COMPETITORS' REACTIONS TO INTRODUCTION OF A NEW PRODUCT, A SELLING CASE

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Abstract:

For a utility application in the capital goods sector use of new technology in production gave the possibility to have a new product at much lower cost than competition

There were about five competitors with approximately equal market shares. In order to optimize timing of marketing and production an analysis of market and competitors' reactions was started.

The work reported covers the main steps and findings of this analysis made in preparation of execution of the optimized marketing exploit.

These steps cover conceptualizing of market-competitor relationship, modelling and simulation to define sensitive parameters, defining some robust market policies and analysing the operational information requirements in executing a set marketing concept.

Specific results obtained were above all elimination of some crude "feel of the pants" notions how to sell and confirmation of the importance of a selling policy even in a seemingly orderly and settled market environment.

Other results contributed very much to an understanding, why a new product at much lower cost is only in part able to gain market share in a setting of wary competitors.

CAUSE-EFFECTS CONSIDERED AND THEIR NETWORK

In order to model the interactions between customers and competitors on the market first a list of the main cause-effect relations was established.

A round up with the sales people involved yielded the follow list:

price difference	-	decision to buy
product awareness	-	inquiries
product awareness	-	activation of competition
customers contacted	-	product awareness
activation of competition	-	price difference, customers contacted
decisions to buy	-	product awareness
acquisition intensity	-	customers contacted

From this a succession of possible causal loops was put together and simulated, thereby eliminating and correcting erroneous, preconceptions brought in.

Fig. 1 shows the final network of cause-effect relationships retained. It consists of an inner Model reflecting the selling and an outer Model linked to price differences, decisions to buy the product and the customers contacted.

Based on this model structure the equations for the nodes were found starting from the descriptions given by the sales people concerned and checked iteratively by simulation of submodels worked on.

SOME NODES AND THEIR EQUATIONS

In this section some special nodes will be explained more in detail in order to illustrate the process of translating written textual definitions into algebra as required for programming. See Appendix A for equations list.

- Nodes representing market experience

  Demand is the sum of replacement plus new installations. Cheaper replacement does shorten the booked lifetime on the customer side, which lets the demand go up after selling sets in.

  General demand is eq. (66)

  where the assumed book lifetime eq. (69) is dependent on price. This works in such a way, that demand goes through an increase if prices per unit fall.

  Selling as influenced by pricing eq. (49)

  in the market considered the selling rate, other things being held equal, goes up with the offered price advantage, along the table of kaufr.

  Inquiries dependent on product awareness eq. (53)

  only above some product awareness inquiries set in. There is an upper limit to these inquiries. See table anfr.

  Pricing reaction due to competition eq. (28)

  We made the assumption, that a competitors reaction would essentially consist of two movement. First he would correct his price with same delay, then after our first aggressive selling wave subsided, he would gradually start to increase his price partially.

  Customers contacted eq. (86)

  To contact potential customers two things happen. First our own marketing has to go out, which results after some delay in a positive contact established. After the first saleswave sets in, the same is done later by the competition nullifying our own effort. Customers contacted influence product awareness.

Product substitution eq. (83)

The product in question is assumed to have a limited product-life. Early simulation runs showed, that if marketing expenditure is held constant under such conditions, a price war is likely to develop at the end of the cycle.
In order to look for optimum market exploitation therefore marketing was assumed in tune with the postulated substitution rate. Eq. 83

SIMULATION RUNS, DISCUSSION

For a given set of market conditions and time constants for the reactions of the competition three different selling policies were compared:

Case A go stepwise, first 15% then 35% reduction

B follow A, but with twice the effort for selling contacts.

C win market share by aggressive price reduction of first 45%, then as competitors follow by 5%

Fig. 2 shows what happens on the market place. First, before a selling wave sets in, marketing has a window to increase the product awareness without direct competitors inference. After the first selling wave sets in, the competition reacts with specific delay times, which first limits the selling and afterwards quenches it. Thereafter the effects of a gradual phase out of the product cause the selling volume to fall off.

