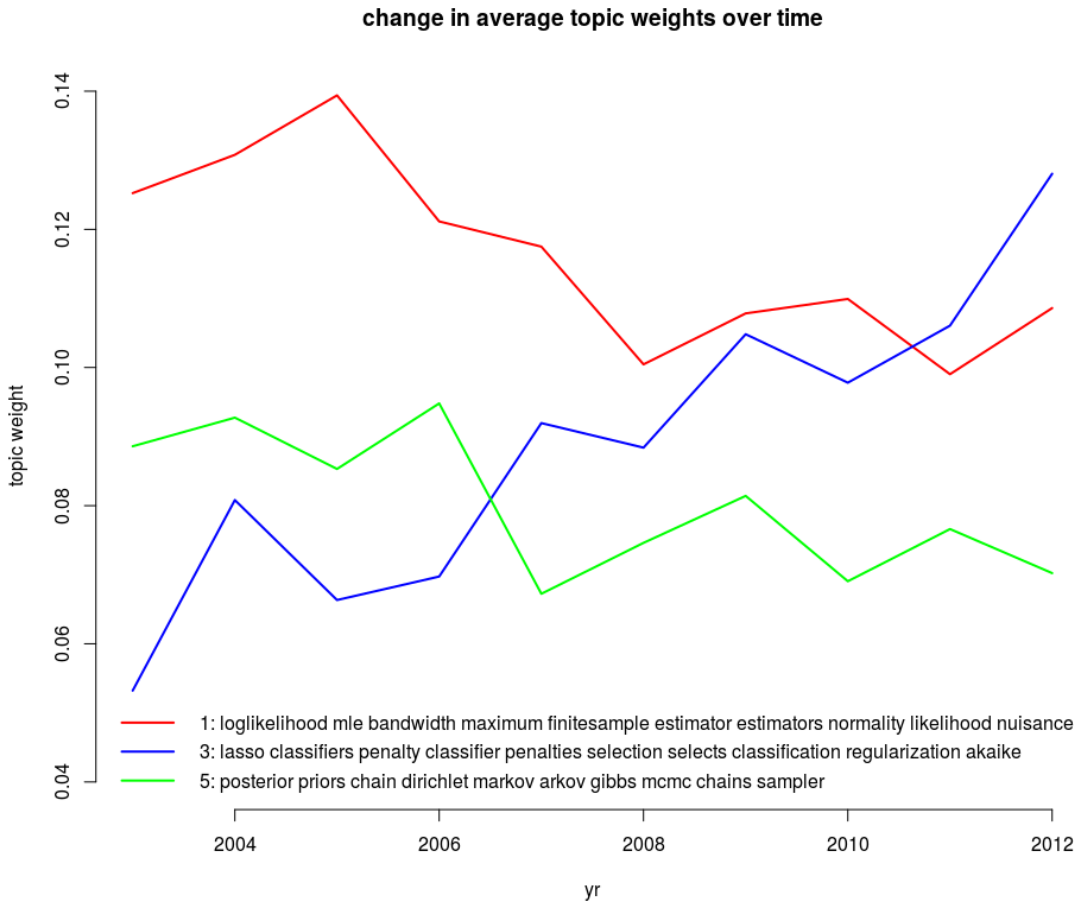
I find a 14 topic representation is optimal, and most of these have a pretty constant market share over time. e.g., a constant topic is "math", with representative tokens *'(', ')', ')(', 'theta', 'bar', 'let', '))', 'cap', 'lambda', 'sigma'*.

The plot below shows the 3 topics whose average weighting changed the most over time. The listed words are those representative of each topic. You have one topic that is like "penalized estimation" (3) that has grabbed the most market share over time, and the two biggest losers are like "traditional math stats" (1) and "Bayesian statistics" (5).



