The Relationship between Revenue and the Size of the Price Tag

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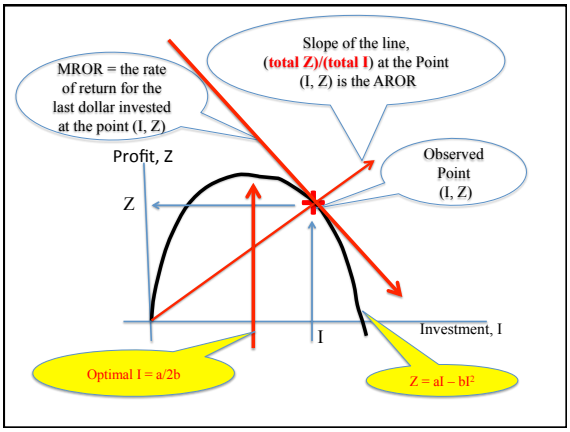
You have learned there is

- A quadratic relationship between the profit, Z, generated by a marketing investment, I
  Marketing Profit, $Z = aI - bI^2$
- an Average Rate at which profit is being Retuned on that Investment
  AROR (on investment) = $a - bI$
- a Marginal Rate at which profit is being Retuned on that Investment
  MROR (on investment) = $a - 2bI$
- An Optimal level of Investment, I, that will maximize the amount of profit, Z
  Optimal Investment, $I = a/2b$

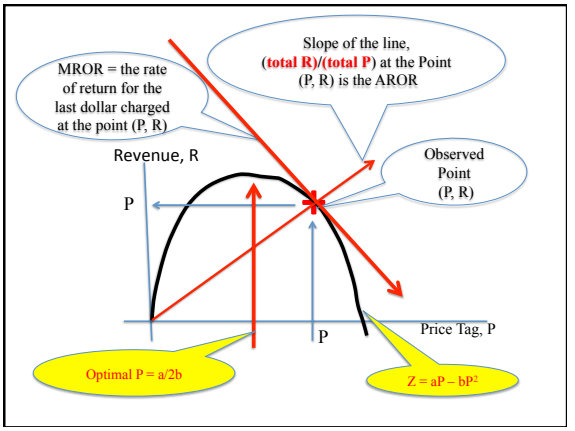


Two Rates of Return with Two Approaches for Estimating Them

	Average Rate of Return AROR (on investment)	Marginal Rate of Return MROR (on investment)
Simple empirical observation (s)	**A Single Performance, AROR = Z/I**	**An Incremental Performance, MROR = ΔZ/ΔI**
Revenue as a Function of Price, $Z = f(I)$ $Z = aI - bI^2$	AROR = $f(I)/I$ AROR = $(aI - bI^2)/I$ AROR = $a - bI$	MROR = the first derivative of the Revenue function w.r.t. Price $dZ/dI = a - 2bI$

Learning Objectives

- 1) To Understand there is a quadratic relationship between the amount of revenue, R, being earned by the sale of a product and the size of the product's price tag, P,
  Revenue, $R = aP - bP^2$
- 2) There is an Average Rate at which revenue is being Returned from the size of the price tag,
  AROR (on Price) = $a - bP$
- 3) There is a Marginal Rate at which revenue is being Returned from the size of the price tag,
  MROR (on Price) = $a - 2bP$
- 4) There is an optimal size for the price tag, P, that will maximize Sales Revenue, R
  Optimal Price, $P = a/2b$

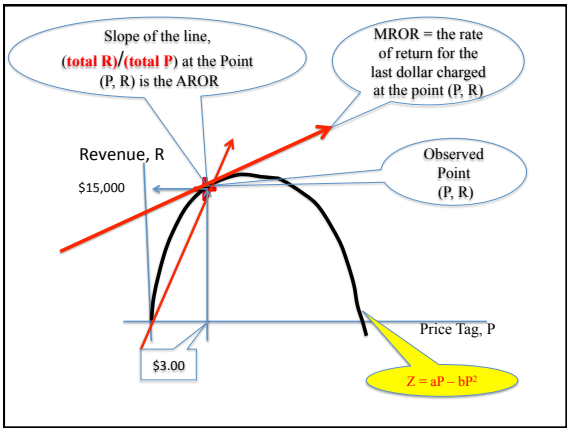


The parallels between

- Profit, Z, as a function of investing in the creation of customer value, I
  $Z = f(I)$
- Revenue, R, as a function of the size of the Price tag
  $R = f(P)$
- Are important
- All four P's are ingredients of customer value

