



Refocusing Personal Promotion and a State Space Approach

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Abstract

Market definition of a new product is a critical decision

- If market is defined wide, success requires an improved profile, lower price or superior 'market powers'
- If none is realistic, sensible strategy is to focus market definition and deploy available market powers against narrower target market

Challenge

- New product is mostly a one-time use, so no observable sources of business are available to guide deployment of scarce market resources

Solution

- Postulate a linear system to infer sources of business, solve and derive following strategy:
 - ***Sources of business are, by far, branded products only***
 - ***Array promotional resources against them before they too go generic***

Background

Drug therapy launching in market with

- Non-drug therapy at 85% share
- Generics at 50% of drug market . . . and growing
- Lower price impractical due to generic competition
- Two more brands expected to go generic over next three years
- Market power lacking due to small size of launch company
- Efficacy perceived average, but convenience superior

Sensible strategy

Focus market powers against most promising sources of business, rather than on sources that have been tried and that traditionally little business transfers from

Challenge

Mostly one-time-use product precludes sources of business data

Objective



How best to focus promotional resources ahead of two brands going generic in the next two to three years?

Idea

Aggregate available data appropriately, and postulate discrete *multi-dimensional* linear system:

$$x_j(t + 1) = Ax(t) + p_j$$

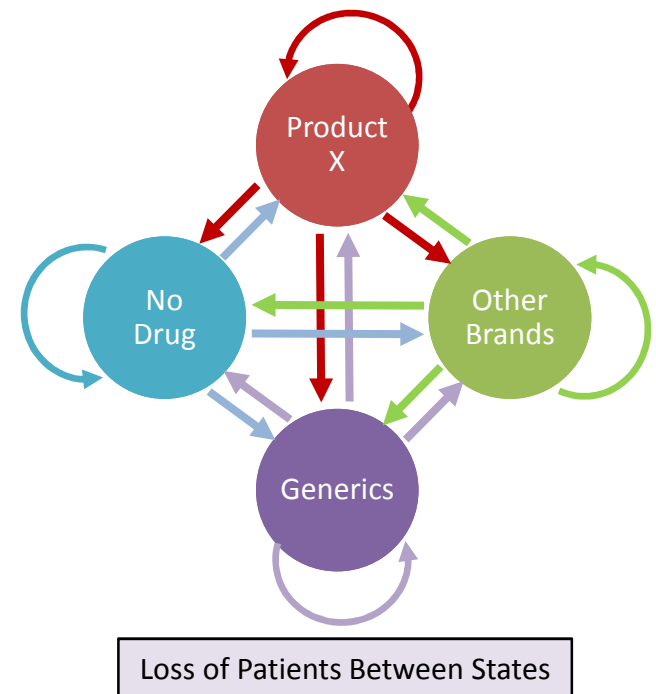
$x_j(t)$: number of patients in state j at month t , observable except for 'No Drug' state

matrix A: represents % monthly loss of patients between states

p_j : effect of promotion, or other market powers, on state j

p could be thought of as $Bu(t)$ if all market powers (or controls) $u(t)$ could be observed as well

As is, the only control that can be measured here are the details physicians receive regarding this new product



Optimization model to estimate A and p

A is not directly observable but assumed stable, based on long-term evidence in this market

As historical data to train model is limited, increase number of equations to estimate unknowns:

randomize physician data into several segments

set up same model with same parameters for each segment

$$\sum_{k,t} \|x^k(t+1) - Ax^k(t) - p\|^2$$

Minimize Sum of Squared Errors:

k : index of randomized segments

constraints: rows of A sum to 1, $A_{ij} \geq 0$, LB/UB constraints to speed up solution

Optimization model to estimate A and p (cont'd)

x contains aggregate representing latent population of patients, No Drugs state, only some of which enter the market at transition periods (and hence become observable)

size of latent patients population estimated along with A and p

inferred estimate of that population turns out in line with the CDC estimate for incidence

Objective function is neither quadratic nor convex, with all the baggage the latter qualifier carries

Conclusion

Sources of business are mostly other brands and very little comes from generics

Therefore, re-define market
to exclude generics

effectively steering promotional resources away from
predominantly generic prescribers and in favor of
predominantly branded prescribers

We confirmed analytically
that

Generic physicians are hard to bring around, so
convert branded prescribers ahead of brands soon
going generic

Importantly, this is another
example of the fact that:

**Analytics need not always take its cues from Strategy,
sometimes Strategy can be derived from Analytics**

Thank you!

For more information on this topic or to connect with the author
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