

List of hypothesis of JMR and 3 msc.

- ① Competition parameters for mid-market are the same as that of adjoining sub-market
- ② Neighborhood price effect: brands with prices closer to one another experience larger cross price effects than brands with more dissimilar prices
- ③ National brand/private label asymmetry hypothesis: national brands steal significant shares from private labels when they reduce their prices, whereas promotion-based share gains for private labels are rather insignificant.
- ④ placing a sale sign on a product reduces the perceived likelihood that the product will be available at a lower price in future
- ⑤ moderation of the sales sign effect is in part due to reduced credibility when they are used on more products
- ⑥ Hyp 1: Sales signs are less effective at increasing demand when more products have them. = interaction's sign
- ⑦ Hyp 2: Total category demand is maximized when some but not all products in the category have sales signs. = int
- ⑧ Hyp 3: placing a sales sign on a product reduces the perceived likelihood that the product will be available at a lower price in the next period, but the effect is smaller when more products have them.
- ⑨ Life cycle hypothesis: in the face of a mismatch b/w their income stream and their desired consumption stream, the consumer should allocate their lifetime income over time in order to smooth their consumption (whether good descriptor of behavior)
- ⑩ Consumers have forward looking behavior (strategic), so
hypothesis H1: depth of the markdown at each period increases with the level of inventory at the end of the previous period, for a given time in a season
H2: The depth of the markdown increases with the time in the season for a given level of inventory
H3: The depth of the markdown increases with the production cost of the fashion good for a given level of inventories
- ⑪ The propensity to spend when credit is available will depend on the size of the credit limit available to the consumer but only when the credibility of the limit is high. When the credibility is low, the effect of the credit limit will be weaker. (Conditioning)
- ⑫ The credibility of limit will be lower for experienced consumers as compared to relatively novice users of credit.
- ⑬ product reviews affect product sales
- ⑭ H₀₁: A composite measure of quality obtained from public reviews of quality will bear no relationship to and cannot be composed from underlying quality dimensions.

- ⑮ H₀₂: There are no abnormal returns to firms whose Composite Quality is publicly reviewed.
- ⑯ H₀₃: A composite measure of quality from published reviews of quality will be positively related to its underlying dimensions.
- ⑰ H₀₄: The abnormal returns to a firm's stock whose Composite Quality is publicly reviewed vary with the ratings in the review.
- ⑱ H₀₅: The abnormal returns for inferior reviews of quality are more negative and greater in absolute value than those for superior reviews of quality.
- ⑲ H₀₆: Inferior reviews of quality lead to more negative abnormal returns for large firms than for small firms. Conversely, superior reviews of quality lead to more positive abnormal returns for small firms than for large firms.
- ⑳ Firms are most successful if they have multiple product concepts in the pipeline at given timelines, forming a portfolio of projects.
- ㉑ Regret: (claim, scenario) (not intuition)
- H₁: If consumer becomes more regretful, she redesigns the custom product to more closely resemble the best standard product.
- H₂: If a second best standard product becomes available, the consumer increases her custom product's dissimilarity to the best standard product.
- H₃: The degree to which a more regretful consumer designs a custom product to resemble the best standard product is diminished by the presence of a second best standard product.
- H₄: If consumers are regretful, then some of them will choose to buy a standard product rather than custom product.
- H₅: If consumers become more regretful, it is more likely that they will buy a standard product.
- H₆: If a second standard product becomes available, fewer consumers choose to buy the existing standard product.
- H₇: Suppose that consumers become more regret averse. The presence of a second standard product lessens the increase in consumers that regrettfully choose the incumbent standard product.
- H₈: If consumers are very regret averse, the addition of a second standard product to the market can increase the proportion of consumers that choose the consumer product.

(22) H₁: In the between-brand choice context, when brand assortment is alignable, a brand's market share will increase with assortment size.

H₂: In a between brand choice context, when brand assortment is nonalignable, a brand's market share will decrease with assortment size.