If as not shown, marketing effort is still upheld towards the end of the product lifetime of 6 years, a rather intensive price war with disruption of any pricelevels start.

Comparison of the three cases is made in Fig. 3 a, b, c on the basis of the integrated volumes of products sold and of turnover realized.

The maximum turnover is reached with Case B, which gives about 60% more than with marketing at standard level, see Case A.

Case C is only superior compared to A and B insofar as market share is gained quicker, but at the price of having reduced the price level in the market and of having to cope with a very steep demand peak, which if not met results in market share lost.

The width and steepness of the first selling wave appears to be entirely controlled by the time the competition takes to get alarmed and mobilized for countermeasures.

Its volume on the other side appears to be controlled by the intensity of selling. Pricing can have a decisive influence on competitor reactions, but for selling a relatively mild advantage over competition would do.

CONCLUSIONS

The advance simulation of the case of introduction of a new product into market did give on one side confirmation of a few well-known rules of the game. A result first overlooked was, that such preaction simulation does contribute very much in preparing the people responsible for the likely dynamics their operations will experience. Furthermore the list of the most relevant feedback information of the market reactions got very much changed as compared to traditional organisational practice.

If done with all serendipity required, such advance simulation may lessen very much the risk of a market flop due to mismatch of the real dynamics of the market encountered and the dynamics of operations from production to selling one had planned for.

