

# Product and Brand Management (MK 8620)

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Center for Excellence in  
BRAND & CUSTOMER MANAGEMENT

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## Assignment 2- Bass Market Growth/Diffusion Model

**Note:** Please submit the assignment in the “assignments” tab on iCollege. Please name the document as: *MK8620\_LASTNAME\_FIRSTNAME\_2*

1. Managers at the computer division of IMC (based in Manchester, CT) have been working on long-range plans for the division. The principal products include: Notebooks and Handheld Computers.

Based on very limited sales data (2014 through 2016) the managers use the Bass market growth/diffusion model to estimate sales forecasts for the two products

$$\text{Notebooks } S(t) = 9.2 + 0.66 Y(t) - 0.0007 Y(t)^2$$

$$\text{Handhelds } S(t) = 7.3 + 0.55 Y(t) - 0.0004 Y(t)^2$$

Where  $S(t)$  is the sales in period  $t$  (in thousands of units) and  $Y(t)$  is the cumulative sales till period  $(t-1)$ . ( $t= 1$  in 2014)

Calculate the market size ( $m$ ), coefficient of innovation ( $p$ ) and the coefficient of imitation ( $q$ ) for the two products given the equations. Do these coefficients ( $m$ ,  $p$ , and  $q$ ) appear unreasonable given your understanding of the two markets (you may want to compare the two sets of coefficients in addition to examining their absolute sizes)? Also calculate the maximum sales  $S(T^*)$  that can be realized for the products and the time period ( $T^*$ ) at which the peak sales will occur and compare these figures for both the products.

2. Blu-ray: The diffusion pattern of Blu-ray is likely to be similar to DVD, subject to the following conditions:
  - a. Total market for Blu-ray is approximately 35 % of the total market for DVD
  - b. Initial purchase probabilities are likely to be lower for Blu-ray because
    - i. Blu-rays are less essential and
    - ii. Require special Blu-ray players to use

Each factor should adversely affect initial purchases by 0.6 (Thus the combined effect is  $0.6*0.6= 0.36$ )

- c. Social desirability/ pressure for purchases of Blu-ray is likely to be the same as for DVD

DVD		Blu-ray	
Year	Sales ('000)	Year	Sales ('000)
2003	18	2014	2
2004	30	2015	5
2005	45	2016	8
2006	65		
2007	85		
2008	255		
2009	425		
2010	495		
2011	460		
2012	450		
2013	435		
2014	305		
2015	242		
2016	192		

Estimate all the relevant parameters and project the sales for **Blu-ray** from 2017 up to 2025. Do not predict sales for 2014 to 2016 for the **Blu-ray** as the actual sales are known.

Note: (You may assume the parameters of the Sales equation for DVD as:  $A=63.79519$ ,  $B=0.51919$  and  $C= -.0.00015$ )

Hints:

- First compute p, q, and M for DVDs (i.e.,  $p_{dv}$ ,  $q_{dv}$ , and  $M_{dv}$ ) using A, B, and C.
- Using the relationships between p, q, and M for DVD and Blu-ray, compute p, q, and M for Blu-ray (i.e.,  $p_{br}$ ,  $q_{br}$ , and  $M_{br}$ )
- Then calculate the parameters of the sales equation (a, b, and c) for Blu-ray.  
 $a = p_{br} * M_{br}$                        $b = q_{br} - p_{br}$                        $c = -q_{br}/M_{br}$
- Finally estimate the sales. For example, the sales of Blu-ray in 2017 can be computed as;  
 $S_{2017} = a + b*Y_{t-1} + c*Y_{t-1}^2$   
 $Y_{t-1}$  in the above equation is the cumulative sales up to 2016  
Therefore,  $Y_{t-1} = 15$  (i.e.,  $2+5+8$ )