H₃: For a nonalignable assortment, the negative impact of assortment size on brand choice will be moderated by the required cognitive effort.

H₄: For a nonalignable assortment, the negative impact of assortment size on brand choice will be moderated by potential for regret.

(23) ... big companies will joint to big universities.

Theory

① literature from component

② justify model based on theory

③ different Context & similarity b/w Contexts

[High data for significance] → need for large data

process of consumer choice

① literature → insight & not modeling

② google scholar

③ why platform

④ selection bias (endogeneity) → systematic difference of allowed & not allowed

⑤ Back to reference search (Deep search)

⑥ incremental

⑦ competition

⑧ Counterintuitive - or at least some info.

- learning category based ↗ add-on
books

- category of bad can increase download
↳ developer oriented software read review more
(bug solve sooner than novice users)
affect of developer: pattern
role of firefox

⑨ interesting idea ① methodological (predictor expert)

⑩ contribution } ② Data Explore (unique)

③ contribution: method that is not used

④ contribution: Counterintuitive ⇒ AHA effect

⑤ confirm theory in context (different data)

of days (idea writing first & it no one has said anything say something new)

people

① Ratchford

② Ernan

② put yourself in shoes of developer, consumer
est benefit of players

Other sample hypothesis

① test sequential search Hypothesis combined with aggregate demand model. Consumer benefit prod revenue via lower search cost. Answe: Quest: (1) mkt share, (2) competition (3) Policy maker issue (lower search cost)

② what makes helpful online review less perceived helpfulness: ① extremity (helpful in experts' eyes)

② popular vs. niche products. ② review depth (positive for more search goods)

③ product type as moderator

④ Consumers learn more from others than their experience in the same genre

⑤ profit impact of product reviews is diminishing return in # of reviews

⑥ estimate optimum # of reviews for representative product

⑦ large effect of credibility on choice probability

⑧ prospect theory Explains behavior better than simple absolute Value Value function

⑨ versioning is optimal when market share of lower quality Version (offered alone) > Mkt share of high qual. vers. alone (in higher cost vs. lower cost)

⑩ high avg rating = high prod. qual.
high variance of rating = niche prod. ⇒
higher subsequent demand ⇒ average rating low

⑪ previously posted behavior affects
whether to write review: incidence (selection effects)
what to contribute: evaluation (adjustment effect)
negative env. ⇒ discourages posting (posit → encourages frequent posters → band wagon behavior)
active customers → differentiation behavior

⑫ # Contribution linked w/ A viewership loc. and
Globally Central (Globally Central: Sh-ttest path)

⑬ compare referral and firm based actions

⑭ context difference: large vs. small firms is interest

⑮ control other variables: to get counterintuitive

sharing
in back)

- Structure of the data
- application should be described
- important question
- insight (marketing part)
- second adviser if you don't get enough attention
- in July once a week
- the main reason for project of summer: product

Deliverable

(1) power point (font 24pt or bigger)

(a) title, advisor

(b) Motivation - max 4 bullet points

(selling paper)

Ram
 Brian
 Ernan
 Mukthi: Intro
 - advisor

(c) Two intended hypotheses (max 3)

referees care about you, as much as you
 care (tiny portion of their mind alloc to you)

(d) three most relevant papers - one main benchmark

(i) For each Explain relevance and your contribution

Remember: This is power point

	Dimension(1)	Dimension(2)
paper1	/	/
paper2		/
paper3		

	Dimension 2	
	Tobit	sur
Dimension 2 stage	paper1	optional control
Cont.	paper1	
Disc.	paper3	

→ Hypothesis: clearly rejected (falsifiable)

- Judge on asking good questions
- managerial implication
- form question (how?)

Deadline: - By wednesday of next week (12th Thurs)

- Interesting questions/problem specific application
- 20 minutes to sell idea

→ mean $y \sim \delta_{it}$

→ decisional download []

→ version? (1) people have it

→ model δ_{it}

→ Poisson model and Count model

→ Dynamics in state space model

→ What good specification of δ_{it}

- Theory about it → linear model?