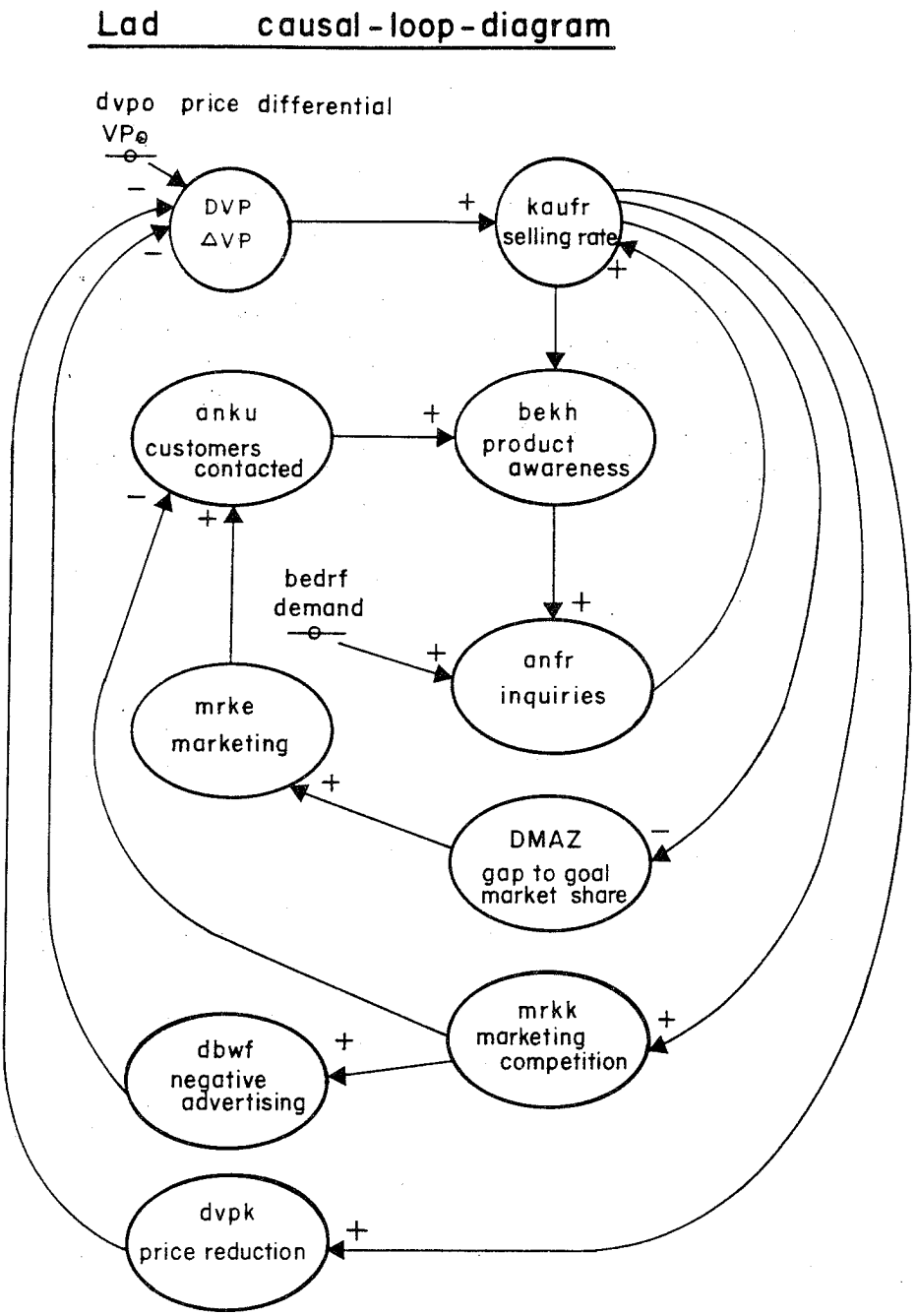

Fig. 1 causal loop diagram

