NZRS
an InternetNZ company

REGISTER SIZE PREDICTION

Thursday 4th May, 2017

.nz Registrar Conference

Huayi Jing

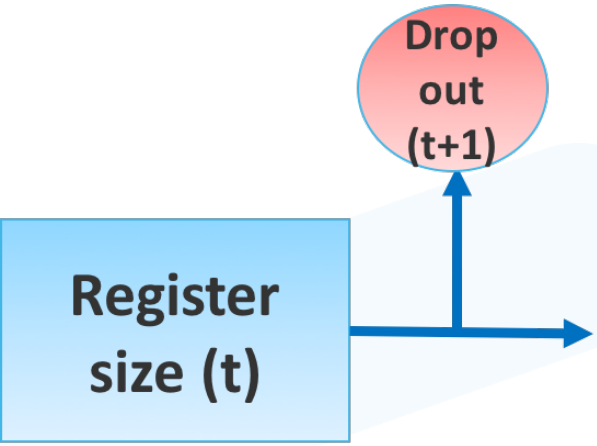
Objective

- Investigate register behavior from a high level
- Support financial planning:
  - Register size prediction for the next financial year

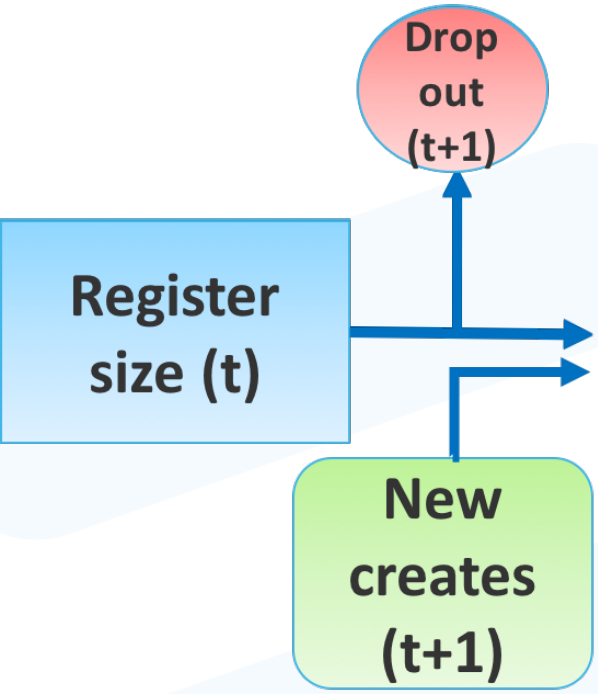
Prediction Procedure

Register size (t)

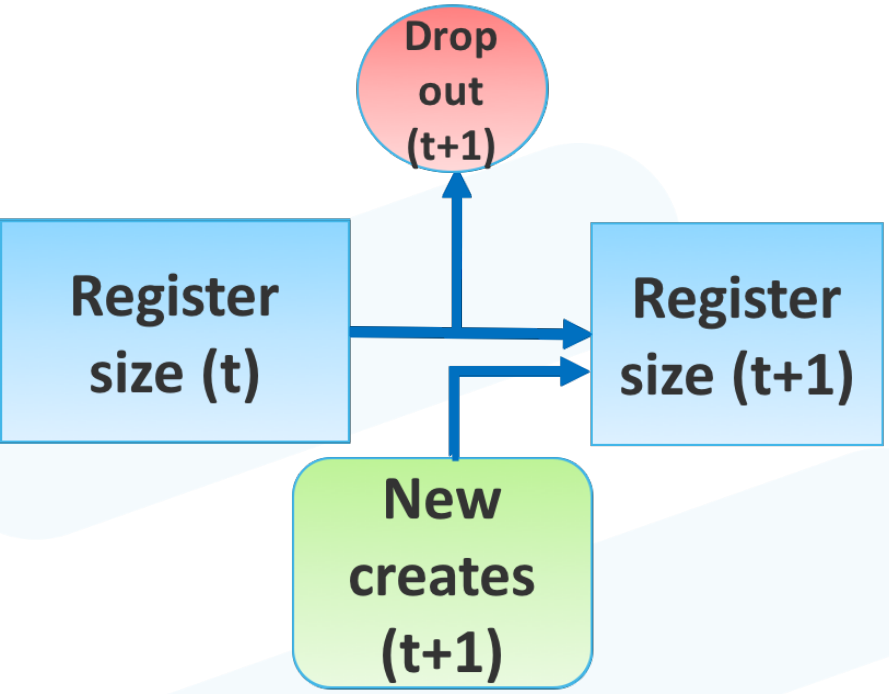
Prediction Procedure



Prediction Procedure

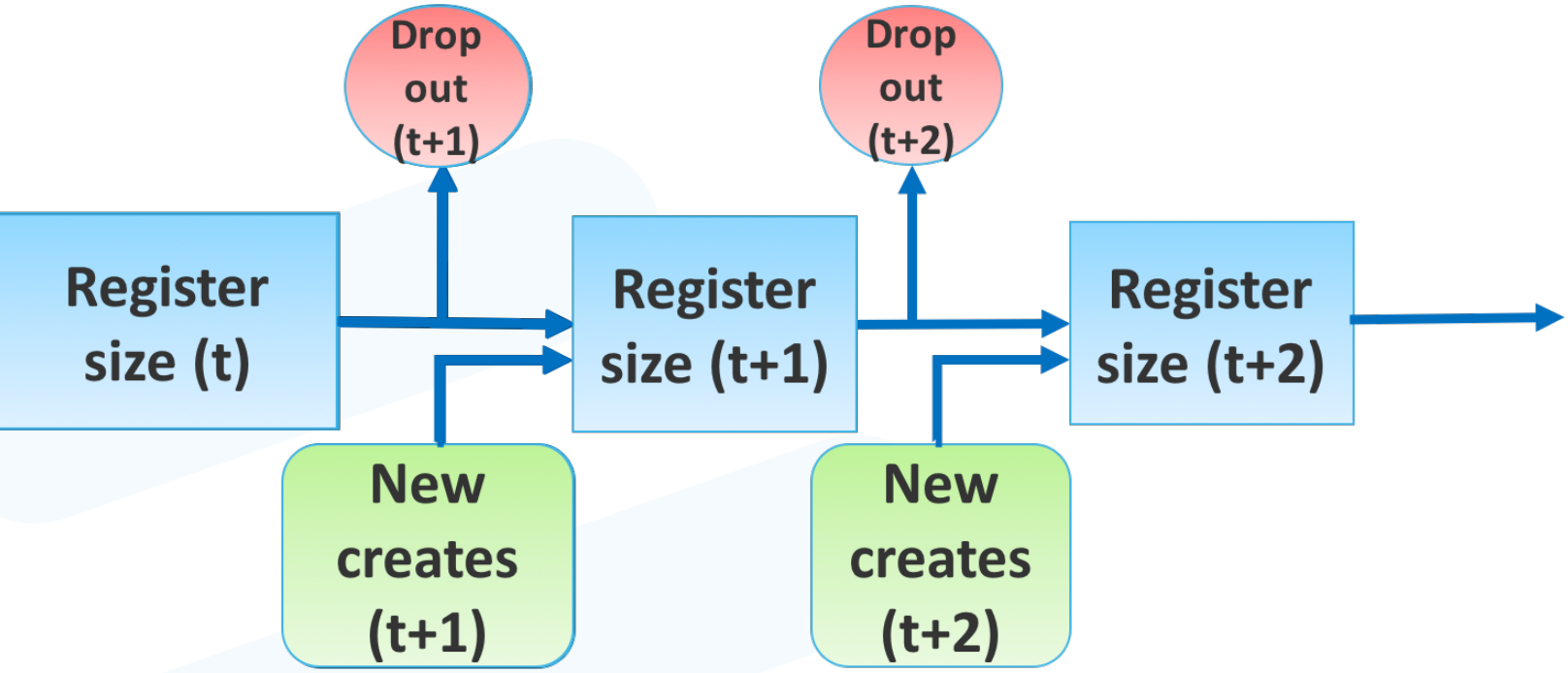


Prediction Procedure



Registry size (t+1) = Registry size (t) + New creates (t+1) – Drop out (t+1)

