

Array to Do It

To: Minion
From: Pointy Hair Boss (Aka Big Cheese)
CC: Big Cheese's 2nd In Command
Subject: Departed Sales People.

With the recent foolish departure of an Advisor team that held \$550MM in AUA can we expect some 'depletion' in the coming months. I am concerned that the impact will cause the Big Guy Up Top to question my bonus amount. If you could please determine the amounts that we may see over the coming months I can determine some good weasel words to prevent any damage!

As this will impact me directly please proceed with haste in deriving the answer.

Given

1. File of departed accounts with date and amount
2. File of Historical balances at month end.

Determine

Rate, by month of 'departed' amounts.

```
1
2 Options MAutoSource SASAUTOS=(SASAUTOS, 'G:\PCGFP\ANALYTICS\MainProcess\SASAUTOS');
3
4 %BaseVar ;
5
6 Run ;
7
8 %MACRO CCALDMTH ;
9   CDATE=INPUT(PUT(DSTAMP,8.),YYMMDD8.);
10  CALDKEY=((YEAR(CDATE)-1990)*12) + MONTH(CDATE);
11 %MEND CCALDMTH;
12
13 FileName DeparAdv  FTP ""FIPP.C.M.DEPARADV.PIABALN(0)""
14   User=""&TSOUser" Pass=""&TSOPass"
15   Host=""&TDMFURL" recfm=Fb lrecl=32
16   ;
17
18 Data DeparAdy (Keep=Account AUA DStamp LogonID CaldKey)
19   FormOne   (Keep=Start Label FmtName  Type)
20   ;
21   Infile DeparAdv ;
22   Input
23   @001 Account  $EbcDic6.
24   @008 RRCODE  $EbcDic4.
25   @012 DStamp  S370FPD5.
26   @017 AUA     S370FPD8.2
27   @025 LogonID $EbcDic7.
28   ;
29   %CCaldMth ;
30   Output DeparAdy ;
31   Start  =Account ;
32   Label  ='GetThis' ;
33   FmtName ='GetThis' ;
34   Type   ='J' ;
35   Output FormOne ;
36   Label  =RRCODE ;
37   FmtName ='GETRR ' ;
38   Output FormOne ;
39   Label  =LogonID ;
40   FmtName ='GetLog' ;
41   Output FormOne ;
42
```

NOTE: 220-TCPFTPD1 IBM FTP CS V1R13 at vipap999.tdbank.ca, 08:53:12 on 2014-10-22.

NOTE: User TEEDL has connected to FTP server on Host vipap999.tdbank.ca .

NOTE: The infile DEPARADV is:

Filename='FIPP.C.M.DEPARADV.PIABALN(0)',
Service Portno=21,Lrecl=32,Recfm=Fixed

NOTE: 44188 records were read from the infile DEPARADV.

NOTE: The data set WORK.DEPARADY has 44188 observations and 5 variables.

NOTE: The data set WORK.FORMONE has 132564 observations and 4 variables.

NOTE: DATA statement used (Total process time):

real time 1.37 seconds
cpu time 0.39 seconds

```
43 Proc Summary NWay data=DeparAdy ;  
44 Class Account ;  
45 Id CaldKey DStamp LogonId ;  
46 Var AUA ;  
47 Output Out=DeparAdx (Drop=_freq__type_) Sum= ;  
48  
49 Run ;
```

NOTE: There were 44188 observations read from the data set WORK.DEPARADY.

NOTE: The data set WORK.DEPARADX has 31672 observations and 5 variables.

NOTE: PROCEDURE SUMMARY used (Total process time):

real time 0.20 seconds
cpu time 0.10 seconds

```
50
51 Proc SQL ;
52 Create Table DepDates as
53 Select LogonId, Sum(AUA) as DeparAUA, Min(Dstamp) as DStamp From
54 DeparAdx Group by LogonId
55 ;
```

NOTE: Table WORK.DEPDATES created, with 152 rows and 3 columns.

```
56 Create Table HighDate as
57 Select Max(DStamp) as HighStamp From DepDates
58 ;
```

NOTE: Table WORK.HIGHDATE created, with 1 rows and 1 columns.

```
59 Create Table DepDateHigh as
60 Select t1.*, t2.* From
61 DepDates as t1, HighDate as t2
62 ;
```

NOTE: The execution of this query involves performing one or more Cartesian product joins that can not be optimized.