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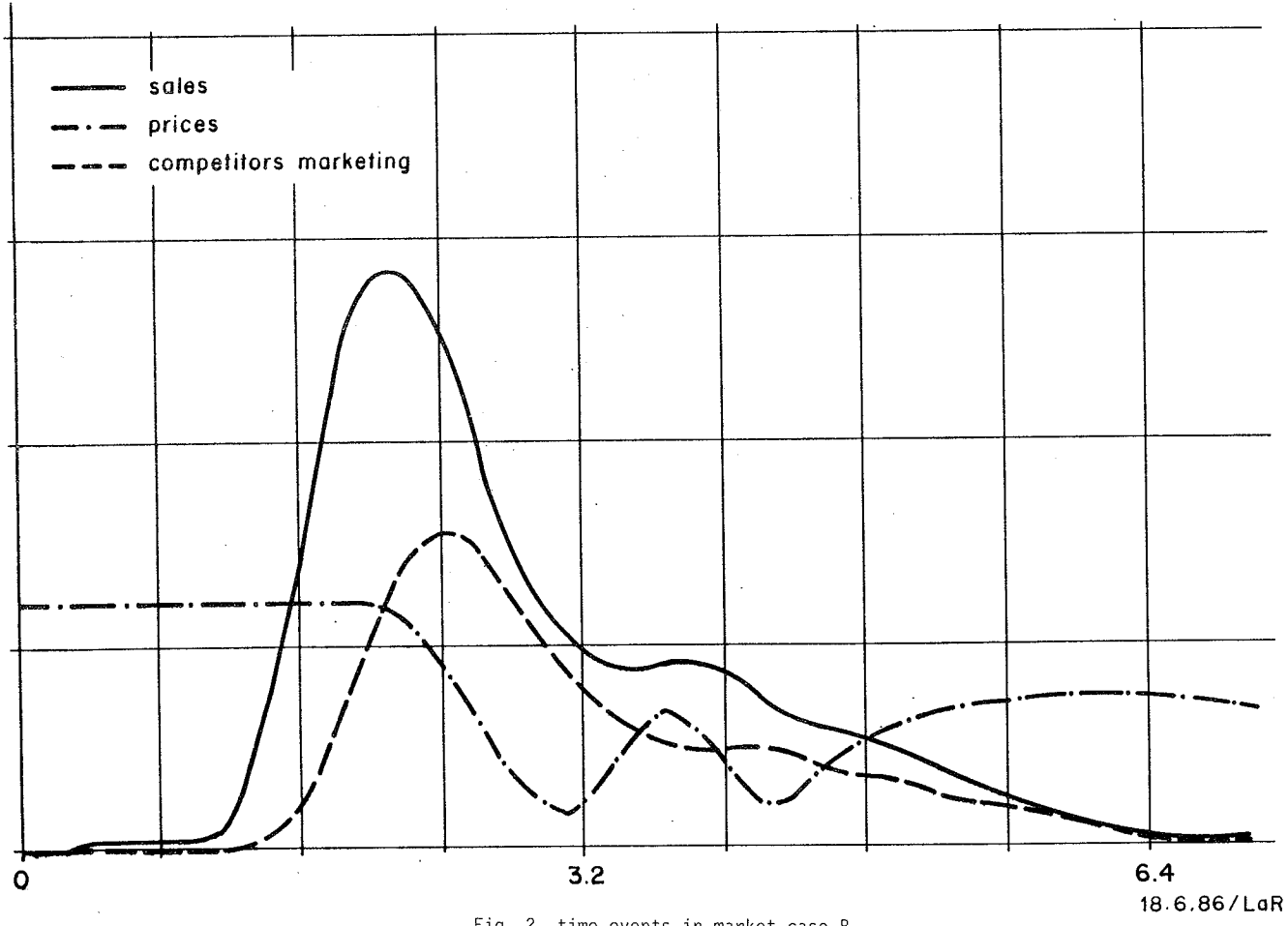

