J.P.Morgan

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U.S. Mid- and Small-Cap Banks Technology Disruption Report

With a New Breed of Regional Banks Emerging, Many Are Positioned as Endgame Winners in the Digital Age

It has been our steadfast view for several years now that the US bank industry remains fully ripe for disruption. In fact, over the past several years we have paid particular attention to mega banks, foreign banks, fintechs, and big tech platforms, and at almost every step along the way have concluded that it was only a matter of time before the vast majority of our regional banks would succumb to the same pressure that many retailers face today. However, the tremendous success of regional banks with the PPP program served as an "aha" moment for us to step back and realize that a fresh look at the regional banks was in order. To this end, we placed our prior conclusions aside and conducted the deepest dive to date into the current value proposition of regional banks. After months of interviewing technology and customer experience officers at almost every bank we cover (as well as from many others), we now firmly believe that many regional banks are positioned to emerge as *the endgame winners in the digital age of banking*. In fact, although regional banks have always competed with relationships as their secret sauce, with the effective combining of high tech along with high touch, we see the ***relationship model as now being on steroids.*** Even though it may be difficult for investors to keep an open mind on the topic given prior conclusions, including those previously espoused by the authors of this report, we now view many regional banks as *challenger banks themselves* (in this report we showcase the efforts underway for each of our banks under coverage). In fact, a study of NPS scores from the top 50 banks fully supports our thesis that regional banks are pulling ahead. Not only do we emerge from this recent journey with a stronger appreciation for the efforts that have been underway at the regional banks over the past 2-3 years but we are so impressed by the transformation which has occurred that, while it is still not a slam dunk, we are increasingly now viewing this game as being theirs to lose.

- **In the age of convenience, the amount being spent on technology is the wrong measure.** We now firmly believe that the amount being spent on technology provides little to no value in terms of how a bank is reshaping its business in the digital age. In fact, with technology a means to an end, the true end in the bank industry is one single concept: providing outstanding convenience to customers.
- **We see net promoter score as the best proxy to measure customer satisfaction.** By analyzing J.D. Power scores, it's clear that regional banks are not falling behind. In fact, our coverage median NPS score is *above* that of the big six banks. We include an analysis of customer satisfaction scores for the top 50 banks.
- **Regional banks are using technology to empower relationships.** With the value proposition for regional banks deeply rooted in relationship banking, rather than replacing human-to-human connections, our banks are adopting a model of high-tech meets high-touch where empowered employees serve as a competitive advantage.
- **Fintechs are now more friend than foe.** For every fintech looking to compete against banks, there are now dozens of other fintechs looking to partner. On top of our banks leveraging fintechs to improve the client and employee experience, many have also banded together (through Canapi as an example) to pull ahead of the pack.
- **Our digital survival handbook for regional banks** includes items such as (1) fully eliminating friction points, (2) using M&A as a key tool, (3) moving to a new core, (4) a warning for niche players, and (5) becoming as customer driven as Amazon.

U.S. Mid and Small Cap Banks

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To read more on our more bullish outlook for 2021 and our upgrades of HBAN, PNFP, and BKU (each from Neutral to Overweight), click here.

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Table of Contents

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JPM U.S. Mid- and Small-Cap Bank Universe Comp Sheet

Table 1: JPM U.S. Mid- and Small-Cap Banks Valuation

J.P. Morgan U.S. Mid- and Small-Cap Bank Universe																					
Ticker	Company	JPM Rating	Senior Analyst	Last Price	Dec '21 Price Target	Total Assets ($ Bil.)	Market Cap ($ Bil.)	Price/ 2020E EPS (x)	Price/ 2021E EPS (x)	Price/ 2022E EPS (x)	Core EPS 2020E	Core EPS 2021E	Core EPS 2022E	MRQ TBV Per Share	Price/ Tangible Book Value	Dollar Volume 30 Day MA ($ MM)	Core Deposit Premium (%)	Dividend Yield (%)	Current Short Interest (% of o/s)
AMAL	Amalgamated Bank	Overweight	Alexopoulos	$13.25	$17.00	$6.6	$0.4	9.4	10.0	7.7	$1.40	$1.33	$1.72	$16.22	82%	$0.7	-2%	2.4%	0.4%
BKU	BankUnited	Overweight	Alexopoulos	$32.42	$41.00	$35.0	$3.0	18.3	12.0	9.4	$1.77	$2.70	$3.44	$29.30	111%	$19.5	1%	2.8%	1.9%
CADE	Cadence Bancorporation	Neutral	Alexopoulos	$14.76	$17.00	$18.4	$1.9	34.0	10.2	8.5	$0.43	$1.45	$1.73	$15.40	96%	$17.1	-1%	2.0%	4.0%
CMA	Comerica	Underweight	Alexopoulos	$51.82	$55.00	$83.6	$7.2	18.2	12.9	11.3	$2.84	$4.01	$4.57	$52.04	100%	$115.2	0%	5.2%	2.8%
CFR	Cullen/Frost	Underweight	Alexopoulos	$86.03	$85.00	$40.1	$5.4	26.4	20.0	18.4	$3.26	$4.31	$4.67	$54.60	158%	$31.3	6%	3.3%	3.4%
EBC	Eastern Bank	Neutral	Lee	$16.25	$18.50	$15.5	$3.0	34.5	33.8	27.4	$0.47	$0.48	$0.59	$15.12	107%	$27.2	0%	0.0%	0.0%
FBK	FB Financial	Underweight	Lau	$34.04	$34.00	$11.0	$1.6	10.7	14.4	13.6	$3.18	$2.37	$2.50	$20.87	163%	$5.2	8%	1.1%	2.0%
FHB	First Hawaiian	Underweight	Alexopoulos	$23.03	$24.00	$22.3	$3.0	16.9	16.1	14.0	$1.36	$1.43	$1.65	$13.38	172%	$19.8	8%	4.5%	4.9%
FHN	First Horizon National	Overweight	Alexopoulos	$12.70	$16.50	$83.0	$7.0	13.9	9.8	7.9	$0.92	$1.30	$1.61	$9.92	128%	$63.4	3%	4.7%	3.2%
FRC	First Republic Bank	Overweight	Alexopoulos	$129.26	$160.00	$133.2	$22.5	23.1	21.0	18.1	$5.58	$6.16	$7.12	$55.02	235%	$121.7	14%	0.6%	1.7%
GWB	Great Western Bancorp	Underweight	Lee	$18.94	$19.00	$12.6	$1.0	75.4	11.9	8.1	$0.25	$1.59	$2.34	$21.03	90%	$6.5	-1%	0.2%	1.6%
HBT	HBT Financial	Neutral	Elian	$15.29	$16.00	$3.5	$0.4	11.1	11.5	10.5	$1.38	$1.33	$1.45	$11.97	128%	$0.8	N/A	3.9%	0.2%
HBAN	Huntington Bancshares	Overweight	Alexopoulos	$12.51	$16.50	$120.1	$12.7	17.5	10.0	8.2	$0.72	$1.25	$1.53	$8.39	149%	$109.6	5%	4.8%	1.8%
KEY	KeyCorp	Neutral	Alexopoulos	$15.43	$18.50	$170.5	$15.1	13.9	10.6	8.7	$1.11	$1.46	$1.78	$13.32	116%	$144.7	2%	4.8%	1.6%
MCB	Metropolitan Commercial Bank	Overweight	Lau	$33.30	$50.00	$4.0	$0.3	7.9	8.0	5.7	$4.21	$4.17	$5.87	$37.80	88%	$0.7	-1%	0.0%	0.7%
MTB	M&T Bank	Neutral	Alexopoulos	$124.76	$148.00	$138.6	$16.0	13.4	12.0	10.6	$9.28	$10.37	$11.80	$79.80	156%	$153.4	5%	3.5%	2.0%
NYCB	NY Community Bancorp	Neutral	Alexopoulos	$10.14	$11.50	$54.9	$4.7	12.0	9.7	8.2	$0.85	$1.04	$1.24	$9.29	109%	$45.7	2%	6.7%	4.4%
PBCT	People's United	Neutral	Alexopoulos	$13.01	$15.00	$60.9	$5.5	11.2	12.1	10.5	$1.16	$1.07	$1.24	$10.36	126%	$80.2	3%	5.5%	3.6%
PNFP	Pinnacle Financial	Overweight	Alexopoulos	$59.76	$74.00	$33.8	$4.5	14.6	13.3	12.0	$4.10	$4.51	$4.98	$35.68	168%	$24.1	N/A	1.1%	1.4%
SBNY	Signature	Overweight	Alexopoulos	$128.15	$160.00	$63.8	$6.9	13.4	10.1	9.0	$9.59	$12.74	$14.21	$92.22	139%	$116.9	4%	1.7%	4.4%
SIVB	SVB Financial	Overweight	Alexopoulos	$349.49	$440.00	$96.9	$18.1	18.3	20.0	16.5	$19.12	$17.43	$21.22	$140.37	249%	$131.3	16%	0.0%	1.4%
SNV	Synovus	Neutral	Alexopoulos	$32.29	$37.00	$53.0	$4.8	15.8	12.1	10.2	$2.05	$2.66	$3.17	$27.34	118%	$38.2	2%	4.1%	1.7%
TCBI	Texas Capital Bancshares	Neutral	Alexopoulos	$57.30	$64.00	$38.4	$2.9	22.7	15.5	12.9	$2.52	$3.69	$4.46	$52.18	110%	$30.7	1%	0.0%	7.2%
TCF	TCF Financial	Overweight	Alexopoulos	$36.95	$42.00	$47.6	$5.6	15.3	13.5	11.6	$2.42	$2.75	$3.20	$25.01	148%	$29.0	5%	3.8%	2.4%
UMPQ	Umpqua Holdings	Underweight	Alexopoulos	$14.81	$15.00	$29.4	$3.3	11.3	10.8	10.5	$1.31	$1.37	$1.41	$11.84	125%	$21.1	3%	5.7%	2.0%
VLY	Valley National Bancorp	Neutral	Alexopoulos	$9.61	$11.00	$40.7	$3.9	10.2	9.3	8.8	$0.94	$1.03	$1.10	$7.12	135%	$21.9	4%	4.6%	1.5%
WBS	Webster Holding	Overweight	Alexopoulos	$41.43	$50.00	$33.0	$3.7	16.7	12.9	9.8	$2.49	$3.22	$4.21	$27.86	149%	$22.0	5%	3.9%	1.8%
ZION	Zions Bancorporation	Neutral	Alexopoulos	$40.71	$50.00	$78.4	$6.7	15.1	12.8	10.7	$2.69	$3.18	$3.81	$37.11	110%	$103.5	2%	3.3%	3.3%
Mid- and Small-Cap Bank Average								**15.2**	**12.1**	**10.5**					**127%**		**3%**	**3.4%**	**2.0%**

Source: Company reports, Bloomberg Finance L.P. and J.P. Morgan estimates. Note: Prices and valuation as of 12/14/20 close. OW = Overweight, N = Neutral, UW = Underweight. For EBC, MRQ TBV is using 4Q20e.

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Technology Disruption Report

We Now See Many Regional Banks in the Catbird Seat to Be the Endgame Winners in the Digital Age of Banking

It has been our steadfast view for several years now that the US bank industry remains fully ripe for disruption. In fact, over the past several years we have paid particular attention to mega banks (which spend multiples more than regional banks on technology), foreign banks (particularly in Asia), fintechs (which are nimble given modern infrastructures and lack of legacy baggage), and big tech platforms (which seem to have ambitions in the financial services industry), and at almost every step along the way have concluded that it was only a matter of time before the vast majority of our regional banks would succumb to the same pressure that many retailers face today. However, along with 2Q20 earnings season we started to question our thinking on the matter as bank after bank in our coverage universe cited tremendous market share gains (from larger banks) being associated with the PPP program. In fact, the vast majority of banks under coverage reported results that punched well above their weight, with banks such as Zions, as an example, reporting that they had provided 48,000 PPP loans which included loans provided to 14,000 customers that were *new* to the bank. Moreover, even though Zions ranks as the 21st largest bank in the US (based on assets), it was the 9th largest issuer of PPP loans. This was a theme that we heard over and over from our banks under coverage, all of which are dramatically outspent by their larger rivals. As a result, this was enough of an "aha" moment for us to step back and realize that a fresh look at the regional banks was in order. To this end, we worked hard to place all of our prior conclusions aside (something that is much easier to do on paper rather than in real life) and started with a blank sheet of paper. Taking an "open book" approach toward the topic of technology disruption also allowed us to further refine our thinking on what matters today in the digital age of banking. To this end, whereas most of the focus (if not *all* of the focus) from analysts and investors on disruption thus far has been on how much a bank was spending on technology as *the* key measure of future success, we started to ask several new questions including:

- Is spending on technology the end or, rather, the means to an end?
- Is scale an advantage or impediment in the age of convenience?
- Are human-to-human relationships still a source of competitive advantage?
- Is the focus of technology to improve efficiency or the client experience?
- How important is a modern underlying infrastructure?
- What is the true measure if a bank is doing enough on technology?

By asking new questions, we fairly quickly arrived at a brand new set of conclusions. First and foremost, we now firmly believe that the amount being spent on technology provides *little to no value* in terms of how a bank is reshaping its business in the digital age. In fact, many of the players in the financial services industry that are spending the most on technology are doing so tied to borderline ancient underlying legacy operating systems which are not only extremely inefficient but require significant additional investment for workarounds (such as adding middleware to make up for an outdated core). Rather than focusing on the amount of spending on technology as the key point of separation between regional banks, US mega banks, foreign banks, and fintechs, we now see technology as much more of *a means to an end* rather than the *end itself* with the true end being one single concept: providing outstanding *convenience* to customers.

In fact, when we look at Amazon, which is a company that many consider to be among the most effective at winning market share by providing an almost unmatched level of convenience to its customers, spending on technology is a means to help deliver superior convenience to customers, but there is much more to the equation than just spending on technology. In fact, if we look at features such as being able to return items with no packaging to either Kohl's or the UPS store, this has far less to do with technology and more to do with a business model that emphasizes convenience. In fact, it is the business model of Amazon to deliver continually improved convenience to customers; a point that is clearly articulated by CEO Jeff Bezos each year in its letter to shareholders. As a result, rather than us contrasting the spending by banks to one another on technology as the end, the real question to be asked was which banks, quite similar to Amazon, are effectively using technology *to improve the client experience*.

