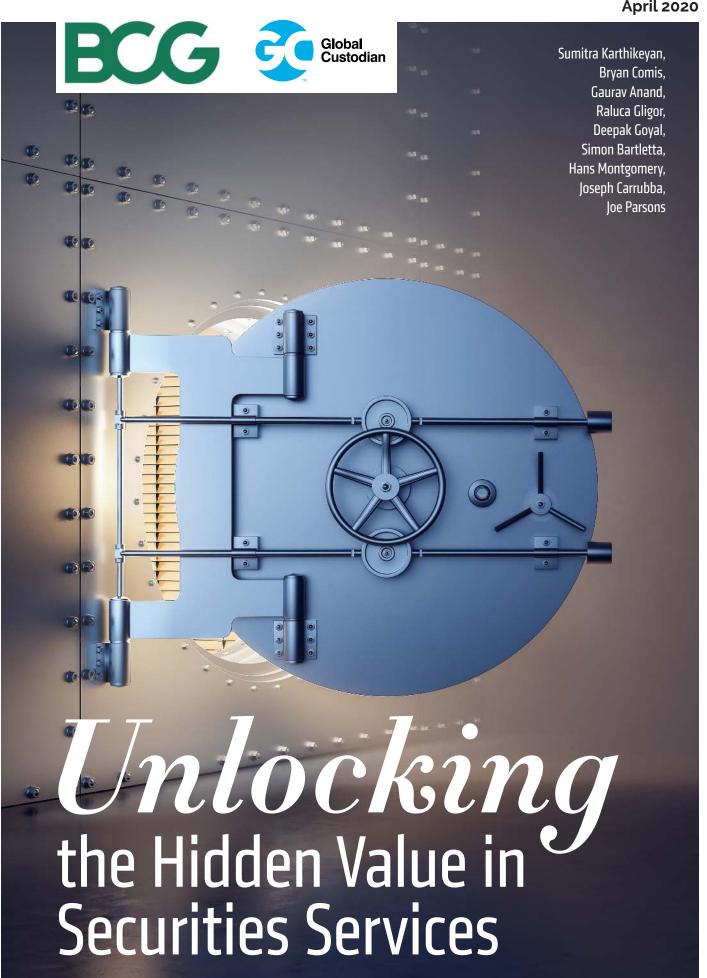
April 2020



t first glance, securities servicing is a robust performer that produces a reliable return on equity compared with other financial services businesses. The segment expanded at a healthy 4% annual rate from 2014 to 2019, much faster than other business lines. Securities servicing's apparently strong performance, however, is more fragile than it seems, with the segment's recent returns driven by market conditions rather than business fundamentals. As the world grapples with the COVID-19

pandemic and an uncertain economic future, the conditions that have supported the industry appear to be coming to an abrupt end. If security servicers are to grow sustainably, they must work harder to reduce costs, boost revenues, and transform a currently mundane customer experience. This requires investment, for example in automation and cutting-edge analytics, and an innovation mindset from top to bottom. All are manifestly within reach, but industry leaders must act decisively to make them happen.

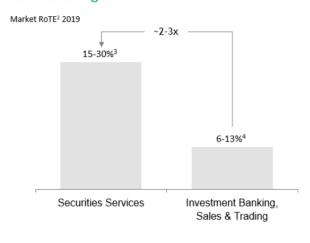
A VALUABLE BUSINESS THAT HAS BENEFITED FROM MARKET CONDITIONS

Securities servicing is a vital cog in the financial industry machine and a valuable contributor to the bottom line. The business boasts a high return on equity, low capital requirements, and stable returns. It also provides banks with deposits that are sticky even in times of market volatility similar to what we are experiencing today. In 2019, the segment generated a return on tangible equity that was two to three times higher than investment banking and wholesale sales & trading. (See Exhibit 1).

Exhibit 1: Securities servicing businesses remain valuable and resilient, with an attractive RoE



...and ~2-3x higher ROTE



Includes IBD, FICC and Equities;
 RoTE (dividing net income available to common shareholders by average tangible common shareholders' equity);
 Based on RoTE of STT, BNYM & NTRS;
 BCG benchmarking (using GS, MS, DB, CS, UBS).