Fig. 2 time events in market case B

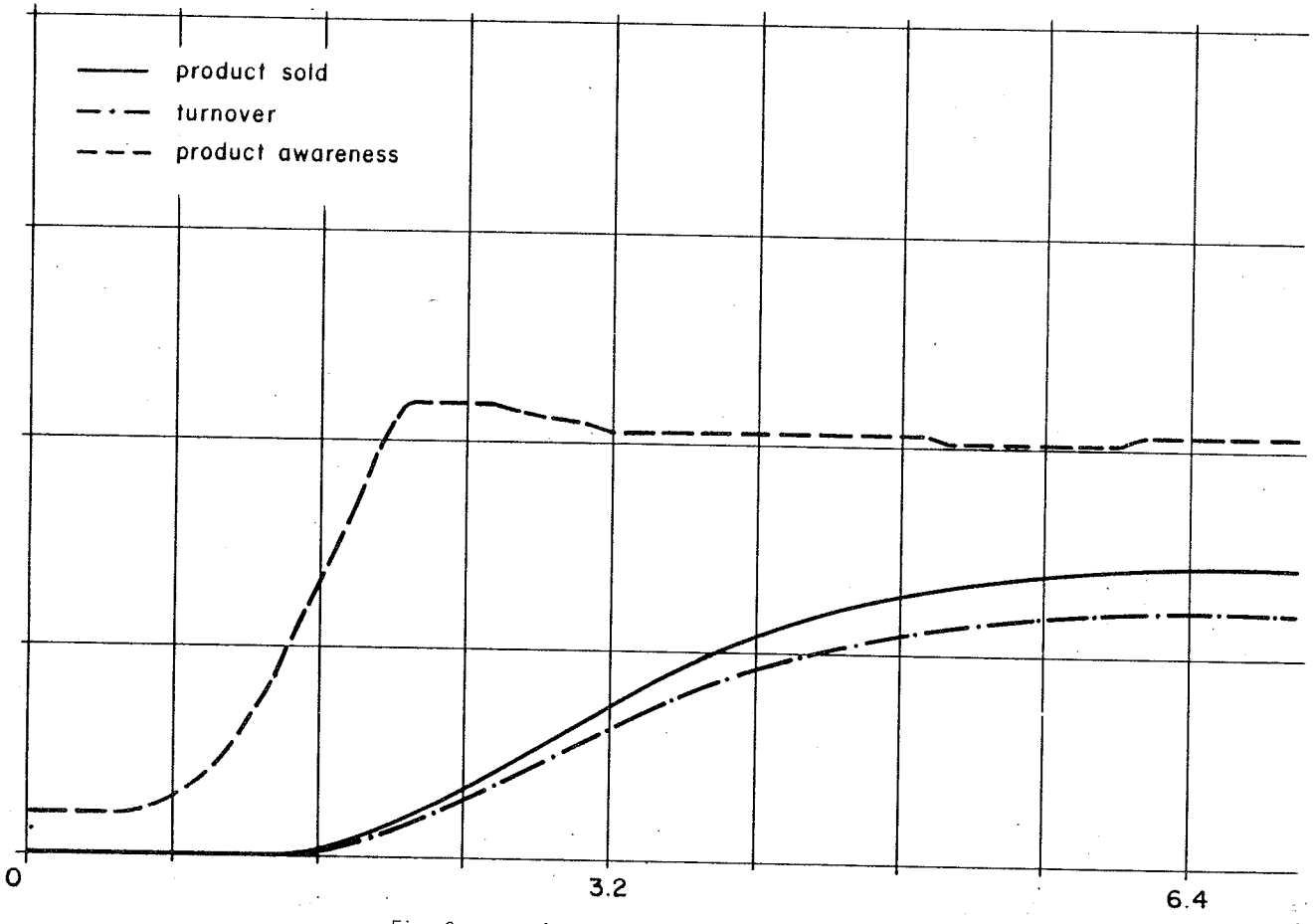

Fig. 3a case A comparison of different