Regression

- Simple static $\delta_{it} = f(\text{something drives demand})$

if rich we can ...
hierarchical Bayes → multilevel

Bayesian → structural Bayesian

- state space [MCMC]

→ Batch of Hypothesis to check what drives
Simple One Variable (Personality)

→ story of how thing work

→ social learning [Appealing]

↳ fix & static current could be used
to explain

$$Y_{it} = X_{it}\beta$$

{ ① hierarchical Bayes model

② simulation → key of this paper (take away)

③ time varying

- notion of learning (social) Sha Yang

① what people do buying

→ variance or low variance of stars (mean)

(1) Variance

→ # downloads and usage

→ Control for observed Version (Version fixed effect)

$$\delta(\text{Version}) = f(\text{version, download, usage, })$$

→ literature [what drives download (hierarchical Bayes)]

① It depends on how fast you can move
(Richness of Data) → Quality of paper

② Social learning → (1) more fancy technique
(2) good theoretical classification

② Prospect theory → try to connect it to
Prospect theory

2) optimization in MATLAB → last part of paper

introduce theoretical Framework

negative & positive stars → different response

→ how people model prospect theory

Social learning → info about how people are doing

- time phenomena of how people respond

Mixture → segment and say some download #,
usage, # Stars

Joseph Williams, style, clarity, grace 48,3 \$

↳ writing book scientific paper (Download)

↳ imitate first → eventually second nature

→ speed is very important

R

Power of Community

st=as.data.frame(namids);

Str(st)

Columnnames(st)[i] = "life_exp"

→ Str(st)

→ Summary(st)

Cor(st)

→ pairs(st)

{model1=lm(life_exp ~ population + income + ... , data = st)}

{summary(model1)}

time series

myts

c(2007/1)

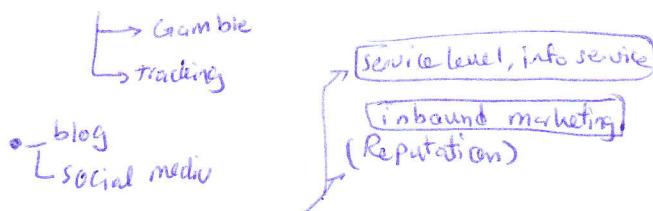
① put in structure ← ts(Vector, Start=c(), end=c(), freq=1, annual)

② subset : window(myts, start=c(2012,6), end=c(2012,12))

LGC

- Volatile
 - Content → adver, worn variable
 - Prom → price discount (auction)
 - Price

- Game → as Content



- Goodwill customer in blog → each post is like

advertising or different wearout effect
↳ household production function
→ where > 50 individuals or brand post
or how estimate demand for individual?

- Only Countable

words
user helpfulness rate
(like reddit)
topics
days b/w responses

- Content generator: a person who answers others question

Open src Community / mySQL
linux
gmatclub

Somewhere that urgently to receive
respond

- multiple people, multiple topic

• or generalize higher level / category
and not person (across) ↴ Product
Population

- e.g. ① Reddit ③ Facebook page of company
② Quora ④ Twitter page of company
⑤ demand: google trend
⑥ Blog with different # of likes
→ ⑦ technorati.com

④ innovation to define new variables

Data
Firefox

- e.g. # variance of stars
- # versions available

Bruch ① data collection Creativity
② data cleaning, Coding

Google interest → normalized weekly Data
from inception (for name of the product)

$$\log(D) = f(\underset{\substack{\downarrow \\ \text{Demand}}}{R_{\text{Downloads}}}, t, \underset{\substack{\downarrow \\ \text{Daily usage}}}{u_s}, s)$$

↳ # stars
↳ Google trend
↳ usage split (mix)

- Check multi collin.