With this new question now guiding us, we sought to dive deeply into the positioning of regional banks in an environment where competition is not only coming from all angles but from competitors with much deeper resources. To this end, on top of the research we conducted from publicly available documents, we talked to a wide array of industry participants including just about every management team for the banks under coverage. With the vast majority participating in these conversations, *we were blown away* with the progress that the regional banks have made over the past few years. Even though it may be very hard for investors to keep an open mind on the topic given prior conclusions, including those previously espoused by the authors of this report, we now firmly believe that regional banks are in a *very strong position* to emerge as the *endgame winners* in the digital age of banking. In fact, we now conclude that ***many of the regional banks are themselves the challenger banks in the digital age***.

With that said, however, we are unable to conclude at this juncture that they will all indeed be *the* endgame winners tied not only to how fast the industry is evolving in the digital age but even more importantly what we also discovered through our research as a key vulnerability (in which many regional banks are leaving a back door open for fintechs to gain access to their customers). On an overall basis, however, we conclude that while the current situation remains a bit of a jump ball between regional banks, US mega banks, foreign banks and fintechs, we are not only very encouraged by the current positioning of regional banks but now actually see this game as *being theirs to lose*! The competitive advantage that regional banks bring to customers in the digital age is a model of high tech meets high touch, where empowered employees serve as a competitive advantage. In fact, although regional banks have always competed with relationships as their secret sauce, with the combining of high tech along with high touch, ***we see the relationship model as now being on steroids in the digital age***. In fact, as the PPP program results demonstrated, with regional banks being more nimble than their larger competitors and more tech savvy than the smaller community banks, we firmly now believe that many of the end game winners in the digital age of banking will be from the group of companies that we analyzed in this report. If readers of this report are able to keep an open mind, you will look at many regional banks very differently once we have taken you on this journey.

Generally speaking, the value proposition for regional banks has historically been deeply rooted in relationship banking. Whereas the largest banks tended to compete on brand and scale, the edge for smaller banks was being involved in the local communities. Whether it be on the soccer field, on the local hospital board, or supporting the local chamber of commerce, regional banks competed by providing more personalized service for customers. While their customer bases tended to be somewhat more commercial in nature, this also applied to consumers who would visit their local branch and be greeted by a familiar face. As we conducted interviews with almost all of our banks under coverage, the approach being taken by most was to use technology to *empower their people* to deliver even *better service*. We would note that this is in direct opposition to companies in many industries (particularly fintechs) which have made it all but impossible to get a human being on the line to discuss an issue. Rather than looking to replace that human-to-human connection, the regional banks are very effectively now using technology to improve customer service by not only providing specific products and services that make it easier to connect with a human but also by using technology to take low value tasks off the plate of front line bankers so that they have more time to spend on high value interactions with customers.

As investors will see throughout this report, we were able to showcase not only the empowerment efforts underway at the vast majority of regional banks that we cover but that many are now offering unique and proprietary products and services to their customers. This is tied in part to the strategy of regional banks to be very selective in the market segments where they chose to lean-in. Whereas the mega banks are able to cover vast customer segments and geographies, the regional banks are able to hone in on the specific areas where they are able to provide the strongest value proposition. Moreover, while many consider a human to human strategy as a relic of the past, we would put forth that a human to human strategy when *combined* with state of the art digital product offerings could prove to be *unbeatable*. As we started working through this journey we had aspirations to be able to point to the handful of banks that were leading the pack, but *this proved to be a very tough challenge*. In fact, we interviewed the head of digital and business line heads of many banks (for which many investors and analysts consider to be long-term market share donors) and *we could not believe that these were the same set of banks that we have covered for more than two decade*s. With that said, however, some notable examples of banks that stood out to us as being *among the best positioned* are provided on the list of banks below, including:

- **Amalgamated Bank** takes a targeted approach to using technology to serve the unique needs of its niche clients (i.e. political organizations and unions), with many of its clients having specific requirements for data feeds, file transfers, integration, and reporting. On the consumer front, Amalgamated partnered with a digital account opening fintech MANTL and integrated it into the bank’s online consumer account opening platform, which not only enabled a modernized and seamless account opening process for customers but also brought advanced real-time fraud and identity verification capabilities.
- **BankUnited** is moving full steam ahead with cloud migration and focusing on specific niches in which the company can provide a differentiated experience with much more to come along with BKU 2.0. In fact, BankUnited already has the ability to customize solutions for business customers to specific needs, particularly on the deposit business side. For example, in selected industry verticals, the bank customizes a suite of treasury management products to serve the unique needs for these customers. Unique fintech partnerships include partners such as Derivative Path, which assists the bank with its customer hedging program. The bank has another fintech partnership with Fundation for automated underwriting of small business loans.

- **Cadence Bancorporation's** relationship-first model which emphasizes "same-day service" provides customers with multiple ways of interacting with bankers, including not only in person (through branches) but also through interactive ATMs where customers can video chat with live tellers during off-hours to help with financial transactions. Outside of interactive ATMs, Cadence also leverages nCino for its commercial loan origination product offering (including assisting with the PPP program) and Ondot to enhance its debit card product which gives customers the ability to track spending habits.

- **Comerica** has revamped its online retail deposit product offering (with 11K new accounts opened since April) and is actively leveraging the cloud, robotics, and artificial intelligence to expedite new product offerings in areas including treasury management, small business deposits, and commercial payments. Internally, Comerica has rolled out new data analytics tools that provide its bankers with customer dashboards and next-best sale information. New senior position fills in technology and customer experience are also notable with several technology projects still in the pipeline.

- **Eastern Bankshares** is at the forefront of leading innovation in the small business banking space. In fact, Numerated Growth Technologies—a leading fintech that enables real-time small business lending—was spun out of Eastern Labs, a technology incubator inside Eastern, with Eastern Labs focused on driving innovation at the bank by partnering with and investing in fintechs (such as Monit which leverages predictive technologies to forecast cash flows for small business owners) to solve pain points for its customers and bankers.

- **First Hawaiian** is now full steam ahead to embark on a digital journey with a core upgrade, API build-up, and cloud migration now in the works, while aiming to be in the driving seat in controlling and making smart use of data. Recently, First Hawaiian partnered with MX Technologies, a money management and data analytics fintech, to renew its personal financial management platform that is now capable of automatically creating budgets on behalf of customers based on past spending behavior as well as making predictions on future spending by leveraging AI-driven predictive analytics.

- **First Horizon** is rolling out new accounting, treasury, and mortgage platforms for clients even with the ongoing full Iberiabank MOE systems conversion while migrating internal systems (for example, its consumer small business platform) to the cloud. First Horizon is partnering with Bottomline Technologies for its treasury solutions platform which will support integration with APIs and is using Dovenmuehle (DMI) for its new mortgage platform which will help streamline the mortgage process and reduce costs.

- **First Republic** is investing heavily in technology as well as quantitative capabilities to drive to an unmatched internal banker experience as well as client experience by providing a myriad of tools to (1) allow the banker to spend much more quality time with clients (such as Customer Relationship Browser, an intelligence engine that provides First Republic bankers with actionable insights that are easy to execute including which clients to call, when and why) while (2) providing very unique (and proprietary) service features to its high net worth cohort (such as "contact team" button where clients can simply tap the gold icon on their mobile phone to reach their personal bankers live as well as "stealth view" that allows for a mobile banking interface with privacy controls to fulfill the unique needs of First Republic clients who tend to travel a lot and are highly sensitive around privacy). In addition, First Republic partners with more than 100 fintechs in multiple areas including payments, data management, account aggregation, fraud, and risk management, which helps to improve its customers' digital experience as well as the bank's efficiency (e.g. automation).

- **Huntington Bancshares** is smartly partnering with fintechs and using digital coaches to deliver industry leading customer satisfaction through unique products such as The Hub (its digital banking platform) along with very customer friendly products and services (including its $50 Safety Zone and 24-Hour Grace for both consumer and business customers). The Hub was developed in partnership with Strands (a Spanish personal finance management fintech), while Huntington also partnered with Personetics (a leading customer-facing AI fintech) to develop Money Scout, which is an automated savings tool that finds pockets of available funds and automatically moves them to savings.

- **KeyCorp** is taking a very targeted approach not only by partnering with many fintechs but acquiring them as well, with Laurel Road a high NPS differentiator that continues to expand its reach. Other examples of KeyCorp's unique fintech partnerships include (1) Bolstr, a fintech providing a digital lending platform that streamlines the process of applying for small business loans online by leveraging robotic process automation technology (which KeyCorp acquired in June 2018), and (2) HelloWallet, a fintech offering a personal financial management product that assesses customers' financial health scores and gives advice to improve their score (which was acquired by KeyCorp in May 2017 and integrated into its proprietary PFM tool, Financial Wellness).

- **M&T** is moving from an outsourced model to one that is 85% in-house today. M&T plans to hire 1,000-1,500 developers within three years and other technology staff for its new Tech Hub with plans to share the building to create an ecosystem of technology talent. The company has already moved to nCino, a modern commercial loan origination and administration tool for commercial lenders. Unique fintech partnerships include Blend, which was used to create a PPP solution. Another unique partnerships include the bank partnering with a group of engineers at the Cornell Business School to develop a small business analysis and valuation app—that is now in beta with a small group of M&T customers.

- **Metropolitan Commercial Bank's** Global Payments Group (GPG) offers a diverse suite of digital product offering to fintech companies such as ACH processing, debit cards, digital asset settlement, P2P payments, and virtual debit cards, to name a few. Unique fintech industries served by MCB include crypto currency, mobile banking, financial services for unbanked/underbanked, and correspondent banking. Clients of Global Payments Group include Revolut, Current, Coinbase, Square, PayPal, and MoneyGram to name a few.

- **New York Community** is now fully migrated on to a modern Fiserv real-time core processing, digital banking and payment solutions. With new digital capabilities, NYCB now can move to improve the customer experience and attract lower cost funding with checking deposit accounts.

- **People's United** has formed a "Business Transformation Office" which focuses on digitization, process optimization, and fintech partnerships with an early implementation of a data strategy now providing a 360 degree view of customers. Unique fintech partnerships include Numerated for its digital business lending solution to speed up the process for business customers.

- **Pinnacle Financial Partners** is not only partnering with but is also investing into fintechs to leverage their technology and have a much closer relationship with fintechs. Most notably, Pinnacle is an investor in a fintech called Apiture which provides a cloud-native digital banking platform that uses APIs to (1) roll out new products in areas including treasury management and online/mobile banking and (2) simplify the online account opening process. Other unique fintech partnerships include: Numerated (small business lending platform that automated the entire PPP origination process and is streamlining the PPP forgiveness process), Five Iron Technologies (a source of information security professionals), and Corserv (enhances purchase card offerings with Pinnacle an account issuer for dozens of other banks).

- **Signature Bank** is pairing its experienced relationship managers with innovative products such as Signet, a payments platform in partnership with fintech company Tassat, that leverages blockchain technology to allow Signature customers to make payments to each other 24/7/365 days a year.

- **SVB Financial** offers unique products to its differentiated niche of startup clients in areas including global payments, foreign exchange, API banking, and an idea-generation community to reduce friction points and free up time for entrepreneurs to run their businesses. As an example of continuing to create a frictionless experience for clients, Silicon Valley Bank is rolling out a fully digitized client onboarding platform to remove some of the administrative areas from the onboarding process. To help enhance the experience for its bankers, Silicon Valley Bank has leveraged its relationship with nCino to roll out a new credit onboarding platform.

- **Synovus** is taking a tailored approach to create solutions for customers with technology being employed to improve customer relationships and help differentiate the company, particularly in areas such as providing advice. Synovus also uses technology to reduce the cycle time for products (such as deposit account opening) and introduce more self-service options (to give customers a preference of how they want to bank). Additionally, not only does Synovus partner with Blend Labs to simplify the mortgage application process, but it also adds a human touch layer by making an outbound call to customers to assist them with the application.

- **Texas Capital** uses an agile framework to increase the speed of product rollout while also leveraging learnings from its national digital bank, Bask Bank, to deploy cutting edge solutions to customers. The usage of cloud-based platforms from Azure and Salesforce has also allowed Texas Capital to gain real-time visibility into customer data which provides insights so bankers can better understand customers.

- **Umpqua** was one of the first banks (if not the first) to introduce human digital as a differentiated strategy along with a mobile platform where customers can select and talk to a dedicated banker (now known as Umpqua Go-To). The key technology underlying Go-To was developed by Pivotus Ventures, Umpqua's in-house fintech incubator (which was sold to fintech Kony in 2018), while Umpqua remains active in forming strategic fintech partnerships, such as MineralTree (an accounts payable automation fintech for integrated payables for Umpqua's commercial clients) and Snowflake (a cloud-based data warehousing fintech used for its cloud-first strategy).

- **Valley** now has much of the technology groundwork laid with new technology talent and an agile culture to fully realize the benefits of fintech partnerships as well as cloud provider services. In fact, Valley has already started to target niche markets (such as Home Owner's Associations) with new technology solutions as well as specific products and offerings. Unique fintech partnerships include Alloy for real-time Know your customer (KYC) / Anti-money laundering (AML).

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- **Webster** looks to differentiate its technology offerings within the Commercial Bank and HSA Bank, with technology offered in Community Banking typically commoditized (with exceptions such as recently rolled out ITMs during the pandemic). The bank rolled out FastTrack, a business banking automation tool to speed up processes by automating credit files and underwriting processes and reduced turnaround times significantly. Unique partnerships include the HSA Bank utilizing WEX Health for its underlying HSA technology.
- **Zions** has introduced new digital capabilities for treasury management products and small business loan and mortgage applications, among many other products, as part of its multiyear journey of upgrading its core platform. For its bankers, Zions has rolled out the Intelligent Real-Time Interactive System (IRIS), an internally-developed real-time sales platform, which uses artificial intelligence to not only provide bankers with customer account data right at their fingertips but also inform bankers of next-best product recommendations for potential cross-sell opportunities.

Keep in mind, even though we took this most recent journey with a fresh set of eyes we have been probing our companies on near continual basis for years. What we previously underappreciated, however, was that as many were starting to count the regional banks out, that *over the past 2-3 years many of the banks under coverage brought new talent to take over digital initiatives*—many of which came from outside the bank industry. Rather than simply let these new technologists take the bank in a new direction, however, what was also eye opening was how the business line heads not only helped shape the long-term direction of the company but in most cases the *ownership of the client experience remained with the business* (as well as front line bankers) rather than being relinquished to a technology group. In fact, it was rather the opposite with the business line heads working side by side with senior management and new heads of digital to forge a unique new path that is very different from the path being forged by US mega banks, foreign banks, and fintechs.