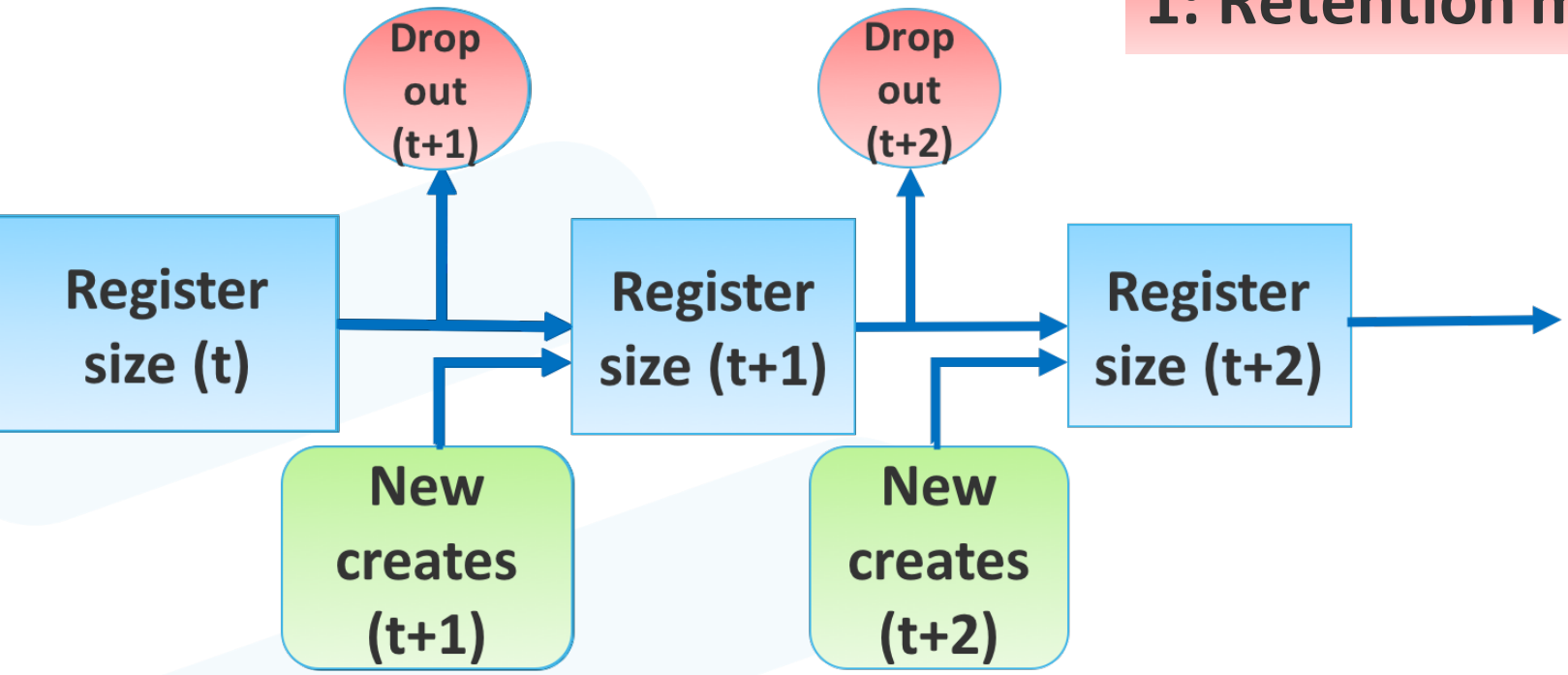
Prediction Procedure



Registry size (t+1) = Registry size (t) + New creates (t+1) – Drop out (t+1)

