

Rothschild's Ten Lessons

P&G and U make and advertise soap powder.

Lesson 1: advertising rivalry

		<i>U</i>	
		DA	A
<i>P&G</i>	DA	3, 3	1, 4
	A	4, 1	2, 2

TABLE 1. A dominant strategy (P&G, U)

4 = Very High, 3 = High, 2 = Medium, 1 = Low

Rothschild's Ten Lessons

P&G and U make and advertise soap powder.

Lesson 1: advertising rivalry

		<i>U</i>	
		DA	A
<i>P&G</i>	DA	3, 3	1, 4
	A	4, 1	2, 2

TABLE 1. A dominant strategy (P&G, U)

4 = Very High, 3 = High, 2 = Medium, 1 = Low

L1: If you have a *dominant strategy* and no opportunity to agree on another course of action with your opponent, then play that strategy.

Lesson 2: advertising with a slight change

Now: if both advertise, then P&G does worst of all.
Otherwise unchanged.

		<i>U</i>	
		DA	A
<i>P&G</i>	DA	3, 3	1, 4
	A	4, 1	0, 2

TABLE 2. Only one firm has a dominant strategy

Lesson 2: advertising with a slight change

Now: if both advertise, then P&G does worst of all. Otherwise unchanged.

		<i>U</i>	
		DA	A
<i>P&G</i>	DA	3, 3	1, 4
	A	4, 1	0, 2

TABLE 2. Only one firm has a dominant strategy

L2: If you don't have a dominant strategy but your opponent does, and there is no opportunity to agree on another course of action with your opponent, then expect her to play her dominant strategy and do the best you can in the circumstances.

Lesson 3: coordination

When neither has a dominant strategy, then each has an interest in persuading the other to act in a particular way.

New products “Hotwash” and “Coldwash”: each does better if one sells Hot and the other Cold.

So each has an incentive to signal its intention of which it will launch.

Especially when product development is long and costly.

By “leaks” or public announcements or even stock exchange announcements. Why?

Perhaps even signal their *commitment* by publicising their R&D results or investment plans.

NB: It's not always best to play your cards close to your chest: sometimes revealing your hand can alter the other's actions to your benefit.

		<i>U</i>	
		Hot	Cold
<i>P&G</i>	Hot	1, 1	3, 3
	Cold	3, 3	1, 1

TABLE 3. No dominant strategy → signalling?

3 = High, 1 = Low

		<i>U</i>	
		Hot	Cold
<i>P&G</i>	Hot	1, 1	3, 3
	Cold	3, 3	1, 1

TABLE 3. No dominant strategy → signalling?

3 = High, 1 = Low

L3: If neither you nor your opponent has a dominant strategy, and there is no opportunity to agree on another course of action, then select, and *signal your commitment to*, a clear strategy to encourage your opponent to behave in a way you'd prefer.

Lesson 4: threats can lack credibility

Incumbent P&G want to discourage newcomer U from entering a market — by threatening a Low Price response if U enters:

“If you U come In, then we (P&G) will Lo P(rice).”

If U stays Out, then U gets Zero,

but if U comes In and P&G price Low, then U’s payoff is Negative.

If U comes In and P&G price Low, then P&G is worse off than if P&G price High ($M > VL$).

∴ P&G pricing Low is *a non-credible threat*, and U enters.

		<i>U</i>	
		In	Out
<i>P&G</i>	Hi P	M, M	H, Zero
	Lo P	VL, N	L, Zero

TABLE 4. The only credible threat
H > M > L > VL > Zero > Negative

		<i>U</i>	
		In	Out
<i>P&G</i>	Hi P	M, M	H, Zero
	Lo P	VL, N	L, Zero

TABLE 4. The only credible threat
H > M > L > VL > Zero > Negative

L4: The only *credible threat* is the one which would be in your interest to carry out, if necessary.

Lesson 5: commitment can add credibility to threats

A threat by P&G to cut price in the face of a new entrant might lack credibility if P&G's production capacity were limited.

Such a threat with full-capacity production already is hollow, since P&G can't produce a greater output.

What if P&G invests in more capacity (at the same unit cost)?

Then the cost without using the extra capacity is X , when $H_i P$.

And the cost when using the extra capacity is $Y < X$, since the extra sales offsets the capacity cost, when $L_o P$.

So long as $M - X < VL - Y$, then P&G will use the extra capacity at Low Price if U enters. And $H - X > L - Y$.

		<i>U</i>	
		In	Out
<i>P&G</i>	Hi P	M-X, M	H-X, Z
	Lo P	VL-Y, N	L-Y, Z

TABLE 5. Credibility through commitment

		<i>U</i>	
		In	Out
<i>P&G</i>	Hi P	M-X, M	H-X, Z
	Lo P	VL-Y, N	L-Y, Z

TABLE 5. Credibility through commitment

L5: Commitment to make a threat credible can pay dividends in the long run.

**if $M - X < VL - Y$
and $H - X > L - Y$**

Lesson 6: investment subsidies can help or hinder

Another entry deterrent is a cross-subsidy.

When will this be effective?

Suppose {In, In} → negative payoffs (-5, -5).