With Technology a Means to the End, Customer Satisfaction Scores Prove to Us that Many Regional Banks Are Pulling Ahead

With us now concluding that technology is a means to an end, with the actual end being the convenience proposition to customers, the needed report card was whether the efforts from the regional banks were starting to bear fruit. To this end, we turn to customer satisfaction scores from J.D. Power and were very impressed with the results from the vast majority of regional banks. First and foremost, we would observe that despite the claims that fintechs were well positioned to eat the bank industry's lunch (a thesis postulated many times in the past by the authors of this report), the data thus far *tells a very different story* with the overall customer satisfaction scores *rising* commensurately for regional banks as well as the big six banks since 2018 with smaller banks (defined as "midsize" on the chart below) maintaining an overall strong customer satisfaction score throughout the period. With fintechs as well as companies such as Amazon "raising the expectations bar" for customers, one surely would have expected to see at least the initial signs of customer satisfaction score deterioration within the bank industry. To this end, however, not only have customer satisfaction scores not deteriorated, but they have improved. In our view, after speaking with the vast majority of banks under coverage recently on this topic we firmly believe that for every fintech raising the expectations bar, in either a direct to consumer or direct to business model, there are dozens of other fintechs looking to partner with banks of all sizes to not only level the playing field but, rather, raise the expectations bar as it relates to direct channel fintechs.

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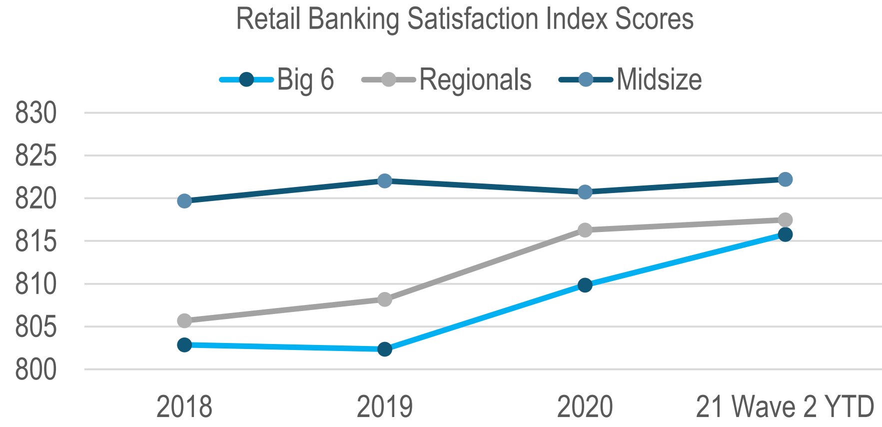
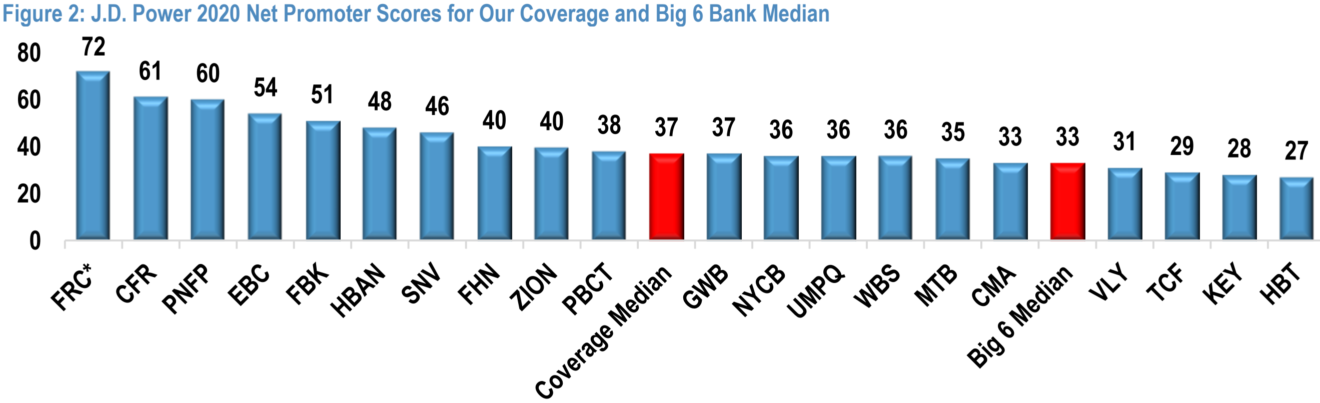
Figure 1: J.D. Power Retail Banking Satisfaction Index Scores, 2018-2021 Wave 2 YTD



Source: J.D. Power.

What is also very interesting to observe from the chart above is that with mega banks having significant resources to help stay above the expectations curve, (1) regional bank customer satisfaction scores have remained above the collective score of the mega banks with (2) smaller banks (defined as "midsize") remaining above each of these cohorts. These results confirm to us that spending on technology on its own is only part of the equation as banks need to deliver an overall value proposition that "wows" customers. For the regional and smaller banks, the competitive advantage versus larger banks comes from the combination of smartly using technology to improve the direct to customer experience but, perhaps even more importantly, using technology to empower employees to deliver even stronger personalized service. In fact, if we next look at net promoter score (or NPS) data, it's interesting to observe that, despite many analysts and investors viewing the regional banks as being unable to keep up with the mega banks, with regional banks using a combination of high tech and high touch, the median NPS score for our banks under coverage exceeds that of the big six banks. We would note that NPS data was only available on banks with above 50 branches and for those banks with above 50 branches, they needed to receive a minimum of 100 responses to qualify as having a sufficient sample size.

Figure 2: J.D. Power 2020 Net Promoter Scores for Our Coverage and Big 6 Bank Median



Source: J.D. Power and company reports. Note: Big 6 banks include BAC, C, JPM, PNC, USB, and WFC. Excludes BKU and CADE due to fewer than 100 survey respondents. Excludes AMAL, FHB, MCB, SBNY, SIVB, and TCBI due to fewer than 50 nationwide branches. *FRC was not available from J.D. Power given a sample size below 100, so we use 2019 NPS from company reports.

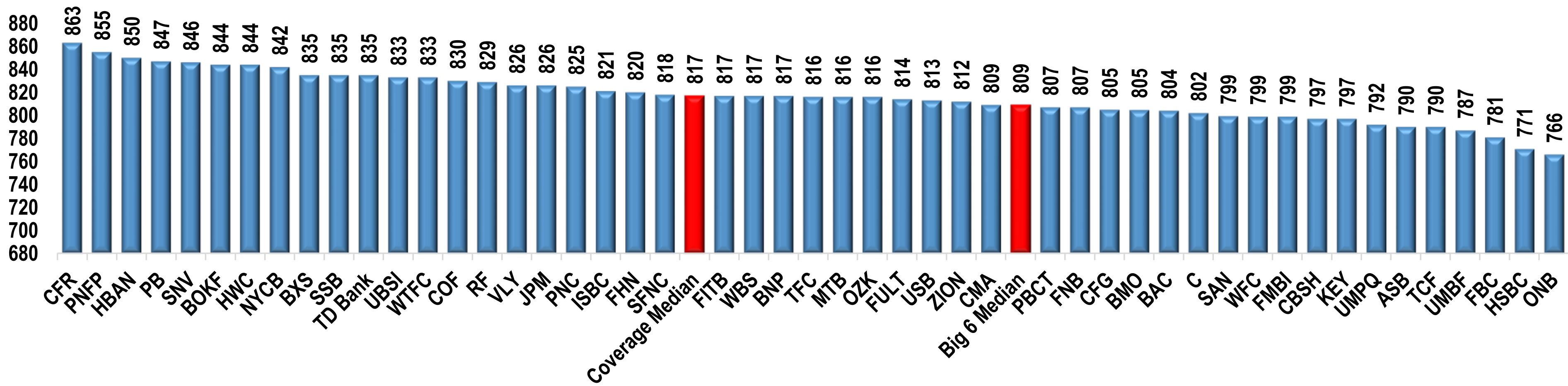
In terms of the individual bank NPS, we must point out that much of the survey work from J.D. Power to arrive at NPS was largely directed at consumers. With most regional banks primarily focused on small business and middle market customers, some may argue that the NPS of their business customers is higher than for retail customers. Although this may be a completely valid argument, we still consider this a very good tool in comparing banks from one to another given that most regional banks are in the same boat (of being more business than consumer focused). With that said, however, we find it very unlikely that a bank would be in position to "wow" one segment of its customer base while being well below par in another segment (note to bank managements: if you have an NPS in a targeted business line that is well above the J.D. Power NPS that we are referencing, feel free to disclose and set the record straight). What we have learned through years of studying companies across multiple sectors, however, is that it's the business model of the company that drives customer satisfaction levels and, quite frankly, some companies are much more focused on client satisfaction as their primary business model than others. There is no better example of this than Amazon (which is customer obsessed agnostic of business line). As a result, we consider the NPS scores of the individual banks to be a very good proxy of customer satisfaction levels today with one major caveat in that, for many of the regional banks we interviewed, such as Zions for example, the best is still to come in terms of improving the client experience through a brand new suite of modern products and services.

Looking at the individual bank NPS results, First Republic tops the charts with an NPS that is nearly double the median for our coverage universe and more than double the median NPS for the big six banks. With First Republic the epitome of "high tech meets high touch" in terms of what the company is doing to improve the customer experience in every channel, the company should serve as a role model for what is possible for other banks. To this end, banks that also stood out as having outstanding NPS scores included Cullen Frost, Pinnacle, Eastern Bank, FB Financial, Huntington, and Synovus. From this group, however, the bank that stood out to us the most as being the most forward in terms of combining cutting-edge technology with very customer-friendly policies was Huntington. In fact, even though Huntington rates well above the typical bank in customer satisfaction as well as NPS scores, we would not be surprised if in the next several years the company moves into a top three position.

If we zoom out and take a wider view of the banks in our coverage universe and compare this cohort to the top 50 banks (screened for branches above 50 and enough of a sample size to generate a reliable customer satisfaction score), one can see that many of the regional banks under coverage remain in a position of strength with only Wintrust and Prosperity being added into the top seven on an NPS basis. Moreover, if one notes the location of the big six bank median on the chart, it's impressive for the regional banks how many are positioned favorably to this benchmark cohort. We would note that the J.D. Power's overall satisfaction score weighs a variety of metrics (such as account opening, communication and advice, problem resolution, branch, convenience, etc.) while the net promoter score measures the percentage of "net" customers likely to recommend a company or product. While both are valuable measures, the added benefit of net promoter score is that the metric is comparable across industries while the displayed overall customer satisfaction metrics would be mostly applicable to the bank industry.

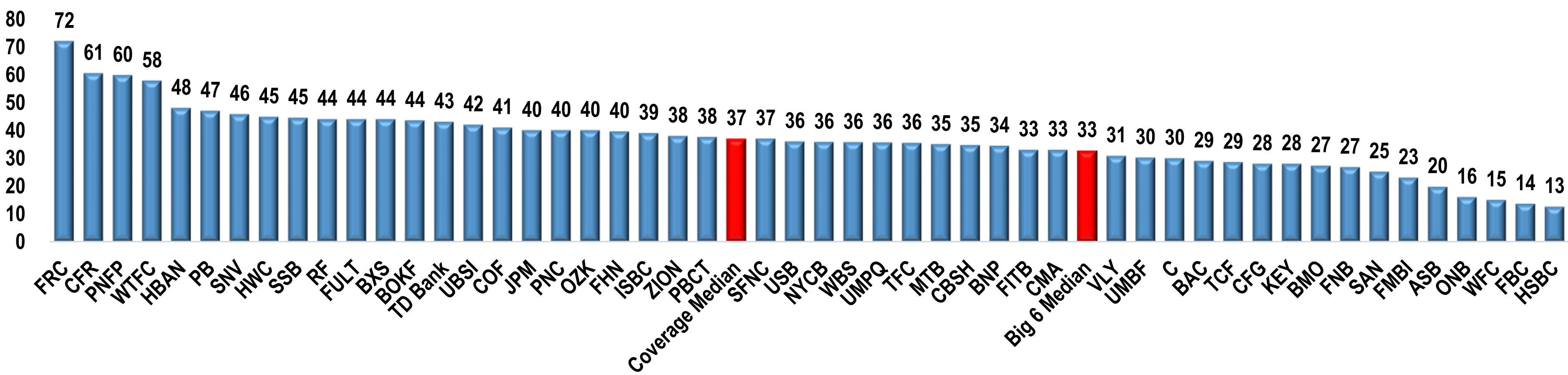
As a result, from this analysis we now find it very difficult to conclude that scale is an asset in the digital age of banking. In fact, even though many bank managements point to increased scale as one of the key reasons to pursue M&A, it appears to us that the larger a bank gets, the increased complexity as well as standardizing of practices actually acts as an impediment toward delivering a “wow” level of service to clients. In fact, from the NPS data below for the top 50 banks it’s interesting to note that *only two* of the big six banks rank above the median NPS score for our coverage universe while four of the big six banks rank below. With the smaller banks already in the lead from an NPS view, however, it was also very clear from our deep dive into the technology skill set of the regional banks that the *best is yet to come* for many of the mid and small sized banks. In fact, with larger players more ahead in their journey and the already above average client experience for regionals likely to improve materially over the next 2-3 years, we see regional banks overall as pulling even further ahead from their larger competitors. On our annual tour of Silicon Valley where we meet with startups across industries, it’s clear that small companies are disrupting larger ones. Following our deepest dive into the value proposition of regional banks to date, we see the bank industry following a very similar pattern.

Figure 3: J.D. Power 2020 Overall Customer Satisfaction Scores for Top 50 Banks (Plus Select Foreign Banks) by Assets



Source: J.D. Power. Note: Big 6 banks include BAC, C, JPM, PNC, USB, and WFC. Data excludes FRC, BKU and CADE due to fewer than 100 survey respondents. Data excludes AMAL, FHB, MCB, SBNY, SIVB, and TCBI due to fewer than 50 nationwide branches or other reason not in J.D. Power survey. BNP = Bank of the West. SAN = Santander. Index score ranges from 0 to 1,000.