NOTE: Table WORK.DEPDATEHIGH created, with 152 rows and 4 columns.

```
63
NOTE: PROCEDURE SQL used (Total process time):
  real time      1.04 seconds
  cpu time       0.32 seconds
```

```
64 Data DepCald ;
65   Set DepDateHigh ;
66   %CCaldMth ;
67   DepartDay=CDate ;
68   DepCald =CaldKey ;
69   DStamp =HighStamp ;
70   %CCaldMth ;
71   HighCald =CaldKey ;
72   Drop Dstamp CDate CaldKey HighStamp ;
73   Format departDay YYMMDD10. ;
74
```

NOTE: There were 152 observations read from the data set WORK.DEPDATEHIGH.

NOTE: The data set WORK.DEPCALD has 152 observations and 5 variables.

NOTE: DATA statement used (Total process time):

```
real time    0.07 seconds
cpu time     0.03 seconds
```

```
75 Proc Sort Data=FormOne ;
76   by FMTName Start ;
77
```

NOTE: There were 132564 observations read from the data set WORK.FORMONE.

NOTE: The data set WORK.FORMONE has 132564 observations and 4 variables.

NOTE: PROCEDURE SORT used (Total process time):

```
real time    0.09 seconds
cpu time     0.07 seconds
```

```
78 Data FormOne ;
79   Set FormOne ;
80   By FmtName Start ;
81   If First.Start ;
82
```

NOTE: There were 132564 observations read from the data set WORK.FORMONE.

NOTE: The data set WORK.FORMONE has 95016 observations and 4 variables.

NOTE: DATA statement used (Total process time):

```
real time    0.06 seconds
cpu time     0.03 seconds
```

```
83 Proc Format CNTLIN=FormOne ;
NOTE: Informat $GETRR has been output.
NOTE: Informat $GETLOG has been output.
NOTE: Informat $GETTHIS has been output.
84
85 FileName BALNacct FTP "'FIPP.C.M.DASNEw.AcctFile.LifeDate(0)'"
86 User="&TSOUser" Pass="&TSOPass"
87 Host="&TDMFURL" recfm=vb lrecl=128 S370V
88 rcmd='Site RDW'
89 ;
90
```

NOTE: There were 95016 observations read from the data set WORK.FORMONE.

NOTE: PROCEDURE FORMAT used (Total process time):

```
real time    0.76 seconds
cpu time     0.56 seconds
```

```
91 Data AllBaln (Keep=LogonId Account AUA CaldKey)
92 ;
93 Infile BalnAcct ;
94 Input
95 @007 Account $EbcDic6.
96 @;
97 GetThis =InPut(Account,$GetThis.);
98 If GetThis eq 'GetThis' ;
99 Input
100 @002 DStamp S370FPD5.
101 @033 AUA S370FPD8.2
102 ;
103 %CCaldMth ;
104 LogonId =Input(Account,$GetLog.) ;
105
106 Run ;
```

NOTE: 220-TCPFTPDP1 IBM FTP CS V1R13 at vipap999.tdbank.ca, 08:53:16 on 2014-10-22.

NOTE: User TEEDL has connected to FTP server on Host vipap999.tdbank.ca .

NOTE: The infile BALNACCT is:

```
Filename='FIPP.C.M.DASNEw.AcctFile.LifeDate(0)',
Pathname= "'RPAU.'" is working directory,
```

NOTE: 244255033 records were read from the infile BALNACCT.

The minimum record length was 40.

The maximum record length was 40.

NOTE: The data set WORK.ALLBALN has 3018334 observations and 4 variables.

NOTE: DATA statement used (Total process time):

```
real time    15:49.22
cpu time     7:46.94
```



```
107
108 Proc Summary NWay data=AllBaln ;
109 Class Account CaldKey ;
110 Var AUA ;
111 ID LogonId ;
112 Output Out=SumBaln (Drop=_freq__type_) sum= ;
113
```

NOTE: There were 3018334 observations read from the data set WORK.ALLBALN.