sales policy

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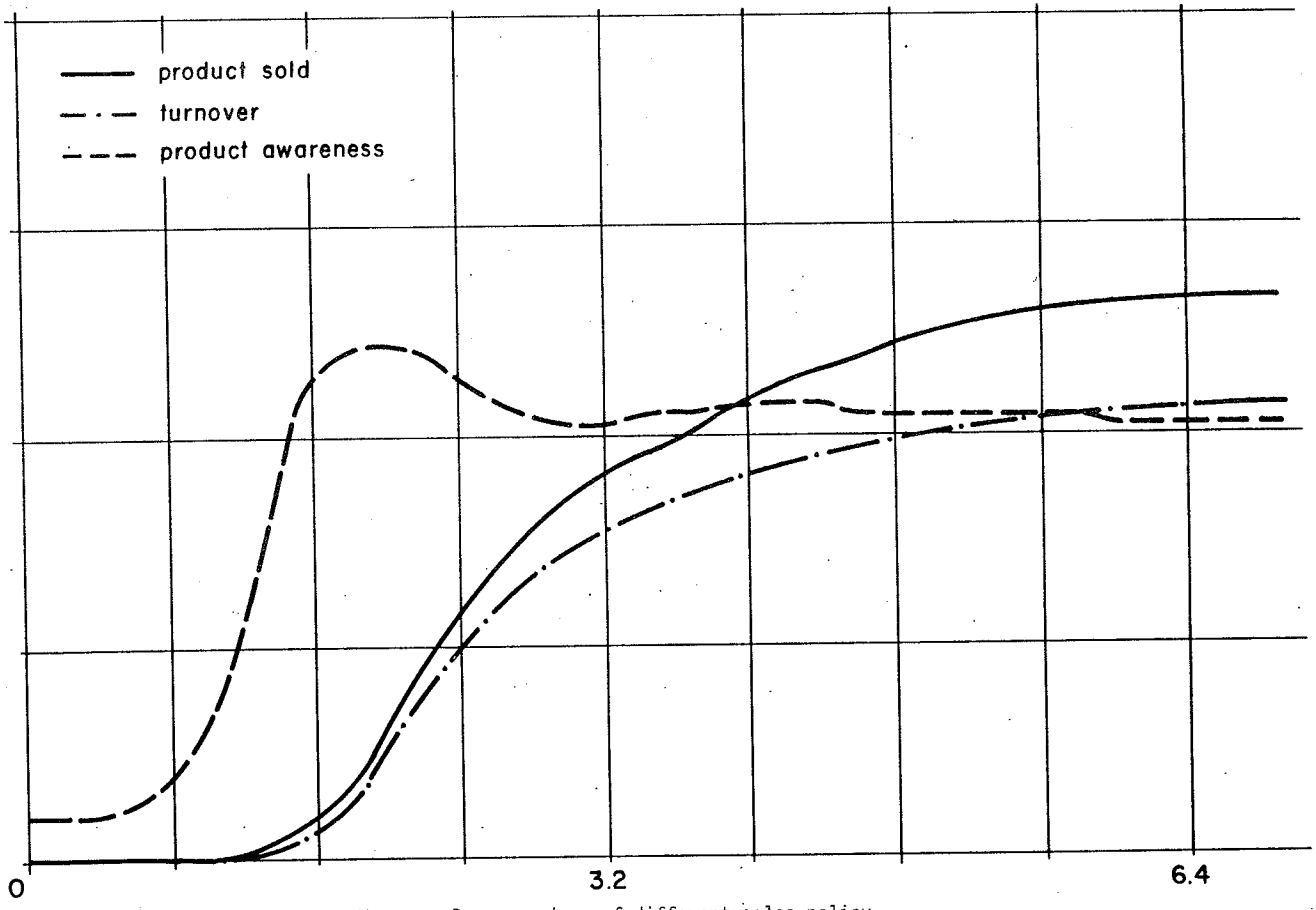

