

Method

- All complaints aggregated into two corpora:
 - Well Fargo complaints
 - Other banks
- Comparative sentiment analysis performed
- Corpora parsed for noun and verb phrases (NPs and VPs) have been
- Frequency analysis of NPs and VPs performed
- Areas of concern identified where Wells Fargo underperformed compared to competitors

Sentiment analysis

	Wells Fargo	Other banks
Polarity	0.0112748338427	0.0141760670126
Subjectivity	0.395043041744	0.389719374541

Polarity: negative vs. positive emotion
scale: -1 1

Subjectivity: fact vs. opinion
scale: 0 1

Wells Fargo patterns in line with other banks on the polarity and subjectivity of customers' complaints

Categories of analysis

- frequency: number of occurrences of a linguistic item
- normalized frequency: number of occurrences corrected for corpus size
- normalization formula:

$$\text{originalFreq} / \text{originalCorpusSize} = x / \text{targetCorpusSize}$$

$$x = (\text{originalFreq} * \text{targetCorpusSize}) / \text{originalCorpusSize}$$

- difference:

Wells Fargo's normalized frequency – other banks' frequency

Corpus size

Consituents	Well Fargo	other banks
Noun phrases (NPs)	229575	815450
Verb phrases (VPs)	158383	771998

NPs: findings

- mortgages
 - primary problem
- loans:
 - especially loan modification (significant difference)
- legal
 - not a significant trend
- checking and savings accounts
 - barely out of line with other banks

Noun phrases: mortgage

NP	Wells freq	Wells normalized freq	other banks freq	difference
my home	1318	4682	2435	2247
my mortgage	869	3087	1722	1365
the house	679	2412	1184	1228
the mortgage	606	2153	1075	1078
the property	729	2589	1609	980
the home	555	1971	1018	953
our home	450	1598	945	653
my house	413	1467	933	534
my property	300	1066	589	477

Noun phrases: mortgage

NP	Wells freq	Wells normalized freq	other banks freq	difference
our mortgage	229	813	483	330
a mortgage	292	1037	756	281
the foreclosure	156	554	307	247
a home	174	618	402	216
reverse mortgage	75	266	65	201
the mortgage company	109	387	204	183
a foreclosure	112	398	228	170
the deed	119	423	257	166
my mortgage company	88	313	151	162
my mortgage payment	113	401	244	157

Noun phrases: mortgage

NP	Wells freq	Wells normalized freq	other banks freq	difference
our house	119	423	266	157
a refinance	83	295	140	155
a deed	84	298	149	149
this property	99	352	204	148
my mortgage payments	95	337	205	132
this house	69	245	122	123
the homeowner	69	245	126	119
a mortgage payment	55	195	82	113
my realtor	63	224	112	112
the foreclosure process	61	217	112	105

Noun phrases: mortgage

NP	Wells freq	Wells normalized freq	other banks freq	difference
their home	45	160	61	99
my mortgage account	47	167	72	95
their homes	45	160	67	93
this home	59	210	117	93
monthly mortgage payment	48	170	81	89
the refinance	54	192	105	87
a property	58	206	125	81
the mortgage payment	41	146	65	81
a mortgage modification	41	146	67	79

Noun phrases: mortgage

NP	Wells freq	Wells normalized freq	other banks freq	difference
real estate agent	43	153	79	74
our mortgage payments	36	128	61	67
the principle	44	156	90	66
a mortgage loan	51	181	133	48
our mortgage payment	31	110	62	48
my mortgage loan	52	185	137	48
my property taxes	32	114	66	48
new home	48	170	132	38

Noun phrases: mortgage

NP	Wells freq	Wells normalized freq	other banks freq	difference
xxxx mortgage	123	437	400	37
a home equity loan	39	139	104	35
first mortgage	43	153	119	34
a house	85	302	270	32
this mortgage	45	160	129	31

