Alphacution Tutorial:

Measuring Return on Technology

Presented by:
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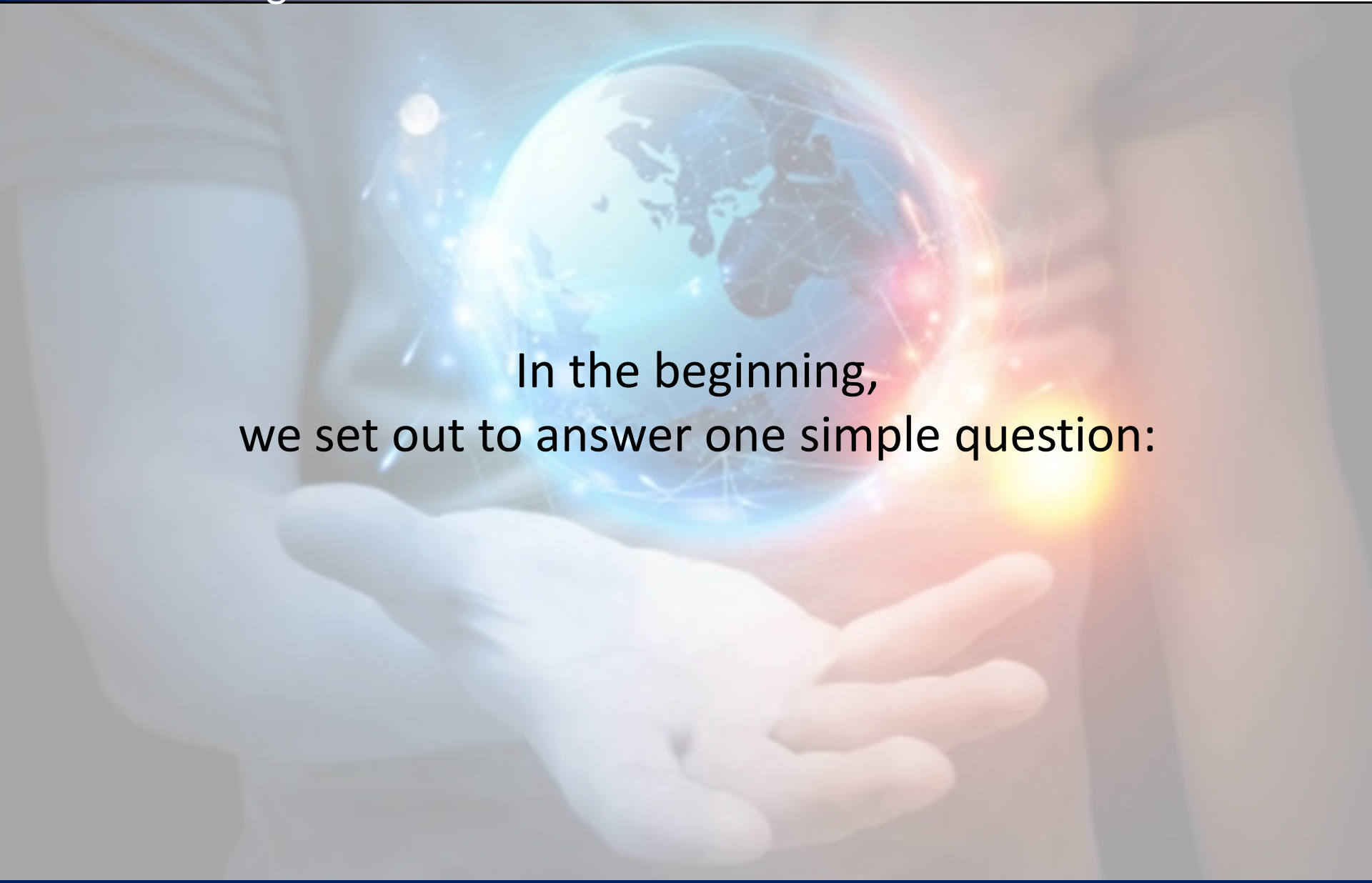
In the beginning,
we set out to answer one simple question:

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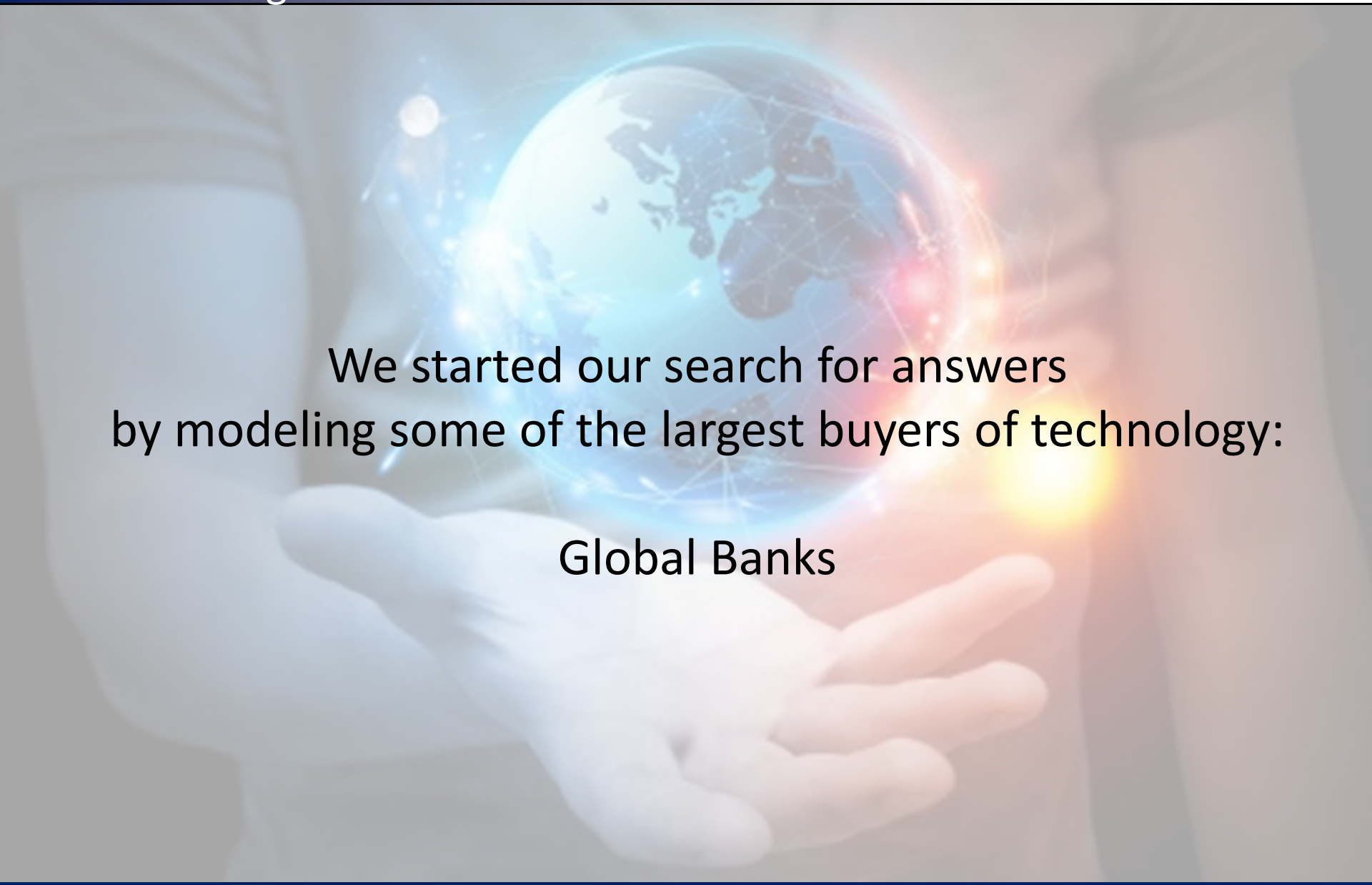
What do members of the financial services industry ecosystem spend on technology*?

* where *total cost of ownership* (TCO) = hardware + software + IT human capital



We started our search for answers
by modeling some of the largest buyers of technology:

Global Banks

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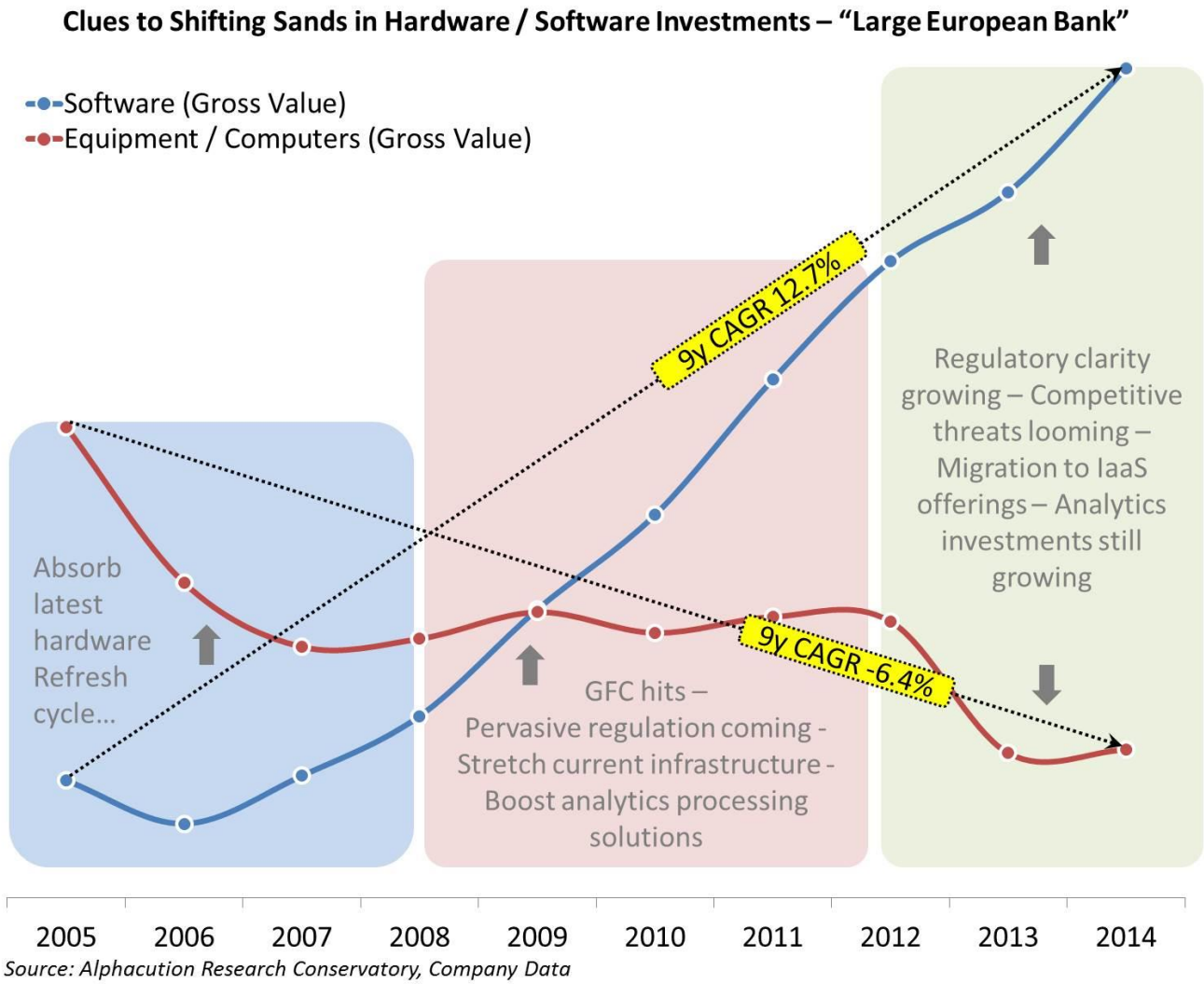
Alphacution harvested financial, operational data from public sources* with emphasis on expenses, investments associated with hardware, software, and IT-related human capital…

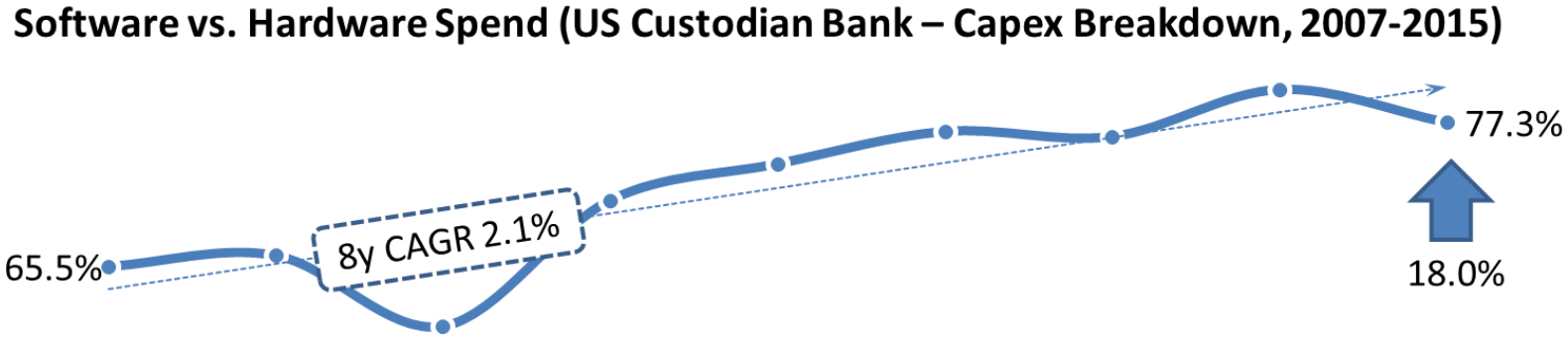
* Sources include, annual reports and regulatory filings (i.e. - SEC forms 10-K, 10-Q and 20-F).