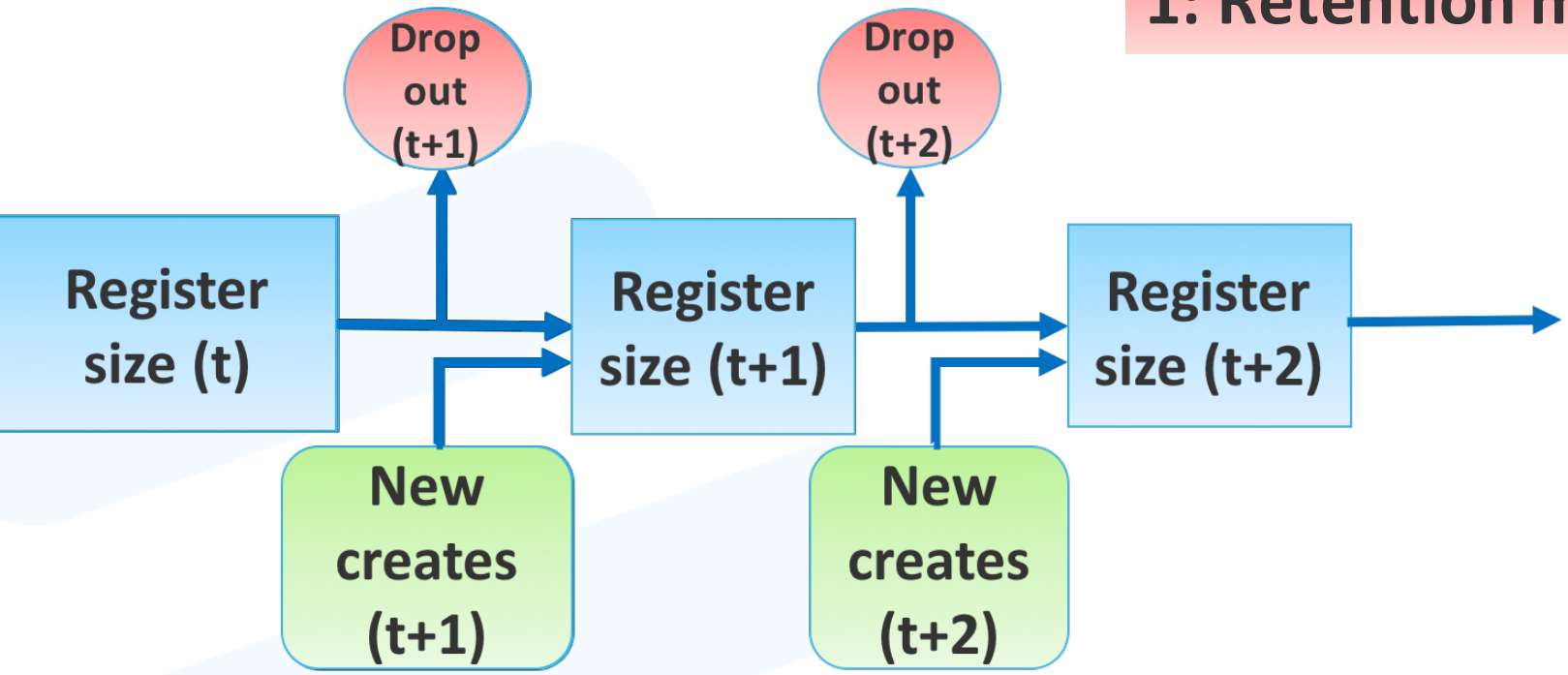
Model Components

1: Retention modeling



Model Components

1: Retention modeling

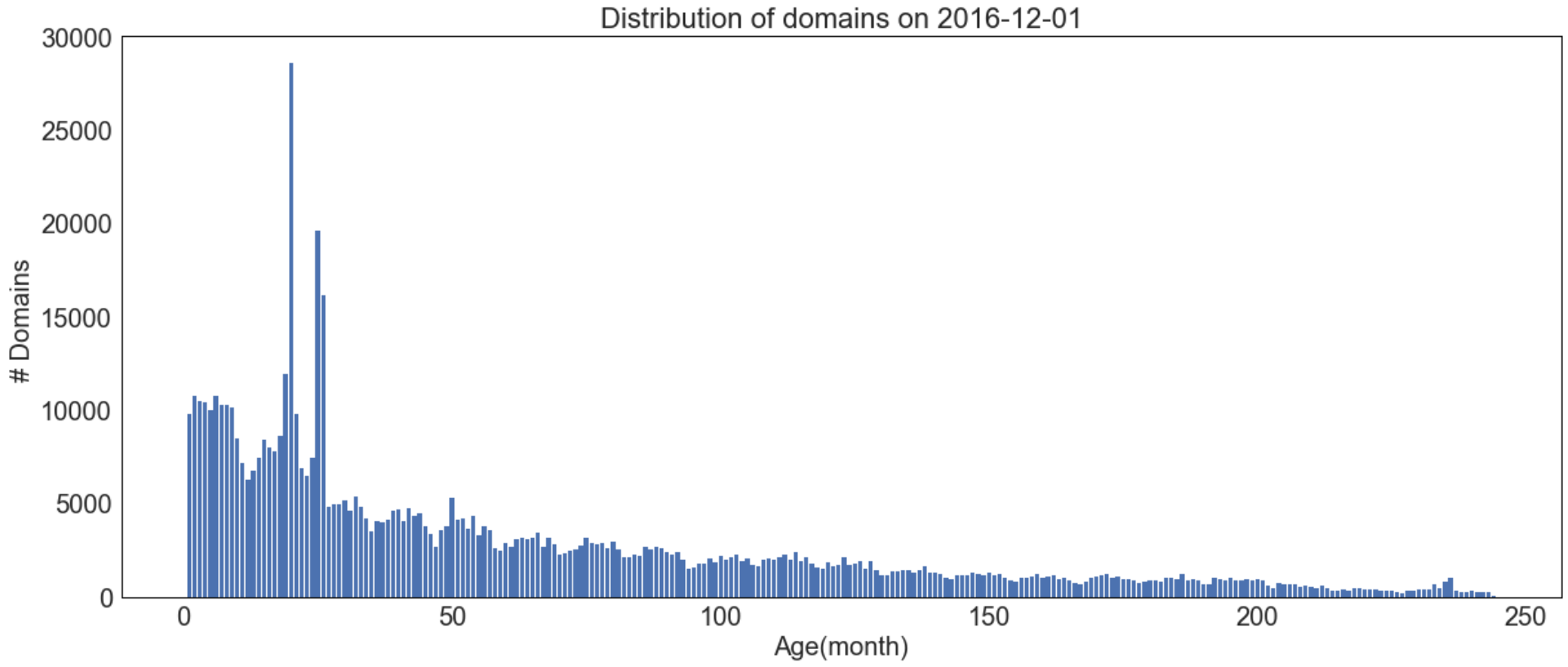


2: New creates forecasting

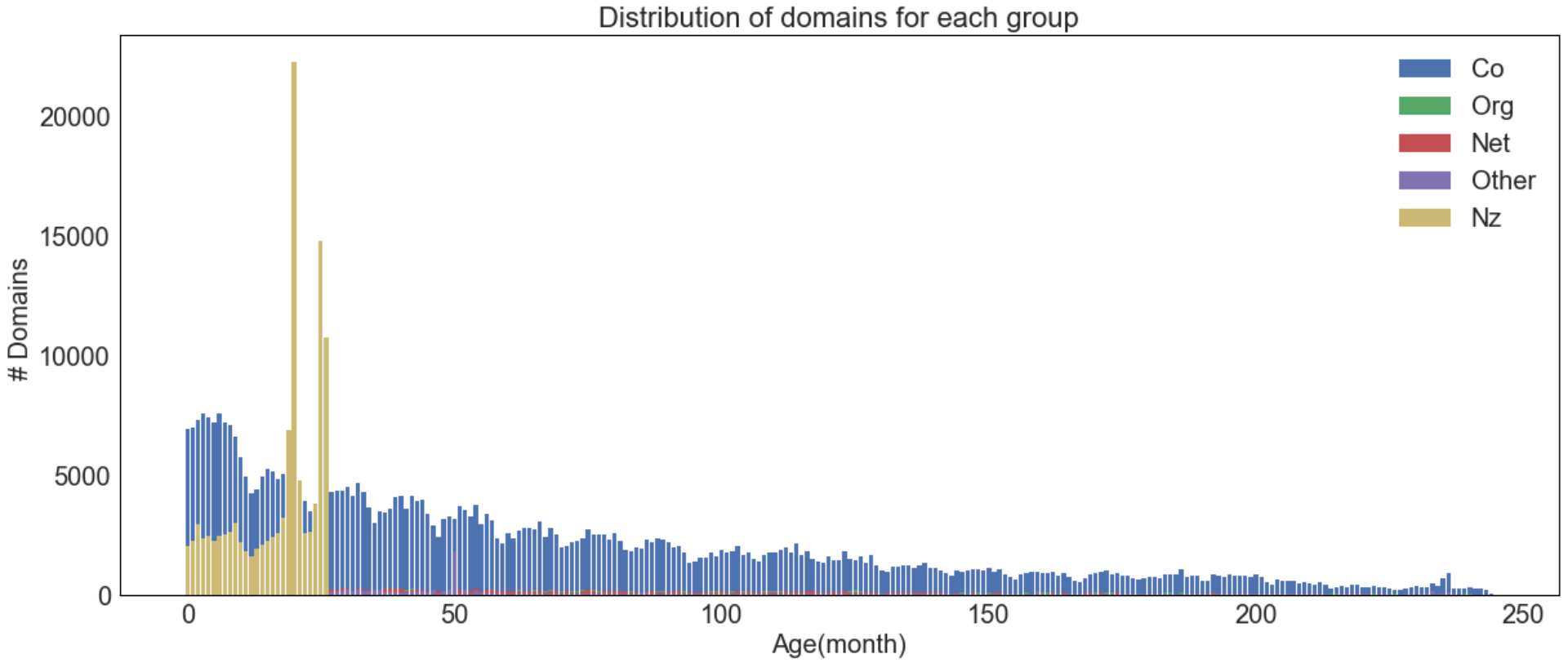
Retention Modeling

Retention rate: the proportion of domains active in t will still be active in t+1.