NOTE: The data set WORK.SUMBALN has 2282243 observations and 4 variables.

NOTE: PROCEDURE SUMMARY used (Total process time):

```
real time    2.43 seconds
cpu time     3.52 seconds
```

```
114 Proc SQL ;
115 Create Table BalnFromDep as
116 Select t1.*, t2.depcald as gonecald, t2.HighCald,
117 Min(t2.HighCald-t2.DepCald,36) as MaxHist,
118 t1.CaldKey-t2.depcald as MthsGone from
119 SumBaln as t1 join DepCald as t2 on
120 t1.LogonID=t2.LogonId
121 Where t1.CaldKey gt T2.depcald and t1.AUA ne 0
122 Having MthsGone lt 37
123 Order t1.LogonID, t1.Account, t1.CaldKey
124 ;
```

NOTE: Table WORK.BALNFROMDEP created, with 284508 rows and 8 columns.

```
125 Create Table DeparAdv as
126 Select t1.*, Min(t2.HighCald-t2.DepCald,36) as MaxHist
127 From DeparAdx as t1 Left Join DepCald as t2 on
128 t1.LogonId=t2.LogOnid
129 ;
```

NOTE: Table WORK.DEPARADV created, with 31672 rows and 6 columns.

```
130
NOTE: PROCEDURE SQL used (Total process time):
real time    0.81 seconds
cpu time     0.85 seconds
```

```
131 Data BalnOver ;
132 Set BalnFromDep ;
133 By LogonId Account ;
134 Array BalnOut {*} MeBaln1-MeBaln36 ;
135 Retain MeBaln1-MeBaln36 ;
136 BalnOut{MthsGone} =AUA ;
137 If last.Account Then Do ;
138     Output BalnOver ;
139     Do I=1 to 36 ;
140         BalnOut{i} =. ;
141     End ;
142 End ;
143 Drop I ;
144
145 Run ;
```

NOTE: There were 284508 observations read from the data set WORK.BALNFROMDEP.

NOTE: The data set WORK.BALNOVER has 25699 observations and 44 variables.

NOTE: DATA statement used (Total process time):

real time	0.07 seconds
cpu time	0.06 seconds

```
146
147 Proc SQL ;
148 Create Table BalnHist as
149 Select t1.DStamp as GoneDate, t1.AUA as AUAOnDep, t1.MaxHist as HighHist,
150 t1.LogonId as HostId, t1.Account As AcctNumb,
151 t2.* From BalnOver as T2 Right Join DeparAdv as t1 on
152 t1.Account=t2.Account
153 Order HostId, AcctNumb
154 ;
```

NOTE: Table WORK.BALNHIST created, with 31672 rows and 49 columns.

155

NOTE: PROCEDURE SQL used (Total process time):

real time	0.09 seconds
cpu time	0.12 seconds

```

156 Data BalnGone ;
157 Set BalnHist ;
158 Array BalnOut {*} MeBaln1-MeBaln36 ;
159 Array BalnGone {*} Gonzo1-Gonzo36 ;
160 Array BalnLeft {*} BalnBase1-BalnBase36 ;
161 If AcctNumb eq " Then do ;
162     Do i=1 to HighHist ;
163         BalnGone{i} =AUAOnDep ;
164         BalnLeft{i} =AUAOnDep ;
165     End ;
166 End ;
167 Else Do ;
168     Do l=1 to highHist ;
169         BalnGone{l} =0 ;
170         BalnLeft{l} =AUAOnDep ;
171         If BalnOut{l} lt 500 Then BalnGone{l} =AUAOnDep ;
172         If BalnOut{l} eq . Then BalnGone{l} =AUAOnDep ;
173     End ;
174 End ;
175 Drop MeBaln1-MeBaln36 ;
176 Run ;

```

NOTE: There were 31672 observations read from the data set WORK.BALNHIST.

NOTE: The data set WORK.BALNGONE has 31672 observations and 86 variables.