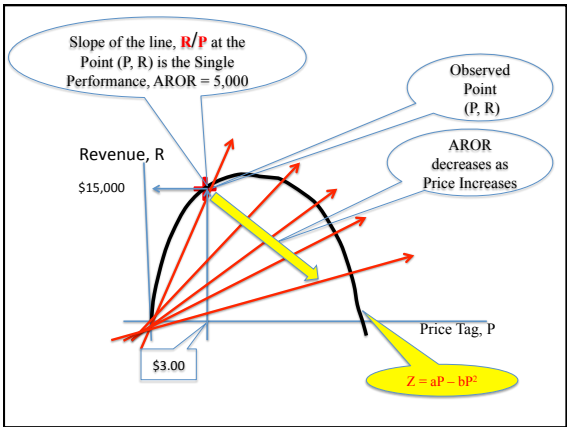
Example of Exam Questions about Setting Price Tags

- The Revenue function for a coffee shop's choice of price tag, P, is given as
  Revenue, $R = aP - bP^2$
- Market research has provided estimates of the values for the constants **a** = 8,000 and **b** = 1,000
- **1)** How much revenue is forecasted when the coffee shop sets the price tag to P = $3 a cup?
- **Answer**
- Revenue, $R = 8{,}000(P) - 1{,}000(P^2)$
- Revenue, $R = 8{,}000(3) - 1{,}000(3^2) = 24{,}000 - 9{,}000$
- Revenue, R = **$15,000**



Example of Exam Question on **AROR**

- The Average Rate of (Revenue) Returned from a coffee shop's choice of price tag, P, is given as the ratio Revenue to Price, **R/P,** for a single observed performance
  Single performance, AROR = R/P
- **2)** What is the average rate at which revenue is being returned when the coffee shop sets the price tag to P = $3 a cup and earns $15,000 in Revenue?
- **Answer**
- Single performance, AROR = $15,000/$3
- Single performance, AROR (on price) = **5,000**



The function which describes the AROR for any proposed price tag is

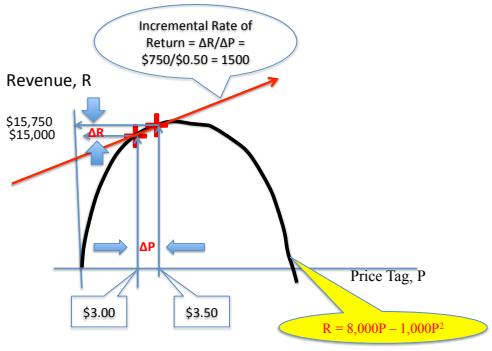
Example of Exam Question on AROR

- The Average Rate of (Revenue) Return for any proposed choice of price tag, P, is given by the function
  AROR (on Price) = **a** – **b**P
- For any proposed Price tag
- Market research has provided estimates of the values for the constants **a** = 8,000 and **b** = 1,000
- **3)** What is the **A**verage **R**ate at which revenue is being **R**eturned when the coffee shop sets the price tag to P = $3.50 a cup?
- **Answer**
- AROR (on price) = 8,000 – 1,000(P)
- AROR (on price) = 8,000 – 1,000(3.5) = 8,000 – 3,500
- AROR (on price) = **4,500**

The function which describes the AROR for any proposed price tag is

There is an Incremental Rate of Return (on Price), ΔR/ΔP

- The Incremental Rate at which Revenue is being Returned from a Price Tag, ΔR/ΔP, is describing the incremental amount of Revenue, ΔR, being generated by the last dollar change in the Price Tag, ΔP
- **Incremental Change (on Price) = ΔR/ΔP**