This exercise produced tons of new insights and clues…

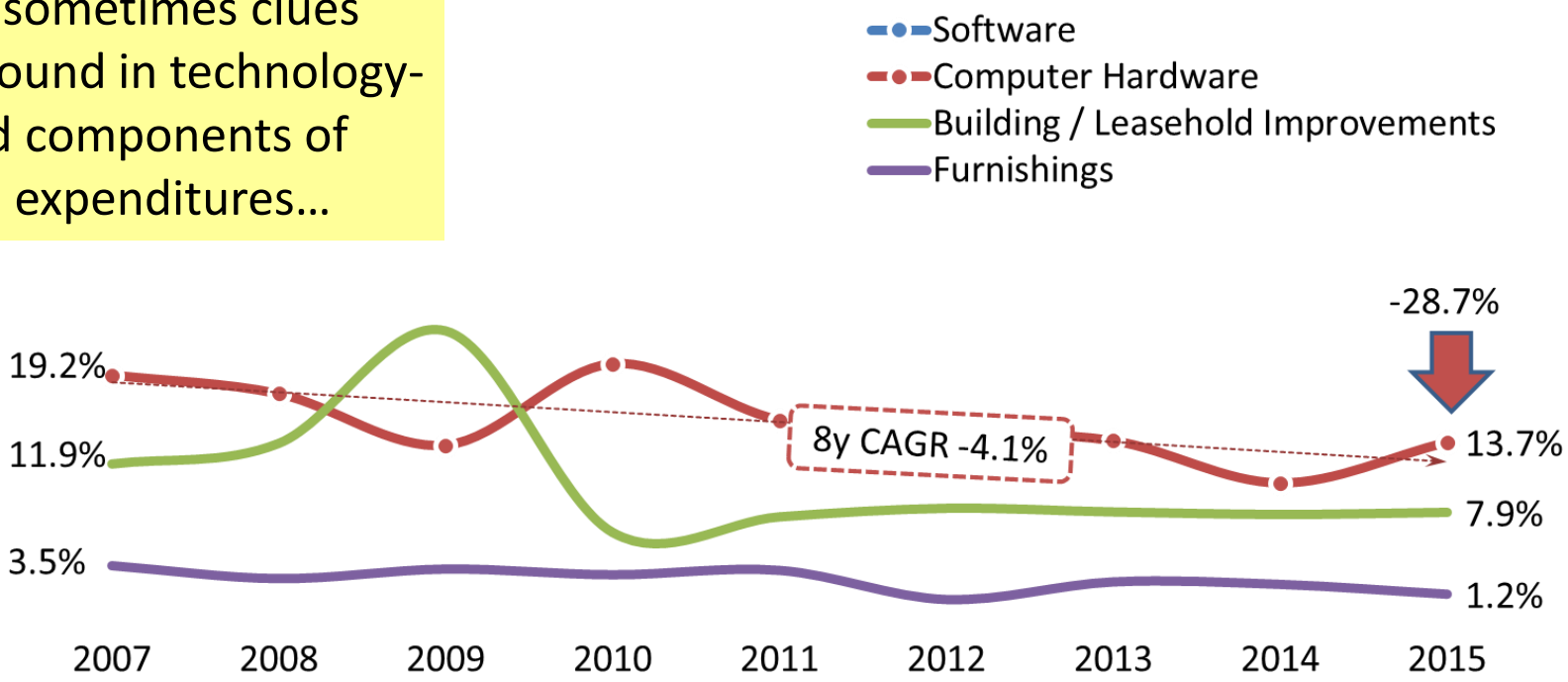
Sometimes, we found clues in balance sheets, like the change in value of computer systems and software…



Source: Alphacution Research Conservatory, Company Data

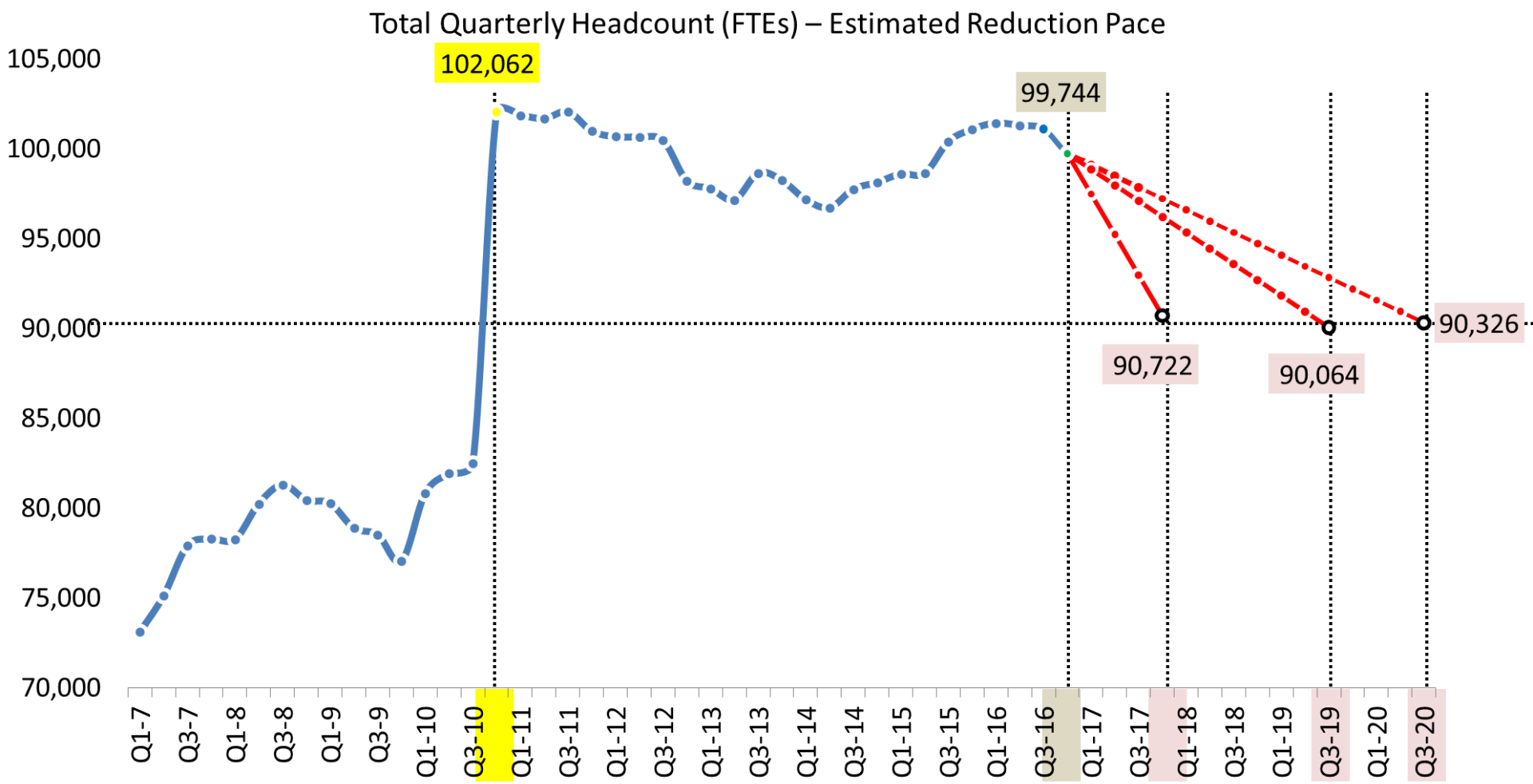


…and, sometimes clues were found in technology-related components of capital expenditures…



Source: Alphacution Research Conservatory, Company Data

Sometimes clues were found in the trajectory of total headcount, which has presented early opportunities for *predictive analytics*…



Source: Alphacution, Deutsche Bank

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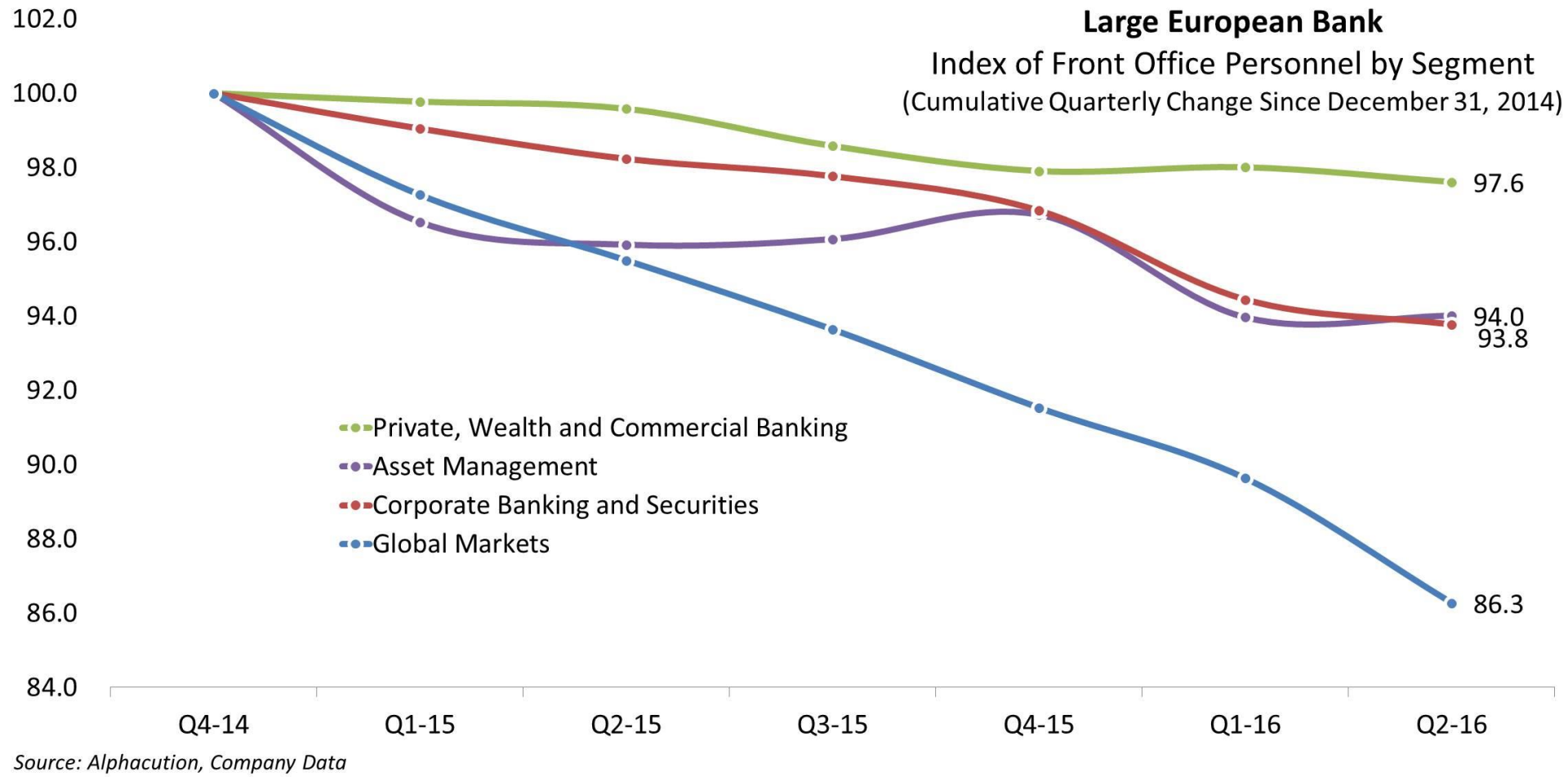
And, sometimes – when looking at data over several years or quarters - fascinating clues were found in detailed changes in front-office headcount….