Figure 4: J.D. Power 2020 Net Promoter Scores for Top 50 Banks (Plus Select Foreign Banks) by Assets



Source: J.D. Power and company reports. Note: FRC 2019 NPS is from company reports. Big 6 banks include BAC, C, JPM, PNC, USB, and WFC. Data excludes BKU and CADE due to fewer than 100 survey respondents. Data excludes AMAL, FHB, MCB, SBNY, SIVB, and TCBI due to fewer than 50 nationwide branches or other reason not in J.D. Power survey. BNP = Bank of the West. SAN = Santander. Net promoter score ranges from -100 to 100.

Although the Regional Banks Are in a Very Strong Competitive Position, Many Are Leaving the Backdoor Open for Fintechs

Even though we think the vast majority of regional banks have made significant strides over the past several years in terms of improving the client experience, for the most part we consider most regional banks as being only in the 2nd to 3rd inning of their digital journey with many improvements on the client-facing front to take place over the intermediate-term. Even though we see many regional banks as being in the catbird seat to be endgame winners in the digital age of banking at the current juncture, we consider the situation to be somewhat of a jump ball between regional banks, mega banks, foreign banks, big tech, and fintechs. The reason that we conclude the situation is a jump ball with regional banks being only potential winners is that the vast majority have left the backdoor open into accessing their customers.

With many fintechs, such as Chime and Robinhood, seeing valuation levels soar, the common denominator is that these new entrants are seeing a surge in customer acquisition. While many of them offer a cutting edge experience for customers, what is also a key point of differentiation is that many fintechs don't charge customers fees for many products and services that the legacy bank industry has become reliant on. For example, pure-play fintech banks such as Chime and Varo do not charge industry standard nuisance fees such overdraft. This is compared to the bank industry where the standard overdraft fee charged by most is still in the $30+ range, even for a small ticket overdraft. What the industry does not seem to realize is that a company can deliver best in class service and then end up turning net promoters of their company into demoters by charging fees in which customers see little value. This is similar to us to airlines which started charging fees for customers to check baggage. These actions create friction points with customers that create the opportunity for customer friendly fintechs to enter the henhouse.

Perhaps best illustrating our point is First Republic, which has the highest net promoter score in the industry yet derives the smallest contribution of revenue from nuisance fees. In fact, if someone is a customer of First Republic and they use a foreign ATM and incur a fee, First Republic will cover the cost of that fee (charged by another bank) for their customers. By creating a frictionless experience for customers, First Republic is then able to marry high tech and high touch to deliver an unmatched experience for customers. Although many banks we spoke to seemed very reluctant to reduce nuisance fees being charged (given that these fees are now supporting top line growth), it is our firm view that if the regional banks end up not being end game winners in the digital age it will be the over-charging of nuisance fees that does them in. To this end, the bank that also appears to be a cut above the rest is Huntington, which offers some of the most consumer friendly products in the industry. Demonstrating perhaps that the resistance of banks to move to more customer friendly practices being more business model than financial, it was very interesting to observe that along with the announced HBAN/TCF merger, it was going to cost only ~$15mm (net of the expected benefits such as improved retention) to expand Huntington's very customer friendly business practices to TCF. If TCF had implemented these changes on their own, it would have reduced our 2022e EPS for TCF only in the 5% range. In our view, trading off 5% off earnings for the prospects of much higher client satisfaction scores is a no-brainer.

As we have studied disruption across sectors, the story is the same with new entrants exploiting incumbent vulnerabilities. Although these weaknesses are in plain sight, with incumbents clinging on to legacy revenue streams in many cases, hard choices need to be made and rather than quickly pivot (and completely eliminating friction points), incumbents that have failed historically have done so by slowly adapting to the new environment, fully allowing new entrants through the back door. In an efficiency ratio obsessed industry, bank managements have a tough choice: take the pain now and be the one doing the disrupting or, rather, continue to cling onto legacy practices that cause friction with customers and get disrupted. Keep in mind, we are not suggesting that banks eliminate all fees but rather whittle the friction points related to nuisance fees down to the point that the backdoor for fintechs is hammered shut!

Could There Be a Plot Twist? Is Stakeholder Capitalism a Backdoor for Banks into B2B/B2C Fintechs' Customers?

Although we currently see areas such as nuisance fees as a backdoor for fintechs to gain access to bank customers, regional banks are in a position to not only close the door, but more importantly, open a back door themselves into fintechs' customers. The competitive advantage of fintechs offering banking services direct to consumers and/or businesses is very clear, with many of them creating a frictionless experience for clients that includes not only not charging many traditional bank fees but helping customers to avoid these fees. From the conversations that we've had with the regional banks, although it's very clear that, while many are working to reduce friction points with customers, the group as a whole seemed far less receptive toward eliminating friction points tied to nuisance fees being charged.

With that said, however, with stakeholder capitalism becoming more mainstream we see this as an opportunity for banks to dramatically reduce (or eliminate completely) the nuisance fees that impair client satisfaction scores as well as move to a stronger position of advice for customers which focuses on financial wellness and includes helping customers to avoid being charged fees. By banks becoming advocates for their customers on top of offering differentiated delivery channels which includes branches and experienced bankers, we see a new breed of regional banks as being in a position of strength to drive market share gains. Moreover, charging fewer fees on customers as well as becoming stronger customer advocates will help consumers, businesses and communities—which collectively are the fabric of stakeholder capitalism. Although many management teams may be hesitant to eliminate fees given the potential for unhappy *current* shareholders, with long-term survival at stake we see no end around it with nuisance fees over time becoming a thing of the past with the only question being whether regional banks used this as an opportunity to win market share or donate market share. To this end, however, we see another tool unique to regional banks which could unleash *a new era* in convenience age of banking. Enter stage left: M&A.

M&A a Key Tool for Regional Banks to Thrive in the Digital Age, but New Metrics Are Needed

We've had an "on-again" "off-again" relationship with bank M&A through the years. Although on paper bank consolidation makes a ton of sense, when it comes to execution many times we have found that either (1) the financial metrics were less than stellar for the acquirer (with very long TBV earnback periods) or (2) that the "too many to list" revenue synergies announced with the deal rarely manifested themselves in a form that we needed to raise our revenue forecast for the acquirer. As a result, market enthusiasm for bank deals has waned considerably with the stock reaction of the acquirer (at best) declining only a few percentage points on news of the deal with the selling bank not seeing the historical "pop" that used to accompany an announced deal. Although the market enthusiasm for bank M&A has diminished over the past several years, however, following our deepest dive into the technology platforms of the regional banks we are increasingly viewing consolidation as one of the key tools to thrive in the digital age of banking. Albeit, it's not for the reason that is commonly assumed.

Over the past 12-24 months, MOEs (or merger-of-equals) saw somewhat of a resurgence. More often than not, one of the justifications that was given for the deal was that, with two smaller banks getting together to become a much larger institution, the new organization would be in a better competitive position against larger banks which had much deeper resources available on technology. With that said, however, one of the questions that we asked just about every bank we cover was that if they had another $10B, $25B, $50B of assets (or double their current assets size), what would they then been able to offer their clients from a technology viewpoint that they were not able to offer today. After some head scratching and looking around the room, all of them (and without exception) replied that there really was nothing that they could not offer today that would be available to them at a larger asset size, particularly given the *significant decline in technology costs over the past several years* as well as myriad of fintechs looking to partner and offer their services. The overwhelming majority of banks are spending in the 8-10% range (of revenue) on technology and if they doubled their size (and revenue) they would likely continue spending in the same 8-10% range.

While the increased scale argument doesn't seem to have much merit in justifying M&A, however, there is another key reason that we see consolidation as a powerful tool for a bank to thrive in the digital age of banking. With that said, traditional thinking as it related to bank M&A needs to change. In a traditional bank M&A transaction, several of the key questions typically asked include (1) how large are the cost saves, (2) what is the EPS accretion, and (3) what is the TBV earnback period. While these served as key measurements of bank M&A for many decades heading into the digital age, we see these traditional measures as needed to be placed on the back burner for a period of time.

It's very clear that in the convenience age of everything, banks need to eliminate friction points with customers. These friction points come in a variety of forms, such as (1) charging customers nuisance fees for which they see little or no value, (2) needing to improve areas of weakness, including problem resolution for many banks, and (3) needing to improve the availability and simplicity of self-service channels, including online, mobile and ATMs. The common denominator of these friction points, however, is that they will cost the bank money to rectify—either in the form of fees being reduced and/or eliminated or in the form of increased investment into areas such as infrastructure and training.

While it might be tough for a bank to come on their earnings call and guide to either a material reduction in fee income and/or increase in investments, particularly given an efficiency ratio obsessed analyst community, consolidation could prove to be an ideal vehicle to reach the end goal (of improved client experience) and on a significantly faster time frame. With that said, however, rather than the focus on bank M&A being on earnings accretion and TBV earnback, the focus needs to be on how many friction points can be eliminated post the transaction closing. With that said, however, without a specific level of earnings accretion for investors to hold management teams accountable, transparency of what is being promised needs to move to a new level.

In fact, if a bank management were to go on their call post an M&A deal being announced and, rather than talk about net cost saves, they focused on the specific areas that the cost saves would be used to *improve the client experience*, this is something we believe investors (and the market) would find far more welcoming. Keep in mind, however, we are talking about specific areas such as (1) post this transaction we are lowering our overdraft fee from $35 to $5, or (2) post the deal we are investing $25mm to roll out a new suite of customer facing apps, or (3) post the deal we intend to improve our problem resolution satisfaction level from X to Y over the next year.

In the decades heading into the digital age, the goal of M&A was to own the targets and then sell once the deal was announced. In the new age of bank M&A, however, the real litmus test for us will be how many investors want to buy shares in the new company *after* the deal has been announced. We would also point, however, that with fewer cost saves falling to the bottom line, TBV earnback periods are likely to extend considerably. While historically we considered anything in the 3-5 year period as reasonable, so long as a bank was laying out a compelling case on how the client experience levels were likely to improve materially post the benefits of the transactions were realized, we could see TBV earnback periods even as high as the 10-year range as being a lucrative trade-off for shareholders.

While some investors might balk at such a long earnback period, we would argue that if the company delivers on the promises laid out with the deal and client satisfaction scores actually improve, even on a lower level of TBV, shareholders will come out ahead given improved top line growth potential (and a higher multiple). The purpose of improving client satisfaction, however, is not to either “level the playing field” or “improve a sub-par customer satisfaction core to a less egregious level of client satisfaction”. Rather, it is a tool to be used by banks with a business model that *already has at its core client satisfaction* with the deal a tool to be used to further improve client satisfaction levels above peers. In fact, we long for the day that a deal is announced and a bank includes in their deal slide deck that because of the deal they will now install a new core or they are eliminating specific friction points or that they will be using cost saves to create a new tech hub with plans to insource 85%+ of their technology (as was the goal achieved by global tech leader DBS Bank in Singapore as well as by M&T Bank). To think that the same M&A playbook that dates back 50 years is still relevant in the digital age is a mistake. In fact, in the convenience age of everything, *M&A should be a key tool used to improve the convenience proposition for customers*.

For banks that are *unable* to drive to a “wow” level of service over the short-run, however, it’s time to plan for an M&A exit. In fact, there are now scores of retailers that could not adapt fast enough that wish they had sold their company to one of the endgame winners—and while they were in a position of strength. We believe that the window is still open to create a win-win for bank shareholders, but time will not remain on the side of banks that don’t already have in place today a culture that drives high client satisfaction. To this end, the recent merger announcement between Huntington, who is a leader in client satisfaction, and TCF Financial, who is a laggard, is a textbook example of how M&A could be used to create a win-win for shareholders. With that said, once the endgame winners among regional banks have been more clearly identified, the sellers won’t have anything of value to offer. On the flipside, we see many banks which today have as their core business model and culture that promotes client satisfaction as being in the catbird seat to drive industry consolidation with industry leaders at this point dealing from a position of strength including banks such as Pinnacle, Cullen Frost, Huntington, M&T, Synovus, Zions, People’s United, Umpqua, and Eastern Bank.

While we see consolidation as an additional tool for regional banks to pull ahead in the digital age, this new approach for regional banks will require bold leadership and management teams being willing to deviate from the status quo. To this end, however, although banks such as First Republic, Pinnacle, Cullen Frost, Huntington, and Synovus are already in a position of strength from a client experience viewpoint, the field is wide open for additional leaders to emerge and *accelerate* the timeline toward providing a "wow" level of service to customers. Even though not every bank we cover scores at the upper-end of the client satisfaction scores today, we can confidently report to shareholders that a new breed of regional banks are indeed emerging.

We would note that in the appendix to this report we include "one-pagers" for our banks under coverage which provides a look into the sub-components of client satisfaction scores.

A New Breed of Regional Banks Emerging

PPP Served as an Unexpected Litmus Test for Regional Banks Capabilities

On March 27, 2020, the CARES Act was passed into law, which was meant to provide relief to consumers and small businesses that were affected by the shelter-in-place and stay at home orders. As part of the program, the federal government launched the PPP program to provide loans to small businesses which could be forgiven if the firm met certain conditions with respect to rehiring employees. As banks worked through these loans they had to implement completely new processes and systems to process PPP loans. With that said, however, the rollout of the PPP program proved to be a litmus test for banks that, similar to most companies, have been reshaping their business and value proposition given the digital age of everything now at hand. To this end, while some banks hit the cover off the ball in terms of success with the PPP program, it was clear that the combination of prior technology investments combined with significant manpower worked in tandem to deliver a superior experience to customers seeking funds through the PPP program. Taking this one step further, with regional banks, fintechs, and mega banks all battling it out to acquire market share, the unique combination of high tech and high touch proved to be somewhat of a Trojan horse in which regional banks gain access to new customers from larger banks as well as fintechs. Moreover, even with an incredible level of success with the PPP program, the digital transformation of the regional banks remains in the very early innings for many—implying that the fuller value proposition from regional banks is still yet to come.