Source: BCG research (May 2019)

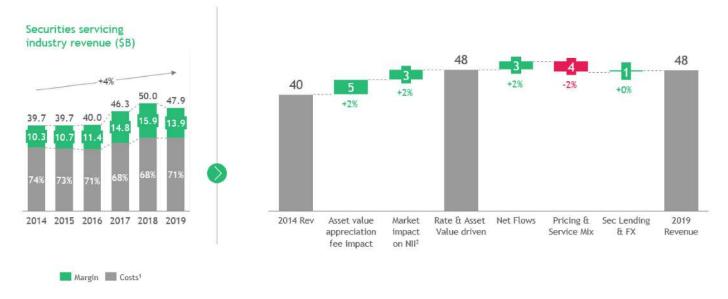
One reason for the segment's relative stability is that it is highly consolidated — a group of four firms account for around 50% of the US market, compared with a 30% share for the top four in retail banking. Scale is a potent source of competitive advantage, reducing cost to serve and enabling investment in technology and infrastructure. Clients also prefer stable, well-capitalized providers, creating a winner-takes-all environment.

Despite these merits, there are underlying

causes for concern. Favorable market conditions, including asset price appreciation and interest rate normalization, were responsible for the entirety of the industry's growth from 2014 to 2019. Core growth, was flat, as uplifts from net inflows and services (e.g. securities lending, FX) were offset by price compression and service mix changes. In 2019, these headwinds were amplified by reduced net interest margins, driving industry revenues lower. (See Exhibit 2).



Exhibit 2: Growth of ~4% p.a. has been driven by market forces, without which it would have been 0%



CIR; 2. Impact of asset value appreciation and rate normalization on NII;
 Source: Annual reports from BNYM, NTRS and STT; BCG research

CHALLENGES GOING FORWARD

Looking forward, we see challenges for the industry. The longrun trend amongst asset managers towards a world of zero fees shows no signs of abating. Cost improvement efforts, which have delivered modest improvements in the past, are showing signs of reduced efficacy. Client needs and expectations are quickly evolving, challenging service providers' ability to adapt. Meanwhile, a COVID-19 catalyzed recession threatens the industry with asset price declines and a sustained period of near zero interest rates.

1. CLIENTS UNDER STRESS, WITH PRESSURE INCREASING

2008-2012 The global financial crisis of 2008-2009 had significant and long-lasting impact on the asset management industry. Industry AUM took four years to recover to pre-crisis levels, and the profit pool took even longer (6 years) as fee pressure outpaced cost cutting (See Exhibit 3). The crisis also catalyzed major industry shifts which impacted securities servicers, including a retail shift to passives, an institutional shift to alternatives, and acceleration of the winnertake-all phenomenon that increased concentration in the industry.

We expect the COVID-19 crisis to catalyze further change in the industry. A recession combined with fee erosion will force firms to accelerate cost transformation programs securities servicers should expect further pressure on fees. Asset-manager 'bar-belling' is likely to accelerate, with opportunistic M&A driving further industry consolidation. We also expect a renewed focus on business continuity planning, with service providers being tested as plans are updated (See Exhibit 4).

pre-crisis levels?

AUM: Pre-crisis AUMrecovered in 2012 following massive global stimulus and rise in market value which accounted for >2/3 4 years of AUM (flows were anemic)

Exhibit 3: What happened after

2008? How long did it take

Asset Managers to recover to

NET REVENUES

- Lagged due to increased fee pressure
- · Shift to passive (nearly doubled)

5 years 2008-2013

PROFIT POOL

- · Profit pools lagged as fee pressure outpaced cost cutting
- · Profit margins have not fully recovered to pre-crisis levels of ~40%



2. COST IMPROVEMENTS HAVE BEEN MODEST, AND ARE SHOWING SIGNS OF REDUCED EFFICACY

Given challenges in expanding their core businesses, security servicing providers have widely focused on reducing costs. However, despite significant efforts, these remain stubbornly high, with cost-to-income ratios averaging around 71%, compared with 74% in 2014 (See Exhibit 5). Put another way, most players have managed annual efficiency gains of just 1%-2% over recent years. Where providers have locked in cost reductions, their levers of choice have been outsourcing, location strategy, and functionalization. However, the efficacy of these

measures is diminishing, and a large proportion of efforts are near-term focused, which does little to fundamentally transform the cost base. As much as 60% of change-the-bank spend is applied to near-term efficiencies, leaving longer-term and strategic programs underfunded. Still, some new technologies promise to bend the cost curve, including cloud-based asset servicing platforms, increased use of digital, APIs, robotics and robotic process automation. Headline-grabbing technologies such as artificial intelligence, distributed ledger technology (DLT), and big data / advanced analytics still do not attract a large proportion of budgets.