Source: Alphacution, Company Data

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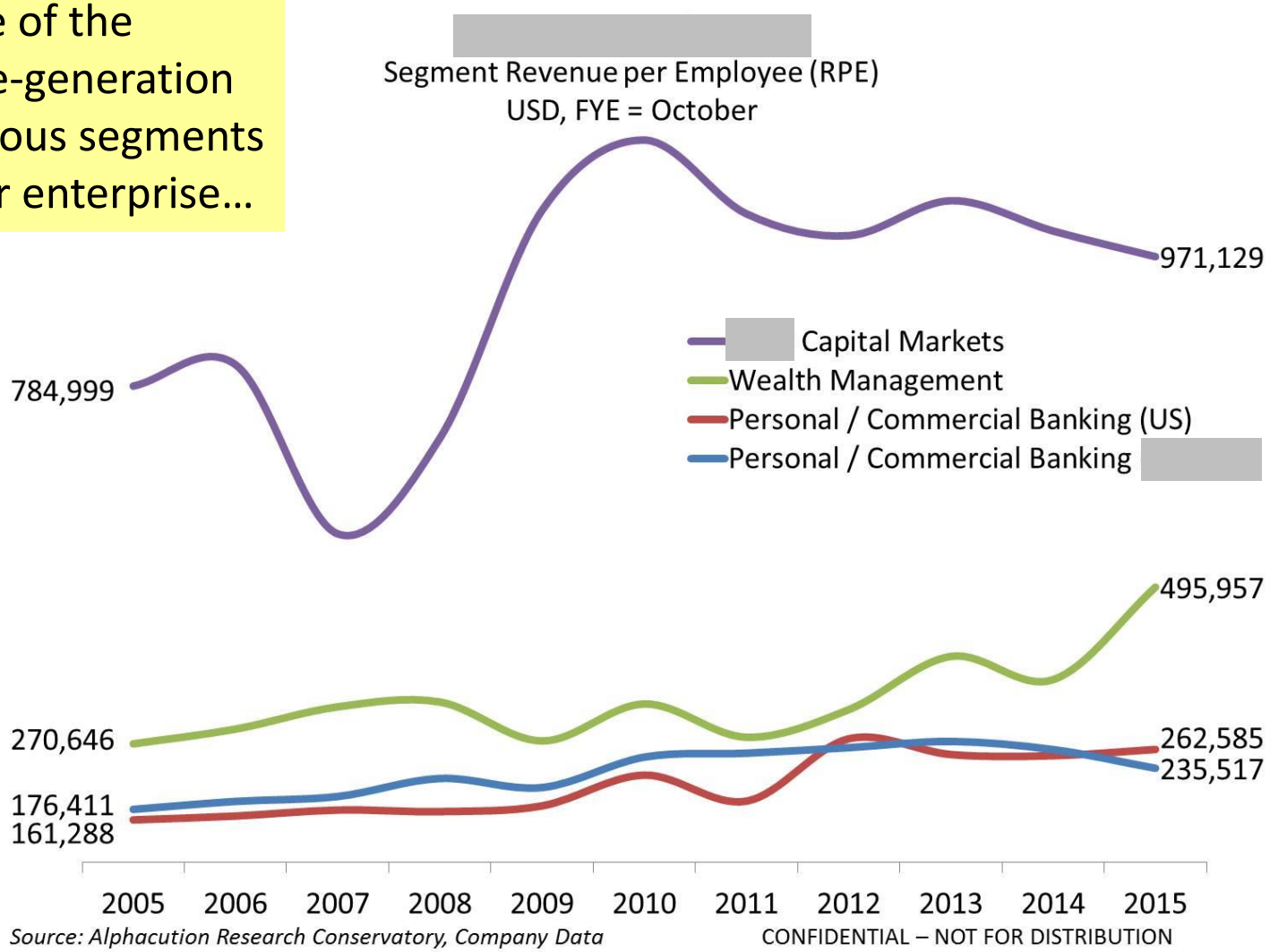
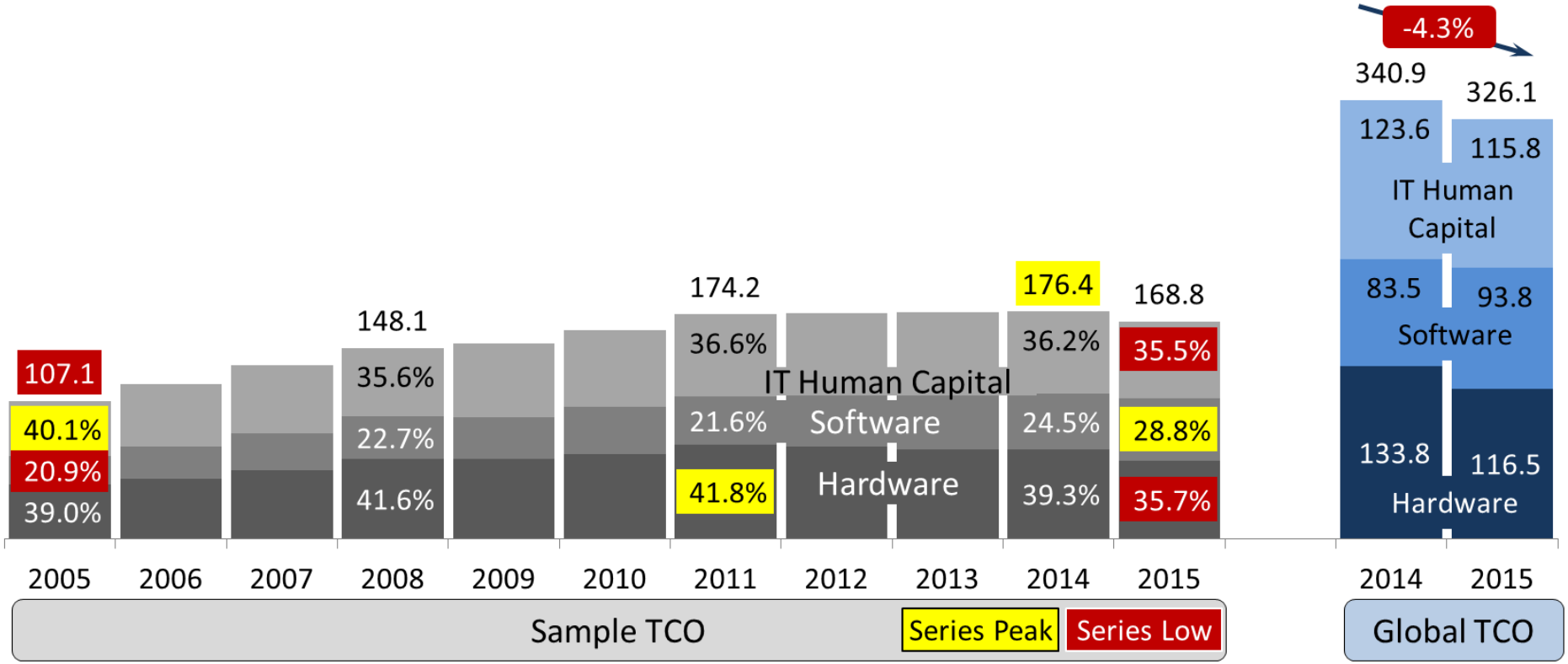
In some cases, we were able to achieve a good sense of the difference in revenue-generation potential among various segments within a single, larger enterprise…



Source: Alphacution Research Conservatory, Company Data

All told, Alphacution was able to achieve a credible read on the size of the technology spending "pie" for the global banking sector…

Sample, Global Bank Enterprise TCO by Framework Components (2005-2015, USD billions)



Source: Alphacution Research Conservatory, USBankLocations.com, Company Data

As a significant bonus from this process, we stumbled upon our first notable discovery: The concept of ***return on technology***

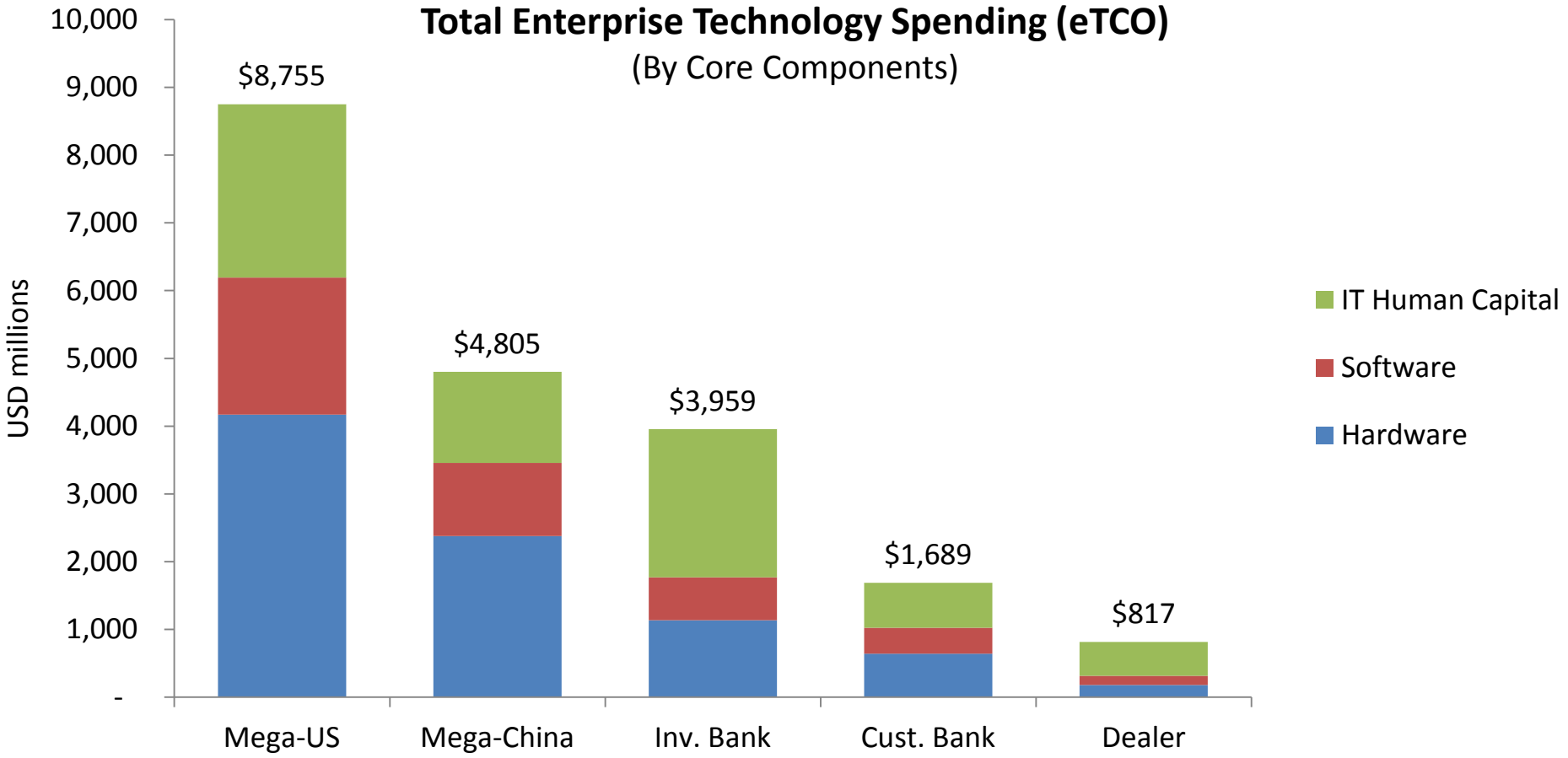
Key Discovery #1: Return on Technology (RoT)

- It turns out that it really doesn't matter what a firm *spends* on technology; what actually matters most is what a firm *receives* for its investment in technology.

- The return on technology (RoT) concept is quantifiable by normalizing the difference between performance (i.e., total net revenue) and the component cost of that performance (i.e., total technology spending).

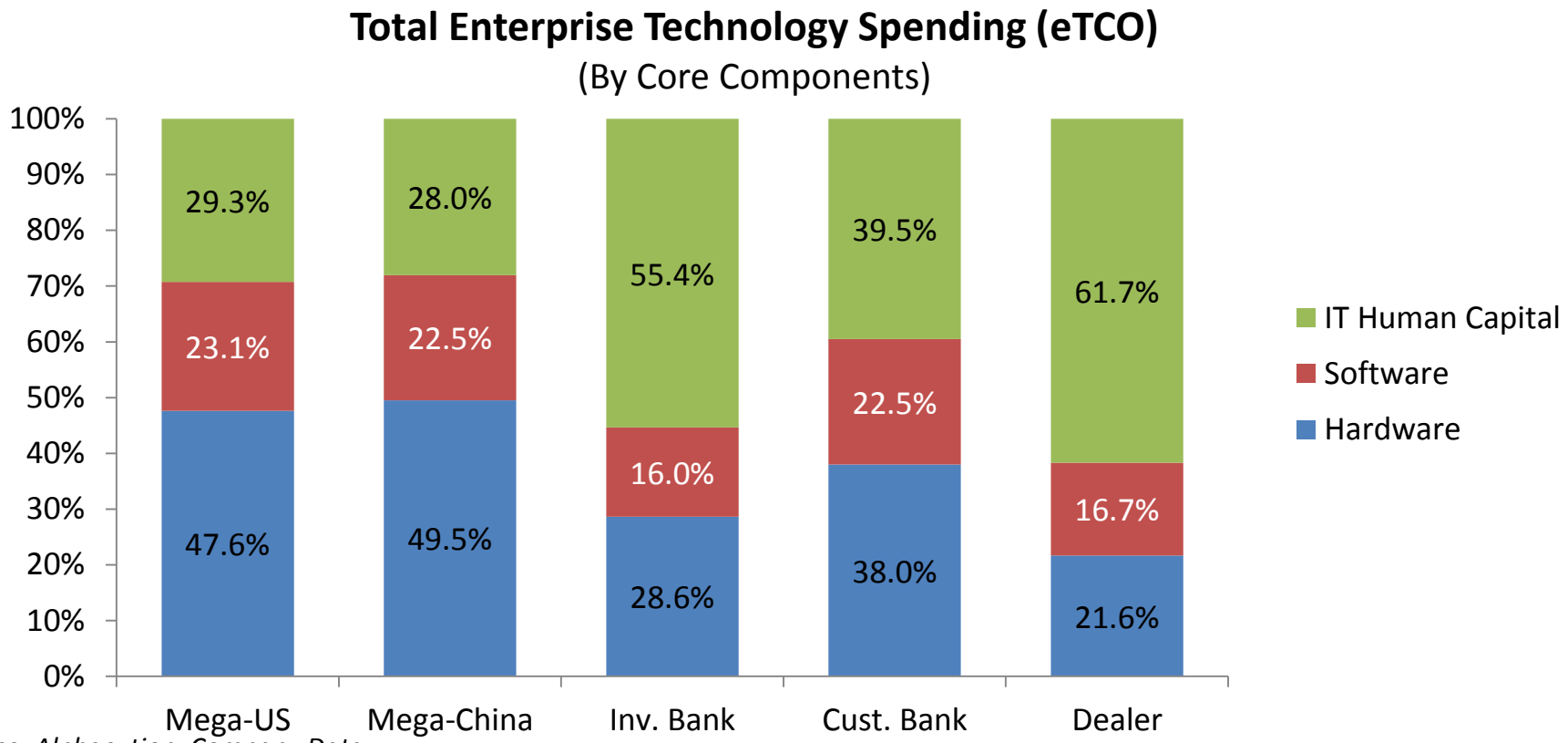
The following describes how Alphacution benchmarks RoT and then ranks the RoT of constituent companies against that benchmark:

We start with a subset of our broader market-sizing dataset for global banks, and then return to the initial question "What do firms spend on technology?" For purposes of this tutorial, we then generate a chart like this (below) to showcase the different types of firms in the broader sample:



Source: Alphacution, Company Data

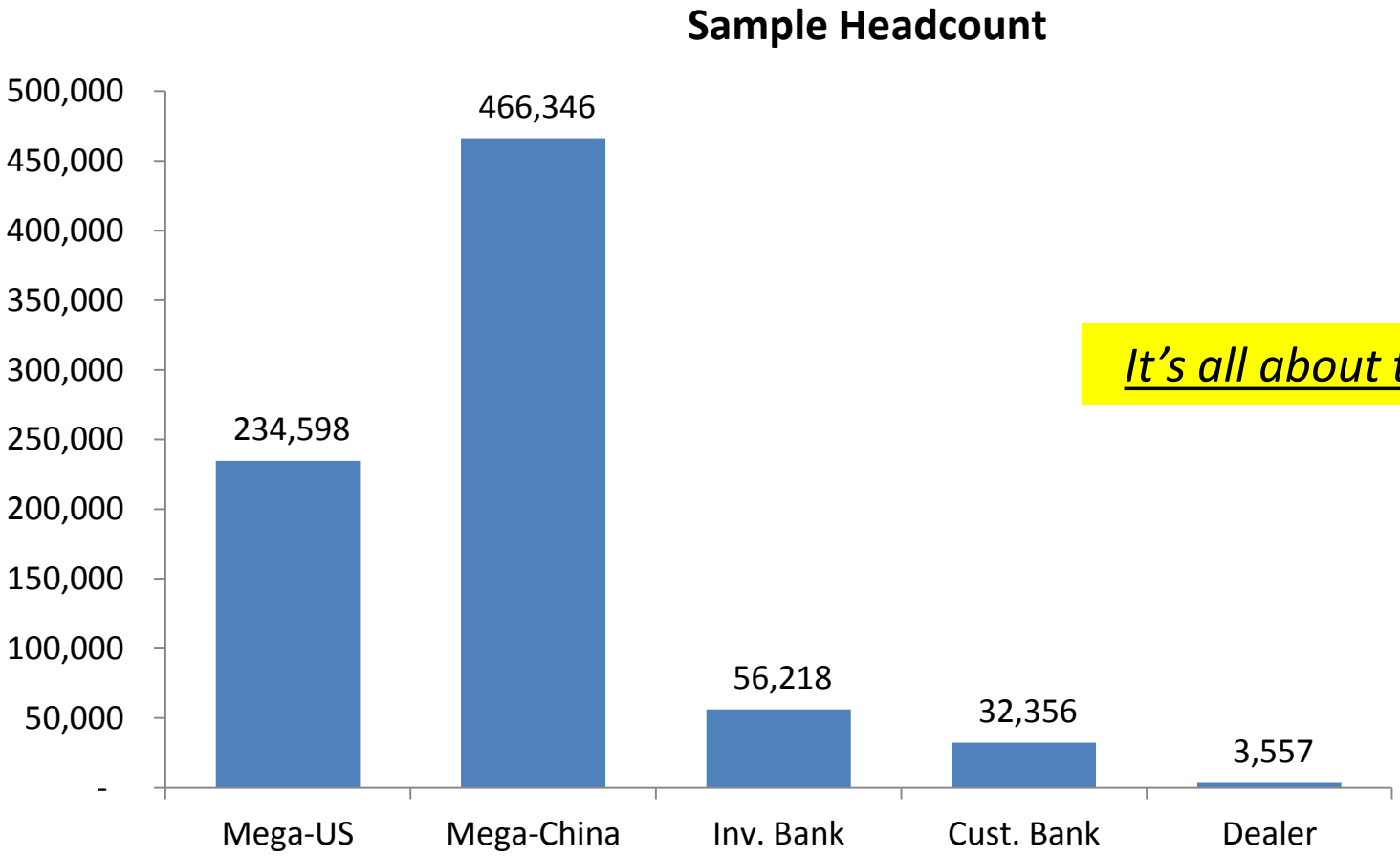
Finding answers to the initial question begged more questions, such as "How to compare technology spending?" One way is to look at core technology component allocations on a percentage basis…



Source: Alphacution, Company Data

…But, though illuminating, looking at these allocations did not address scale differences among the different firms…

In order to normalize for scale, variance in headcount needed to be reflected in the calculations and analysis…

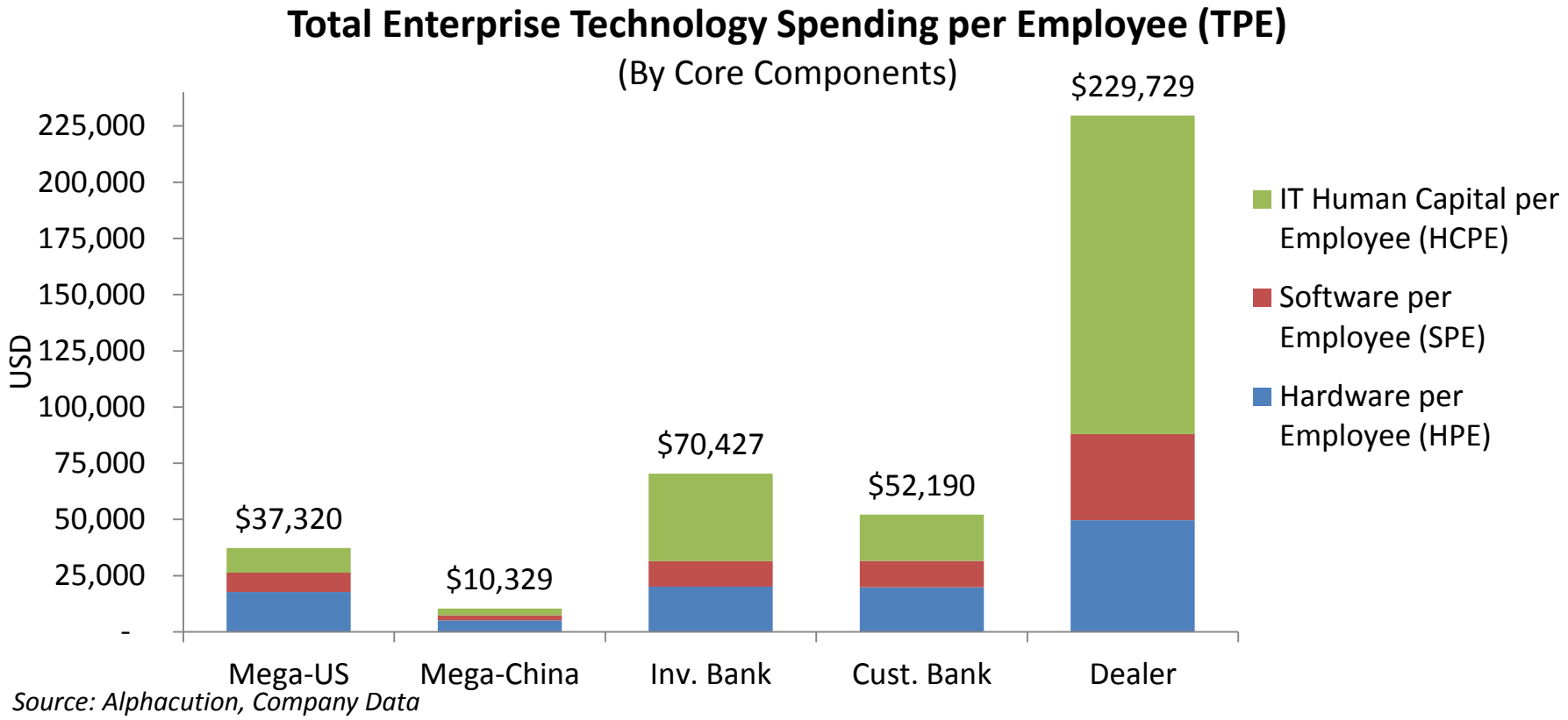


It's all about the people!

Source: Alphacution, Company Data

In this case, it turns out that normalizing for scale (by headcount) is the critical step towards a standardized TCO-related benchmarking framework…

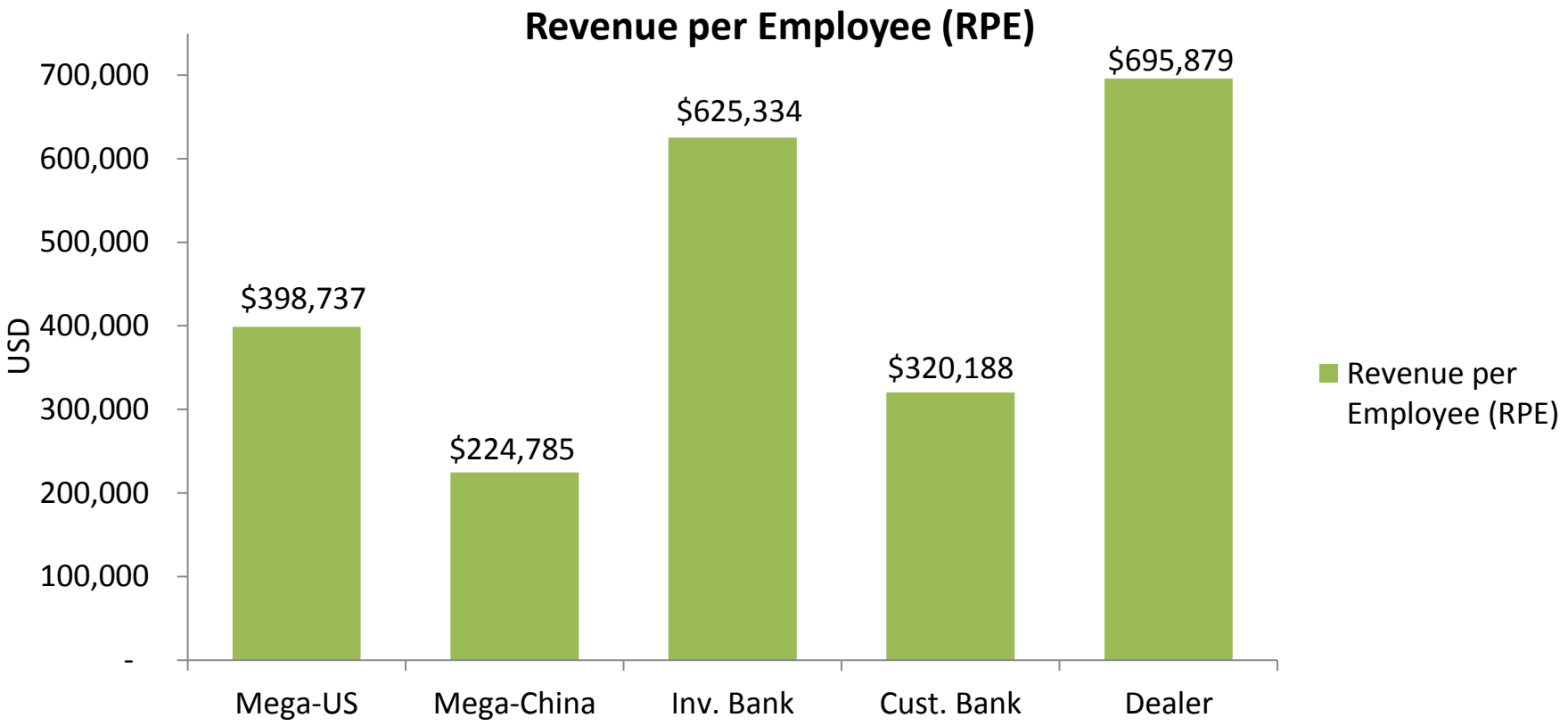
Once we adjust for variance in headcount – using TCO per Employee (TPE) – the picture changes dramatically (from that of absolute tech spending)…



Source: Alphacution, Company Data

But, of course, this perspective begs more questions, as well. Remember: In the final analysis, it really doesn't matter what your firm ***spends*** on technology. What actually matters most is what your firm ***receives*** for its investment in technology…

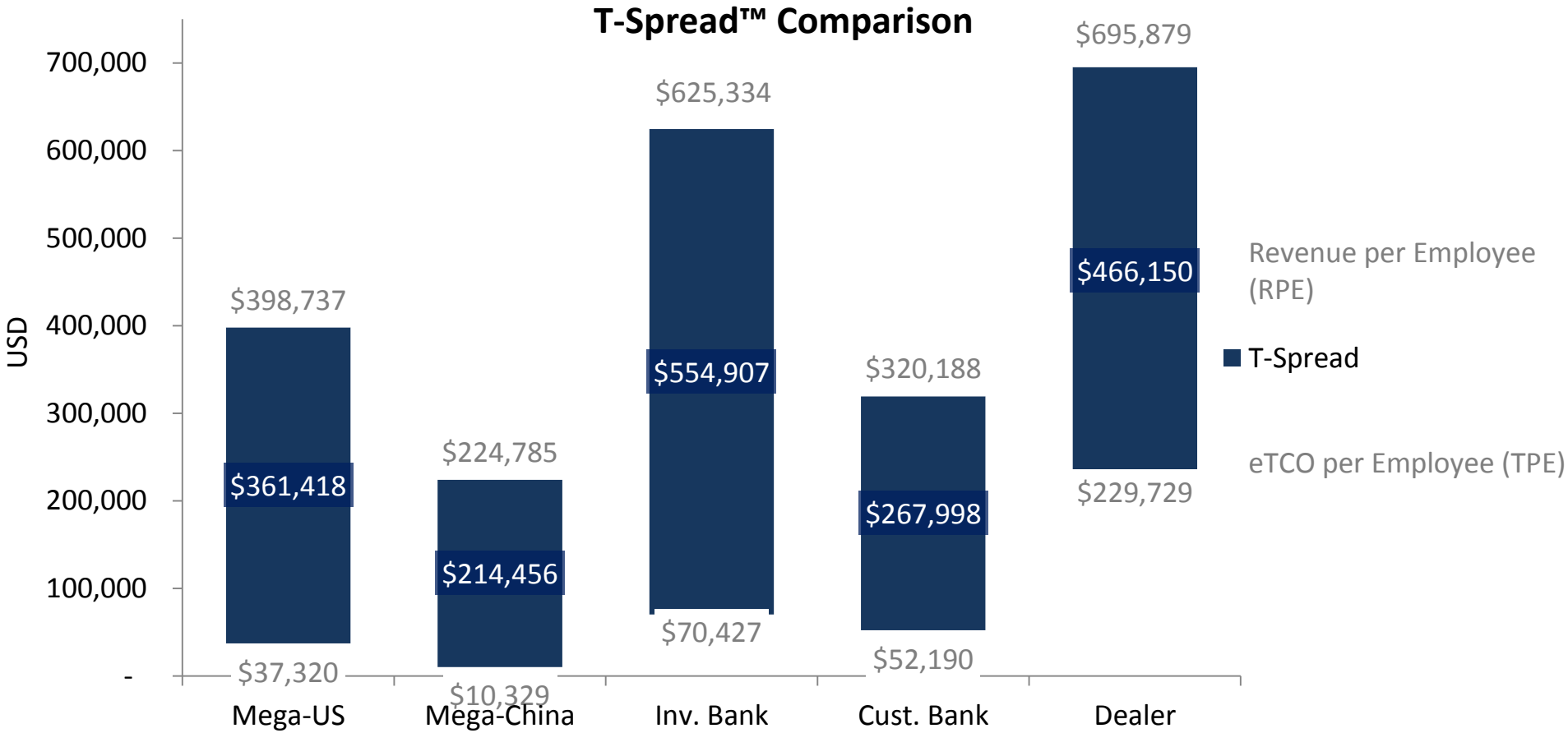
What firms *receive* from technology investments is ultimately revenue. Therefore, what we needed to do next is compare TPE with another normalized factor, namely: *revenue per employee (RPE)*…