$$\beta = f(C_s, C_{\text{avg}}, C_u, \underset{\substack{\downarrow \\ \# \text{ of products}}}{a_n}, \underset{\substack{\downarrow \\ \# \text{ of stars}}}{s_t}, \underset{\substack{\downarrow \\ \# \text{ of ratings}}}{a_r}, \underset{\substack{\downarrow \\ \# \text{ of complementary add-ons}}}{a_c}, \underset{\substack{\downarrow \\ \# \text{ of users}}}{m})$$

author's stars
author's avg (AVG)
of products
of stars
of ratings
of complementary add-ons
of users

mix { ① # app. avail (New ver) ≈ Firefox
② % engl. speaker non engl. speaker
③ % active vs. inactive { ① positive (#)
② negative (#)

Collections { ① popularity (total of collect) { ① positive (#)
② # add-ons in collection { ② negative (#)
③ # Followers

- ④ platform share
- ⑤ # versions in use
- ⑥ % of src of download shares

daily
weekly

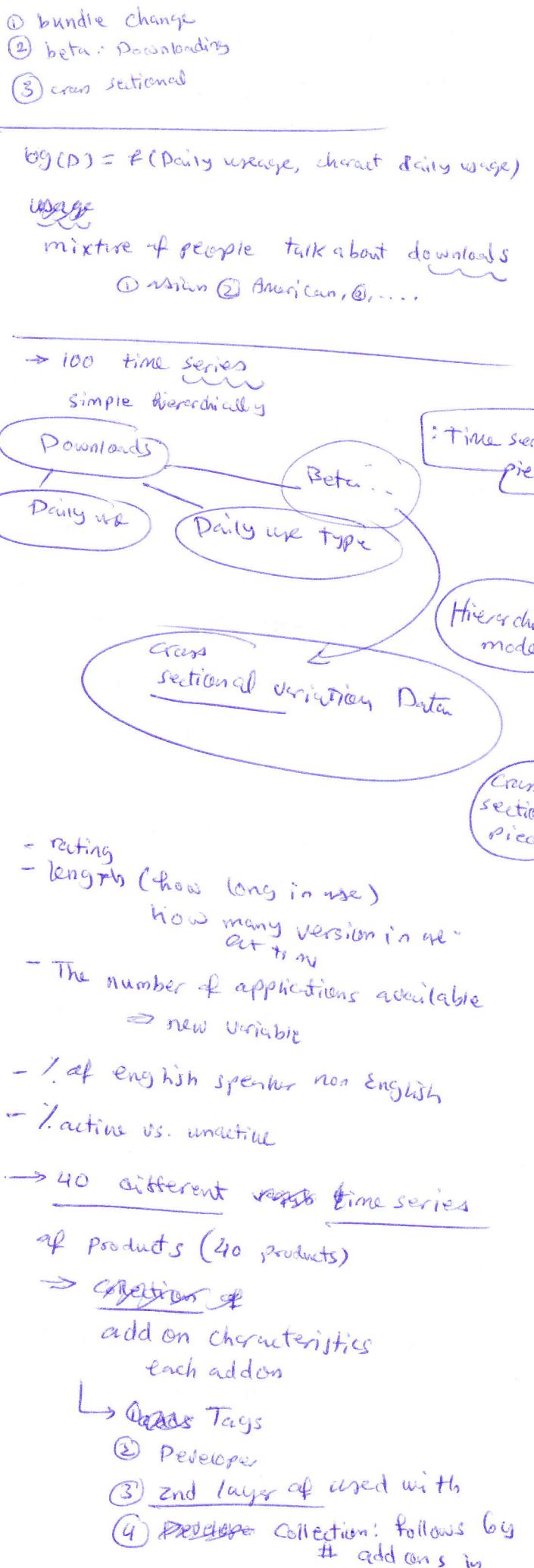
- merge with google trend later

Trick summarize sparse matrixes

- ① application: not usable

Granger Causality

- N
- ① orange juice, chintzguitar
Orange juice promotion decision model
when manager few looking
aggregate rand logit
mean level: obsv equation
kalman filter
decision when more myopic vs.
few looking
 - Dynamic programming (2008-2009)
 - State Space & BIP & Kalman Filter
effectiveness of advertising
 - ② Take a position → single product
① Download → stars - ③ google trend ④ users
windowing problem (multiple window) ⇒ stupid
duration of time (cross sectional charact.)
 - ③ multi dimensional mode
inertia, next one comes in
lack of learning
 - ④ premium analysis ⇒ gives hypothesis
Download one &
all charact. to it
simplicity → look at one & understand one
dummy variable of src.
 - ⑤ competitive, alternative
 - ⑥ log transform data if 200
log transform add ons as well ($\log(\text{bit}+1)$)
 - ⑦ Filtering to play with it
 - ⑧ Dummy variables $(n-1)$ in terms of versions
 - ⑨ Save all stuff but use both that give explanatory power
 - ⑩ English & non-English
H₁: rating significant
H₂: the number of usage significant
-
- ① Daily usage
② Stars
③ log(Download)
 - ④ Explain
Download { rating, Daily activities }
 - ⑤ English speakers



① popularity of the author

→ numeric Data goes to Collected

→ Collect Data

H₁: impact of popularity of product
on Download

User type
time level
(stars)
H₂: How does mix of data user affect
downloads

H₃: what are effect of complementary
products in influencing download
quality

- ① popularity of complement (# stars)
- ② the number of users of complementary
products
- ③ number of reviews

H₄: what is the effect of success of the