NOTE: DATA statement used (Total process time):

```

real time    0.07 seconds
cpu time     0.07 seconds

```

```

177
178 Proc Summary Data=BalnGone ;
179 Class HostID HighHist ;
180 Var AUAOnDep Gonzo1-Gonzo36 BalnBase1-balnBase36 ;
181 Id GoneDate ;
182 Output Out=SumGone (Drop=_freq_) Sum= ;
183
184 Run ;

```

NOTE: There were 31672 observations read from the data set WORK.BALNGONE.

NOTE: The data set WORK.SUMGONE has 340 observations and 77 variables.

NOTE: PROCEDURE SUMMARY used (Total process time):

```

real time    0.06 seconds
cpu time     0.07 seconds

```

```
185
186 Data Consol1 ;
187 Set SumGone ;
188 Select (_type_) ;
189   When (0) Do ;
190     RType  ='Consolidated' ;
191     HostID  ='_Consol_' ;
192   End ;
193   When (1) Do ;
194     RType  ='Mths_History' ;
195     HostId  ='_MthHist' ;
196   End ;
197   When (2) Do ;
198     Delete ;
199   end ;
200   when (3) Do ;
201     RType  ='Advisor' ;
202   End ;
203 End ;
204 Drop _Type_ ;
205
206 Run ;
```

NOTE: There were 340 observations read from the data set WORK.SUMGONE.

NOTE: The data set WORK.CONSOLE1 has 188 observations and 77 variables.

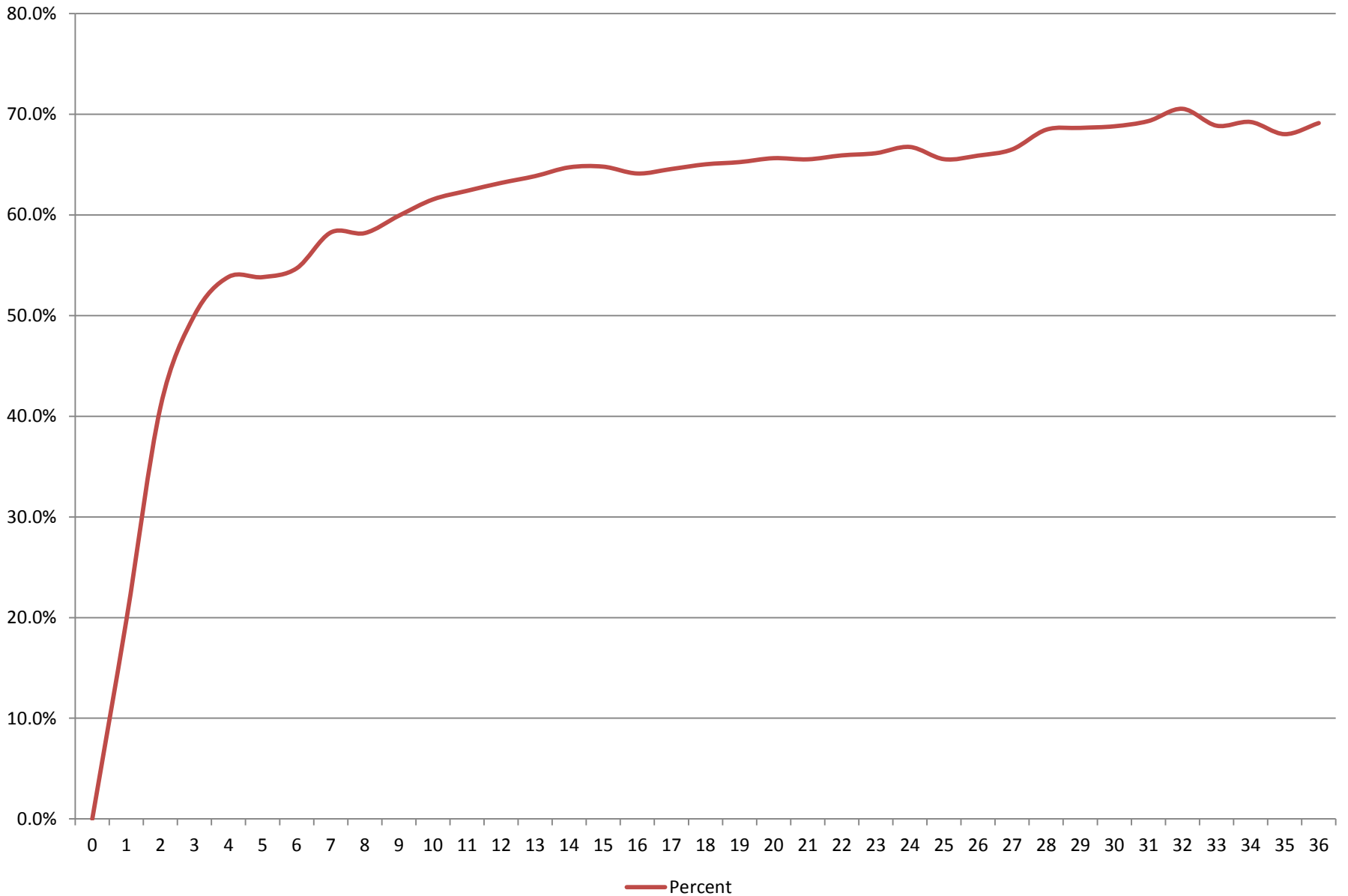
NOTE: DATA statement used (Total process time):

```
   real time    0.00 seconds
   cpu time     0.00 seconds
```