Source: Alphacution, Company Data

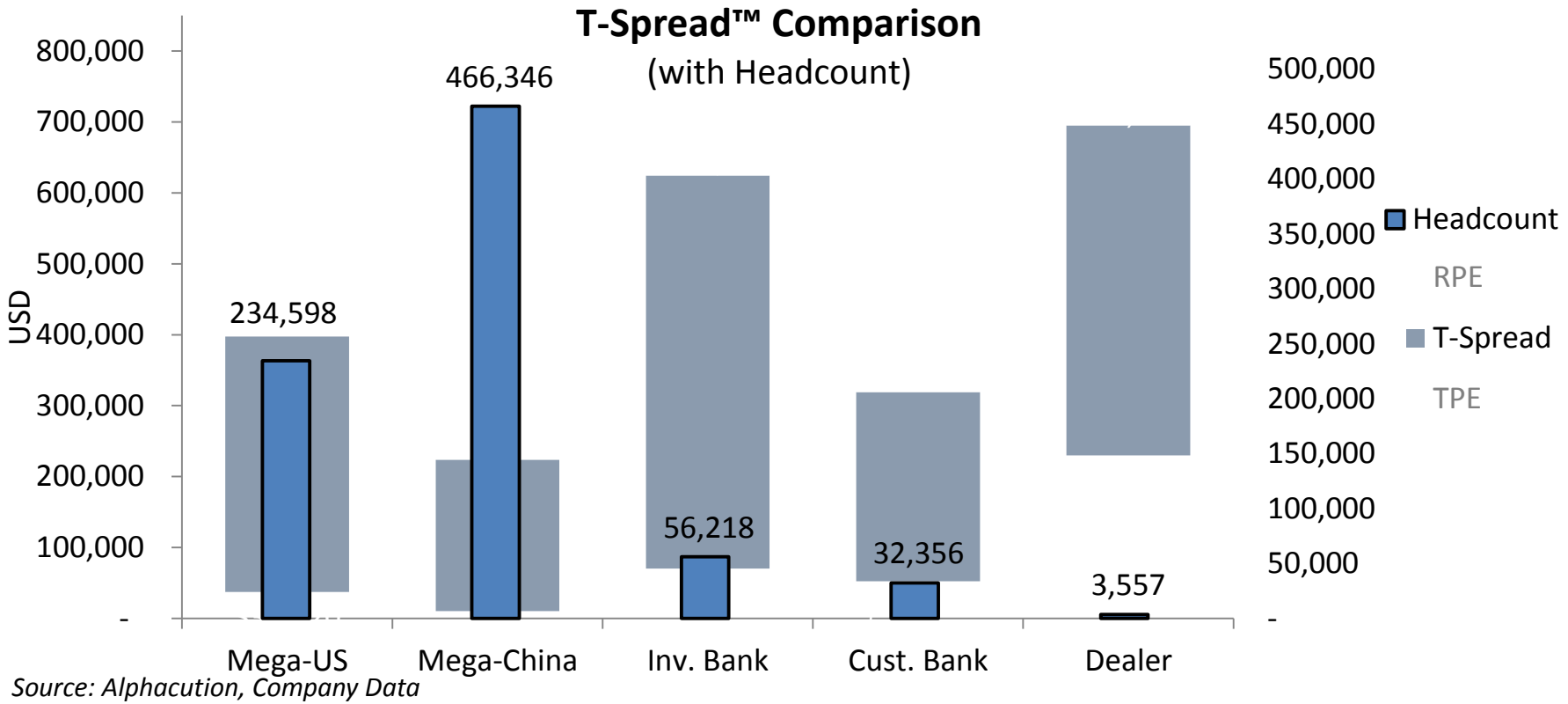
…where RPE represents the "return" component of *return on technology*…

Focusing in on the new question, "What is your *return on technology?*" gives birth to Alphacution's proprietary *T-Spread™* analytic, which is the difference between revenue per employee (RPE) and TCO per employee (TPE). This is how the picture of our sample of 5 banks changes now…



Source: Alphacution, Company Data

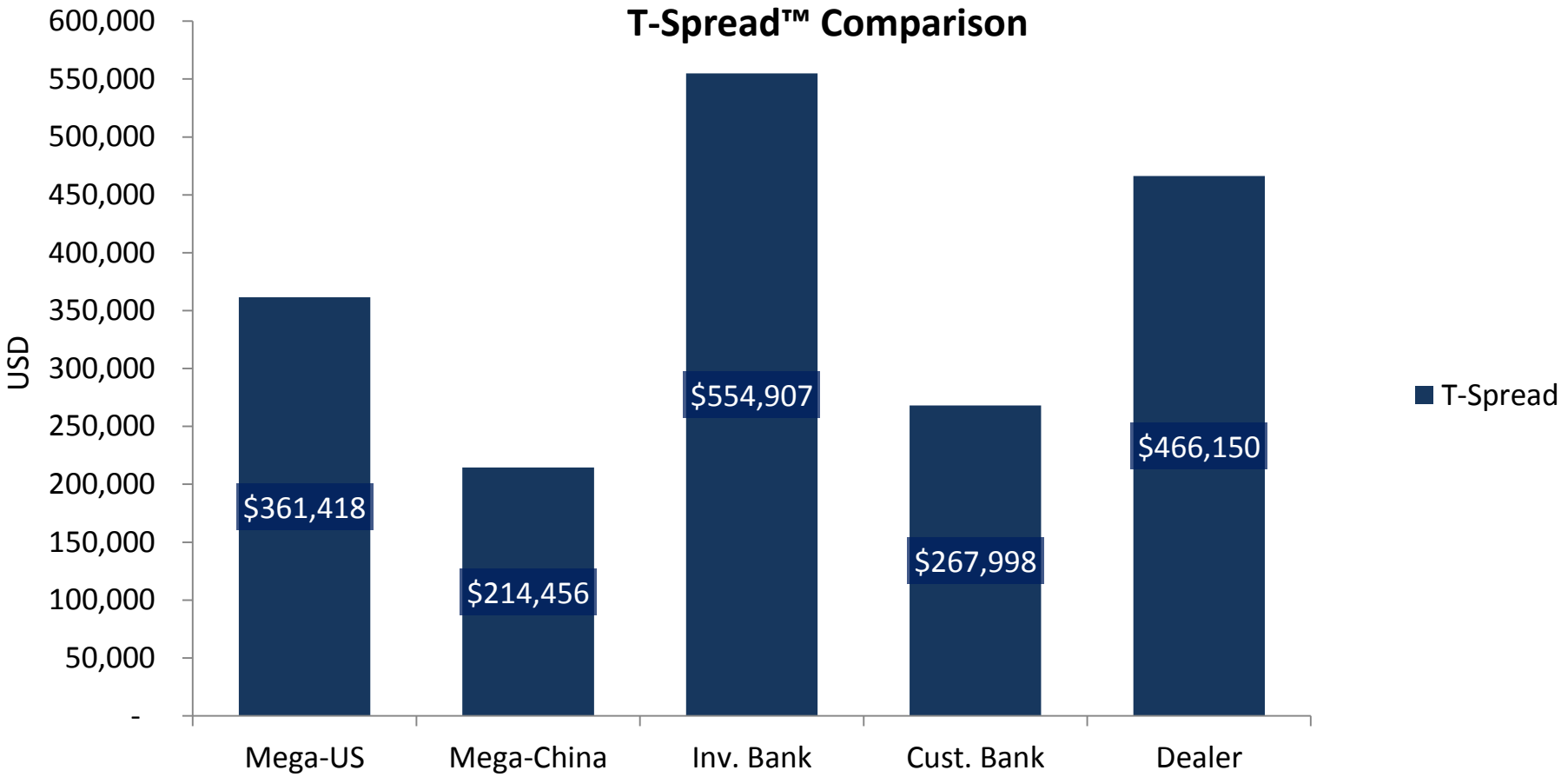
Now, if we overlay our headcount chart with the *T-Spread* chart, we begin to see clues about how much "technical leverage" is achieved relative to scale *under different banking business models*:



Source: Alphacution, Company Data

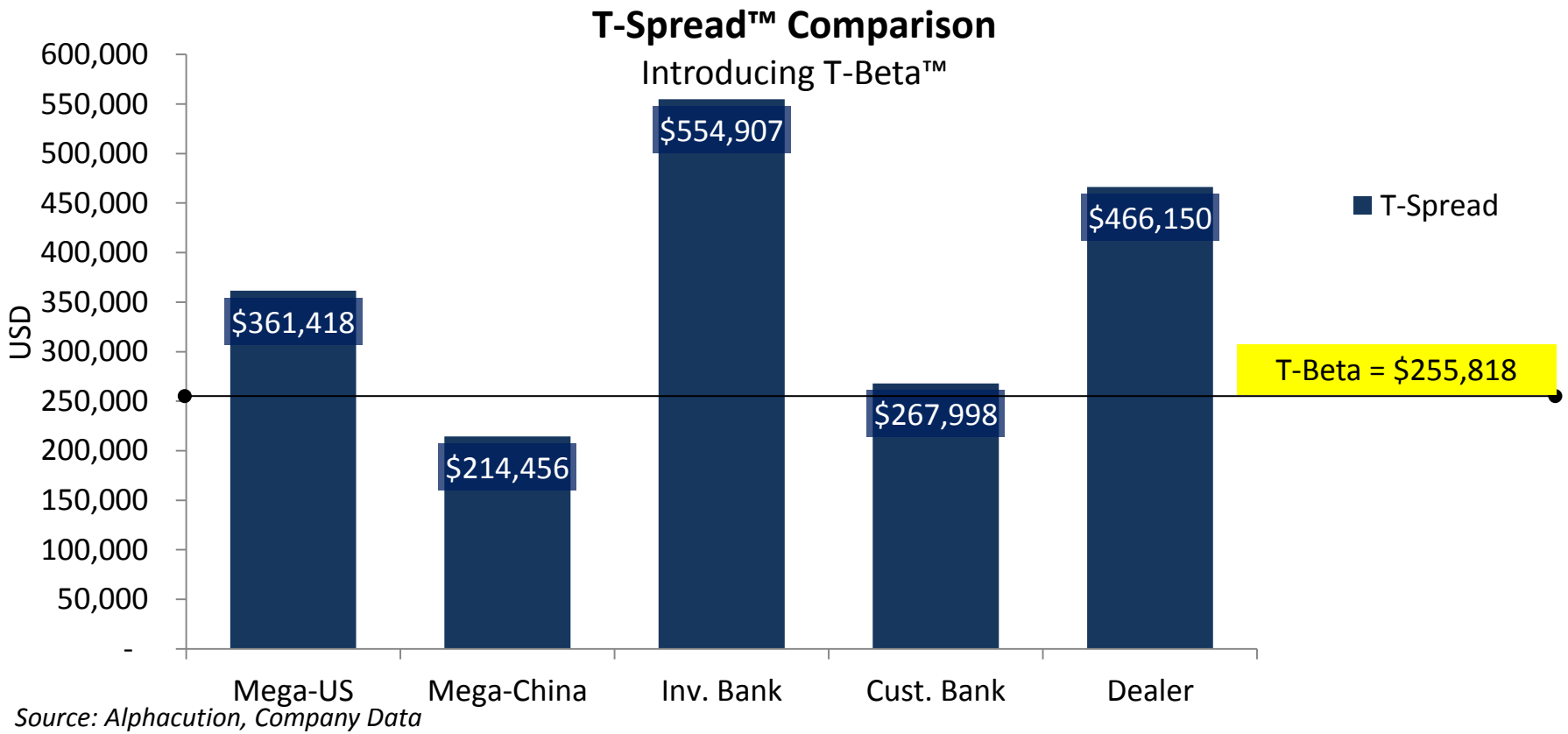
Though achieving any meaningful level of technical leverage is difficult, achieving technical leverage given increasing scale is far more challenging… (Major clue: RoT, technical leverage are correlated to levels of workflow automation.)