Exhibit 4: Future outlook on key trends in Asset Management Outlook on trend Digital everything: Digital access to clients/selling, need to access remote research will spur a new leg of 'need to have', not 'nice to have' Accelerate Winner takes all: Overall flight to safe, brand name, and low cost managers - flows already Key trends today indicating this pattern Accelerate Flight to passive: Active products continue to lose ground in favor of passive, solutions, and alternatives via fee sensitivity and search for yield Accelerate Fee pressure: Continued fee pressure force asset managers to make up for fee loss through cost reduction or other revenue streams Accelerate ? ESG: Strong trend globally, unclear what the impact will be with COVID; easy to imagine stronger emphasis on 'purpose' TBD Cost transformation: Recession paired with continued fee erosion cause asset managers to make up for AUM & fee loss New trends Digital sales & marketing: Rapid increase as an alternative means to reach clients while sales & marketing staff are under travel restrictions Strategic M&A: Recession likely to cause a rise in underperforming firms ripe for potential acquisition BCP resilience: Firms look to augment BCP capabilities as COVID-19 reveals key gaps Client experience / personalization: With digital communication as the new norm, standard for client

The COVID-19 crisis has highlighted an additional benefit of these cost saving initiatives. Technologies that remove manual processes and support quick changes in operating model also ensure resiliency in times of crisis. Modern technology platforms permit remote working models and enable quick re-deployment of resources as operating centers are impacted. The crisis further highlights the need for firms to pursue these technologies aggressively.

3. CLIENT EXPECTATIONS ARE EVOLVING

experience set by digital giants

One reason that incumbents need to ramp up investment is that there is rising client pressure to do so. Clients expect more than they did in the past, reflecting the seamless digital experiences they see in other parts of their lives. Hedge fund managers, for example, expect highly-tailored solutions that match the specific needs of their most complex funds, and asset managers expect data

to be used intelligently to ensure errors are remediated before they impact services.

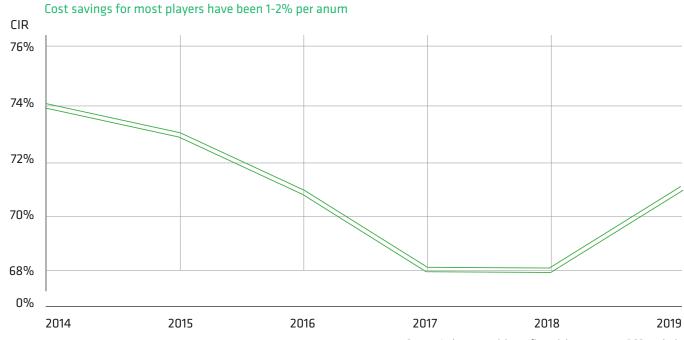
The onus is on incumbents to create a more compelling customer experience. Clients, however, have seen little by way of innovation from their service providers, and are becoming skeptical of the ability of providers to support their evolving needs. Providers must act to demonstrate they understand the evolving needs of their clients, and that they are equipped to deliver against those needs.

Investing in data & analytics can also open new sources of revenue for securities servicers. Clients are laggards in leveraging data & analytics as a source of competitive advantage — a recent BCG survey found that only 20%-30% of asset managers are "pioneers" in their use of data. There is an opportunity for securities servicers to play a role in catalyzing adoption, for example by investing in specific use cases in conjunction with their clients. The good news for the industry is that the building blocks are



² Private equity/real estate

Exhibit 5: Efficiency gains in the industry have been modest



Source: Industry participant financial statements, BCG analysis

in place. Many firms have large volumes of data sitting on their IT systems which could be leveraged to support clients, streamline decision making, and create a more tailored and responsive service.

4. DETERIORATING MARKET CONDITIONS - RATES & ASSET PRICES

On top of other challenges, COVID-19 threatens the

securities servicing industry with a protracted period of near zero interest rates and reductions in asset prices. While it is too early to forecast the impact of this crisis, we observe that recovery from past drawdowns can take between 1-5 years. The last of these, the global financial crisis of '08-'09, resulted in a contraction in securities servicing industry revenues of 15%-20%1 vs. pre-crisis levels.

PERCEPTION OF CONSTRAINED INDUSTRY; STRATEGIES MAXIMIZE EXISTING SOURCES OF COMPETITIVE ADVANTAGE

Strategies pursued by securities servicers vary by firm type, with each looking to maximize their source of competitive advantage:

Securities servicing banks. Banks are betting that scale will remain a critical source of advantage as core services are commoditized. Their preferred strategy is focused on pursuing operational efficiencies, for example in the middle and front offices, and seeking revenue growth through value-chain expansion.