Fig. 3b case B comparison of different sales policy

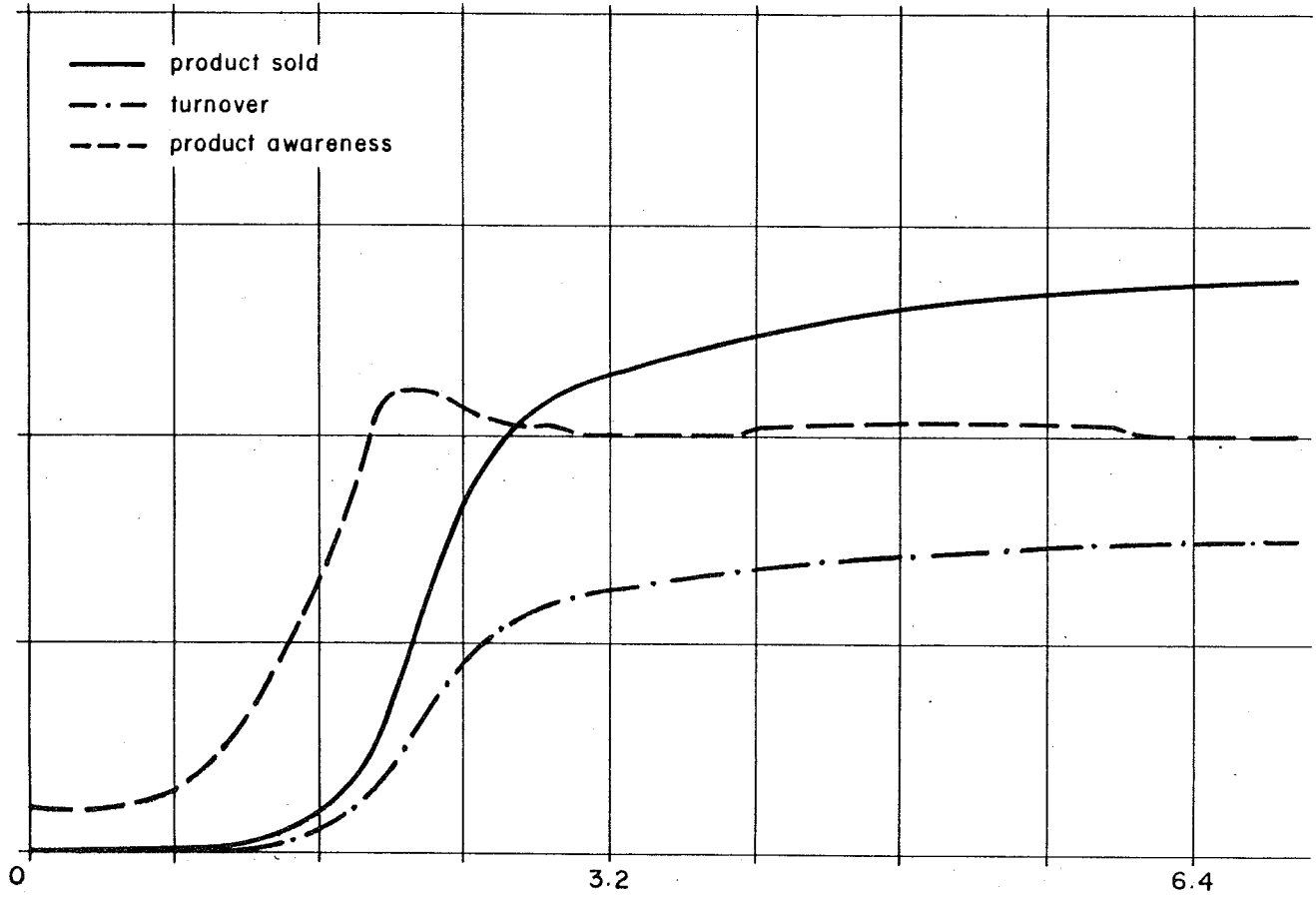

Fig. 3c case C comparison of different sales policy

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Appendix A Model Listing for Micro-Dynamo Page 1

```
                                                                    (0)
*lad marketing model ver.178c
note
note delta vp
note
note dvp0=initial dvp/dvpk=reaction of competitor/dvpe=second price drop
note dvpk2=second price drop competitor                             (5)
a dvp.k=step((dvp0-dvpk.k+dvpe.k-dvpk2.k),2*dt)
a dvpk2.k=delay3(dvpe.k,delk2)
c delk2=.33
a vpe.k=1-dvp0-dvpe.k                                               (10)
note vpe=selling price
a dvpe.k=dlinf3(dmaz*dvpr.k,vpedel)
c vpedel=.5
a dvpr.k=dlinf3(clip(dvpr0,0,dvpk.k,.1*dvpc.k),dvdel)
a dvpc.k=clip(-1,1,dvprl.k,.01)                                     (15)
l dvprl.k=dvpr.k
n dvprl=0
c dvdel=.3
note dvpc,dvprl used for arthmetic to build flip/flop for dvpk-switch
c dvpr0=.2                                                          (20)
c dvp0=.3
note
note price of competition dvpk
note
note dbwf=weight of pricedifference/dvpka=pricedrop of competition
note dvpkb=recovery of this pricedrop/proc=part of own pricedrop    (25)
note procp=part of pricedrop that is recovered
a dbwf.k=1-dlinf3(mrkk.k/(mrke.k+mrkk.k),bwt)*bwf
a dvpk.k=dvpk0+dvpka.k-dvpkb.k
c dvpk0=0
a dvpka.k=dlinf3(clip(proc*dvp0,0,kaufr.k,.3*best0/40/kswel*kc.k),delvp) 30)
a kc.k=clip(-1,1,dvpkal.k,.01)
l dvpkal.k=dvpka.k
n dvpkal=0
note dvpkal,kc arithmetics for flip/flop kaufr
a dvpkb.k=dlinf3(clip(procp*dvp0,0,dvpka.k,.99*proc*dvp0),delvpp)   (35)
c delvpp=1
c procp=.5
c kswel=5
c delvp=.75                                                         (40)
c proc=1
```

```
note
note decisionsrate to buy
note
note kaufs=number of products sold/umstz=turnover
l kaufs.k=kaufs.j+dt*kaufr.jk                                          (45)
n kaufs=0
l umstz.k=umstz.j+dt*kaufr.jk*vpe.k
n umstz=0
r kaufr.kl=dlinf3(table(tab,dvp.k,-.3,.5,.1)*anfr.k*dbwf.k,delk)
n kaufr=0                                                              (50)
c delk=.2
t tab=.025/.032/.04/.05/.075/.125/.2/.325/.5
a anfr.k=delay3(bedrf*bekhr.k*table(anfrf,bekhr.k,-.1,1,.1)*aufmp,aufdel)
a bekhr.k=bekh.k*subst.k
c aufdel=.17                                                           (55)
t anfrf=0/0/.1/.2/.55/.8/.915/.93/.95/.965/.985/1