As the Crisis Unfolded, Regional Banks Used PPP to Help Their Clients in an Uncertain Environment

With the launch of the PPP program in April, banks across the country sprang into action to begin processing the PPP applications for their clients. In the first round of the program, the focus for most regional banks was to provide PPP funds to existing clients for two major reasons: (1) Existing clients did not have to undergo additional AML and BSA screenings to receive PPP funds; and (2) Banks had much of the documentation in place for existing clients which could speed up the approval process. To this end, banks like BankUnited, M&T Bank, and KeyCorp noted on the first quarter earnings call that their primary outreach in terms of clients requiring PPP loans were existing clients. With regional banks having their roots in relationship-based banking, stepping up during a time of need has historically been a strength of smaller banks. What is not always the case, however, is that during a period of turmoil, regional banks have been able to deliver a level of service that resulted in an improved level of customer satisfaction. To this end, BankUnited emerged as one of the first banks on their second quarter earnings call to call out that the company was knee deep in processing PPP loans for new clients who were dissatisfied with their primary bank. This ended up becoming a key theme for many regional banks as they moved beyond serving their existing customers with the PPP program. Taking a step back and looking at the factors behind the differentiated service that regional banks were able to provide with the PPP program, we note three major factors that help regional banks provide standout client service during a period of turmoil:

- **Using Technology to Complement Relationship Banking:** With most banks rushing to create technology tools to process PPP applications, many clients found it difficult to reach banks once they had their application processed. However, most regional banks use a relationship banking approach to clients which ensured that client needs are met and complemented this approach by using technology to enhance the process. For example, First Republic was able to close as many PPP loans in one day as it closed mortgages in one month while First Hawaiian Bank leveraged their digital investment strategy to develop an online application for PPP program leading to the bank processing 6,000 loans (for nearly $1B in funding). In addition, KeyCorp was the #2 PPP lender in the first wave (as measured by the number of PPP loans) and the #7 PPP lender in the overall program with over 40K PPP loans processed (with over $8B in funding) with the company leveraging robotic process automation.
- **Smaller and Nimble Structure Allows Regional Banks to Execute Better:** Another key point of differentiation for the regional banks is their nimble structure that allows them to be more agile and responsive to client needs. In fact, even the most senior executives were involved in responding to client needs at regional banks which led to a more agile approach in taking decisions to suit client requirements. In the case of the PPP program, banks like Cullen/Frost used their smaller teams of bankers to help process PPP applications and were able to process more PPP applications in a week than they did in a typical couple of months.
- **Using Banker Feedback to Drive Technology Adoption:** For regional banks that follow a high-touch service model, bankers are the key points of contact for clients. As an example, at First Republic, a new client is introduced to a banker who remains the point of contact for the bank throughout the life of the client's relationship with the bank. Similar to First Republic, Signature Bank's service model involves a team that acts as a point of contact for the client. Both banks noted that banker feedback in terms of technology offerings/products are a major part of the tech investment process at these banks. Bankers being more aware of the technological needs of their clients helps the regional banks elevate the level of client service and meet the needs of clients instead of providing multiple products/offerings that may or may not be useful to clients.

Cullen/Frost and Valley National Have the Highest Volume of PPP Loans Relative to the Size of Their C&I Portfolio

Among banks in our coverage universe, PPP loans as a percentage of total C&I loans are at 16% as of 3Q20. Cullen/Frost and Valley National have the highest proportion of PPP loans relative to the size of their C&I portfolio at 52% and 33% of C&I loans followed by Eastern Bankshares also at 33% of C&I loans. On the other side of the spectrum, Metropolitan Commercial Bank and New York Community Bank have the

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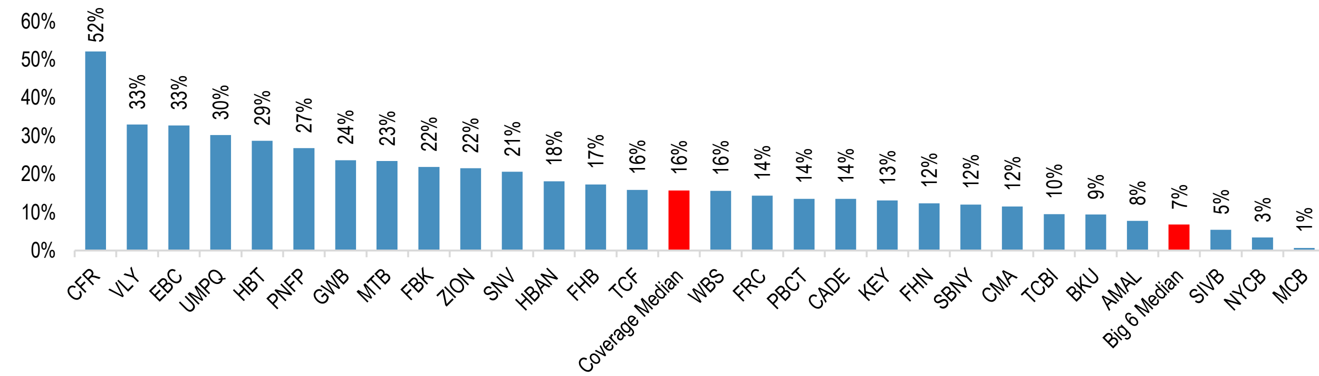
lowest PPP to C&I loan ratio at 1% and 3%, respectively. Meanwhile, the median PPP to C&I loan portfolio for the big 6 banks is at 7%, which is much lower than the coverage median at 16%.

Figure 5: PPP Loans as % of C&I Loans, 3Q20



Source: SNL Financial and company reports. Note: Big 6 banks include J.P. Morgan, Bank of America, Citigroup, Wells Fargo, PNC Financial, and U.S. Bancorp.

Frost's PPP Program Led to a Sharp Increase in New Relationships

Texas-based Cullen/Frost is the bank that had the highest PPP loans to C&I loans among our coverage. It was also one of the first few banks that was ready to process PPP applications on day one of the program launch while most other banks were still building the process around PPP loans. Bankers readily adopted the technology on the go and processed a large volume of PPP applications while processing only existing clients first. In fact, with the bank expanding in Houston, the PPP program was a shot in the arm with the bank rated as the #1 SBA lender in Houston in April. As disclosed on the second quarter earnings call, the bank was the #3 PPP lender in Texas and in San Antonio, while the bank managed to disburse more PPP loans than Bank of America, Wells Fargo, and J.P. Morgan combined in its markets. The eventual result—the bank witnessed a 28% year-on-year increase in new relationships for the bank in the first half of the year. Furthermore, nearly 75% of the new relationships at Frost pointed to choosing the bank tied to the PPP program.

Zions Used Technology to Enhance PPP Execution, Propelling the Bank to Compete Head to Head with Mega Banks

Zions ranks as the largest PPP loan provider among our coverage with respect to its size with about 9% of assets in PPP loans, nearly twice the coverage median at 4.7%. However, in our view, it is more impressive that the bank ranks as the ninth largest PPP lender in the country despite being only a fraction of size of every other bank ranked in the top 10. A key enabler of the bank's success with the PPP program is attributable to the tech initiatives at Zions which include the bank modernizing its technology infrastructure including the upgrade of its core loan systems in early 2019. Through its new core platform, Zions was not only able to provide PPP loans to borrowers but was also able to service new borrowers that were turned away from larger competitors, eventually creating an opportunity to acquire new relationships. In fact, Zions disclosed that of the 48K PPP loans originated by the bank, nearly 14K came from new relationships with Zions now focused on converting these relationships to using more products from Zions to drive growth for the overall bank. Overall, Zions' execution of the PPP program is a prime example, in our view, of the bank being nimble and agile to provide better service for clients than the mega banks.

PPP Program Likely Helped Contribute to Higher Customer Satisfaction Scores

The PPP program helped many regional banks win new customer relationships and deepen relationships with existing customers, and it's likely that the success that regional banks had with the PPP program led to higher customer satisfaction levels. Moreover, with technology spend alone not being the endgame as to what drives a positive experience between a customer and a bank, even if a bank spends double the regional bank peer median of ~10% technology spend as a percentage of revenue, as we have unearthed in many of our conversations with our banks, higher spend alone is not enough to translate into an improved customer experience. What is more important in driving an improved customer experience, as we have heard from most of our banks, is the ability of banks to leverage technology and combine that with the human aspect of a client's relationship with a banker in order to still provide a personalized level of service (and drive higher customer satisfaction) with the PPP program being a recent example of this partnership. With that said, although it's difficult to directly attribute the success of the PPP program to regional banks' satisfaction scores, as we examine below, a handful of our banks that demonstrated great success with the PPP program (including Frost, Eastern, and Pinnacle) were among our banks that had the highest customer satisfaction scores.

Customer Satisfaction Scores Should Shatter Perceptions on Regional Banks

There Is No Uniform Way That Banks Measure Customer Satisfaction Levels

One of the questions we asked each of our banks during our conversations was how they measure whether what they are doing on technology is translating into higher customer satisfaction levels. While we received a mixture of responses, most banks said that they use either one or a combination of the following:

- J.D. Power data
- Net promoter score
- Household acquisition
- Customer retention levels
- Internal customer surveys

To this end, although our preferred metric for measuring customer satisfaction is net promoter score (given its simplicity in that it is the percentage of customers that are likely to recommend a company or a product to a friend), very few banks have themselves disclosed this metric publicly. Given this, with there being no commonplace way of measuring customer satisfaction levels, we analyzed J.D. Power data which includes metrics for most our banks (as well as the largest banks in the US) on items including: (1) overall satisfaction and (2) net promoter score.

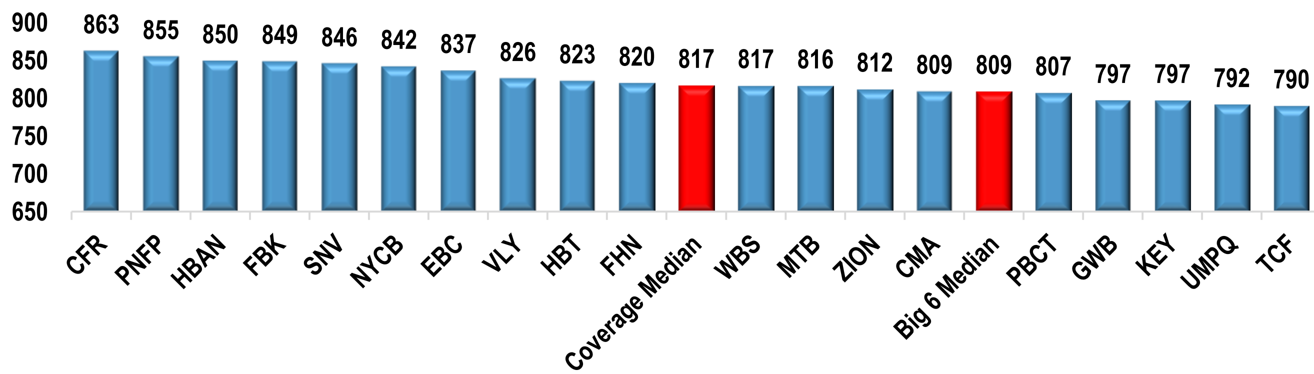
Leveraging J.D. Power Data to Level Set Customer Satisfaction Scores

To get a better understanding of how the actions that banks have taken have translated into improved customer satisfaction levels, we leveraged J.D. Power's 2020 U.S. Retail Banking Satisfaction Study, which is a benchmarking study that profiles customer experiences from banks of all sizes across the US. The study received tens of thousands of individual responses and was conducted between June 2020 and October 2020. Survey scores ranged from 0 (lowest) to 1,000 (highest) not only on areas such as overall satisfaction but also on satisfaction levels on more specific areas including ease of account opening, problem resolution, convenience, and online/mobile. For net promoter score, possible scores ranged from -100 (lowest) to +100 (highest). Of note, banks with fewer than 50 branches nationwide and banks that received fewer than 100 survey responses are excluded from the data set. Below, we plot the survey's findings on overall satisfaction and net promoter score.

Median Overall Satisfaction Score for Our Coverage at 817 Out of 1,000, with Frost, Pinnacle, and Huntington at the High End

The survey included data for 19 of our 28 banks under coverage for overall satisfaction score. At the high end, Frost (863), Pinnacle (855), and Huntington (850) are above the coverage median at 817, and TCF Financial (790), Umpqua (792), Great Western and KeyCorp (each at 797) are at the low end of the spectrum. Beyond overall satisfaction scores and digging deeper into these, each of these banks at the high end and at the low end also had scores on other metrics (including ease of account opening, convenience, and online/mobile) that also ranked above/below our coverage median. For reference, we have also included in the chart below the overall satisfaction scores for six of the largest US banks.

Figure 6: J.D. Power 2020 Overall Satisfaction Ratings for Our Coverage and Big 6 Bank Median

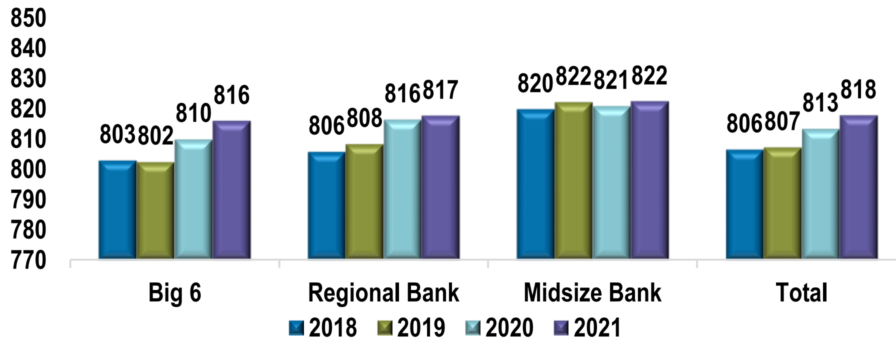


Source: J.D. Power. Note: Big 6 banks include BAC, C, JPM, PNC, USB, and WFC. Excludes BKU, CADE, and FRC due to fewer than 100 survey respondents. Excludes AMAL, FHB, MCB, SBNY, SIVB, and TCBI due to fewer than 50 nationwide branches.

Overall Satisfaction Scores Have Been Increasing in the Past Few Years Across the Bank Industry

Putting these overall satisfaction scores in perspective, we examined how these scores have changed in the past three years. The latest data available (marked as 2021 in the chart below) was completed halfway through 2020. Overall, satisfaction scores across the board have increased in each of the past three years for the six largest banks, regional banks (defined as banks with $55-259B in domestic deposits), and midsize banks (defined as banks with less than $55B in domestic deposits). On an aggregate basis, total overall satisfaction scores have risen from 806 in 2018 to 818 in the latest data set.