Diversified / universal banks: These players see that the power of the universal banking model is increasing as technology enables improved use

of data across the franchise. Their strategies are often focused on cross-selling the full suite of banking products and developing bundled solutions.

Tech-based asset servicers: Tech-based players leverage the fact that a portion of the market is not tracking towards commoditization, and that complexity can be solved with technology. Their strategies are focused on serving complex segments of the market (e.g. private equity, real estate funds, and hedge funds) and on a SaaS/technology-renting model.

In assessing these strategies, we observe three notable common threads:

- Revenue diversification is still limited to small experiments. There are few examples of efforts to pursue new sources of revenue that might account for 20%-30% of the portfolio in future a level of change we believe is necessary given challenges to the core business.
- Efficiency ambitions are generally in the region of 3%-4% per annum, and even these relatively modest targets are not easy to achieve. In addition, they fall well short of the expectations of clients such as asset managers, for whom fees are trending downwards.
- Core revenue growth aspirations



³ Asset manager/Asset owner

are modest. In the face of price compression, providers are primarily focused on growing asset classes (for example PE/RE2) or their presence in specific regions (e.g. China, Luxembourg), and on pursuing cost efficiencies to preserve margins.

Leading securities servicing players largely agree that new entrants are unlikely to make significant market share gains in the short term, citing their complex operating models and a highly-regulated environment that deters competition. Still, the combination of performance stagnation, continuing fee pressure, shifting client expectations, and

the rise of technology create an environment in which some form of disruption is likely. We see three scenarios that could result in a significant shift in industry makeup and structure:

1. Incumbent as challenger:

Through a step-change in cost efficiency (30%-40% improvement) and technology-led transformation, a visionary incumbent could fundamentally recalibrate the proposition.

2. Industry collaboration: Immense cost pressure may force consolidation and perhaps mutualization of some

non-core activities such as KYC, corporate action processing, and regulatory reporting.

3. Client-led disruption: Clients with scale are in a position to step up and address their needs themselves, particularly if they are willing to work with technology partners. We may see an accelerating trend of asset managers insourcing post-trade activities.

While none of these scenarios are certain, security servicers should pressure test their strategies under each, and be prepared to take bold actions

CHANGE AGENDA: TIME FOR BOLD ACTIONS

In order to tackle the growing list of challenges, we believe that Security Servicers need to embrace an aggressive change agenda:

1. Pursue a path to achieve 30%-40% efficiency gains through technology-led transformation

In a world where process fees for traditional assets are trending towards zero, there is indeed a case for transformative efficiency improvements (~30%-40%), and it can be achieved by leveraging technology to fundamentally rethink service delivery. Cost transformation programs, already high on the agenda of providers and clients, has increased in importance as a result of COVID-19. To that end, firms should pursue three paths in parallel:

- Embrace process efficiency through digitization and technology. COVID-19 has refocused firms on their digital agendas, both for business resiliency and for improving cost efficiency (e.g. AMs accelerating plans for digital sales, marketing, and distribution). This requires a mind-set shift from Ops to Tech with focus on short development cycles and SaaS models. Examples of potential applications include intelligent trade capture, robotic process automation, and cloud platforms. Technology can accelerate cost savings from 1%-2% to 3%-4% per year.
- Adopt new ways of working. This includes agile ways of working and focusing on continuous improvement to drive productivity not just in IT but through the organization. These methods, when combined with process efficiency measures described above, have been shown to drive efficiency improvements of as much as 10%-15%. The COVID-19 crisis has created a window of opportunity to push aggressively on these initiatives as clients, employees,

regulators, and others are forced to test new ways of working.

• Reimagine services and delivery. Rather than anchoring to the status quo and searching for ways to improve existing processes, incumbents should consider how, given a clean slate, they would design service delivery. For example, development of a 'no-touch NAV.' This can form the basis for pilots that deliver superior services at a fraction of the cost. We see potential efficiency improvements of 30%-40% (including those made in the two points above).

2. Meaningfully diversify revenue

The policy response to COVID-19 will put pressure on fees and negatively impact NIM, increasing pressure on firms to diversify their revenues to mitigate the impact of this and future crises. One promising area to explore for revenue diversification is data and analytics, rooted in use cases that address specific client needs. Multiple investment styles and fund types within the same AM/AO3 require a rethink of traditional client segmentation and go-to market models may need to evolve.