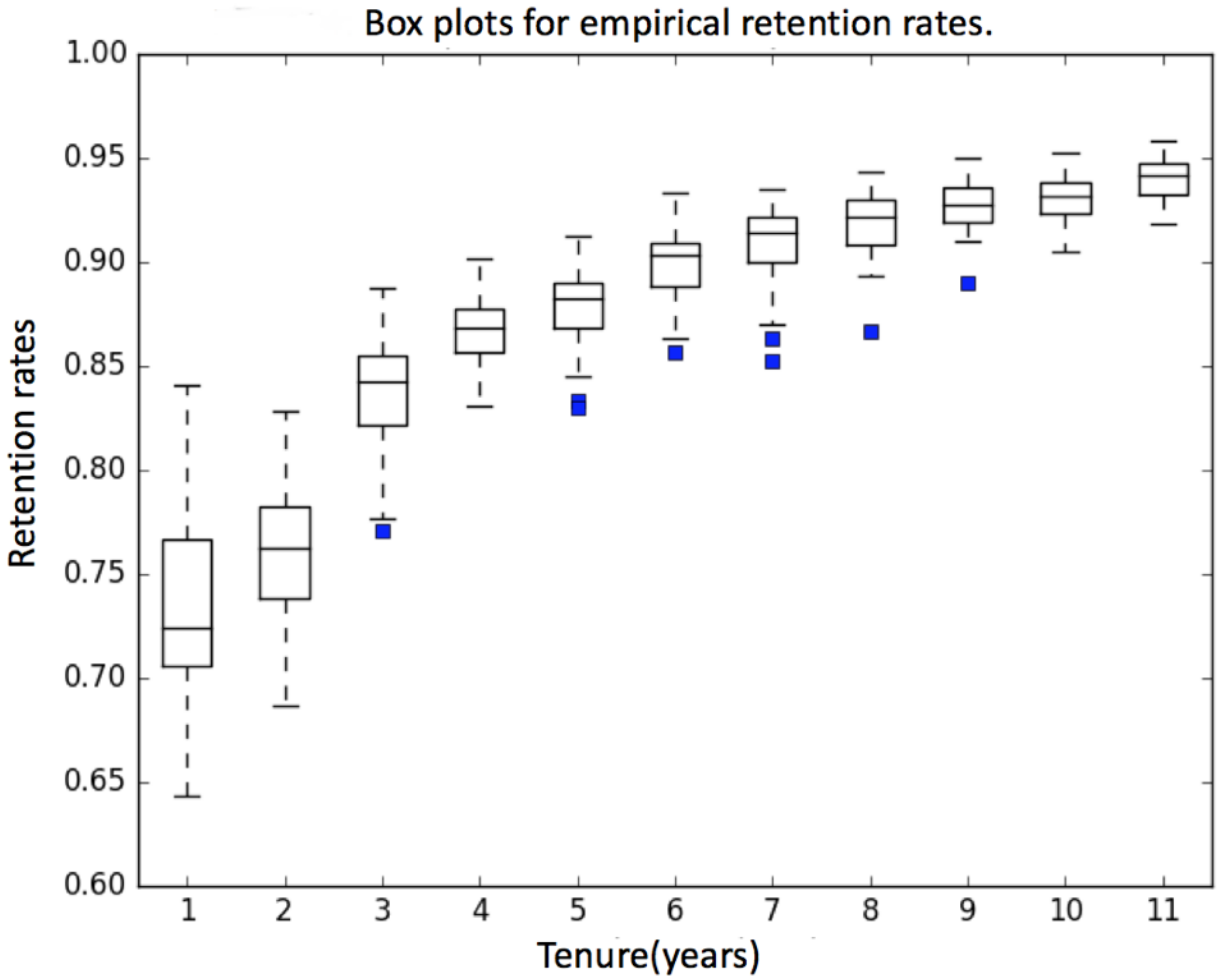
Preliminary analysis



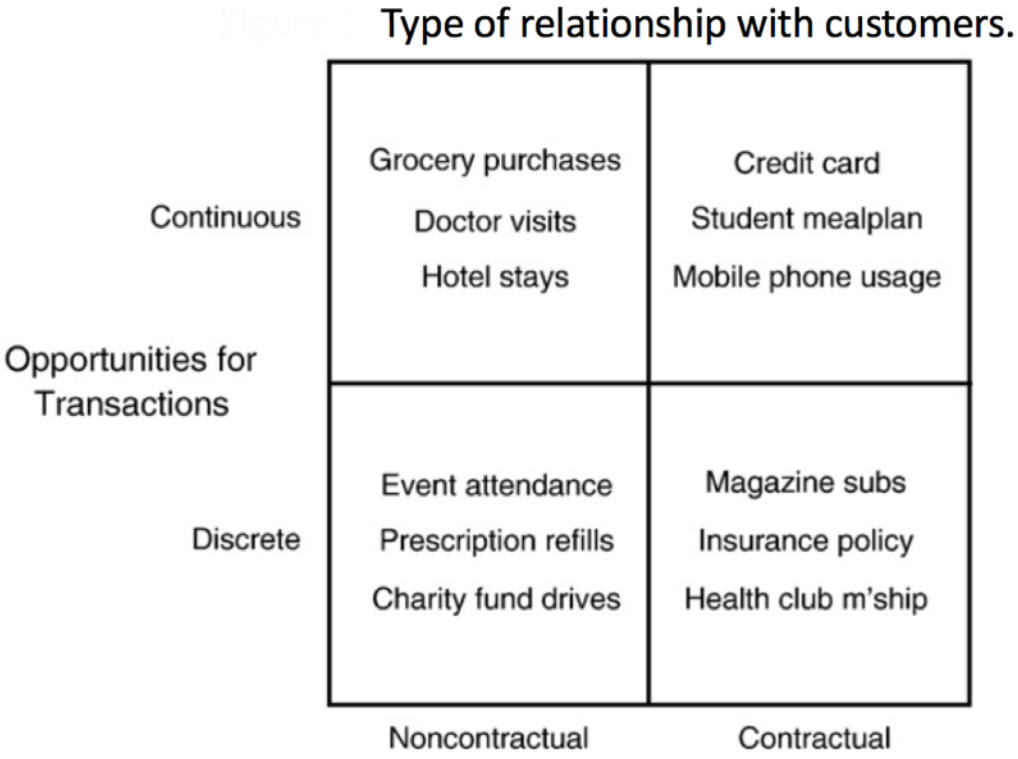
Preliminary analysis



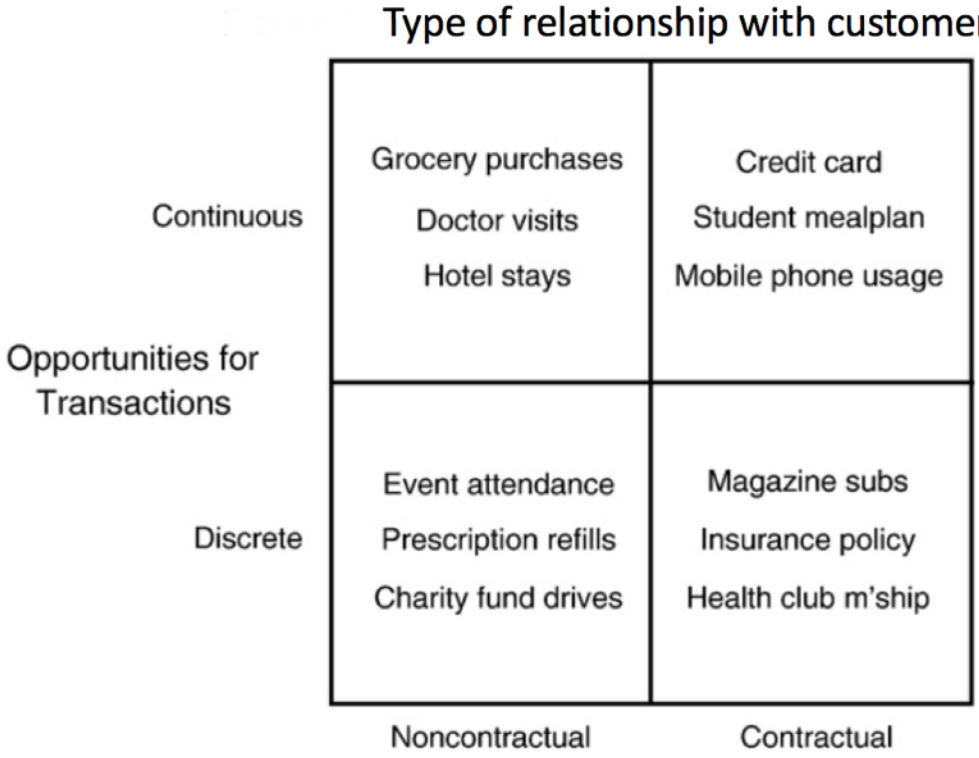
Preliminary analysis



Business Type Ref[1]

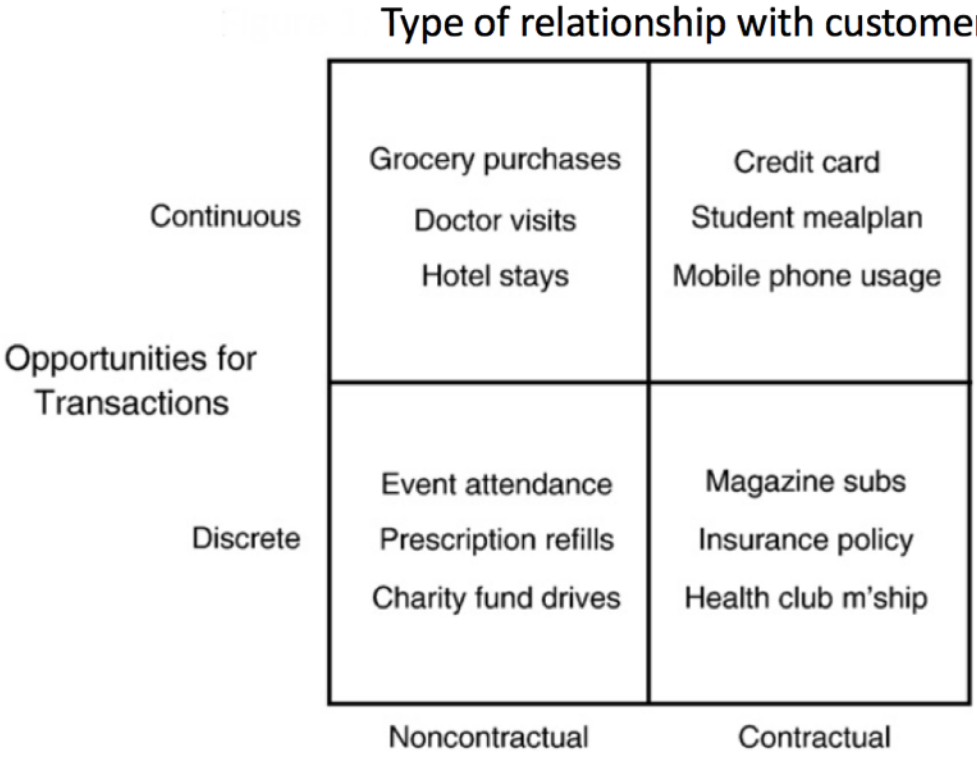


Business Type Ref[1]



(1) Contractual: Whether a domain name is registered / renewed / cancelled can be observed from the database;

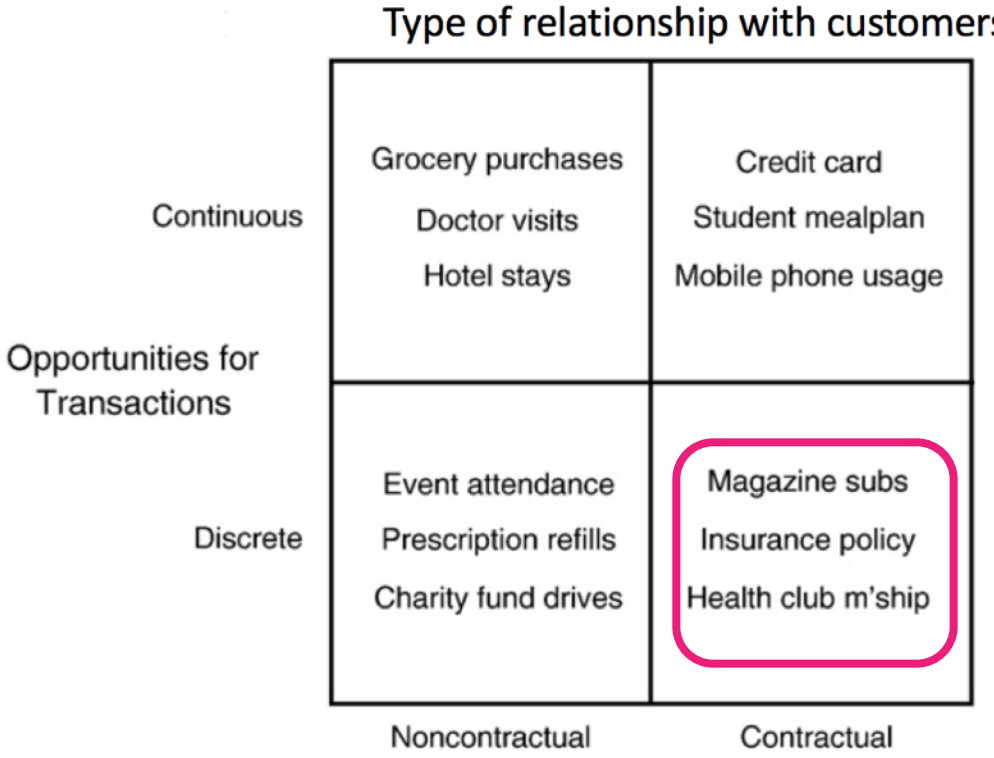
Business Type Ref[1]



(1) Contractual: Whether a domain name is registered / renewed / cancelled can be observed from the database;

(2) Discrete: A domain is usually registered / renewed for a fixed length of period.

Business Type Ref[1]



(1) Contractual: Whether a domain name is registered / renewed / cancelled can be observed from the database;

(2) Discrete: A domain is usually registered / renewed for a fixed length of period.

sBG Model Application Ref[1], Blog[1]

Input : # Active domains each year.