Figure 7: J.D. Power Overall Satisfaction Scores (Big 6 Banks, Regional Banks, Midsize Banks)

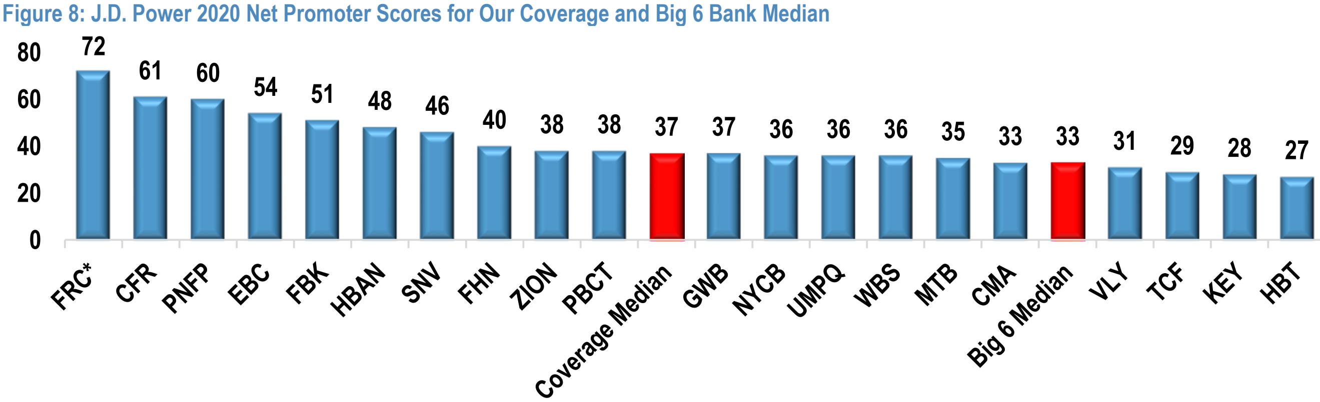


Source: J.D. Power.

Median Net Promoter Score for Our Coverage at 37 (Max is 100), with First Republic, Frost, and Pinnacle Leading the Way

Examining what we believe is a cleaner measure of customer satisfaction levels, we looked at J.D. Power's data for net promoter score (NPS). For our coverage, the median NPS is at 37 with First Republic (72), Frost (61), and Pinnacle (60) at the high end. As an example, First Republic (which is our only bank to publicly disclose its NPS) has a net promoter score of 72 which means that 72% of First Republic customers are net promoters. Note that this is a net number. If a bank had 50% of respondents that were net promoters and 10% of respondents that were detractors, their net promoter score would be 40. As a result, we consider an NPS above 50 as very high. For reference, companies in other industries that score very high include Costco with an NPS of 76, Southwest Airlines at 71, and Ritz Carlton at 70, according to SATmetrix.

Figure 8: J.D. Power 2020 Net Promoter Scores for Our Coverage and Big 6 Bank Median



Source: J.D. Power and company reports. Note: Big 6 banks include BAC, C, JPM, PNC, USB, and WFC. Excludes BKU and CADE due to fewer than 100 survey respondents. Excludes AMAL, FHB, MCB, SBNY, SIVB, and TCBI due to fewer than 50 nationwide branches. *FRC was not available from J.D. Power given a sample size below 100, so we use 2019 NPS from company reports.

Examining the Actions that Banks Are Taking on the Technology Front to Help Drive Higher Customer Satisfaction and Net Promoter Scores

High customer satisfaction scores and net promoter scores for banks are not only driven by the deep relationships that bankers have with their clients, but also as we have uncovered, the usage of technology to help further these relationships. With that said, it is not only the client-facing technology that is important to elevate customer satisfaction but also the technology on the back end that provides relationship managers with the tools they need, such as client dashboards and data analytics, to spend more time working with clients (and less time doing administrative work). With this in mind, in the following section we dive deeper into specific technology examples that are allowing bankers to more effectively serve their clients and create longer-lasting client relationships.

Regional Banks Using Technology to Empower Bankers to Better Serve Clients

Business Line Heads and Front Line Bankers Own the Client Experience with Technology a Key Partner

Historically, the value proposition for regional banks has been rooted in relationship banking. While megabanks tend to compete on brand and scale, the competitive advantage of smaller, regional banks is the relationships they have with customers and communities. With the relationship model at regionals being predicated on its bankers building a deep level of trust and relationships with customers, many of our banks point to their bankers as their *single best asset* that drives differentiation. To this end, many of our banks are using technology as a means to enhance their relationship model by empowering their bankers to deliver better service to clients. Over the past few years, a number of banks under coverage have brought new talent to take over digital initiatives, many of which were recruited outside of the bank industry. Rather than simply letting their new head of technology take the bank in a new direction, what we find is that business line heads are leading the long-term direction of the company as they work side by side with senior management and new heads of digital/technology to pave a new path. As such, the ownership of the client experience in most cases remains within the business as well as front line bankers. Recognizing the rapid pace at which customers' expectations are changing as well as the need to constantly reinvent themselves, many of our banks have emphasized collaboration across business lines, with client-facing banking teams owning the client experience and being on top of what customers want and technology/IT teams executing the needs of customers based on the feedback from the front line bankers.

Regional Banks Use Technology as a Means to Enhance Relationship Model with Bankers Still at the Center

Typically, business models of regional banks are driven by the relationships that their bankers have with clients, with bankers providing advice to customers and forming stickier relationships, while technology is being used as an enabler to deepen relationships between bankers and customers. From our conversations with our banks, the vast majority of them were using technology to make bankers' job easier and to help them spend more time interacting with customers (and less on manual and low value time-consuming tasks). This is contrary to many companies in other industries where technology is most often used to replace human-to-human connections. Turning to fintechs, while they are focused on delivering a better digital experience and service to customers as a point of differentiation vs. traditional banks, human relationships are often taken out of the equation as their model is typically based on self-driving finances. However, regional banks are mostly using technology to improve customer service by not only providing technology products but *also* by using the technology to take low value tasks off the plate of front line bankers so that they have more time to spend on high value interactions with customers. With that said, technology is being used at regional banks to enhance the relationship model, not to replace bankers. Below we provide examples of how technology is used as a means to empower bankers and elevate the relationship model, including a spotlight section on First Republic which we view as an epitome of technology being used for banker empowerment.

- **BankUnited:** BankUnited has rolled out a small business auto credit decisioning tool, which cuts the time as well as administrative work for bankers and therefore frees up resources and lowers the amount of time it takes to make credit decisions (for loans under $250K in size) from 45-60 days down to just one week.
- **Cadence Bancorporation:** Its network of interactive video ATMs provides an alternative way for customers to interact with bankers, with these ATMs allowing customers to video chat with live tellers to help them with various financial transactions.
- **KeyCorp:** KeyCorp is revamping digital tools in their branch system to have a 360-degree view of the client with a sharable touch screen, with the company piloting out the system by the end of 2020. The modern branch system is expected to offer more leads to bankers and provide recommendations to call clients on.
- **New York Community Bank:** New York Community Bank has worked on revamping its branch account opening tool to make it easier for bankers to open accounts for clients in branches. Account opening used to take 40-45 minutes under the old system, and the goal is to reduce this down to 15 minutes.
- **People's United:** People's United partners with Horizn (a Toronto-based fintech that helps banks accelerate the way they take innovations to market and increase digital adoptions among employees and customers) to create digital simulated tools that allow bankers to send demos to customers on how to do things on its mobile app. People's has also formed a partnership with another fintech, Numerated, to streamline its digital business lending solution and expedite the process for business customers to apply for and receive a loan. Numerated allowed People's to speed up the PPP loan process for both bankers and business customers.
- **Signature Bank:** Signature is in process of creating tear sheets and contact lists for bankers, which are the front-end system to be used on the deposit side.
- **Umpqua:** Umpqua uses advanced data and analytics to provide its bankers with actionable insights. Umpqua Smart Leads and Credit Insights (both proprietary) use transactional data, analytics, and custom algorithms to provide bankers with next best offer leads and help with identifying risk management activities.
- **Webster:** Webster has Interactive Teller Machines (ITMs) in place, which allow customers to drive to a banking location and virtually communicate face to face with a banker and perform financial transactions 24/7, all from the comfort of their car. This way, bankers can connect with customers and serve them virtually.

First Republic: Epitome of Using Technology to Enhance—Not Replace—Relationships by Empowering Employees to Scale Service Model

With First Republic's growth driven by its high service model (with satisfied clients doing more business with First Republic and making more referrals), the company uses technology to scale its differentiated service model. First Republic's approach to technology goes hand-in-hand with its overarching business model, with the company using technology to enhance—never replace—human relationships and to empower bankers to deliver exceptional service to clients. For any of First

Republic's technology investments, they need to always meet either of these two criteria: (1) technology that improves client experience and/or (2) technology that enhances bankers' ability to serve clients. Digging deeper into the latter point about empowering bankers, First Republic is heavily invested into technology that aims to help bankers to be more productive to serve clients better and grow their book of business. With First Republic making investments in technology to not only improve customer experience but also to improve bankers' experience and their ability to serve clients (behind the scenes process), all of these efforts have one overarching goal: deliver even better client service.

First Republic has a dedicated sales analytics and technology department, called Eagle Intelligence, which leverages data and technology to develop products that help bankers stay close to their clients, increase their productivity, and continue to deliver high quality service as the bank scales up in size. Eagle Intelligence has rolled out a variety of proprietary tools and platforms that empower bankers by (1) providing data-driven insights into clients so bankers can better serve clients along with actionable recommendations that are easy to execute (leading to higher client satisfaction and growth in bankers' book of business), as well as by automating back-end processes to reduce the amount of low value activities they have on their plates and spend more time interacting with clients. Below we provide select examples of how technology is being utilized at First Republic to empower employees:

- **Customer Relationship Browser (CRB):** First Republic built the Customer Relationship Browser (CRB), which is a proprietary client insights engine / dashboard that provides First Republic bankers with important client information with a goal of deepening client relationships and providing actionable recommendations that are easy to execute (i.e. recommending bankers on who to call, when, and why). For example, CRB alerts bankers each morning when it's a client's birthday or when it seems there will be a potential liquidity event, with the tool prepopulating the email template with the option to customize to the bankers' liking.
- **Quant for Banker:** In June 2018, First Republic rolled out Quant for Banker, a personalized analytics concierge for bankers which leverages the expertise of quants that are partnered up with bankers. Quant for Banker uses data analytics and AI technology to help bankers be more efficient, prospect new clients, and deepen client relationships. For example, for the capital call lending business, quants have created a dashboard that helps bankers monitor capital call line activity from clients and alerts bankers ahead of time if a capital line is being drawn on repeatedly, which could signal that additional funding may be needed.
- **Eagle Tearsheets:** It provides First Republic bankers with "tearsheets" that help with client prospecting efforts. For example, Eagle Tearsheets provides insights into which nonprofit organizations to target and which missions they care about, so First Republic bankers can smartly target new clients.
- **Natural Disaster Mapping/Emergency Response App:** In 2019, First Republic built the Natural Disaster Mapping/Emergency Response App, a proprietary platform that identifies potentially impacted clients and guides targeted outreach during natural disaster events (i.e. wildfires, storms, and flooding). During the third quarter of 2020, approximately 700 First Republic bankers reached out to more than 6,000 clients who could potentially have exposure to the impacted areas as identified through this app.

- **Robotic Process Automation (RPA):** First Republic embraces robotic process automation (RPA) to streamline routine tasks so it frees up time for bankers to spend more time interacting with clients. For example, First Republic's bot "Hemingway" auto-generates a loan pre-approval letter (which is typically a very manual process that can take up to 24 hours) for relationship managers, which can be e-signed and sent to the client/prospect from their phone right on the spot.
- **Deposit Client Onboarding:** First Republic revamped its deposit client onboarding system to optimize and digitize the entire workflow, taking down a total of eight systems to just one fully integrated system. The new deposit client onboarding system led to 50% time savings for bankers in opening accounts.

Fintech Partnerships One Way for Banks to Embrace New Technologies That Increase Bankers' Productivity and Enhance Customer Relationships

With regional banks not having the same amount of financial resources as mega banks to spend on technology, fintech partnerships are an alternative to building technologies and new products in-house, which may be more costly or take a longer time to finish. With that said, we find that an increasing number of regional banks are partnering with fintechs to embrace new technologies and tools that are not available in-house in order to not only improve the customer experience but also their bankers' experience for increased productivity and enhanced customer relationships.

Not Just a Threat: Fintech Partnerships on the Rise at Regional Banks

Our Banks Say Fintechs Are Not Simply a "Competitor" or a "Threat" to Fear

With competition rising from all angles in the banking space, one of the questions we asked all of our companies we interviewed was around who do they see as a bigger threat: fintech or megabanks. A vast majority of responses from the regional bank executives was either that (1) they see fintechs as a bigger threat or that (2) they fear neither fintechs nor megabanks (pointing to how these regional banks are actually in a sweet spot). Most banks acknowledge that megabanks were dominant in the mass market consumer space and many regional banks took a targeted approach to competing in areas such as commercial banking to differentiate from mega banks and to win. Regardless of their answers, one message that we heard almost universally across all conversations we had was that fintechs possess a number of key competitive strengths, including (1) speed to market (as it relates to new product launches and delivery) and (2) focus on digital customer experience / convenience (with their business model often being tied to this). In fact, many of our banks indicated that they don't see fintech as a "competitor" or "threat" but instead they are the partners whom they can learn from and work with to advance their technology offerings, increase their speed to market, and deliver better customer experience.

Acknowledging Some Key Competitive Strengths of Fintechs, Banks Are Increasingly Partnering with Fintechs

As we held our conversations with companies in our coverage on fintechs, our initial focus was around how big of a threat fintechs are for regional banks. While it is no surprise that the overall banking space is becoming more competitive with fintechs having some major competitive advantages over banks, fintechs are not without weaknesses. With that said, key strengths of fintechs are that: (1) they can be more nimble and flexible than banks (i.e. the ability to push out new, innovative products more quickly) and (2) they tend to be laser-focused on customer experience and service (as the fintechs' business models often revolve around providing a better customer experience than traditional banks). On the other side of the coin, fintechs such as Chime and Varo have their own weaknesses in that: (1) they lack human touch as they tend to rely on self-service technologies and therefore the stickiness of their customer relationships are often weaker than banks (i.e. replacing human interactions with technologies to make service transactions faster and more convenient) and (2) they often have a very narrow focus (which may hinder them from scaling their business and expanding their client base).