Noun phrases: lending

NP	Wells freq	Wells normalized freq	other banks freq	difference
xxxx loans	76	270	101	169
xxxx loan	36	128	76	52
this loan	389	1382	760	622
these loans	55	195	88	107
the principal	79	281	187	94
the loans	91	323	154	169
the loan officer	78	277	214	63
the loan modification	107	380	172	208
the loan amount	42	149	78	71

Noun phrases: lending

NP	Wells freq	Wells normalized freq	other banks freq	difference
the loan	1636	5811	3719	2092
the lender	301	1069	568	501
the interest rate	112	398	342	56
the interest	182	646	510	136
the client	46	163	98	65
the borrower	181	643	372	271
principal balance	97	345	246	99
our loan	217	771	492	279
original loan	43	153	122	31
my student loans	34	121	63	58

Noun phrases: lending

NP	Wells freq	Wells normalized freq	other banks freq	difference
my mortgage loan	52	185	137	48
my loans	69	245	90	155
my loan modification	50	178	102	76
my loan	848	3012	1877	1135
my lender	62	220	157	63
my interest rate	72	256	212	44
my interest	31	110	80	30
my client	38	135	91	44
any interest	34	121	86	35
another lender	36	128	76	52

Noun phrases: lending

NP	Wells freq	Wells normalized freq	other banks freq	difference
an interest	40	142	102	40
a mortgage loan	51	181	133	48
a loan modification	598	2124	856	1268
a loan	367	1304	877	427
a lien	59	210	142	68
a home equity loan	39	139	104	35
a car loan	33	117	87	30
a borrower	37	131	69	62

Noun phrases: lending

NP	Wells freq	Wells normalized freq	other banks freq	difference
an interest	40	142	102	40
a mortgage loan	51	181	133	48
a loan modification	598	2124	856	1268
a loan	367	1304	877	427
a lien	59	210	142	68
a home equity loan	39	139	104	35
a car loan	33	117	87	30
a borrower	37	131	69	62

Noun phrases: legal

NP	Wells freq	Wells normalized freq	other banks freq	difference
my attorney	216	767	344	423
the court	160	568	321	247
an attorney	168	597	389	208
the attorney	112	398	222	176
the judge	70	249	136	113
the courts	57	202	101	101
our attorney	50	178	85	93
a lie	54	192	105	87
a lawyer	80	284	200	84
my lawyer	57	202	124	78

Noun phrases: legal

NP	Wells freq	Wells normalized freq	other banks freq	difference
legal department	49	174	96	78
the state	151	536	459	77
the taxes	63	224	149	75
real estate agent	43	153	79	74
my taxes	69	245	172	73
the government	63	224	158	66
legal fees	40	142	78	64
false information	64	227	171	56
my property taxes	32	114	66	48
federal government	43	153	106	47
a settlement	54	192	156	36
the irs	100	355	324	31

Noun phrases: accounts

NP	Wells freq	Wells normalized freq	other banks freq	difference
my checking account	172	611	465	146
my savings	131	465	327	138
the escrow	62	220	103	117
a savings account	58	206	96	110
the escrow account	53	188	89	99
my mortgage account	47	167	72	95

VPs: findings

- not too many significant concerns
- minimal indicators of wrongful behavior
- employees appear to advise more than in other banks
- some problems with payments

Verb phrases: assessment

VP	Wells freq	Wells normalized freq	other banks freq	difference
was not able	91	444	259	185
is unfair	42	205	156	49
is unacceptable	38	185	154	31
were not able	32	156	96	60
is incorrect	31	151	99	52

Verb phrases: employee behavior

NP	Wells freq	Wells normalized freq	other banks freq	difference
advised me	86	419	245	174
denied due	46	224	62	162
advised that i	41	200	114	86

Verb phrases: wrongful behavior

NP	Wells freq	Wells normalized freq	other banks freq	difference
made a mistake	44	214	121	93
did nothing	38	185	95	90
is fraud	35	171	101	70
is not true	33	161	102	59

Verb phrases: payment

NP	Wells freq	Wells normalized freq	other banks freq	difference
paid on time	45	219	102	117
made a payment	45	219	186	33

Future analysis

- single word frequency
- ngram frequency
- stratification by problem area and bank