But if P&G cross-subsidizes by 25, then {In, In} → (20, -5).

Provided P&G's payoff without U entering > the cross-subsidy, then P&G will do it: $80 = 105 - 25$.

		<i>U</i>	
		In	Out
<i>P&G</i>	In	-5(20), -5	80(105), 0
	Out	0, 80	0, 0

TABLE 6. Subsidies as a good idea

The cross-subsidy of 25 → U stays out.

when $105 > 25$

But if U 's payoff if both firms are In is 5, instead of -5 (it has lower costs than before), then it will enter, and P&G's payoff (-5) is less than the subsidy (25).

		U	
		In	Out
$P\&G$	In	$-5(20), 5$	$80(105), 0$
	Out	$0, 80$	$0, 0$

TABLE 7. Subsidies as a bad idea

But if U 's payoff if both firms are In is 5, instead of -5 (it has lower costs than before), then it will enter, and P&G's payoff (-5) is less than the subsidy (25).

		U	
		In	Out
$P\&G$	In	-5(20), 5	80(105), 0
	Out	0, 80	0, 0

TABLE 7. Subsidies as a bad idea

L6: An investment can be profit-increasing if it discourages entry, but costly if your potential competitors are lower-cost than you are.

Lesson 7: dominant strategies are credible threats

If the incumbent (P&G) cannot deter entry, then it's better for the two firms not to fight.

But explicit collusion is illegal (see antitrust laws).

Signalling is possible: P&G – “We will match any price.” Or: “We will beat any other price.”

		<i>U</i>	
		“HP”	“LP”
<i>P&G</i>	“HP”	3, 3	1, 4
	“LP”	4, 1	2, 2

TABLE 8. A dominant strategy is a credible threat

Then the threat of “LP” is credible.

Lesson 8: response timing matters

Will entrant U be deterred from cutting price (LP) even if it knows that P&G's threat "LP" is credible?

U 's gain from cutting price (LP) might be limited: until P&G is able to retaliate with its own LP.

But how long before U returns to a HP?

A trade-off between present gains and future losses — depends on timing and interest rates.

Lesson 8: response timing matters

Will entrant U be deterred from cutting price (LP) even if it knows that P&G's threat "LP" is credible?

U's gain from cutting price (LP) might be limited: until P&G is able to retaliate with its own LP.

But how long before U returns to a HP?

A trade-off between present gains and future losses — depends on timing and interest rates.

L8: A credible threat is not always a deterrent, even if implemented.

Lesson 9: An apparently incredible threat might still be worth carrying out.

		<i>U</i>	
		“HP”	“LP”
<i>P&G</i>	“HP”	3, 3	1, 4
	“LP”	4, 1	0, 2

TABLE 9. Short-run non-credible, long-run credible

In the short run, P&G lets U LP ($1 > 0$).

And P&G benefits if U's HP is eventually restored ($3 > 1$).

If P&G stays at HP, then no incentive for U to return to HP ($4 > 3$).

But if P&G does LP, and reduces U's payoff ($2 < 4$), then P&G trades costs now ($0 < 1$) for gains later ($3 > 1 > 0$).

Lesson 10: Market stability without direct threats.

Now, both players' LP is a dominant strategy.

		<i>U</i>	
		Hi P	Lo P
<i>P&G</i>	Hi P	100, 100	80, 140
	Lo P	175, 75	85, 80

TABLE 10. Price war as a dominant strategy

But P&G can signal its reluctance to “LP” by telling its own customers: “If we sell to anyone else at a lower price than we charged you, in the next six months, then we’ll refund you, so long as we’re not responding to a cut by rival U.” (Does U need to hear this?)

		<i>U</i>	
		Hi P	Lo P
<i>P&G</i>	Hi P	100, 100	80, 140
	Lo P	70, 75	85, 80

TABLE 11. Avoiding a price war by tying oneself

L 10: A firm which appears to be tying its own hands may actually be tying those of its opponent as well.

Ten Lessons from Rothschild.

(See the Reading by Rothschild in the Package.)

1. If you have a *dominant strategy* and no opportunity to agree on another course of action with your opponent, then play that strategy.
2. If you don't have a dominant strategy but your opponent does, and there is no opportunity to agree on another course of action with your opponent, then expect her to play her dominant strategy and do the best you can in the circumstances.
3. If neither you nor your opponent has a dominant strategy, and there is no opportunity to agree on another course of action, then select, and *signal your commitment* to, a clear strategy to encourage your opponent to behave in a way you'd prefer.
4. The only *credible threat* is the one which would be in your interest to carry out, if necessary.

5. ***Commitment* to make a threat credible can pay dividends in the long run.**
6. **An investment can be profit-increasing if it discourages entry, but costly if your potential competitors are lower-cost than you are.**
7. **Always take your opponent's threat seriously if implementation is his dominant strategy.**
8. **A credible threat is not always a deterrent, even if implemented.**
9. **A threat which lacks credibility in the short run may be credible in the long run.**
10. **A firm which appears to be tying its own hands may actually be tying those of its opponent as well.**

Later: we use game trees to model sequential moves in such games as these.