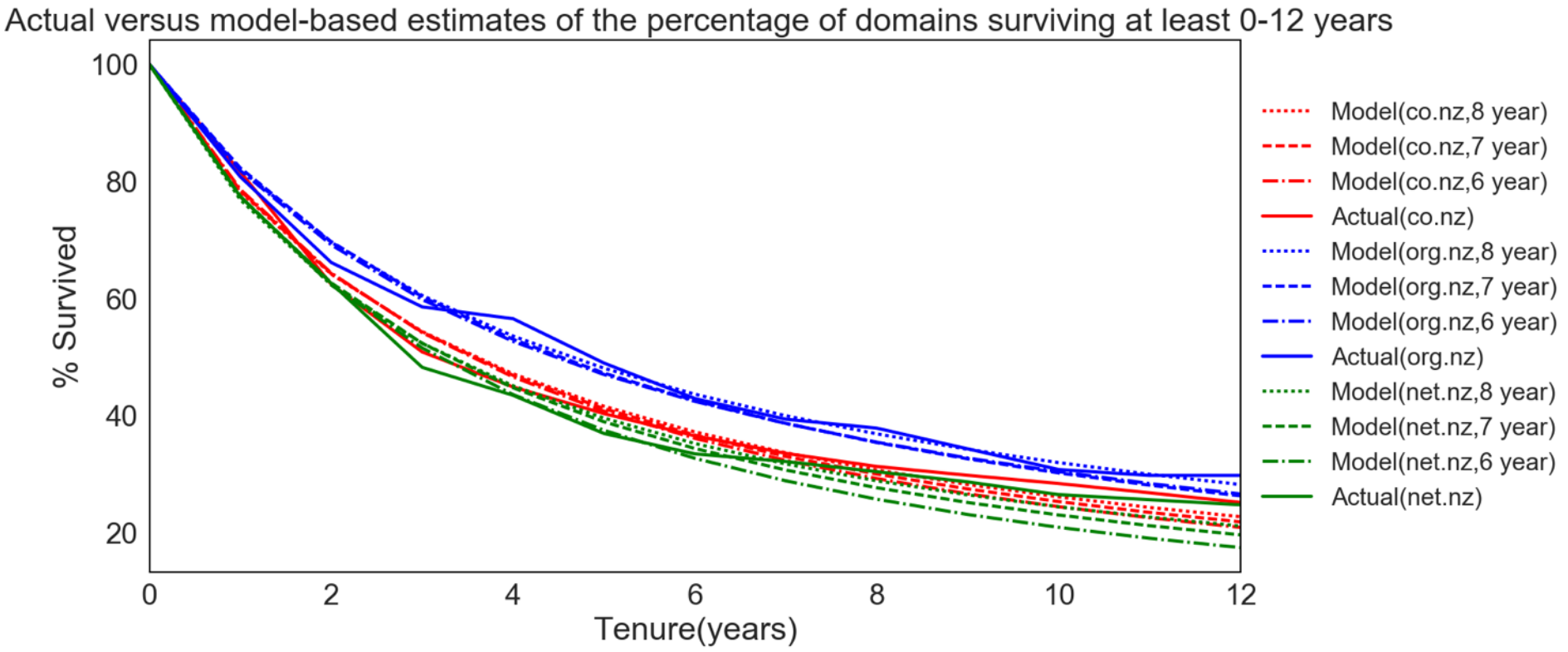
Year-month	Age (Year)	.co	.org	.net
2004-04	0	3712	198	230
2005-04	1	3031	160	178
2006-04	2	2318	131	144
2007-04	3	1889	116	111
2008-04	4	1667	112	100
2009-04	5	1498	97	85
2010-04	6	1357	85	77
2011-04	7	1246	78	74
2012-04	8	1163	75	70
2013-04	9	1107	68	66
2014-04	10	1055	61	61
2015-04	11	996	59	59
2016-04	12	935	59	57

sBG Model Application Ref[1], Blog[1]

Output : Parameter estimation results.

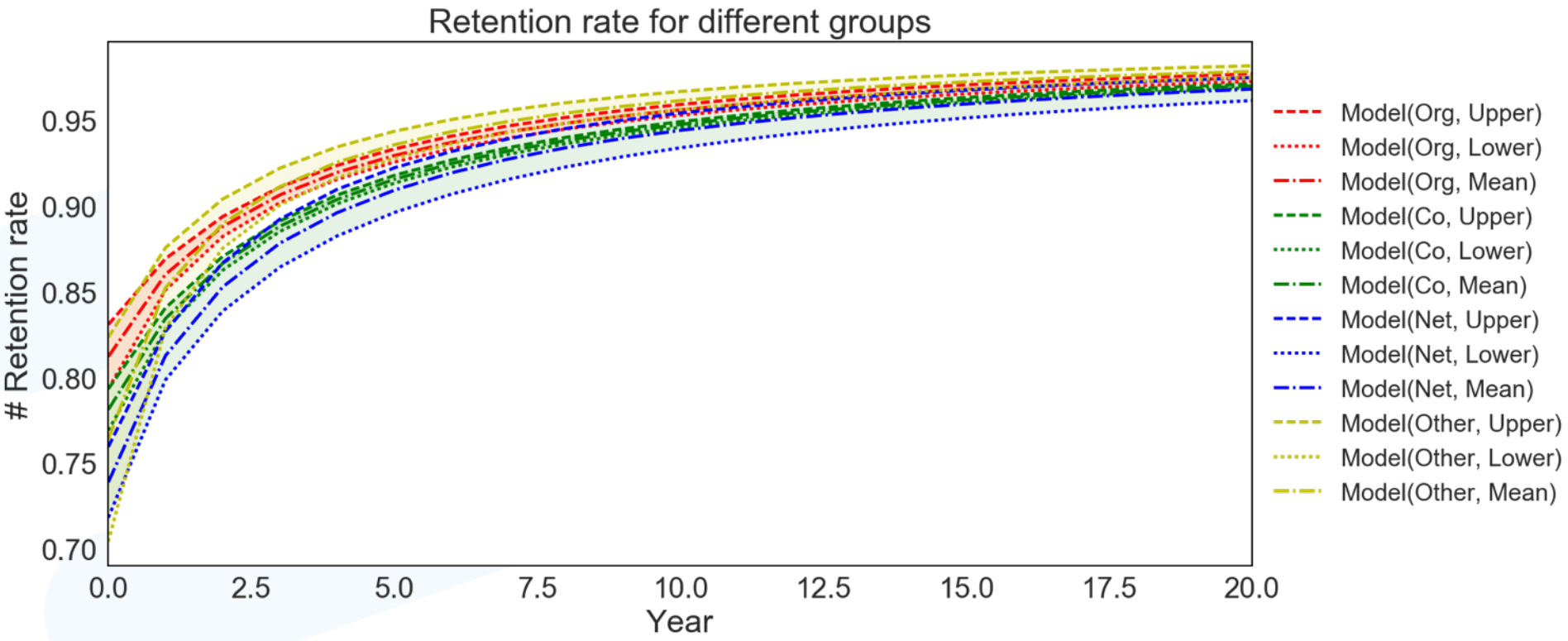
Parent Level		Parameter Estimates		
		6-year data	7-year data	8-year data
.co	$\hat{\alpha}$	1.221	1.098	1.018
	$\hat{\beta}$	4.491	3.986	3.651
.org	$\hat{\alpha}$	1.157	1.007	0.913
	$\hat{\beta}$	5.404	4.522	4.101
.net	$\hat{\alpha}$	1.678	1.210	1.053
	$\hat{\beta}$	5.960	4.127	3.507

sBG Model Application Ref[1], Blog[1]