How does the effect of being in
the bundle affect downloads.

use: Demand word and download at
product

H₅: How does the productivity and quality
of author affects demand for
the product.

H₆: number of people working of the
group with the demand of
the product.

→ demand for product

$$y_{it} = \beta x_t + \epsilon_i$$



explain with cross section

position, demand for supplementary product
add on (literature)

②

① write the research question

② write model

③ collect data

model → (instrument)
SSIP & hierarchical mode

② Dynamic: DEM state state
will be simpler than instrument
variable (product) → filtering

③ simple regression: hierarchical Bayes
estimate param as individ add on
one beta is now data run

Bayesian regression (Beta + fixed charac)
each add on 80% same

= $\bar{x}_i \beta_0$ population
conjugate prior → hierarchical model

time varying component problem

assume no investment

next week: Kalman filter

time component for publication

→ First look at the data and then ask what
question (in empirical)

① next week at 11:00

Often used with $\times 6$

- ① Star /
- ② # rating /
- ③ users /
- ④ category /

Crawler

Collection } # addons ①
 $\times 3$ } # follows ②

Other addon by author }
 $\times k$ }

- ① # addons
- ② stars
- ③ # raters
- ④ # users

i.htm

- ① → future idea on Variable of each row see element
- ② → use max or min user to explain

Copy files back
 ↗ 2 review ↗ No rating ↗ Decision about how many items to show to one

- ③ Count # used with plugins
- Does it pay to be grouped with unknown people? (Topic)
- Customers or producer?
 role of packaging or consumer usage
- How usage of prod from different category helps predict demand for product (Joint usage)
 ↳ Complementary?
- so - most popular Firefox plugin
 learn from review vs. learn from usage
- write perl code to read header of CSV & move file to related folders (root of plugin)

Fill up for so

① Implement

Demand for supplemental product

② Don't take full data

just take one and simple model

Good will notion

is it good will or addon

addon it → Goodwill decay but increase

go goodwill

Goodwill = decay + summation

+K only one series

$g = G_{it} e^{2t}$

$$G_{it} = \delta G_{it} + \sum_{i=1}^3 \beta_i x_{it} + w_t$$

estimate this

try to estimate β, U, W

FFBS

Same state for all

then it becomes data

so betas

→ Stack all could be done and do one FFBS

SOA FFBS

Then nice story of Regression

→ take out english

Var → negative
usage → positive
Avg str → negative

→ run

→ lag

mean

std → explains why based on data (hierarchical)