note
note demand and productlifetime
note best=inventory installed/neub=new installations
note lifet=liftime of equipment/bedrf=demand                           (60)
note akunr=customers contacted for given unit marketing spending
l best.k=best.j+dt*neub
c neub=2000
n best=best0
c best0=180000                                                         (65)
a bedrf.k=delay3((neub+best.k/lifet.k),delb.k)
a delb.k=2*dt+delbf
c delbf=0
a lifet.k=delay1(40*(1-clip((dvp.k-.1),0,dvp.k,.1)),delclc)
c delclc=.5                                                            (70)
l bekh.k=bekh.j+dt*kaufr.jk/best0*40+dt*akunr.k-dt*max((bekh.j-1),0)*sens
c sens=10
a akunr.k=clip(akun.k,0,kaufr.jk,0)/aufw
n bekh=.1
note                                                                   (80)
note technical product substitution
note
a subst.k=(1-dlinf3(step(1,.25),delsub))
c delsub=4
```

```
note customers contacted                                                    (85)
a akun.k=max((dlinf3(mrke.k,delm)-delay3(mrkk.k,delm)),0)
c delm=.5
note
note own companys marketing spending
note                                                                        (90)
note aufmp=multiplier(efficiency)/aufw=nominaler spending/customer
a mrke.k=delay3(mfak.k*aufw*aufmp,delmrk)*subst.k
c delmrk=.5
c aufmp=1
c aufw=1000                                                                 (95)
a mfak.k=step(1,2*dt)+.01
a dmaz.k=max((maz0-kaufr.jk/best0*40)/maz0,0)
c maz0=.2
note
note marketing spending of competition                                      (100)
note
note konk=number of equivalent competitors
a mrkkh.k=(kaufr.jk)*konk*aufw/best0*40
a mrkk.k=delay3(mrkkh.k,delko)
c delko=.3                                                                  (105)
c konk=5
note
note measures of competitors on price and product
note
note bwf=weighting of our advantage in counteradvertising by competition 10)
note bwt=timelag of the effect of this counteradvertising
c bwf=.2
c bwt=.5
note
note parameters and output                                                  (115)
note
spec length=0/dt=.04/pltper=.08
plot kaufr=k(0,2000)/dvp=p(0,.5)/bekhr=b(0,2)/mrke=+(0,1000)/mrkk=-(0,4000)
plot akun=a(0,1000)/anfr=?(0,16000)/dbwf=w(.6,1)/dvpk=r(-.5,.5)/dmaz=m(0,1)
plot dvpe=e(-.5,.5)/subst=s(0,1)/vpe=v(0,1)/lifet=l(0,40)/bedrf=n(4000,12000)
plot kaufs=$(0,4000)/bekh=#(0,2)/umstz=u(0,4000)
plot dvprl=1/dvpkal=2/dvpc=3/kc=4
```