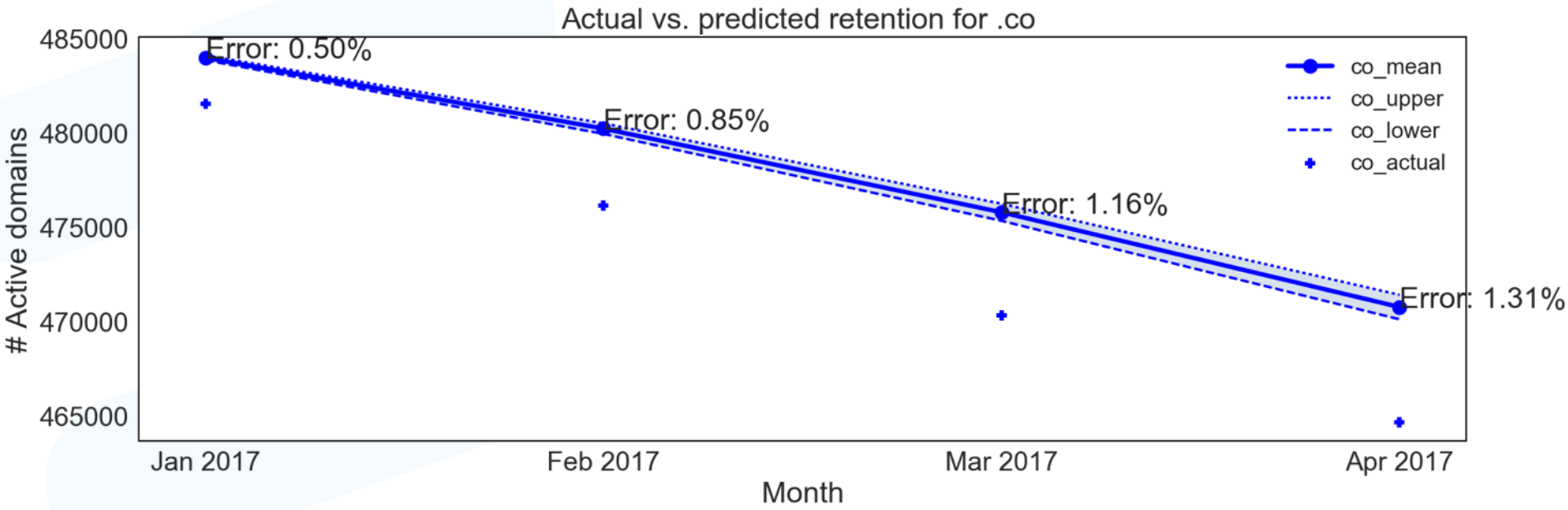
sBG Model Application

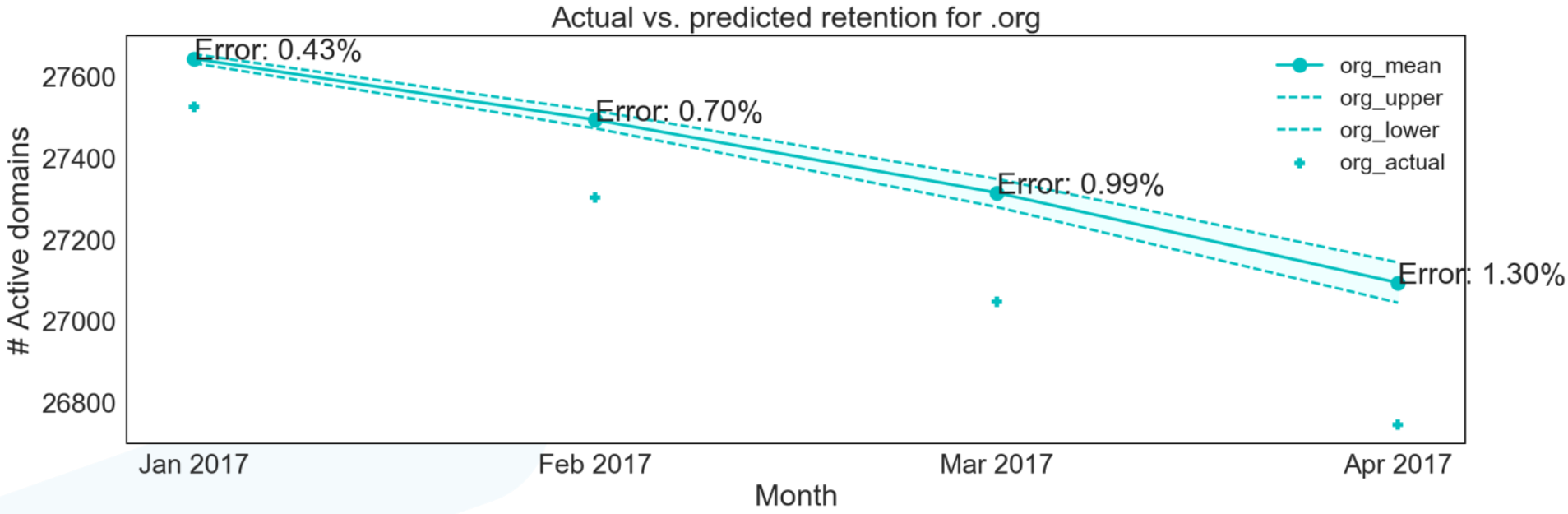
sBG Model Application

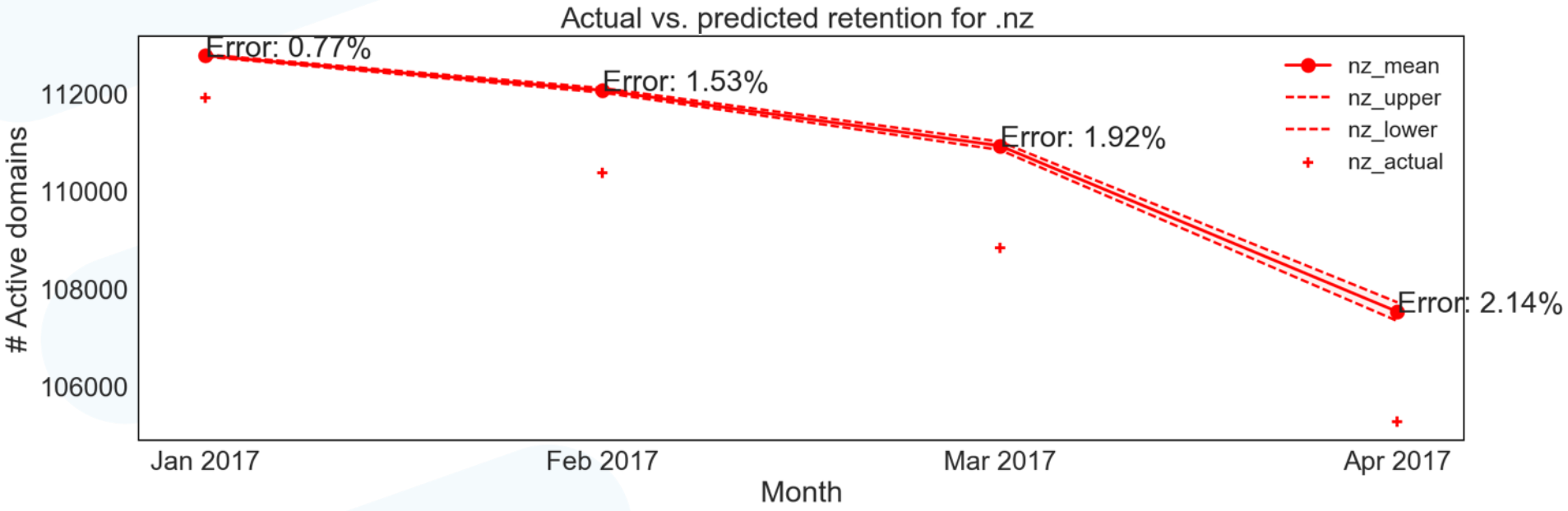


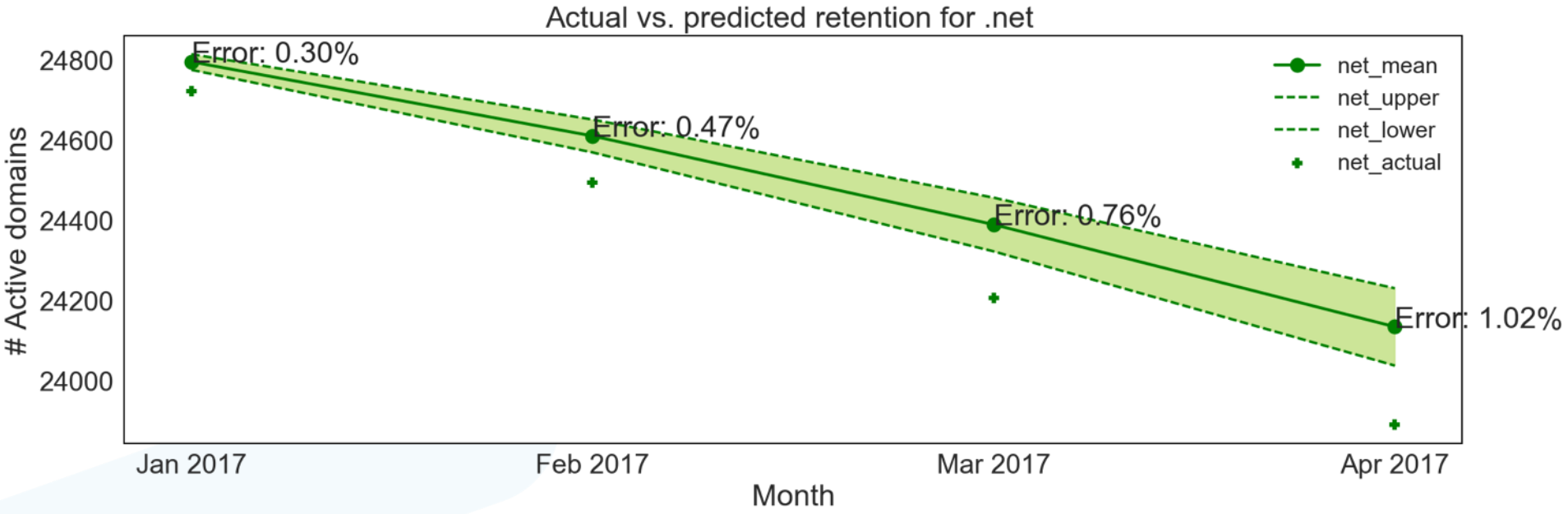
sBG Model Application

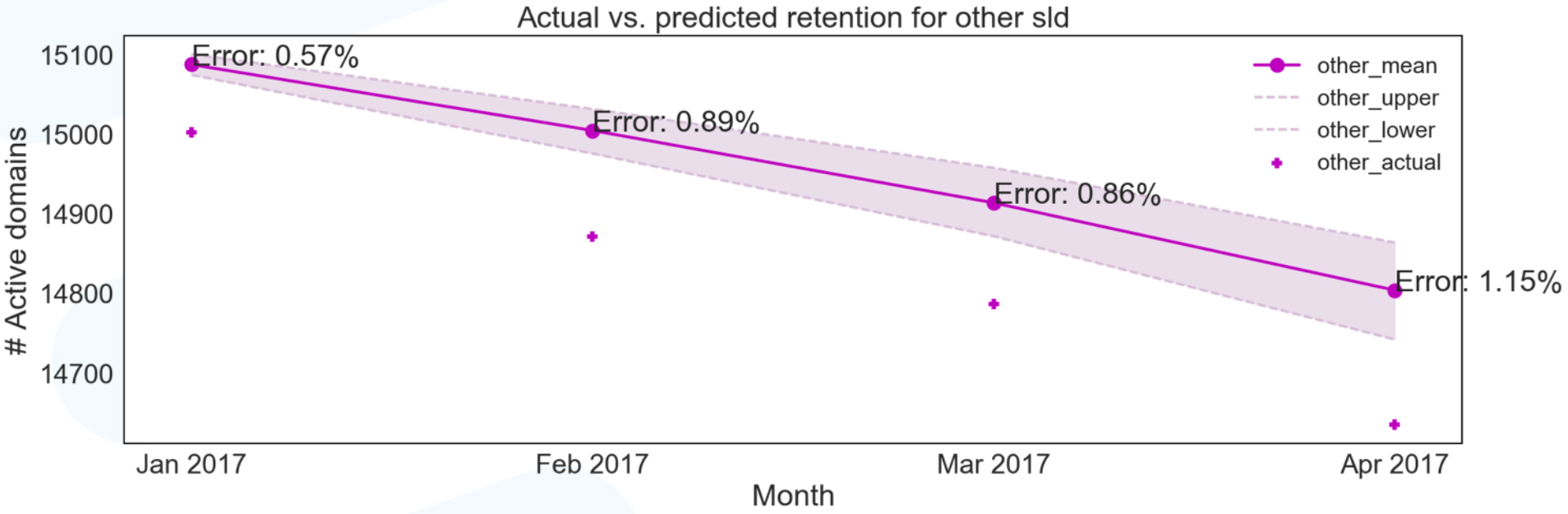
Test: Predict on the domains that are active on 2016-12-01.




Actual vs. predicted retention for .org
Error: 0.43%
Error: 0.70%
Error: 0.99%
Error: 1.30%
org_mean
org_upper
org_lower
org_actual
Active domains
27600
27400
27200
27000
26800
Jan 2017
Feb 2017
Mar 2017
Apr 2017
Month

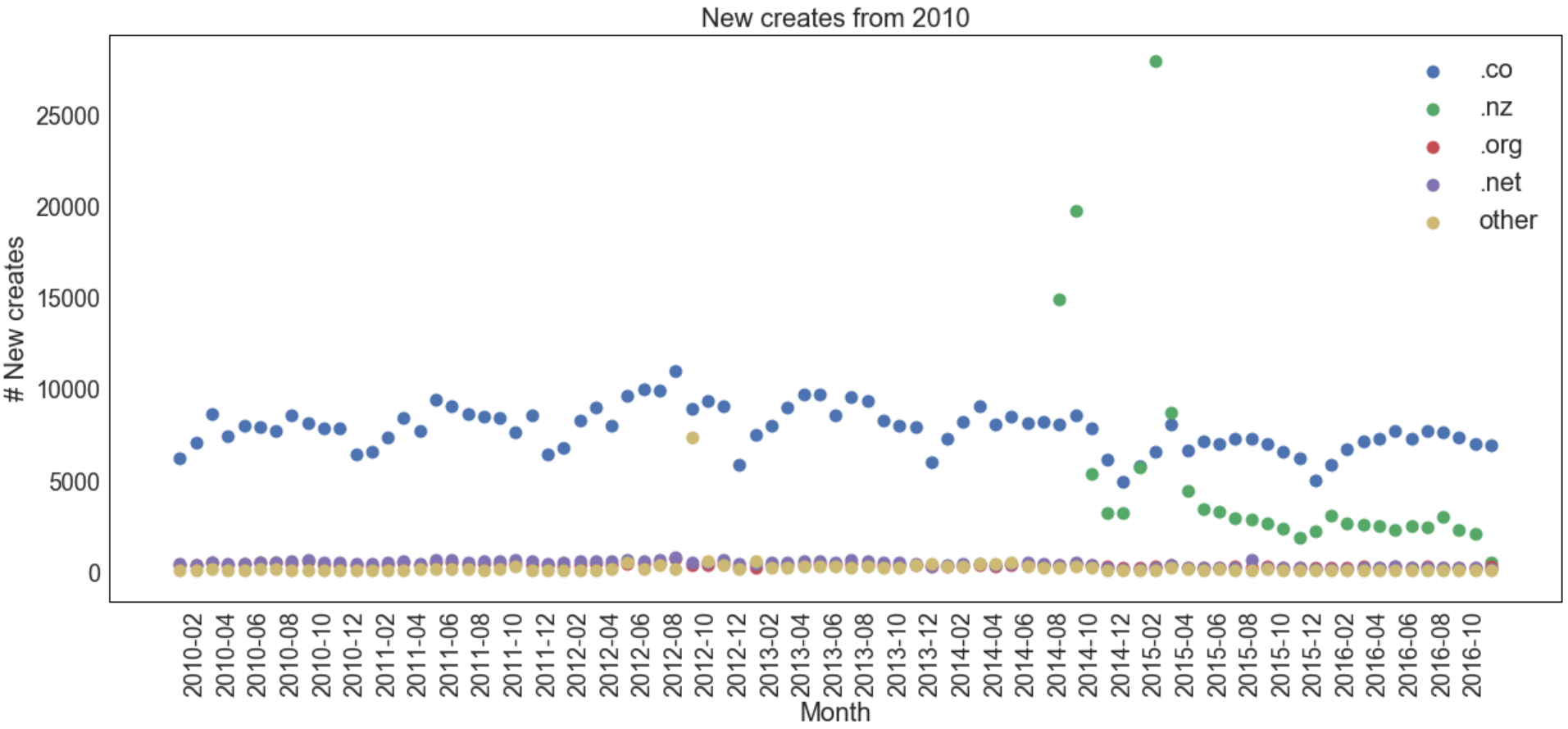

Actual vs. predicted retention for .nz
Error: 0.77%