endogenous

→ Dynamic model

effect of lags at early days different from later days

simply as random walk

negative is spurious

effect of stars time varying

$G_t = \begin{cases} \text{effect of stars time varying} \\ \text{download verbings (time varying)} \end{cases}$

$$Y_{it} = G_{it} + \varepsilon_{it}$$

$$G_{it} = \delta G_{it} + \sum_{i=1}^3 q_{it} X_{it} + \eta_{it}$$

$$q_{1t} \text{ AVG} = \delta_1^i + w_1 \text{ English Const.}$$

$$q_{2t} \text{ Std-Stars} = \delta_2^i q_{2i} + w_2$$

$$q_{3t} \text{ usage} = \delta_3^i q_{3i} + w_3$$

Bass et. al.

random walk

$$\begin{aligned} F \text{ matrix?} &= \begin{pmatrix} G \\ q_1 \\ q_2 \\ q_3 \end{pmatrix} \\ G \text{ matrix?} &= \begin{pmatrix} G \\ q_1 \\ q_2 \\ q_3 \end{pmatrix} \end{aligned}$$

$W \rightarrow 4 \times 4$

$$F = [1 \ 0 \ 0 \ 0]$$

$$G = \begin{bmatrix} \delta_0 x_1^t & x_2^t & x_3^t \\ 0 & \delta_1 & 0 \\ 0 & 0 & \delta_2 \\ 0 & 0 & 0 \end{bmatrix}$$

$$F = [1 \ 0 \ 0 \ 0]$$

in FFBS → generate G_t outside

FFBS per $t \rightarrow 4 \times 4 \times T$ matrix

Pick up $g = G_{it}(\cdot, \cdot, t)$

β, U, W are fixed
estimate variable

→ try that for next week

plot $G, q_{1t}, q_{2t}, q_{3t}$

how G is changing

Start Coding in Stata help -

run one by one how ?

build simple model

one add on then loop &

same for each q

then can see component

Theory

Sha Yang \rightarrow effect at later stage lower

Momic \rightarrow effect at variance

① new versioning means advertising Sheet

② FFBSI all params (mean & var)

③ Gibbs sampler for $G_{it} = q_0 G_{it-1} + X_{it} q_{it}$ ④

$$x_{2t} q_{2t} + x_{3t} q_{3t}$$

⑤ use Gibbs sampler for drugs ①, ②, ③, ④:

$$\left. \begin{array}{l} q_{1t} = q_1 q_{1t-1} + w_1 \\ q_{2t} = q_2 q_{2t-1} + w_2 \\ q_{3t} = q_3 q_{3t-1} + w_3 \end{array} \right\}$$

Q) when nesting should we run iteratively

all Gibbs sampler or only one draw?

I have to do it multiple times in loop

to get best estimate since like Inversion

I need best value & nesting means

. to run a function

① model we run

$$G_t = \alpha G_{t-1} + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + w$$

$X\beta$: drift

② cut the long time series

③ FFBS has drift in

what new thing you have to do: $\alpha, \beta_1, \beta_2, \beta_3$ &

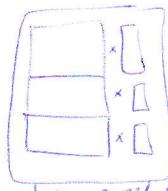
$$v_1, v_2, v_3, v_4$$

④ G_t is drift: d

⑤ Gibbs: Only one draw

⑥ rearrange matrix $\begin{bmatrix} \cdot & \cdots & \cdot \\ \vdots & \ddots & \vdots \\ \cdot & \cdots & \cdot \end{bmatrix} = \begin{bmatrix} \cdot & \cdots & \cdot \\ \vdots & \ddots & \vdots \\ \cdot & \cdots & \cdot \end{bmatrix}$ then rearrange again

⑦ multivariate inverse wished



data panel creation

after Convergence
Burn in

the mean

⑧ draw from joint, but make sequential to simplify
(sequentialize by Conditioning) integral calculation
How many times they occur together \Rightarrow what is weight