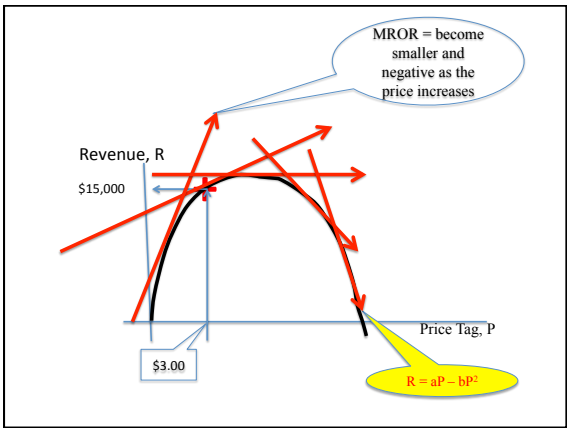


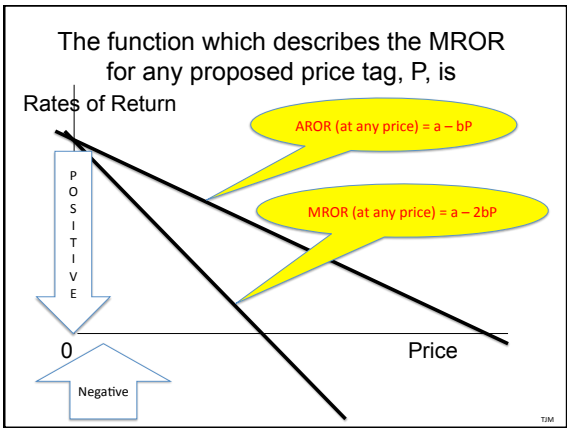
The Incremental Rate of Change is

- An algebraic estimate of the Marginal Rate of Return using two observed performances
- The **Marginal Rate of Return is best calculated** directly from the Quadratic Relationship between Revenue and Price Revenue, $R = aP - bP^2$
- The MROR is the first derivative of the revenue function w.r.t. the price, **$dR/dP = a - 2bP$**

Marginal Rate of Return, MROR

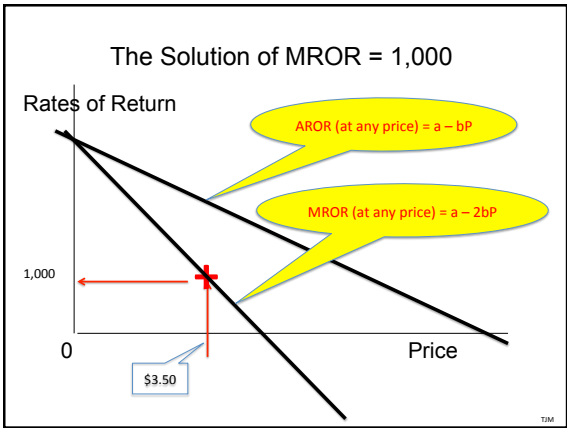
- The Marginal Rate at which Revenue is Returned from a given Price at any point on the profit Function is
  MROR (on Price) = a – 2b(P)

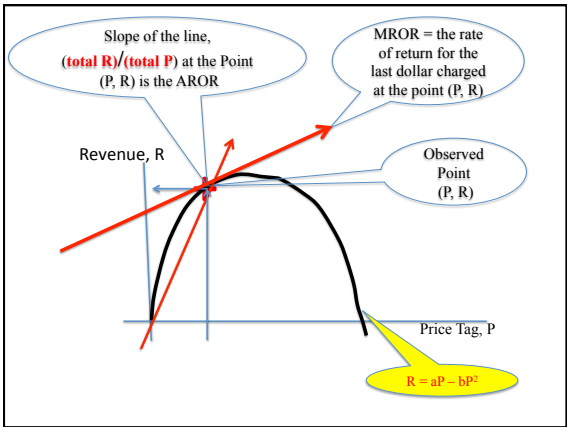


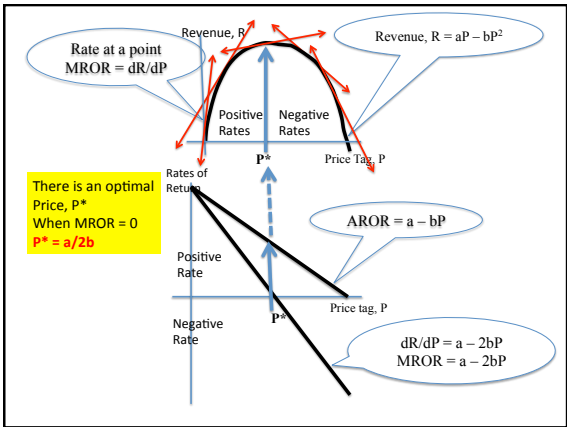


Example of Exam Question on MROR

- The Marginal Rate of (Revenue) Return for any proposed choice of price tag, P, is given by the function MROR (on Price) = **a** – 2**b**P
- Market research has provided estimates of the values for the constants **a** = 8,000 and **b** = 1,000
- **4)** What is the **M**arginal **R**ate at which revenue is being **R**eturned when the coffee shop sets the price tag to P = $3.50 a cup?
- **Answer**
- MROR (on price) = 8,000 – 2(1,000)P
- MROR (on price) = 8,000 – 2(1,000)3.5 = 8,000 – 7,000
- MROR (on price) = **1,000**







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Any questions on

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- 4) the optimal size for the price tag, P, that will maximize Sales Revenue, R Optimal Price, P = a/2b