Buy-side spend in data and analytics is more than US\$9bn annually and has been growing at high-single digits per annum. While many securities servicing incumbents have begun to focus on data offerings, few have committed to building product ranges. To be successful, providers will need to break from traditional approaches to service delivery and monetization. A good starting point is to clearly identify where clients see most value in post-trade data.

3. Move towards an ecosystem play

Firms need to consider how to embrace fintechs to fill



capability gaps in the future industry ecosystem. Options to best engage with fintechs include incubating internally, strategic partnerships, and acquisitions. The decision to build or partner should be decided case-by-case depending on required speed to market, internal capabilities and cost.

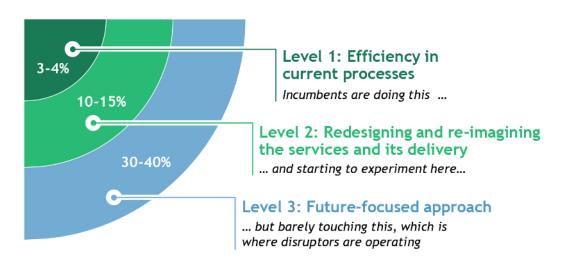
Additionally, firms should consider outsourcing the lower value pieces. Banks need to differentiate on their ability to deliver non-custody services, thereby remaining competitive against new tech-based asset servicers.

4. Bring innovation to the forefront

Clients have seen little innovation from their service providers. The changing industry landscape requires breaking away from existing approaches and moving towards an innovation mindset directed at addressing fastevolving client needs.

To do this, firms should bring innovation to the forefront by elevating its position in their organization. This will enable mobilization of resources, ensure effective collaboration with stakeholders across the ecosystem, and streamline efforts to co-invest in promising use cases with clients.

Exhibit 6: Achieving 30-40% cost efficiency improvement requires firms to take multiple paths in parallel



While security servicing providers have performed well in recent years, they face anemic core growth, shifting client expectations, rising pressure on fees, and the potential for disruption. The COVID-19 pandemic and associated recession will put further pressure on the industry. In response, they must be bold in their planning and approach to service delivery. Firms that successfully diversify revenue into growth areas (e.g. data and analytics) stand to add 2-3pp of growth to their top-line, and those that deliver a step-change in efficiency in service delivery can expand margin in the core business, despite continuing pressure on fees and net interest margin. Firms that take decisive action will be rewarded with financial outperformance, and will secure their positions as industry leaders.



THE GLOBAL CUSTODIAN VIEW: HOW CUSTODIANS SHOULD RESPOND

Global and sub-custodians have seen significant growth over recent years, as banks and other incumbent securities services providers have benefited from the continued increase in global AUM, helping fuel asset servicing fees. Between 2016 and 2018, the industry grew 16% from custody business lines, with most new income originating from Asian-based clients.

However, the industry is now at a crossroads, as asset management trends such as the relentless pressure on fees, the shift to passive investment, and increased consolidation, will require securities services providers to innovate or face dislocation. Asset servicing revenues among the top four global custodians plateaued last year due to poor market conditions and a sharp fall in net fee income, while global securities lending revenues also dropped due to macro uncertainties.

The fact that growth for the securities services industry is over-reliant on asset appreciation is concerning, and any contraction in asset prices could push growth

into the negative. This will mean custodians will have to evolve their business models and expand into new markets and services.

Front-office services, data and analytics appears to be the most likely area where securities services firms will expand. To tap into new revenue streams, custodians will move closer to the point of execution, and align themselves with trading and risk management platforms. Securities services firms will also offer more data-management capabilities for clients that are not users of custody services, enabling them to tap into new revenue streams. This will involve building out a significant data vault with enhanced application programme interfaces (APIs) to gather data not only across their own business but also other third-party providers.

Regulation, non-bank Fintech entrants and new technologies could cause significant disruption. In the coming decade, custody banks face a dilemma of how much of their legacy platform do they replace. Legacy applications will

most likely continue to last, as replacing custody systems across multiple locations is a project that could cost into the hundreds of millions.

But there is a fundamental shift in mindset to how providers approach their legacy platforms, and firms are starting to look outside their own environment to see how they can implement new standards to their technological infrastructure.

Custodians will look to utilize APIs and cloud-based platforms to help overcome the challenges of legacy infrastructure to create self-service functions and improve their cost structure. That will help increase automation, eliminate manual-intensive tasks, and allow them to reinvest into core and new value-add services which will constitute a meaningful portion of revenue in the future.



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