Month	Percent		Gonzo	Base
			\$ -	\$ 9,326,652,451.18
0	0.0%			
1	19.7%		\$ 1,692,670,245.90	\$ 8,578,870,907.01
2	40.9%		\$ 3,506,111,035.65	\$ 8,574,609,934.85
3	50.0%		\$ 4,257,097,711.92	\$ 8,507,775,564.73
4	53.8%		\$ 4,509,314,617.21	\$ 8,375,915,394.26
5	53.8%		\$ 4,050,570,751.63	\$ 7,526,966,094.42
6	54.7%		\$ 3,940,654,136.24	\$ 7,205,143,877.45
7	58.2%		\$ 3,961,828,459.95	\$ 6,801,512,112.19
8	58.2%		\$ 3,657,170,608.74	\$ 6,284,854,258.91
9	59.9%		\$ 3,591,644,083.51	\$ 5,994,204,118.07
10	61.5%		\$ 3,642,746,051.19	\$ 5,919,804,944.22
11	62.4%		\$ 3,551,842,420.89	\$ 5,693,200,440.22
12	63.2%		\$ 3,531,342,013.82	\$ 5,589,951,683.57
13	63.8%		\$ 3,394,556,123.37	\$ 5,316,489,484.11
14	64.7%		\$ 3,422,431,930.67	\$ 5,288,032,671.87
15	64.8%		\$ 3,326,455,947.22	\$ 5,134,351,762.39
16	64.1%		\$ 3,014,289,856.97	\$ 4,701,798,472.69
17	64.6%		\$ 3,021,201,335.84	\$ 4,679,940,712.31
18	65.0%		\$ 3,042,874,758.59	\$ 4,679,931,008.35
19	65.2%		\$ 2,994,715,610.36	\$ 4,590,287,289.57
20	65.6%		\$ 3,010,201,188.16	\$ 4,586,635,984.77
21	65.5%		\$ 2,741,504,029.35	\$ 4,184,460,176.22
22	65.9%		\$ 2,757,844,919.33	\$ 4,184,460,176.22
23	66.1%		\$ 2,763,701,678.82	\$ 4,179,524,761.78
24	66.7%		\$ 2,691,186,789.19	\$ 4,032,052,218.47
25	65.5%		\$ 2,462,435,255.75	\$ 3,757,591,611.71
26	65.9%		\$ 2,361,584,186.44	\$ 3,584,319,600.39
27	66.5%		\$ 2,174,003,396.65	\$ 3,269,094,222.38
28	68.5%		\$ 2,184,092,389.07	\$ 3,190,385,834.30
29	68.6%		\$ 2,182,674,310.19	\$ 3,179,985,955.33
30	68.8%		\$ 2,180,257,460.25	\$ 3,169,136,102.87
31	69.3%		\$ 2,105,961,892.04	\$ 3,038,221,163.60
32	70.5%		\$ 2,043,375,315.96	\$ 2,896,981,295.59
33	68.9%		\$ 1,435,394,319.62	\$ 2,084,546,083.11
34	69.2%		\$ 1,443,035,528.50	\$ 2,084,546,083.11
35	68.0%		\$ 1,192,073,102.06	\$ 1,752,607,759.39
36	69.1%		\$ 1,144,891,079.28	\$ 1,656,449,040.86