Ok, so how do we get to the benchmarking part?
First, we return to an isolated version of our basic *T-Spread* comparison…



Source: Alphacution, Company Data

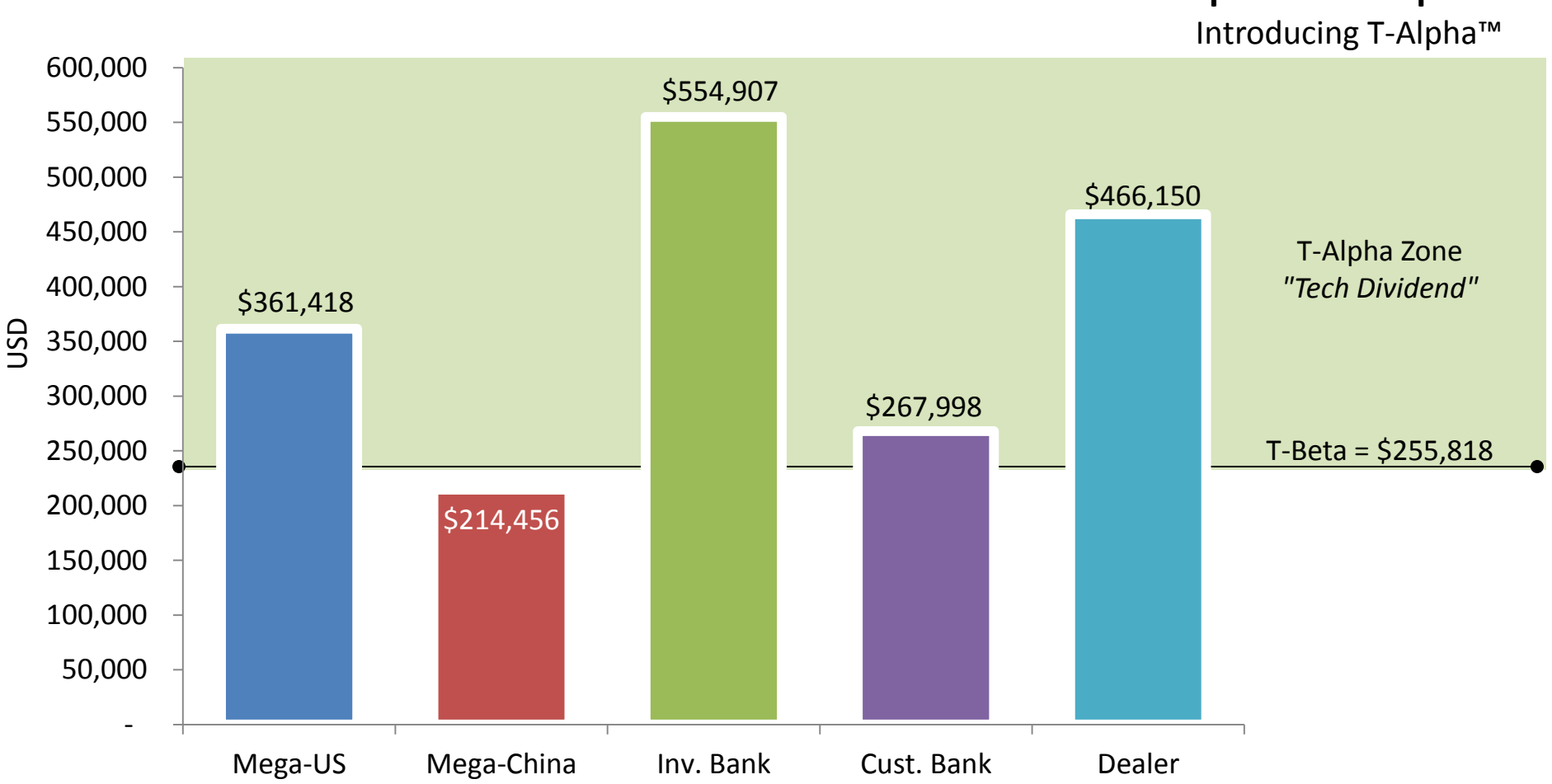
Then, we calculate the weighted average of all *T-Spreads* in our sample. In the case below, these 5 banks are part of our latest model set (58) of the largest global banks and where the weighted average of all those *T-Spreads* is $255,818 (for 2015)…



Source: Alphacution, Company Data

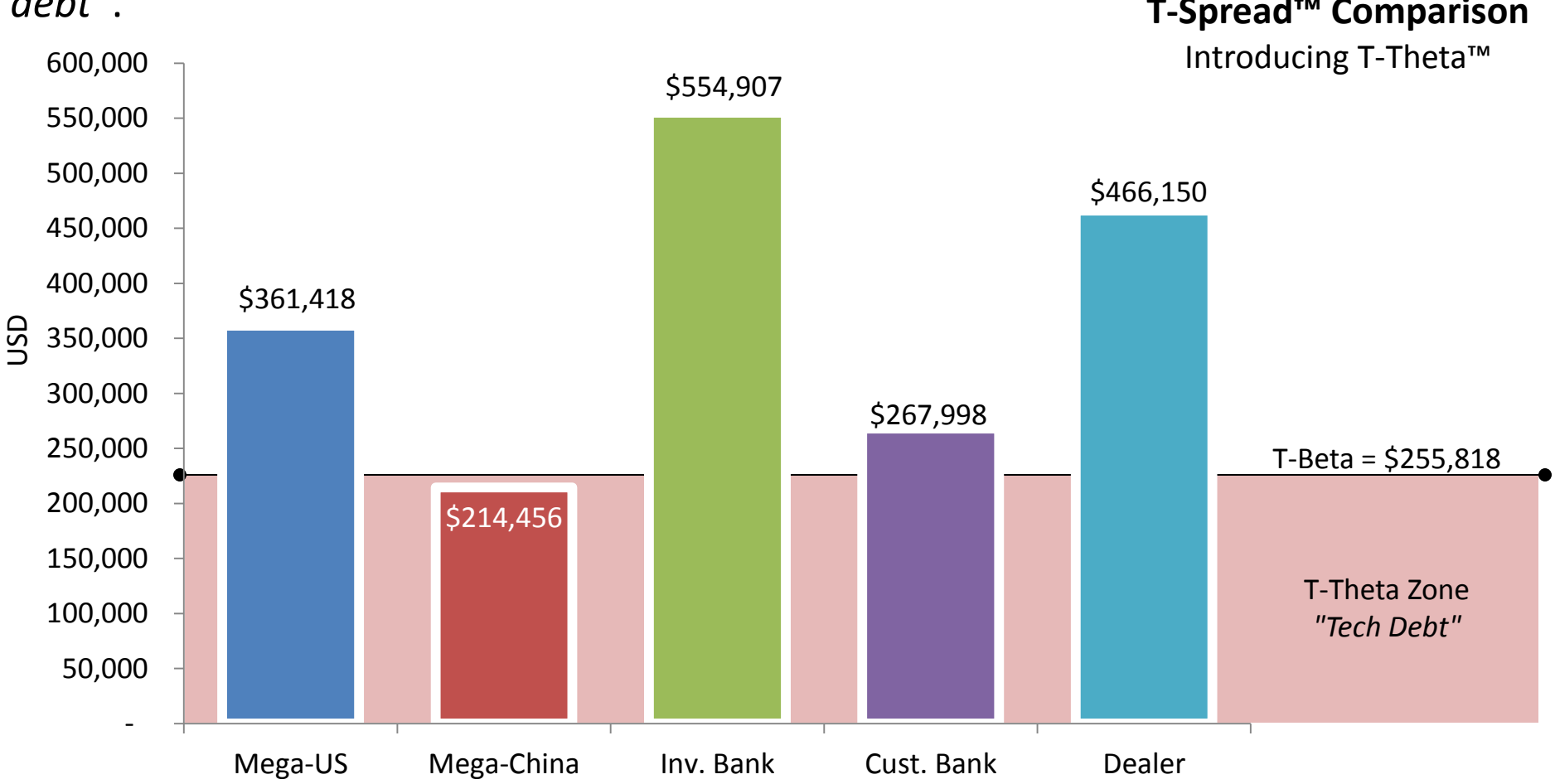
The weighted average of *T-Spreads* in a defined grouping – or business profile type - is also known in Alphacution's framework as *T-Beta™*

From there, the individual *T-Spreads* that are greater than *T-Beta* are known to be in the *T-Alpha Zone*; in this case, where banks have *T-Spreads* greater than $255,818 and are noted to possess a condition known as (net enterprise) *"tech dividend"*.



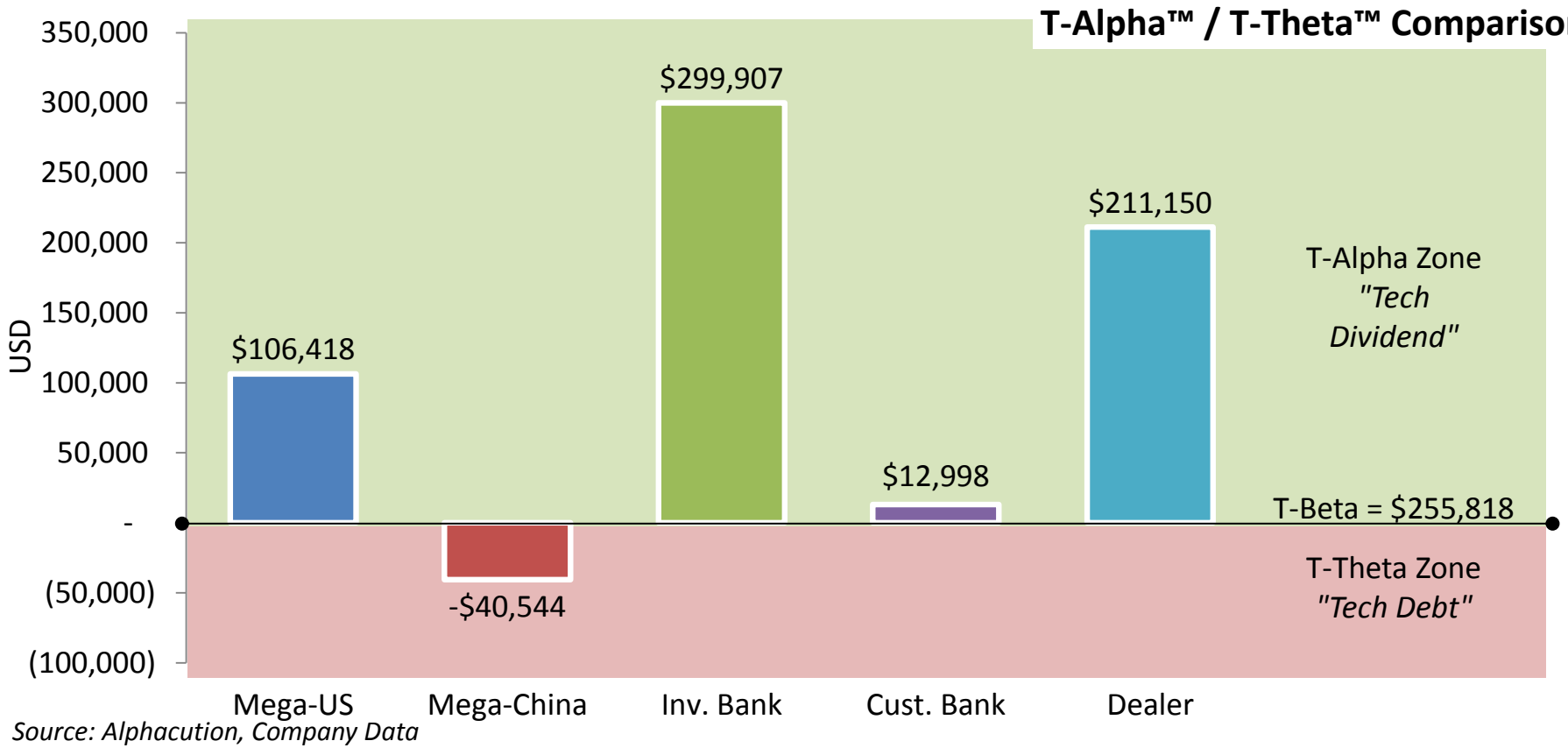
Source: Alphacution, Company Data

Alternatively, where individual *T-Spreads* are less than *T-Beta,* these banks are known to be in the *T-Theta Zone*; in this case, where banks have *T-Spreads* less than $255,818 and are noted to possess a condition known as (net enterprise) *"tech debt"*.



