Bank Account Withdrawals

Nassim Nicholas Taleb ✓
@nntaleb

QUIZ (Statistical sleuthing)
We know that
+1% of accts in #Lebanon own 50% of total, $170 bil
+accts <$200K represent $20 bil in total
(rough numbers)
Assume Pareto distr.

How many accounts have > 200K, 1 mil, 10 mil ?

What's the weekly drain from 1000$ withdrawal per acct?

8:09 AM · Nov 18, 2019

```
In[•]:= Solve[(q^((α-1)/α) /. q → .2) == .8, α]
```

Solve: Inverse functions are being used by Solve, so some solutions may not be found; use Reduce for complete solution information.

```
Out[•]=
{{α → 1.16096}}
```

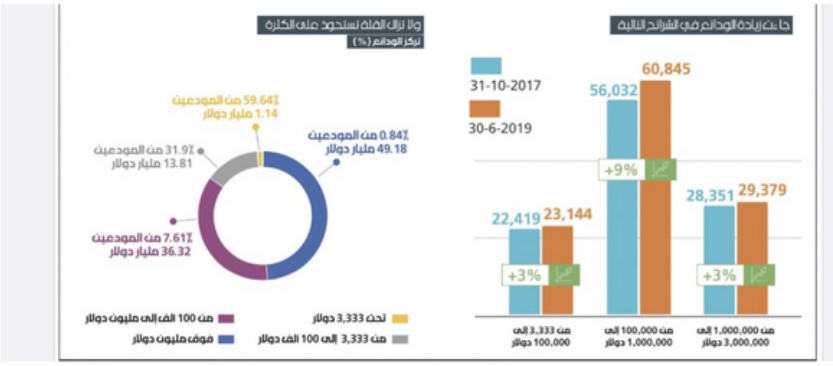
```
In[•]:= TableForm[Table[{100 q, (1 - q^((α-1)/α) /. α → 1.16096), 170 (1 - q^((α-1)/α) /. α → 1.16096), "?", "?"},
  {q, {0.000001, 0.005, 0.1, 0.2, 0.405, 0.99}}],
 TableHeadings → {None, {"Perc", "Share of Total",
    "Cumulative Deposits", "Deposit Size", "Number of Accounts"}}]
```

```
Out[•]//TableForm=
```

Perc	Share of Total	Cumulative Deposits	Deposit Size	Number of Accounts
0.0001	0.852722	144.963	?	?
0.5	0.520293	88.4498	?	?
10.	0.273298	46.4607	?	?
20.	0.199996	33.9993	?	?
40.5	0.117782	20.0229	?	?
99.	0.00139245	0.236716	?	?

Determine Tail Exponent

New Data



.84 % of depositors have $49.18 B, over 1 mil
59.64% have $1.14 B, accounts under $3,333
7.61% have $36.32, betw 100K and 1 Mil
31.9% have $13.81, betw $3,333 and 100K

```
W = {.0084, .0761, .3191, .5964};
Wc = Accumulate[W]
X = {49 180, 36 320 , 13 810, 1140};
Y = X / Total[ X] // N
Yc = Accumulate[Y]
{Total[W], Total[Y]}
```

Finding the α exponent
It allows us to interpolate between 1 million and 3.3K

```
Table[Solve[(q^((α-1)/α) /. q → Wc[[i]]) == Yc[[i]], α], {i, 1, 3}]
```

```
{{{α → 1.17567}}, {{α → 1.06976}}, {{α → 1.01274}}}
```

W represent each bracket.

In[•]:=
```
W = {.0084, .0761, .3191, .5964};
Wc = Accumulate[W]
```

Out[•]=
```
{0.0084, 0.0845, 0.4036, 1.}
```

In[•]:=
```
X = {49 180, 36 320, 13 810, 1140};
```

In[•]:=
```
Y = X / Total[X] // N
```

Out[•]=
```
{0.489597, 0.361573, 0.137481, 0.0113489}
```

In[•]:=
```
Yc = Accumulate[Y]
```

Out[•]=
```
{0.489597, 0.85117, 0.988651, 1.}
```

In[•]:=
```
{Total[W], Total[Y]}
```

Out[•]=
```
{1., 1.}
```

In[•]:=
```
Table[Solve[(q^((α-1)/α) /. q → Wc[[i]]) == Yc[[i]], α], {i, 1, 3}]
```

Solve: Inverse functions are being used by Solve, so some solutions may not be found; use Reduce for complete solution information.

Solve: Inverse functions are being used by Solve, so some solutions may not be found; use Reduce for complete solution information.

Solve: Inverse functions are being used by Solve, so some solutions may not be found; use Reduce for complete solution information.

General: Further output of Solve::ifun will be suppressed during this calculation.

Out[•]=
```
{{{α → 1.17567}}, {{α → 1.06976}}, {{α → 1.01274}}}
```