	HighHist	GoneDate	AUAOnDep	Gonzo1	Gonzo2	Gonzo3	Gonzo4
		20140917	\$ 9,326,652,451.18	\$ 1,692,670,245.90	\$ 3,506,111,035.65	\$ 4,257,097,711.92	\$ 4,509,314,617.21
_MthHis	0	20140917	\$ 747,781,544.17
_MthHis	1	20140821	\$ 4,260,972.16	\$ 0.89	.	.	.
_MthHis	2	20140730	\$ 66,834,370.12	\$ 1,737,655.38	\$ 2,937,335.33	.	.
_MthHis	3	20140629	\$ 131,860,170.47	\$ 25,863,704.51	\$ 40,330,232.31	\$ 47,270,027.14	.
_MthHis	4	20140522	\$ 848,949,299.84	\$ 186,177,242.16	\$ 537,764,373.64	\$ 629,764,249.72	\$ 655,387,119.80
_MthHis	5	20140428	\$ 321,822,216.97	\$ 67,824,076.11	\$ 95,798,915.22	\$ 205,017,229.02	\$ 212,016,175.63
_MthHis	6	20140331	\$ 403,631,765.26	\$ 31,983,835.96	\$ 53,080,014.85	\$ 59,908,756.12	\$ 66,196,985.22
_MthHis	7	20140225	\$ 516,657,853.28	\$ 127,284,287.80	\$ 246,725,105.21	\$ 314,449,978.62	\$ 332,406,181.09
_MthHis	8	20140123	\$ 290,650,140.84	\$ 45,363,071.00	\$ 74,069,596.67	\$ 87,633,165.25	\$ 95,601,397.27
_MthHis	9	20131230	\$ 74,399,173.85	\$ 5,519,863.52	\$ 7,776,668.48	\$ 18,822,765.07	\$ 19,920,893.93
_MthHis	10	20131117	\$ 226,604,504.00	\$ 46,319,778.96	\$ 84,102,274.21	\$ 98,375,379.22	\$ 105,193,423.94
_MthHis	11	20131031	\$ 103,248,756.65	\$ 7,819,952.83	\$ 17,796,930.30	\$ 24,202,043.71	\$ 27,402,498.64
_MthHis	12	20130919	\$ 273,462,199.46	\$ 120,387,757.93	\$ 152,895,135.26	\$ 162,140,290.32	\$ 172,079,276.71
_MthHis	13	20130830	\$ 28,456,812.24	\$ 964,118.55	\$ 918,604.93	\$ 2,885,494.89	\$ 3,857,889.71
_MthHis	14	20130725	\$ 153,680,909.48	\$ 69,765,410.15	\$ 77,420,210.32	\$ 87,360,222.09	\$ 88,681,822.91
_MthHis	15	20130623	\$ 432,553,289.70	\$ 103,881,796.68	\$ 201,746,079.09	\$ 242,395,755.30	\$ 273,691,849.05
_MthHis	16	20130506	\$ 21,857,760.38	\$ 254,319.47	\$ 475,465.42	\$ 497,788.91	\$ 505,766.70
_MthHis	17	20130403	\$ 9,703.96	\$ -	\$ -	\$ -	\$ -
_MthHis	18	20130325	\$ 89,643,718.78	\$ 25,322,335.47	\$ 44,531,365.60	\$ 55,379,628.16	\$ 61,592,699.56
_MthHis	19	20130203	\$ 3,651,304.80	\$ 90,076.33	\$ 90,076.33	\$ 384,796.06	\$ 829,720.35
_MthHis	20	20130131	\$ 402,175,808.55	\$ 80,688,158.45	\$ 149,392,715.96	\$ 196,886,451.20	\$ 209,589,308.37
_MthHis	22	20121118	\$ 4,935,414.44	\$ 28,207.37	\$ 43,406.99	\$ 309,035.48	\$ 376,530.69
_MthHis	23	20121031	\$ 147,472,543.31	\$ 25,605,394.47	\$ 47,532,412.56	\$ 60,778,916.45	\$ 69,492,527.44
_MthHis	24	20120909	\$ 274,460,606.76	\$ 6,989,027.08	\$ 241,490,322.13	\$ 243,843,107.01	\$ 244,316,043.55
_MthHis	25	20120821	\$ 173,272,011.32	\$ 48,151,942.39	\$ 80,146,697.94	\$ 93,067,961.78	\$ 99,062,739.13
_MthHis	26	20120724	\$ 315,225,378.01	\$ 64,590,813.87	\$ 116,246,261.97	\$ 138,028,834.93	\$ 173,360,874.54
_MthHis	27	20120617	\$ 78,708,388.08	\$ 1,701,931.53	\$ 3,039,052.06	\$ 3,480,103.11	\$ 3,858,113.12
_MthHis	28	20120517	\$ 10,399,878.97	\$ 920,363.39	\$ 1,682,551.10	\$ 2,506,521.17	\$ 2,506,521.17
_MthHis	29	20120418	\$ 10,849,852.46	\$ 1,351,760.36	\$ 2,636,540.89	\$ 4,329,963.54	\$ 4,329,963.54
_MthHis	30	20120325	\$ 130,914,939.27	\$ 11,932,997.62	\$ 21,900,579.13	\$ 31,521,772.44	\$ 37,228,814.41
_MthHis	31	20120220	\$ 141,239,868.01	\$ 24,251,736.75	\$ 26,980,351.15	\$ 34,097,612.41	\$ 36,474,767.76
_MthHis	32	20120131	\$ 812,435,212.48	\$ 90,717,720.28	\$ 289,195,344.96	\$ 385,335,326.39	\$ 429,494,831.32
_MthHis	34	20111127	\$ 331,938,323.72	\$ 64,946,286.21	\$ 147,326,692.00	\$ 190,382,268.33	\$ 205,662,454.91
_MthHis	35	20111031	\$ 96,158,718.53	\$ 24,116,446.10	\$ 35,231,133.71	\$ 41,362,417.81	\$ 43,350,458.79
_MthHis	36	20110928	\$ 1,656,449,040.86	\$ 380,118,176.33	\$ 704,800,589.93	\$ 794,679,850.27	\$ 834,846,967.96