Source: Alphacution, Company Data

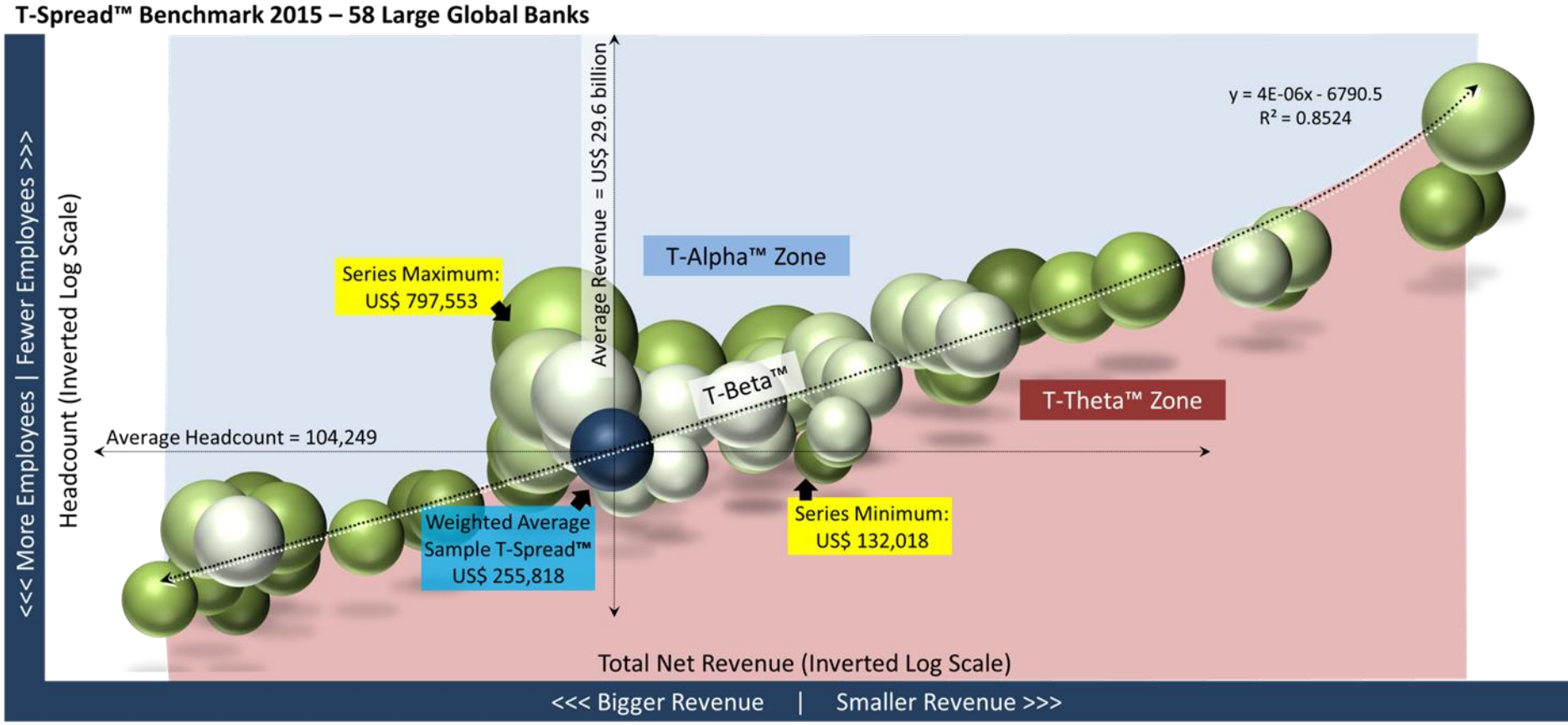
When we combine these two "zones" and set *T-Beta* as the x-axis, we get the following chart:



Source: Alphacution, Company Data

Unlike where we started with the illustration of absolute spend ranking (on Slide 21), the picture is far different now. In the final analysis it turns out that the *Mega-China* bank is actually lagging in technical leverage, generating *T-Theta* -$40,544 and the *Investment Bank* leads all others in this small sample with a *T-Alpha* reading of $299,907. Moreover, there are fascinating stories to tell about why each company is in each condition (which is the basis of our ongoing analysis)…

Finally, when we expand the analysis and visual template to include the entire Global Bank (58) sample, the illustration can seem daunting at first…

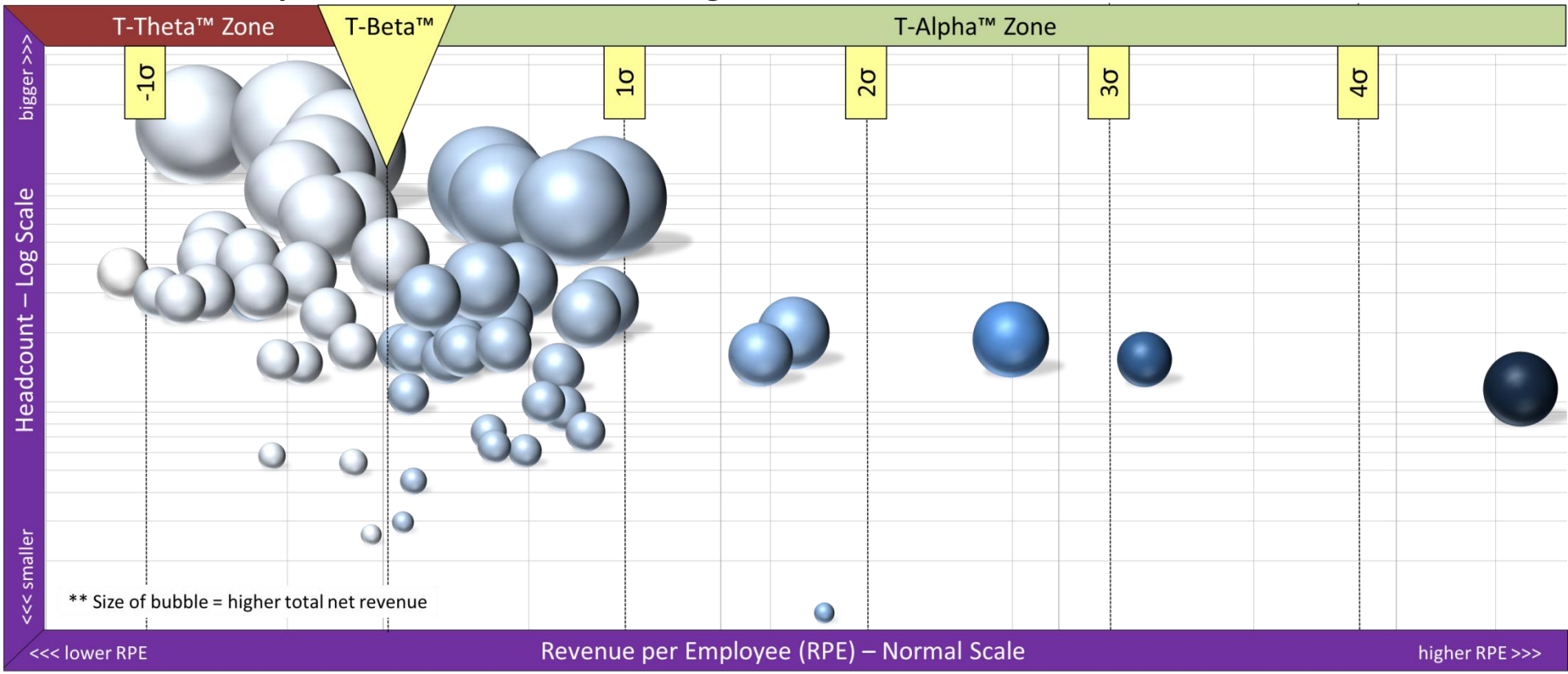


Source: Alphacution Research Conservatory, Company Data

Since visually creative presentation is such an important component of Alphacution's business model (and vision), we are always experimenting with the appropriate layouts to use when illustrating *T-Greeks* (and other) concepts and calculations…

In the alternative version of *T-Spread* below, we re-orient the axes to get a better sense of how difficult (and rare) it is to achieve RoT that is beyond +1σ *T-Beta.* There were only 6 banks generating this level of technical leverage in 2015….

Alternative View T-Spread™ Benchmark 2015 – 58 Large Global Banks



Source: Alphacution Research Conservatory, Company Data

…and ~40% of our sample – banks of all sizes - that are burdened with *tech debt*…

Tutorial: Summary Conclusion
Understanding the T-Greeks Framework

Normalizing, benchmarking technology spending patterns can be achieved by identifying, estimating *only* 3 numbers per company per period*:

- Revenue (x);
- Technology costs (x) – which is the sum of hardware, software and IT-related human capital; and
- Headcount (x),

where (x) is enterprise-, business segment-, defined workflow-, and/or solution-level.

This one is the most difficult due to lack of reporting and transparency standards.

Note: Alphacution's current phase of modeling is focused on enterprise-level analysis. As we collect more data, and model an increasingly diverse spectrum of participant profiles, Alphacution will move into more detailed modeling, benchmarking of business segment-level scenarios, etc. There is a method to our madness. (Our hypothesis is that the *T-Greeks* framework is *fractal;* meaning, it will continue to hold up at more granular levels of detail, assuming we have the data.)

*not counting figures needed for currency normalization to US dollars.

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Alphacution's *T-Greeks* TCO benchmarking framework is based on its proprietary *T-Spread* analytic.

- *T-Spread* is calculated as the difference between revenue per employee (RPE) and TCO per employee (TPE)

T-Spread is the basis for the other* *T-Greeks* analytics, namely *T-Beta*, *T-Alpha*, and *T-Theta*, where:

- *T-Beta* is the weighted average of *T-Spreads* from a given sample;
- *T-Alpha* – also known as *tech dividend* – occurs when *T-Spread* is greater than *T-Beta*; and,
- *T-Theta* – also known as *tech debt* – occurs when *T-Spread* is less than *T-Beta*

* Note: There is currently one additional *T-Greeks* analytic – *T-VOL™*, the volatility of *T-Spreads* – which we will detail at another time.

Tutorial: Summary Conclusion
Understanding the T-Greeks Framework

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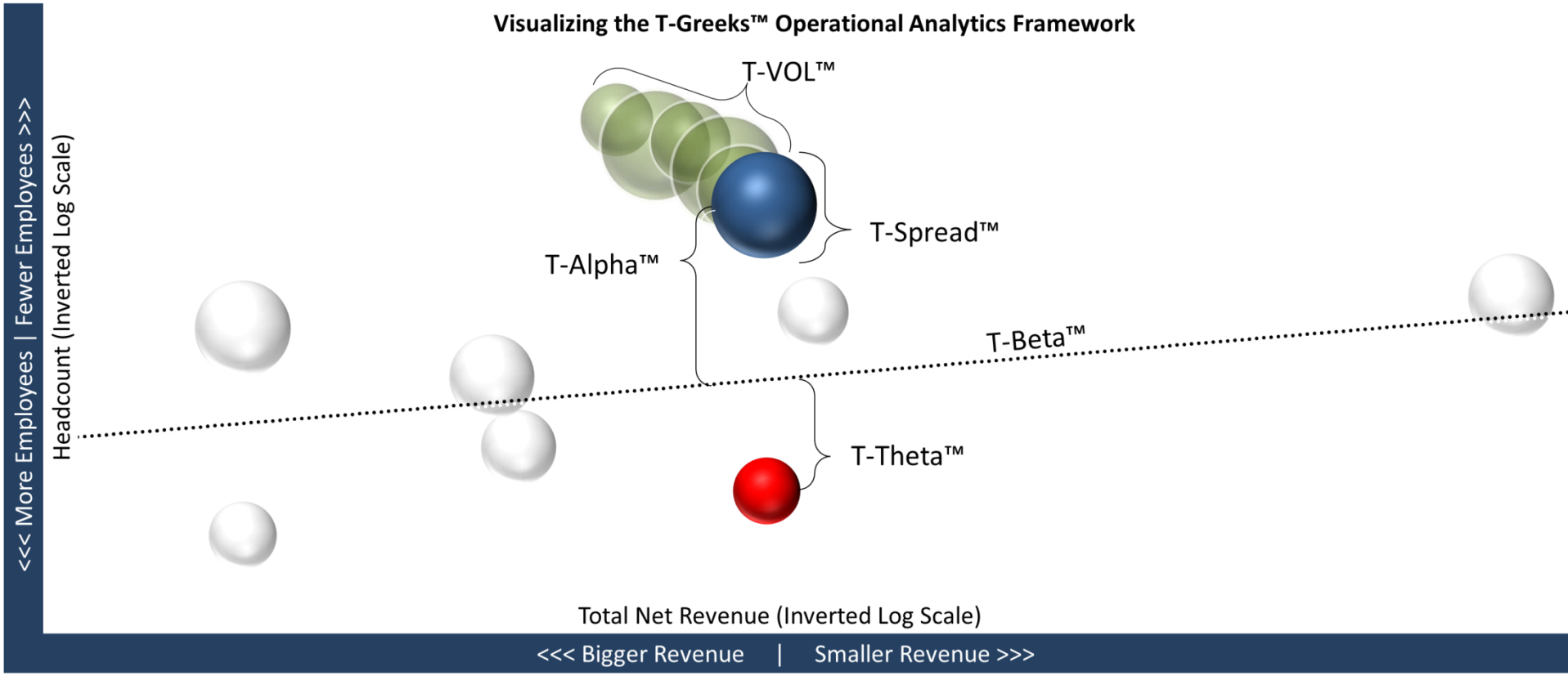
To summarize, the following is an illustrative version of Alphacution's *T-Greeks* TCO benchmarking framework and its component analytics based on the previous example of the latest presentation methodology.



