = 12

Do all Games Have Dominant Strategies?

Firm 2 does not have a dominant strategy.

		Firm 2's choices	
		Technical model change	Styling model change
Firm 1's choices	Technical Model Change	**π_2 =20** π_1 = 40	π_2 = 15 π_1 = 60
	Styling Model Change	π_2 = 16 π_1 = 8	**π_2 = 18** π_1 = 12

Do all Games Have Dominant Strategies?

Firm 2's choice is still obvious: assume #1 acts rationally. Adopt a technical change.

		Firm 2's choices	
		Technical model change	Styling model change
Firm 1's choices	Technical Model Change	π_2 =20 π_1 = 40	π_2 = 15 π_1 = 60
	Styling Model Change	π_2 = 16 π_1 = 8	π_2 = 18 π_1 = 12

Do all Games Have Dominant Strategies?

The lesson: assume your opponent will act rationally.

		Firm 2's choices	
		Technical model change	Styling model change
Firm 1's choices	Technical Model Change	π_2 =20 π_1 = 40	π_2 = 15 π_1 = 60
	Styling Model Change	π_2 = 16 π_1 = 8	π_2 = 18 π_1 = 12

Early and Late Entry

The new firm has a dominant strategy

		Firm 2's choices of when to enter the new brand	
		Early entry	Late entry
Firm 1's choices of When to extend the brand	Early entry	π_2 =60 π_1 = 40	π_2 = 20 π_1 = 45
	Late entry	π_2 = 80 π_1 = 95	π_2 = 55 π_1 = 35

Early and Late Entry

The existing firm does not have a dominant strategy but it can rely on the new firm's strategy

		Firm 2's choices of when to enter the new brand	
		Early entry	Late entry
Firm 1's choices of When to extend the brand	Early entry	π_2 =60 π_1 = 40	π_2 = 20 π_1 = 45
	Late entry	π_2 = 80 π_1 = 95	π_2 = 55 π_1 = 35

Early and Late Entry

Moral of the story. Let the new guys try the gutsy strategies.

Stodgy pays.

		Firm 2's choices of when to enter the new brand	
		Early entry	Late entry
Firm 1's choices of When to extend the brand	Early entry	π_2 =60 π_1 = 40	π_2 = 20 π_1 = 45
	Late entry	π_2 = 80 π_1 = 95	π_2 = 55 π_1 = 35

Multiple Nash Equilibria

This is the styling problem with a new payoff matrix.

		Firm 2's choices	
		Technical model change	Styling model change
Firm 1's choices	Technical Model Change	π_2 =20 π_1 = 20	π_2 = 55 π_1 = 60
	Styling Model Change	π_2 = 55 π_1 = 60	π_2 = 25 π_1 = 25

Multiple Nash Equilibria

Now there are two Nash Equilibria

		Firm 2's choices	
		Technical model change	Styling model change
Firm 1's choices	Technical Model Change	π_2 =20 π_1 = 20	π_2 = 55 π_1 = 60
	Styling Model Change	π_2 = 55 π_1 = 60	π_2 = 25 π_1 = 25

te Entry

New entrant can enter either new or wait.

Established Firm can extend early or late.

Firm 1's choices of when to extend the brand	Firm 2's choices of when to enter the new brand: Early entry	Firm 2's choices of when to enter the new brand: Late entry
Early entry	π_2 =60 π_1 = 40	π_2 = 20 π_1 = 45
Late entry	π_2 = 80 π_1 = 95	π_2 = 55 π_1 = 35

Multiple Nash Equilibria

Look at the first Nash Equilibrium. Neither firm has reason to change

Firm 1's choices	Firm 2's choices: Technical model change	Firm 2's choices: Styling model change
Technical Model Change	π_2 =20 π_1 = 20	π_2 = 55 π_1 = 60
Styling Model Change	π_2 = 55 π_1 = 60	π_2 = 25 π_1 = 25

Multiple Nash Equilibria

Ditto for the second equilibrium

Firm 1's choices	Firm 2's choices: Technical model change	Firm 2's choices: Styling model change
Technical Model Change	π_2 =20 π_1 = 20	π_2 = 55 π_1 = 60
Styling Model Change	π_2 = 55 π_1 = 60	π_2 = 25 π_1 = 25

Multiple Nash Equilibria

This is an introduction. It shows how to get going. There is more to come.

Firm 1's choices	Firm 2's choices: echnical model change	Firm 2's choices: Styling model change
Technical Model Change	π_2 =20 π_1 = 20	π_2 = 55 π_1 = 60
Styling Model Change	π_2 = 55 π_1 = 60	π_2 = 25 π_1 = 25

End

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