This gives a nice story where penalized deviance minimization, a sort of bastard child of math stats and Bayes, emerges to grab market share from both. When I run a regression for cite counts per year since publication as a function of pubyear and topic %, I find that topic 3 (penalized estimation) is the only topic that has a significant (pval < 0.01) effect on cite count:

```
Estimate Std. Error t value Pr(>|t|)
w3     0.108089   0.009906  10.911  < 2e-16 ***
```

So that we could say people moved into this area because they get cited more, or vice versa. Or, this is just the Jianqin Fan effect.

Here are the representative articles from each of the three dynamic topics:

```
## most Math Statsy articles
> meta[order(-tpc$omega[,1])[1:5],"title"]
[1] "On {B}artlett correction of empirical likelihood in the presence of nuisance parameters"
[2] "Locally efficient semiparametric estimators for generalized skew-elliptical distributions"
[3] "Constrained local likelihood estimators for semiparametric skew-normal distributions"
[4] "The efficiency of the estimators of the parameters in {GARCH} processes"
[5] "A paradox concerning nuisance parameters and projected estimating functions"


## most Penalizy articles
> meta[order(-tpc$omega[,3])[1:5],"title"]
[1] "The benefit of group sparsity"
[2] "Regularization and variable selection via the elastic net"
[3] "The adaptive lasso and its oracle properties"
[4] "High-dimensional classification using features annealed independence rules"
[5] "Variable inclusion and shrinkage algorithms"


## most Bayesian articles
> meta[order(-tpc$omega[,5])[1:5],"title"]
[1] "A conjugate prior for discrete hierarchical log-linear models"
[2] "Bayesian analysis for reversible {M}arkov chains"
[3] "Instability, sensitivity, and degeneracy of discrete exponential families"
[4] "Compatible prior distributions for directed acyclic graph models"
[5] "On {B}ayes' theorem for improper mixtures"
```

And here are representative words from all 14 topics, by topic-over-null term lift (and usage %)

[1] 'loglikelihood', 'mle', 'bandwidth', 'maximum', 'finitesample', 'estimator', 'estimators', 'normality', 'likelihood', 'nuisance' (11.6)
[2] 'genes', 'clustering', 'gene', 'genomic', 'expression', 'supplementary', 'technology', 'material', 'profiles', 'management' (9.4)
[3] 'lasso', 'classifiers', 'penalty', 'classifier', 'penalties', 'selection', 'selects', 'classification', 'regularization', 'akaike' (8.7)
[4] 'eigenvalues', 'volatility', 'eigenvectors', 'marked', 'spectral', 'series', 'processes', 'exchange', 'trajectories', 'stationary' (8.3)
[5] 'posterior', 'priors', 'chain', 'dirichlet', 'markov', 'arkov', 'gibbs', 'mcmc', 'chains', 'sampler' (8)
[6] 'treatment', 'causal', 'patient', 'intervention', 'observational', 'policy', 'confounding', 'period', 'care', 'assignment' (7.7)
[7] 'rejections', 'familywise', 'fdr', 'tests', 'testing', 'null', 'test', 'hypotheses', 'factorial', 'pvalues' (7.6)
[8] '(', ')', ')(', 'theta', 'bar', 'let', '))', 'cap', 'lambda', 'sigma' (7.3)
[9] 'censoring', 'survival', 'hazards', 'frailty', 'hazard', 'casecontrol', 'missingness', 'failure', 'censored', 'incidence' (7)
[10] 'confidence', 'intervals', 'surveys', 'coverage', 'nonresponse', 'unequal', 'imputation', 'bands', 'auxiliary', 'population' (6.1)
[11] 'sliced', 'quantile', 'heteroscedastic', 'reduction', 'regressors', 'predictors', 'squares', 'measurement', 'errors', 'subspace' (6)
[12] 'spline', 'backfitting', 'mixed', 'splines', 'additive', 'generalised', 'correlation', 'rank', 'anova', 'generalized' (5.1)
[13] 'forecasts', 'bootstrap', 'particle', 'approximations', 'changepoint', 'approximation', 'smoothed', 'forecasting', 'et', 'al' (4.3)
[14] 'wavelet', 'besov', 'median', 'thresholding', 'multiscale', 'nested', 'rules', 'growth', 'adaptation', 'curve' (2.8)