Error: 1.53%
Error: 1.92%
Error: 2.14%
nz_mean
nz_upper
nz_lower
nz_actual
Active domains
112000
110000
108000
106000
Jan 2017
Feb 2017
Mar 2017
Apr 2017
Month


Actual vs. predicted retention for .net
Error: 0.30%
Error: 0.47%
Error: 0.76%
Error: 1.02%
net_mean
net_upper
net_lower
net_actual
Active domains
24800
24600
24400
24200
24000
Jan 2017
Feb 2017
Mar 2017
Apr 2017
Month

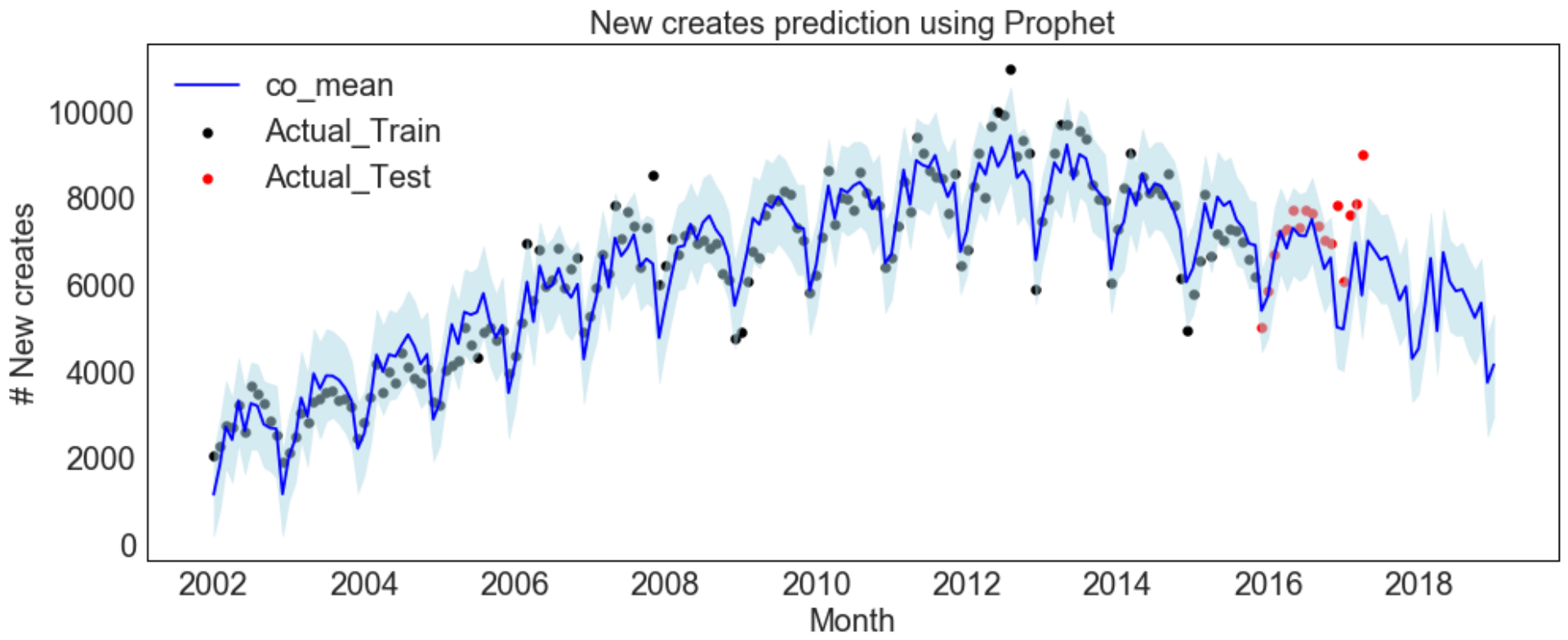

Actual vs. predicted retention for other sld
Error: 0.57%
Error: 0.89%
Error: 0.86%
Error: 1.15%
other_mean
other_upper
other_lower
other_actual
Active domains
15100
15000
14900
14800
14700
Jan 2017
Feb 2017
Mar 2017
Apr 2017
Month