⑨ why marked chain converges \bigcirc

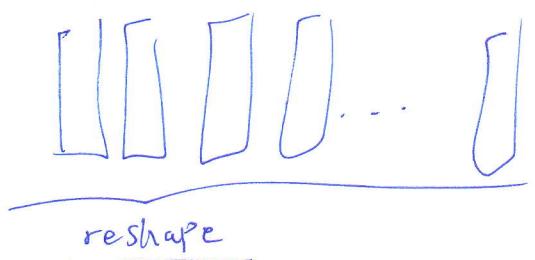
⑩ estimation FFBS: \hat{G}_t then simple MVR reg

$$\hat{G}_t = d \hat{G}_{t-1} + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + E$$

⑪ First run on simulated data $G_t = d$ Priors
② First unit need lag of $\theta_t \sim N(\mu_0, C_0)$ \downarrow
 $\Sigma^{-1} = S \otimes \text{INV}$ prior (α_0, r_0)
 $(1, T+1)$

⑫ all w_t should be for previous moment

⑬ when reading I should take care of the
natural lag I have in stores (no its fine because
rate will be clear tomorrow) \Rightarrow No problem



① read xls ② y ③ $X = [x_1 \ x_2 \ x_3]$

estimate existing
 $y \rightarrow$ Download do for one

② start with assuming them fixed & get negative

tell that I did with static model

key part) to run first

estimate Basic first

$$G_t = \alpha G_{t-1} + \beta_1 x_{1t} + \dots + \beta_3 x_{3t} + w$$

$\rho = 1$

$G_{matrix} = \alpha$

MSE

$u_T \rightarrow$ drift

Expectation \rightarrow will have drift

$$u_t = \beta_1 x_1 + \beta_2 x_2 + \dots$$

time varying

only affect mean (no affect var)

\rightarrow in backward you add again

④ define u_T at the top

x store variable

$$t+1 \rightarrow G_t \Rightarrow \underbrace{G_0 - G_T}_{\text{output}}$$

Sample set v, w

System equation

- in each one cycle

$$\theta_1, \dots, \theta_T, \beta, d, v, w$$

draw join

One iteration

Sequence of cond.

posterior

\rightarrow only one phgin

one y , 3 x

take longest time series

$$\hat{G}_T = d \hat{G}_{t-1} \beta, x_1 + \beta_2 x_3 + \beta_3 + \varepsilon$$

$\uparrow \quad \uparrow$
data data

$$\frac{[G_{t-1} \ x_1 \ x_2 \ x_3] \beta}{}$$

$$\bar{y} = \mathbb{E} x \left(\begin{matrix} d \\ \beta \end{matrix} \right) + \varepsilon$$

write mean of posterior

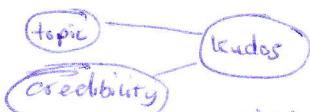
$\beta \sim N(\ ,)$ find the formula from slides

$\alpha \rightarrow$ should b/w

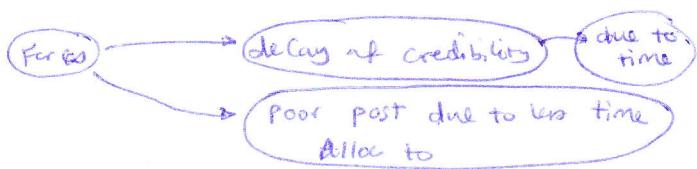
zero and one

should we do in cycle or just one draw of Gibbs

Bayesian Seminar Question



right quest. right answer



$$G_t = \gamma G_{t-1} + \epsilon_t$$

$$p(k) = \alpha G_t + \beta G_{E_t} + S_t$$

$$G_t = G_{t-1} + k_t + \eta_t$$

↓
decay

credibility or competency

$$C_t = \delta G_{t-1}$$

↓
real credibility

communication credibility

Q: Shall we talk more?