Based on our conversations with banks, we found that our banks' views on fintechs were not just black and white. In fact, many regional banks are not just viewing fintechs as a competitor to fear but as a partner whom they can pair with and learn from, acknowledging that fintechs are ahead of many traditional banks when it comes to (1) the unwavering focus around customer experience and service, (2) willingness to differentiate in order to survive, and (3) flexibility and speed to market on innovation delivery. With regional banks' business models often being predicated on relationships where fintechs are lagging, many regional banks see benefits of partnering with fintechs to provide more innovative products at a faster pace and improve customer experience.

Regional Banks Are Partnering with Fintechs to Improve Customer Experience and Roll Out Innovative Products

Acknowledging some of the key strengths exhibited by fintechs, regional banks are increasingly partnering with (or even acquiring) fintechs in order to offer more innovative and diversified products and elevate customer experience—which are the primary areas where fintechs excel at. Below are examples of how and where our companies are pairing up with fintechs as a way to advance their technology offerings or enhance the level of convenience for customers:

Huntington Partnering with AI-Driven Data Analytics Fintech Personetics, With Their Technologies Used in Their State of Art Money Management Apps

In direct response to customers' requests during the pandemic, Huntington rolled out an automated savings tool called "Money Scout." Money Scout analyzes customers' spending patterns and income and uses predictive analytics to forecast upcoming expenses. Using artificial intelligence models, the app would find pockets of available funds and then automatically move those funds from checking to savings accounts (to potentially earn higher interest and to save more). This tool is powered by Personetics, a fintech that Huntington has partnered with for many years, which provides customer-facing AI solutions with the goal of enabling self-driving finance, such as providing real-time insights to personalized recommendations and automated money management. Huntington has also partnered with Personetics in its development of other cutting-edge features in its digital banking platform, such as Heads Up, which lets clients know real time where their money is being spent and offer personalized and proactive insights to help them make more informed decisions (i.e. informing clients of when their subscriptions are up for renewal and alerting customers when it requires their attention such as duplicate charges or returned checks). Putting it together, through partnership with Personetics, Huntington was able to roll out innovative solutions for customers that help them see an opportunity to save money where they previously didn't and in a way that doesn't require the customers any extra effort. Similarly, Huntington also partnered with Strands, a

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Spanish fintech that leverages big data and AI to develop personalized digital banking experience in the personal financial management space, for the development of its digital banking platform, The Hub. The Hub is the bank's state of the art digital banking platform that is designed to help customers save more money, manage their budgets, and reach their financial goals by providing personalized recommendations with predictive analytics and AI technology.

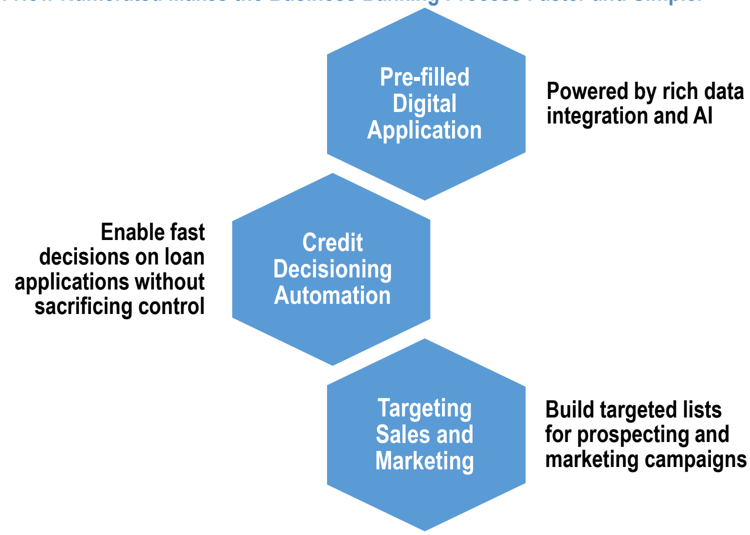
KeyCorp Acquired Laurel Road, a Cutting Edge Online Student Loan Refinance Platform Providing Seamless, Personalized Experience to Customers

KeyCorp is another company in our coverage that has been active in partnering with fintechs. In fact, KeyCorp has not only partnered with fintechs but also acquired a number of fintechs in a few areas where the company has focused on, such as consumer banking and personal financial management. A prime example of KeyCorp's fintech acquisition is Laurel Road (in April 2019), an online student loan refinancing platform that offers a streamlined and transparent process for customers. While Laurel Road's primary product is student loan refinance (primarily targeting young professionals with advanced degrees such as doctors), it has expanded into other areas such as mortgage loans and other personal loans with the same goal of simplifying lending for customers though technology and personalized service. A key differentiating point for Laurel Road is that it takes a digital-first but not a digital-only approach. Put differently, Laurel Road doesn't stop at providing an intuitive and seamless digital lending experience to customers but it complements it with providing easy access to human experts (with its customer service team having 19 average years of experience) if the customer needs assistance from humans. Combined with differentiated technology and high-quality customer service, Laurel Road boasts a high net promoter score of 70+ (which is nearly 2x above the average for financial services). Through the acquisition, Key was able to meaningfully enhance its digital capabilities with Laurel Road's customer-centric technology while also leveraging Laurel Road's ability to attract professional millennial customers. Since Key's acquisition in 2Q19, Laurel Road has been a major growth engine at KeyCorp over the past year, with total originations from Laurel Road topping $3B in just over a year and adding 31K net new households with opportunity for further integration. Not to mention, KeyCorp is further expanding and streamlining its digital capabilities through Laurel Road in areas such as mortgage (another growth driver for KeyCorp).

Partnerships with Numerated a Key Contributor for Eastern, People's, and Pinnacle to Support Small Business Owners During Pandemic and Process PPP

Most fintechs out there are largely focused on mass market consumer banking and therefore the banking technology options available to businesses tend to be more limited than retail consumers. A lot of that has to do with the complex and heterogeneous nature of business customers (as each business' cash flows, financial situations and business models differs), making it harder to develop products that would automate the process. To this end, Numerated is unique in that it's a fintech that provides a digital lending & sales platform that was developed for banks by bankers and inside a bank (note that it's a spin-out of Eastern Bankshares' Eastern Labs) with the company specifically aimed at improving business customers' banking experience. Digging deeper, Numerated is a Boston-based fintech that provides a real-time online commerce platform that is aimed at making banking easier, faster, and more efficient for small to medium-sized businesses to purchase financial products from banks and allows banks to make loans real-time by digitizing their credit policies using cutting edge data analytics and technology. Numerated supports a wide array of business banking products including deposit account opening and credit decision for lines of credit, term loans, and SBA loans, to name a few.

Figure 9: How Numerated Makes the Business Banking Process Faster and Simpler



Source: Company website and J.P. Morgan.

A number of our banks such as Pinnacle Financial Partners, People's United, and Eastern Bankshares have benefited from their partnership with Numerated, which helped the banks to support and process significant volumes of PPP loan applications during the pandemic.

- **Eastern Bankshares:** Not only did Numerated originate from Eastern Labs (spun out from Eastern in 2017), Eastern was also a "partner" with Numerated in the build-out of its PPP processing module. Through Numerated, Eastern's small business customers are able to obtain loans of up to $100K in as little as five minutes from application to close, completely digitally. During the pandemic, Eastern processed $1.1B of PPP loans to ~8K customers, representing ~8% of total assets in 2Q20.
- **People's United:** In December 2018, People's United partnered with Numerated for its digital business lending solution to speed up the process for business customers to receive credit. During the pandemic, the company's partnership with Numerated helped originate and process $2.6B in PPP loans to more than 16K small business owners across the Northeast region.
- **Pinnacle Financial Partners:** Pinnacle indicated that the decision to partner with Numerated was easy, as the fintech was unique in that it automates the entire end-to-end origination process for business loans. Thanks to the company's partnership with Pinnacle, the company was able to process ~$2.4B in PPP loans to over 14K businesses in five states.

Synovus and People's United Partnering with Blend for Reimagined Mortgage Lending Experiences for Customers

Blend is a digital lending platform that streamlines the customer journey from application to close for consumer banking including mortgage and other consumer loans. Some of our banks including Synovus and People's United have partnered with Blend to make their customers' experience of getting a loan simpler and faster. A key benefit of partnering with Blend is the ability to scale (i.e. close more loans at a faster pace), as the platform significantly reduces manual downstream work through automation such as analyzing the borrower data to automatically detect issues and surface them at the time of application and automate pre-filled invites for client referrals from the bank's preferred CRM. At Synovus, approximately 60% of the company's mortgage applications are submitted and processed through Blend. People's United was also an early adopter of Blend's technology in originating mortgages.

With fintech partnerships at regional banks becoming more widespread, while these partnerships are complementing our banks with improved customer experience and faster delivery of innovation to market, one cannot understate the extent of fintechs' ability to solve some of the key friction points that bank customers often face, such as fees—perhaps better than many banks.

Banding Together to Pull Ahead

Canapi Alliance Created to Help Regional Banks Form a Greater Partnership with the Fintech Ecosystem

Regional banks in the current environment compete not just with banks ranging from small to large but also new age fintechs that are leveraging breakthrough technology to challenge the bank industry. In fact, some of the products/services offered by fintechs have not yet been offered by either the regional banks or the megabanks. The strategy for the megabanks have largely been around partnering or acquiring these fintechs and scaling the products and services to their larger client base. Few larger regional banks have also used this approach with the example of KeyCorp's acquisition of Laurel Road to offer student loan refinancing but other smaller regional banks have resorted to more of a partnership approach with fintechs (case in point, Synovus' partnership with SoFi and GreenSky). With that said, however, a regional bank consortium known as Canapi Alliance that aims to help banks form a greater partnership with the fintech ecosystem was launched earlier in the year. In our view, this seems to be a smart move for regional banks to gain access to innovative technology products/services that fintechs are offering and allow the smaller regional banks to bridge the gap with the megabanks. In fact, many of the banks in our coverage universe are part of the Canapi Alliance (although the full list of specific investors in Canapi has not yet been disclosed).

Led by Industry Veterans, Canapi Sets the Stage for Regional Banks to Partner with Fintechs and Offer Innovative Products and Services

In January 2020, Canapi Ventures announced the launch of its inaugural venture capital fund with $545mm in capital commitments which includes a total of 35 banks, which includes 11 of the top 50 US banks and 23 of the top 100 US banks by asset size. American Bankers Association, Independent Community Bankers Association and several state banking associations are also part of the Canapi alliance. The venture aims to invest in early to growth stage fintechs that provide innovative products and services in banking. In fact, the mission statement of the venture is based on "connecting banks to innovators to change the future of financial services" which in our view cuts to the heart of what the consortium aims to do. The venture is led by long-term industry veterans, Mr. Gene Ludwig, Mr. Chip Mahan, and Mr. Neil Underwood whose brief bios are below:

- **Gene Ludwig, Managing Partner, Canapi Ventures:** Mr. Gene Ludwig has over four decades of financial services experience and is the founder and CEO of

Promontory Financial Group which is now an IBM company and recognized as the premier regulatory and compliance consulting firm for financial services and fintech companies. He is also the co-founder of Promontory Interfinancial Network which has provided hundreds of billions of dollars in funding to its network of 2,900 financial institutions. He served as the 27th Comptroller of the Currency earlier in his career and is widely recognized for his expertise in fintech regulatory and compliance matters.

- **Chip Mahan, Co-Managing Partner, Canapi Ventures:** Mr. Chip Mahan founded and currently serves as the CEO and Chairman of Live Oak Bancshares which specializes in providing lending and financial services to small businesses nationwide and is headquartered in Wilmington, North Carolina. Mr. Mahan co-founded nCino, a cloud banking services provider to banks and previously led S1 Corporation and also founded Security First Network Bank, which was one of the world's first internet banks. He is known for revolutionizing the banking industry through nCino and Security First Network Bank.
- **Neil Underwood, Partner, Canapi Ventures:** Neil Underwood currently serves as a partner for Canapi Ventures and as a President of Live Oak Bancshares. He co-founded nCino, a cloud-based bank operating system during his tenure as President of Live Oak Bancshares. He has incubated and helped raise capital for multiple companies focused on digital bank transformation such as Finxact, Payrailz, DefenseStorm, and Greenlight through the venture arm of Live Oak Bank. In 2017, he co-founded Apiture, a joint venture between Live Oak Bank and First Data, which focuses on creating next-gen technology for financial institutions. Prior to joining Live Oak, he served as general manager of S1 Corporation where he was responsible for S1 enterprise division.

Canapi Has Made a Wide Range of Investments Thus Far

Through the years, Canapi has made about seven investments in a wide range of fintechs ranging from fintechs offering operating systems to banks to fintechs that use alternative data to build credit histories for immigrants in a format familiar to American underwriters. Below, we give a brief overview of the fintechs that Canapi has invested in and how they can potentially benefit regional banks:

- **Alloy:** Alloy is a fintech that allows clients to use its API for KYC, AML, and fraud detection. Using Alloy, banks can automate manual and time-consuming processes such as KYC, and Alloy's API allows banks to automate KYC and AML processes. The fintech has partnered with many community banks and top 20 banks and helped reduce fraudulent account openings by 50%.
- **Blend:** Blend is a digital lending platform that provides a streamlined end-to-end experience for clients. The fintech also offers a platform for consumer banking and auto loans and has processed $771B in loan volume year-to-date (as of August 2020). We note that partnering with digital lending platforms such as Blend can help banks expand into other niche verticals such as auto loans or mortgage lending as an example while lowering the cost base associated with running a separate auto lending or mortgage vertical.
- **Built:** Built is a fintech that provides construction finance technology connecting, commercial real estate owners, homebuilders, contractors, and commercial construction lenders. The platform is particularly useful for banks that lend to construction companies.
- **Greenlight:** Greenlight is a parent-managed debit card platform for kids with features that allows parents to set store-level spend controls and pay allowances.

The company launched in 2017 and has been valued at $1.2B as of September 2020.

- **Laika:** Laika is a platform to automate compliance requirements for banks which can help drive expense savings for banks. The platform uses workflows to manage vendor management and compliance certifications for transactions.
- **Moov:** Moov provides APIs for banks to execute a variety of banking tasks like disbursements, collections and account-to-account transfers digitally. These APIs can be custom-built for a bank's infrastructure. Banks can use Moov’s secure cloud infrastructure for their applications and are bank-agnostic (which means the APIs can work with any bank partner). This would be particularly beneficial for banks that do not have their own API infrastructure and can use Moov’s API infrastructure to offer digital banking needs for clients.
- **Nova Credit:** Nova Credit provides a solution to translate international credit history to an equivalent US equivalent credit score. In October 2019, Nova Credit announced a partnership with American Express that enabled immigrants from Australia, Canada, India, Mexico, and the UK to use their international credit history to apply for a personal card in the US.