Source: Alphacution Research Conservatory

…But, there's more, (much more) …

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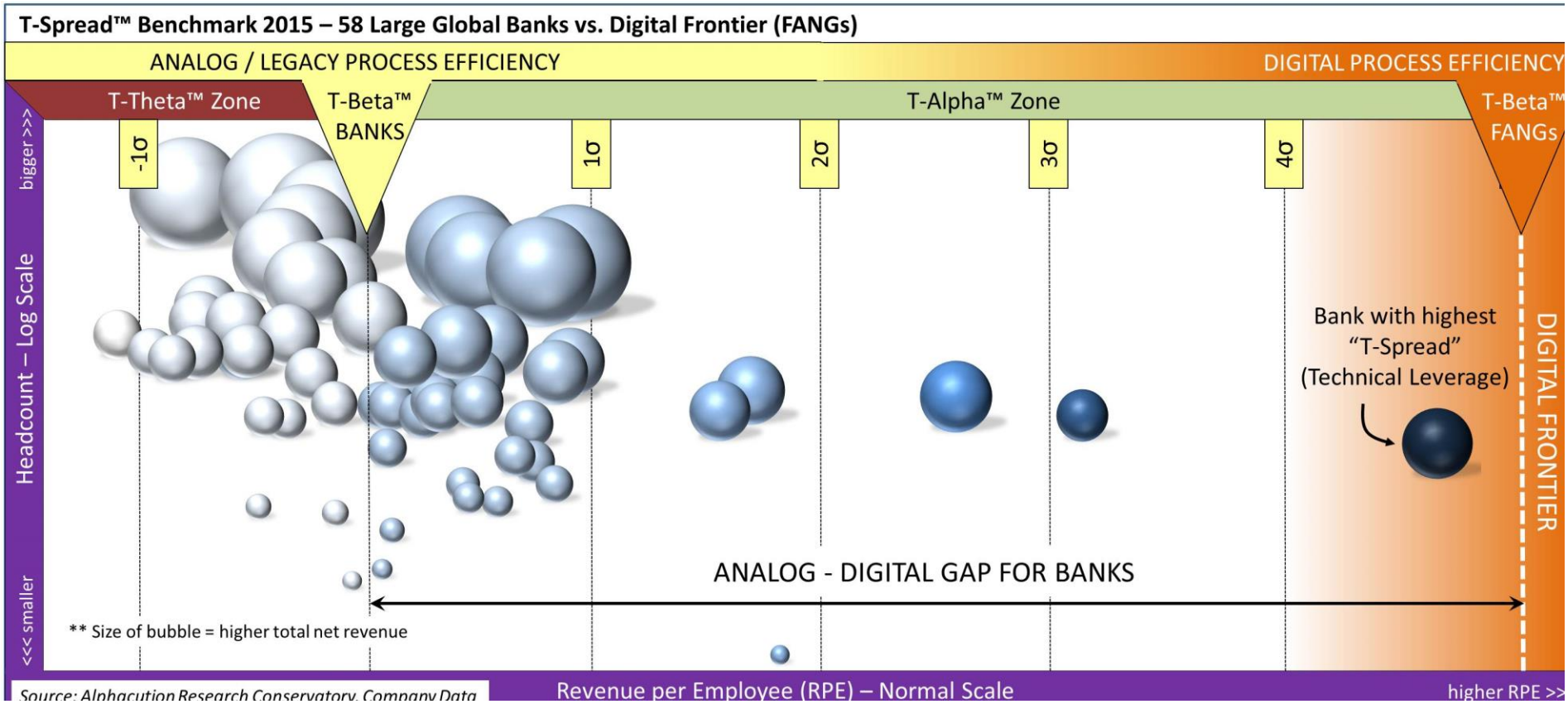
Key Discovery #2
Digital-Analog Technical Leverage Gap

Companies operating on the "digital frontier," like Facebook or Google, can be measured and benchmarked in the same way as banks, using *T-Greeks*, which ultimately means that *"digital transformation" can actually be quantified*:

If we compare "Bank (X) *T-Spread*™ with "Digital Leadership" *T-Beta*™ (i.e. – weighted average *T-Spread* of Facebook, Amazon, Netflix and Google – or "FANGs") then we have essentially quantified the gap between digital and "analog" versions of *technical leverage*. Going forward, this gap can be monitored, updated to quantify the progress of any company's (digital) transformation.

Stay tuned.

This is one of the key upcoming intelligence offerings from Alphacution…



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Alphacution
Research Mission

- To develop a composite model representing a detailed, 360° view of technology spending patterns – and other key business drivers - in the global financial services industry (FSI) ecosystem.

- To provide the most impactful, data-driven *navigational intelligence* to our clients for their ongoing *business transformations*.

Tutorial: Summary Conclusion
Understanding the T-Greeks Framework

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- Based on 95 models completed thru YE 2016, and a total of ~200+ models planned for completion by YE 2017, clients and other interested parties can expect the following themes to be explored in depth:
  - FSI Technology spending trends
    - Including: hardware, software, and IT human capital
  - FSI Technology- and data-related market sizing
  - (Enterprise) Technology Spending Benchmarks: T-Greeks™ Framework
  - Other financial, operational trends, analytics
  - Data-driven analysis of other financial services themes

- and with both standard and custom output templates:
  - Blog Posts (Website Section: Feed)
  - Reports / Studies (Website Section: Open Documents Library)
  - Comprehensive Exhibit Libraries (Website Sections: Open / Premium Exhibit Libraries)
  - Custom Decks and Analysis

- For additional background and insights into this material and the broader Alphacution portfolio, please consider the following from the Feed section of the Alphacution site (www.alphacution.com):

  - #Digital Research (10/19/2015)
  - #Technical Leverage: Can You Defy Your Scale? (11/12/2105)
  - #DigitalDisruption: Process Replacement vs. Process Re-engineering (3/8/2016)
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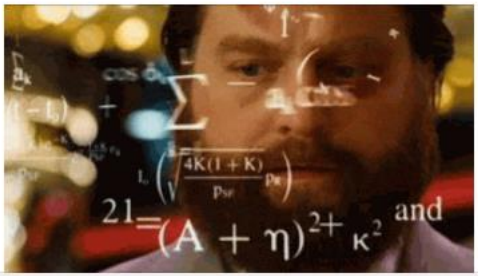
@DeutscheBank: Predicting the Pace of Shrinkage

If today's announcement by Deutsche Bank CEO, John Cryan, is to be believed, total group headcount is set to be reduced by 9,000 souls. Note that these reductions will come from a year-end 2016 flock of 99,744 (which, by the way, is still within 2.3% of the all-time high of 102,062 set at year-end 2010). We decided to look into our DB model to take a quick read of the expected pace of these reductions. Here's the setup: Over the 40 quarters from Q1-2007 through Q4-2016, 21 of those quarters represented total headcount reductions. Furthermore: The maximum headcount reduction in a down quarter was -2,256 FTEs (full-time equivalents); The average headcount change over the 40 quarters (not counting an acquisition in Q4-2010) was 880 FTEs; and, The average of the 21 quarters with headcount reductions was -668 FTEs Separate from an outright sale of a business segment (which is being contemplated here in the form of its DB Asset Management arm), organic shrinkage is painful and can take more time than originally anticipated. At [...]

By Paul Rowady | February 3rd, 2017 | Alphacution Feed, Rant Read More ›



Top Hedge Funds: AUM per Employee = Trading Strategy?

We have been playing with some new equations; looking to see if anything interesting can be learned from benchmarking assets per employee across various firms. (It turns out that adding this analytic to our suite of other "per employee" metrics yields significant insights.) In the figure below, we took the top 10 hedge funds ranked by assets under management (AUM) and then re-ranked that list by AUM per employee. We also tossed in Virtu Financial and KCG (Getco) for giggles - and to test the extremes. Notice anything interesting? Based on what you might know about these trading companies, how would you label the X-axis? some additional data to consider: The correlation between assets and

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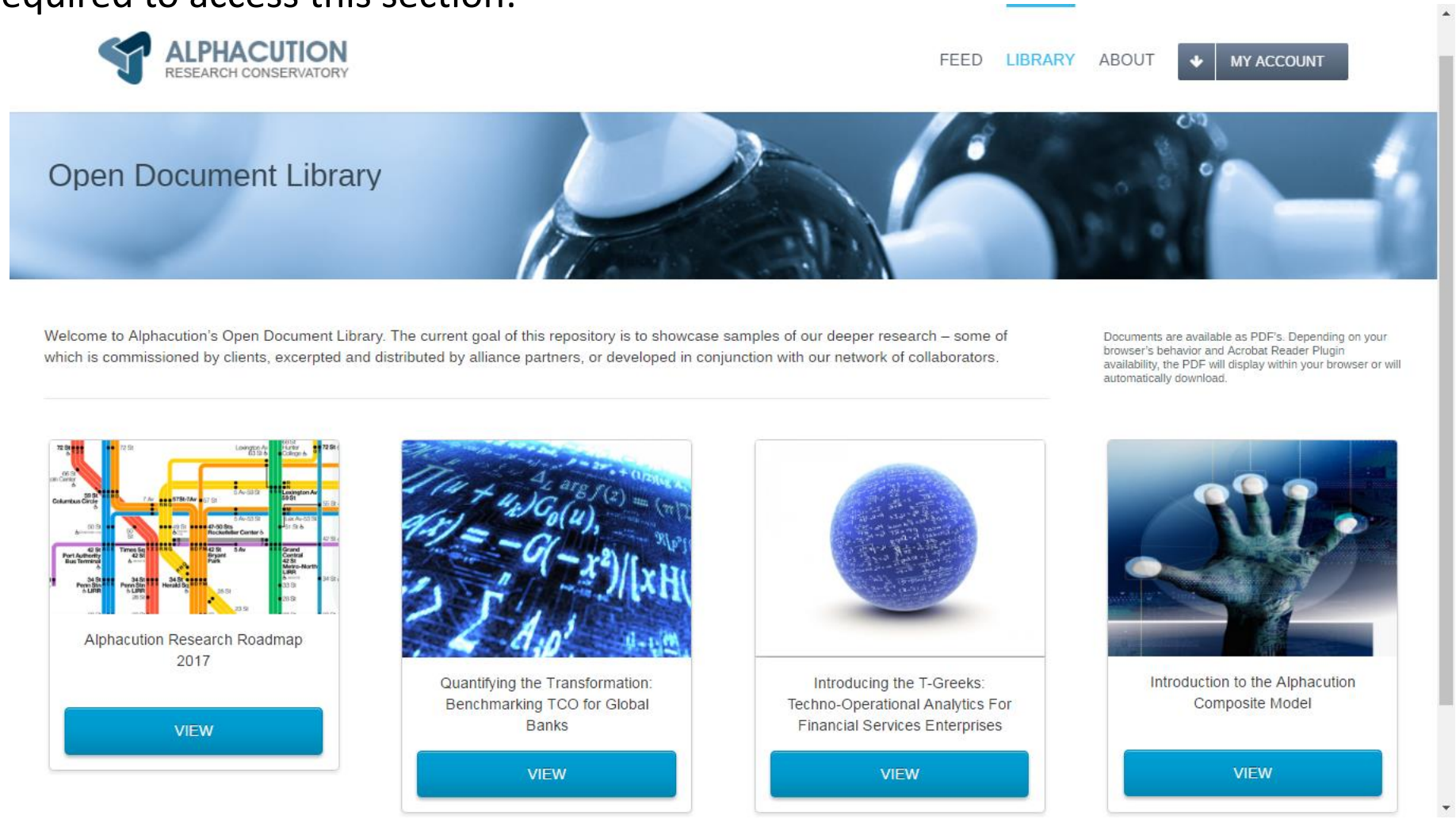

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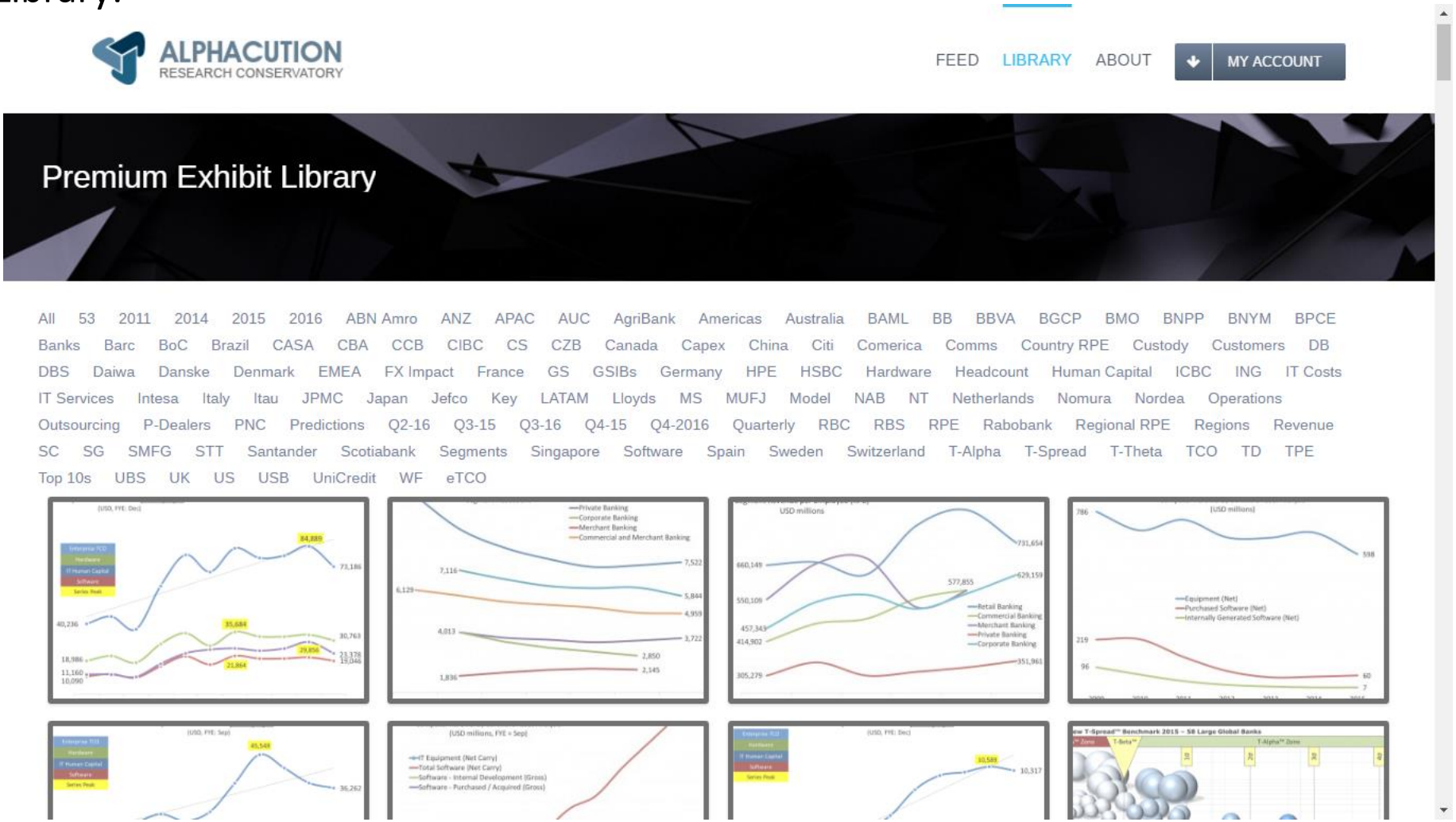

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