New Creates Forecasting

Preliminary Analysis

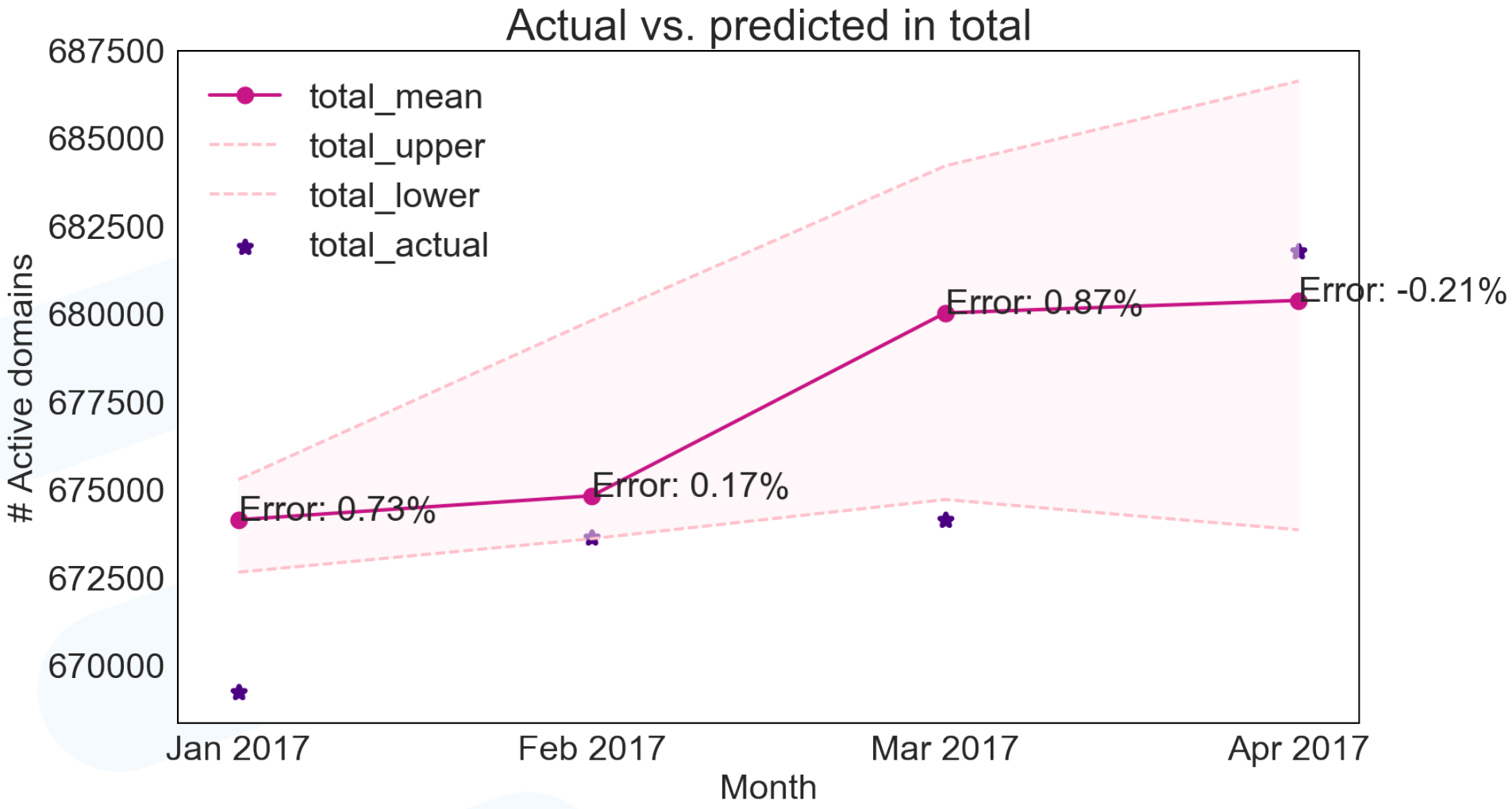


Using Facebook's Prophet Ref[2]

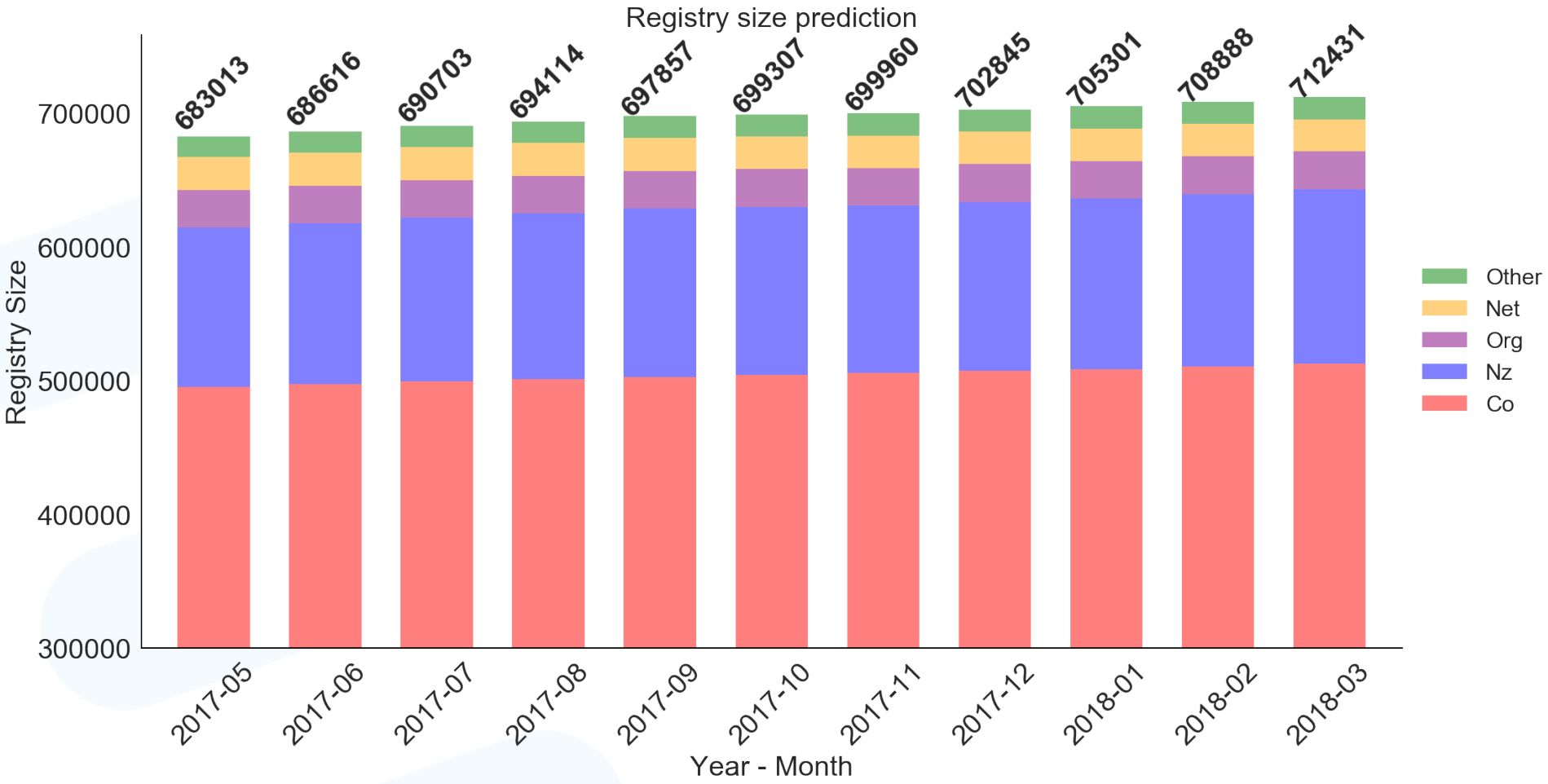


Register Size Prediction

Registry Size Prediction



Registry Size Prediction



Bibliography

- Reference:

[1] Fader, Peter S., and Bruce GS Hardie. "Probability models for customer-base analysis." *Journal of Interactive Marketing* 23.1 (2009): 61-69.

[2] Sean J. Taylor and Benjamin Letham , “Forecasting at Scale.” 2017

- Blog post:

[1] “Domain Retention Prediction”, http://blog.nzrs.net.nz/domain-retention-prediction/

[2] “Time Series Analysis of .nz Activity Data”, http://blog.nzrs.net.nz/time-series-analysis-of-nz-activity-data/

Thank You