Optimal # of periods b/w answering

topic adjustment

decay of communication skills

* Learning from feedback of society

$$G_t = (1-\delta) G_{t-1} + tw + f_t + \gamma_1 + \gamma_2 + \gamma_3 + \gamma_4 + \epsilon_t$$

$$tw = \gamma G_{t-1} + f_t + \text{contnt}$$

$$f_t = \beta G_{t-1}$$

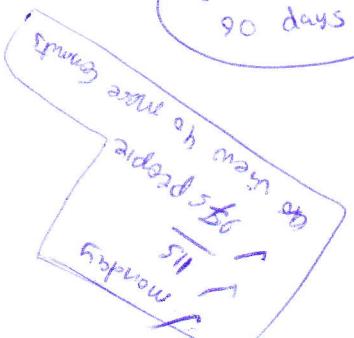
$$\gamma = \delta G_{t-1}$$

trend of tag
uncertainty, but not posting

key words

daily trend
90 days

for 90 days



Data hunting: bloomberg

⑬ Question answer that start with 5th simph

① Good question

② Good answer

③ critique question

④ memory synergy (link)

⑤ rule out impossibles quickly

⑥ patience & practice

⑦ reverify assumptions with friends & msc

⑧ create & ask for correction (yr)

⑨ organize reorganize chaos

≡ play

⑩ fearless & quick, everybody intelligent but hardworking matters

⑪ understand supplier (econometrics) & market

⑫ customise

⑬ creativity

* Focus on Brand well known with

lots of follower & try to

Explain stock price using it

well known brands

effect of social media on
interest in brand

(Back sch.)

① TA → presentation

↳ corrective

② writing

③ data collect Bayes.

④ Email report ↳ theory

⑤ Bayesian seminar sessions

↳ corrective

② writing

③ data collect Bayes.

④ Email report ↳ theory

↳ T-stat

⑤ Hypoth Correlation

⑥ archive filing of current papers &
get new papers (air)

business attr

meetings

TT:
econometric &
statistic

Prod:

① literature compnt

② Hypoth

③ data cleaning

④ model spec

⑤ run models

bloomberg
JMSC

Help

ADKT stu & brnts:

Data stud

Fruit

motivation: organize & document

product

Revenue

Creativity

Help

motivation:

organize & document

product

Revenue

Creativity

Help

product

Revenue

Creativity

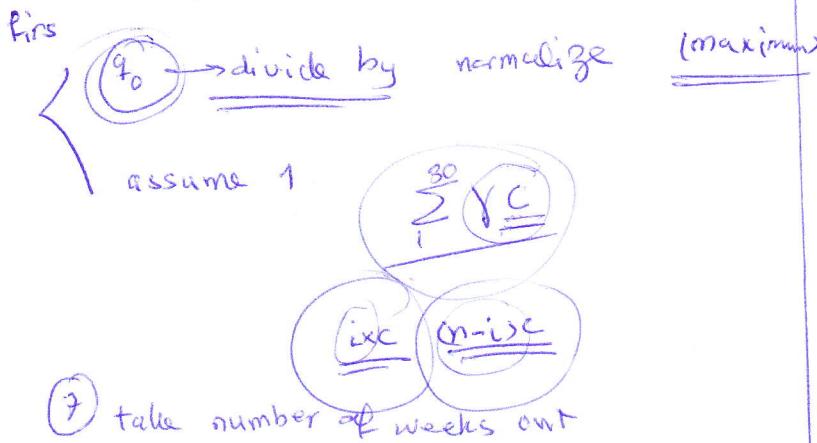
Help

motivation:

organize & document

Strategic!

- ① only delayed make decision
- ② Sum Sides
- ③ First available = 1
second \rightarrow first time slot
- ④ turnship must cost low
ask again assumption one how distributed
availability in one \rightarrow available in
fictional store
- ⑤ first avail \rightarrow max
2nd period avail \rightarrow mean
assump: equally prob to come out
the 2nd one



- ⑦ take number of weeks out
- ⑧ ask the teachers of Indiv. dates
- ⑨ take dates out with logic \sqsubset thw

8 t-state $\frac{\beta}{\text{Var}}$

- ⑩ Both of the method

- ⑪ Wednesday meeting