Percent of Original Book Departed



To: Big Cheese
 CC: Big Cheese's 2nd In Command
 Subject: Departed Sales People.

With the recent departure of an Advisor team that held \$550MM in AUA we can expect some 'depletion' in the coming months. To predict that depletion I went back and reviewed the departure 'results' for the last 3 years and summed up the information. The resulting graph is pasted below. The left side of the graph shows the amount of the original book from departed Advisors that has 'Departed' (The client no longer has a balance in the account). The bottom portion is the length of time from Advisor departure. As can be seen, the depletion occurs fairly rapidly, and then appears to settle down around the 70% mark. With the recent team departure, and past historical depletion rates we would predict the amounts noted below. So far we have seen \$85MM go in the Sept-Oct period. Sadly, I suspect that this team may be a higher performing team with respect to the capacity to take clients away, and I would tend to increase the depletion rate by about 15%. This would show that we should expect about \$125MM in depletion by October. And then a further \$210MM by end of Q1.

Month	Predicted	Enhanced
Sept-Oct	\$ 106,940,328.54	\$ 122,981,377.82
November	\$ 114,680,502.70	\$ 131,882,578.11
December	\$ 49,583,661.91	\$ 57,021,211.20
January	\$ 20,590,302.70	\$ 23,678,848.11
	\$ 291,794,795.85	\$ 335,564,015.23