Banks That Are Part of Canapi Could Have an Edge in Adopting Upcoming Innovative Banking Technology

As we note in the section above, Canapi has made investments in multiple fintechs that offer innovative products/solutions that can save costs for regional banks while also ensuring that they remain competitive with megabanks and other fintechs with respect to services offered by regional banks. Since Canapi is a regional bank consortium, this helps the group to achieve scale in terms of making fintech investments—something that could have been more difficult for regional banks to do on their own. Furthermore, this could likely end up as a “win-win” proposition for fintechs and regional banks in that regional banks are able to provide innovative products and services to their clients while fintechs are able to scale their products and services to a larger clientele through their partnership with regional banks. Additionally, the marriage of relationship banking with innovative products and services for clients would be the perfect recipe, in our view, to elevate client experience. Although the regional bank consortium is still in the early innings of its strategy, it looks like to us that banks that are part of the Canapi Alliance would be better suited to offer more cutting-edge technology products and services in banking potentially setting them up to differentiate themselves versus larger players and megabanks.

As Canapi looks across the banking sector for fintech solutions to address industry needs, one area that stands out is the decade old systems that banks were built upon. In fact, these decade old systems used to record banking transactions were never created with the capabilities to function efficiently in a digital world. To enable regional banks to connect with fintechs in a seamless way, banks need modern technology infrastructure to allow true partnership with outside fintech companies. The first and most obvious area in need of modernizing is the core system which stores customer data: the core banking system.

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Different Approaches to Adapting Core Systems to Digital Age of Banking

Modern Core Banking System a Critical Component in Order for Banks to Partner with Fintechs

The ability to partner with fintechs to develop banking solutions requires the partnering bank to have a modern technology infrastructure to enable innovation. One of the key components of a bank's technology infrastructure is its core system. The core banking system, or also known as the system of records (SOR) is the back-end system used to process banking transactions for products such as loans, deposits, and payment activities. Along with processing the transactions, the system updates the bank's accounts and financial records for the activities. Examples of things that core systems enable include opening accounts, calculating interest on loans, servicing loans, processing deposits and withdrawals, and setting interest rates offered on deposits, to name a few. Core systems are surrounded by an ecosystem of technology to enable different channels of banking including branch banking, call centers, online banking and mobile banking. Currently in the United States, the three top providers of core banking systems to regional banks include FIS, Fiserv, and Jack Henry. These three providers own the majority of the market share with the three serving financial institutions of all sizes ranging from community banks and credit unions to large banks. While these providers are a dominant force in the US market, there are also other non-US based core banking system providers looking to enter the US market such as SAP, Infosys, Tenemos, Accenture's Alnova, and Tata Consultancy Services (TCS).

Figure 10: Top Three US Core Banking System Providers

Company	Headquarter	Founded	Core Products
FIS	Jacksonville, Florida	1968	IBS, Horizon, Profile, Systematics
Fiserv	Brookfield, Wisconsin	1984	DNA, Premier, Precision, Signature, Cleartouch
Jack Henry	Monett, Missouri	1976	SilverLake System, Episys, Core Director, CIF 20/20

Source: Company disclosures.

M&A Activity May Result in Duplicate Core Systems in Combined Bank

The bank industry has been consolidating for years and as a result of this, many combined banks house duplicate systems for different products within one bank. Over time as banks offer more products or acquire other institutions, there may be many legacy core systems for different products in a bank. Those pose a challenge to accessing data seamlessly across cores to gain insights from the data. For example, one bank may have multiple loan systems or deposit systems acquired over times. Many of the largest banks in the country have this issue as duplicate systems that were built differently and can even be in different computer languages that technology staff may not be able to support. However, not all acquirers have this issue because some bank acquirers as part of merger integration will combine duplicate systems into one to avoid future issues. One example is People's United, which has a practice of integrating duplicate systems into one for each product such as deposits and loans. On the other end of the M&A spectrum, for banks that have limited or no M&A activity in its history, this provides for a cleaner core system for the bank use. One example of this is First Republic, which has grown for the past three decades almost entirely through organic growth and as a result, does not have the same issues that a serial acquirer may have.

The Challenges of an Outdated Core Banking System

One of the key obstacles facing regional banks in their pursuit to modernize their technology infrastructure and product offering sits behind the scenes in each banks' core banking systems. The challenge for the bank industry is that with most banks operating for decades or even centuries, their core banking systems are typically decades old and were not built to operate efficiently in the digital age of banking. On top of this, with the bank industry built on mergers and acquisitions as a tool for growth prior to the crisis, most large banks have gone through multiple mergers, combined core systems, and created an IT architecture that is in desperate need of a complete redesign. In fact, some banks which we cover still have a system for deposits, a system for mortgage lending, and a system for commercial lending, and more often than not, none of those would communicate with each other. Banks which have core banking systems that have been patched up over time to meet new needs include increased risk and complexity for the bank in the future. Core banking systems handle high volumes of transactions and when faced with extended outages, this poses risks from both a customer and regulatory point of view.

A modern core enables banks to rollout new products to the market faster and improve the customer experience. One of the obstacles of older cores is that with these cores being created decades ago, it may be written using older technological infrastructure and as the technology work force ages it becomes costly to maintain and harder to find talent that is familiar with the older technology infrastructure. Other needs for banks include the desire for faster speed to market with new products and a more open platforms to integrate fintechs offerings via APIs. Instead of modernizing core banking systems, middleware software (otherwise known as short-term software patches) is used bridge the gap and allow new systems to talk to old ones. However, as organizations become more complex particularly when there is M&A involved, these middleware solutions may prove to be more of a short-term fix rather than a long-term one. In recent years as banking has moved digitally on computers and mobile, this opened the door for more potential products and services, as well as opportunities to use the data. Future technologies that would rely on a strong technology infrastructure include analytics, machine learning, artificial intelligence, and internet of things (IOTs).

Many Barriers to Upgrading Core Banking Systems Including Long-Term Vendor Contracts

While many would agree that replacing core banking systems is a task many banks view as beneficial, replacing an old core can be a highly risky and costly process. As an example, Zions' core banking system upgrade started in 2013 with an original expected time line of 5-7 years and a $200mm budget but is now targeting to finish rolling out its deposit core in 2022, with the latest cost in the $40mm range per year (as of 1Q20). One notable obstacle that banks may face with opting to replace their existing core banking system is that there may be long-term contracts that banks are locked into with the core provider. It may be costly to break these contracts as there would be a termination fee for the remaining life of the contract. In some cases, competing core providers may "buyout" the prospective contract by paying the termination fee in order to onboard to their core banking platform.

A Modern Core Enables a Better Customer Experience

While bank customers are unlikely to care about banks having the latest and greatest core banking systems, they do care about having a great customer experience. The expectation from customers is that when they do conduct banking business with a

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bank, the experience across the channel should be seamless whether it is at a branch, on a mobile phone, speaking to call representative or at an ATM/ITM. For example, if a customer started a banking transaction on the bank's website, a seamless customer experience would enable the customer to complete that transaction in a branch with the help of a branch employee, if enabled by good technology. The benefits of a modern core are that customer experiences are seamless and makes it easier to do business with a bank, such as being able to click on an old bank statement online or select a certain bank account to look at the details.

A Modern Core Is Key to Rolling Out New Features and Product with Speed

While features like these may seem simple, not all banks are able to provide these basic features due to older core systems that not able to easily communicate with one another. While over time, banks have eventually rolled out basic features such as remote check deposit which allows for checks to be deposited with a photo taken from a phone, the banks with older cores would have to go through more complexities to roll out this feature and likely to be slower to roll out the products. As a reminder, the time it takes to roll out new features and products require time for testing and quality assurance. With a modern core there is a centralized source of customer data and allows for banks to utilize this customer data to improve the customer experience by analyzing the data and personalizing the customer experience.

Some Banks Are Taking Steps to Upgrade Core Systems

Forward thinking banks are changing their technology infrastructure to be in prime position to adapt to the rapidly changing environment ahead. Increasingly, more banks are modernizing core systems and IT infrastructures to allow for a flexible and adaptable bank. Improved core systems are built on architecture which allows banks to integrate APIs, process transactions real-time, utilize data driven decisioning, and much more. While core banking systems across the industry is largely unfit for banking in the digital age, we're already seeing banks under our coverage undertake large projects which come with higher expenses up front but are likely dollars well spent.

Figure 11: US Mid and Small Cap Banks Core Banking System Tracker

Company	Completed core upgrade	In process of upgrading core	On existing core
AMAL			X
BKU			X
CADE			X
CMA			X
EBC			X
FBK	X		
FHB		X	
FHN			X
FRC		X	
HBAN			X
KEY			X
MCB			X
MTB			X
NYCB	X		
PBCT			X
PNFP			X
SBNY			X
SIVB			X
SNV		X	
TCBI			X
TCF	X		
UMPQ	X		
VLY			X
WBS		X	
ZION		X	

Source: Company disclosures.

Banks recently upgraded or in process of upgrading core systems:

- **Eastern** has pushed innovation around the existing core by building an in-house a cloud-native API management system that connects all of its partnering fintechs and app providers, such as Stripe and Pinkaloo.
- **FB Financial** converted its core operating platform to Jack Henry in 2016.
- **First Hawaiian** is now working to upgrade its core system and this should provide additional opportunities to smartly leverage data and further trim expenses as manual tasks are replaced with automation. Over the longer term, the plan is to digitize all systems with a new website and mobile banking app on the way.
- **First Republic** chose the FIS IBS banking platform as part of core banking modernization program. The new FIS platform will provide expanded functionality and data analytics, as well as access to third-party solutions through the growing FIS Code Connect ecosystem of open APIs.
- **New York Community** recently upgraded its core banking system to the Fiserv DNA core platform to improve its retail banking and commercial lending services.

- **TCF Financial** operates on the FIS IBS core, which was adopted from its merger of equals with Chemical Financial.
- **Umpqua** has moved to a modern core after completing the integration with Sterling six years ago and is now on a FIS core. The company uses Q2 for its mobile digital banking platform and has made a big upgrade with Q2 about 60-90 days ago with the company now on the latest version of its offering. On business banking, Umpqua will be upgrading its platform next year using Business Online Banking through FIS, which should impact Positive Pay, integrated receivables, and remote deposit capture offerings among others.
- **Webster** is in the process of upgrading a customized version of Systematics, hosted by FIS. The upgrade is supported by data and integration services architected independently of the core to allow WBS to decouple front-end digital development from the core.
- **Zions** is in the process of replacing its core system with work started in 2013 and management expects it to be finished in 2023+. The final upgrade is the deposit system, which is expected to roll out in 2022. Zions selected the TCS BaNCS platform. With Zions having several banking subsidiaries through multiple acquisitions, its core banking system was customized for each banking subsidiary and has led to increased complexities and the need for a new banking core system.

Notably amongst the banks that we cover, some of the largest project expenses are for upgrading or even replacing entire core systems which are lengthy projects that require significant time and resources. Additional to the costs related to revamping core systems, banks run the risk of failure or projects that extend too long. Management teams willing to undertake large core system overhauls are taking a necessary risk, in our view, in order to set the foundation for the bank to survive in the upcoming decades.

Spotlight on Finxact

A Fintech Offering a Cloud-Native Core as a Service

One of the key advantages of some fintechs is that the company is built in recent years on a modern infrastructure that serves as a foundation for these companies to be agile and adaptive in a changing environment. When banks choose to replace their core banking system and become more agile like fintechs, they have the option of replacing their existing cores with (1) a traditional enterprise or (2) a next-generation cloud-based core banking system. One fintech that provides this next-generation capability to companies is Finxact, which provides a cloud-native Core as a Service. Finxact is led by Founder and CEO Frank Sanchez. Mr. Sanchez is an industry veteran who created a real-time core banking system in the 1990s, which was used by some of the largest banks before being sold to FIS for $184mm in 2004. Finxact was started $12mm in capital from Live Oak Ventures and other investors and later secured a $30mm strategic investment by banking and financial services firms in 2019. The company’s offering ranges from full core conversions to digital-only initiatives for clients of all sizes ranging from de novo to top tier banks both domestically and internationally. Today, Finxact offers one of the first cloud-based core systems that is sold as software as a service. This provides its clients the ability to skip over the heavy upfront capital costs of setting up a traditional core banking system and instead is charged by Finxact a per-user monthly subscription fee so as

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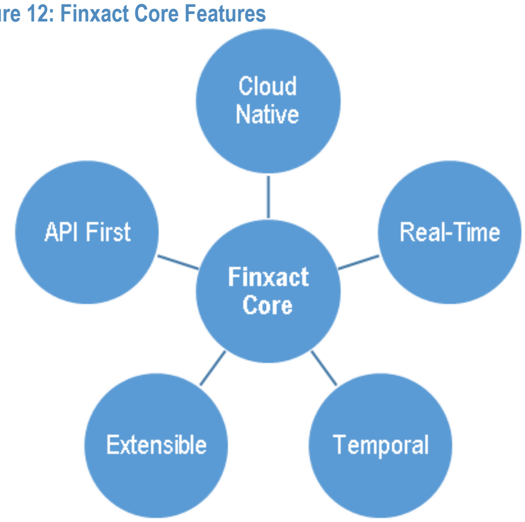
the bank grows its user base, there is a variable cost for the core services provided by Finxact.

Below are some features unique to the Finxact core:

- **Cloud Native.** The Finxact Core is cloud-native and built without layers of legacy technology, making it globally accessible, highly scalable, and cost effective. Containerized applications designed to deploy into an elastic and resilient cloud to ensure operational continuity. SaaS delivery model will reduce capital costs, infrastructure costs, development costs, and maintenance costs.
- **Real-Time.** The Finxact Core enables true real-time, customer-centric banking. Ultrahigh performance transaction processing engine ensures high integrity at elastic scale. Transactions are always in balance. End-of-day reconciliation and batch processes are eliminated.
- **Temporal.** Finxact's temporal database allows the context around any historical transaction, event, or application occurrence to be recreated as of an instant in time. Provides "as-of" time indicators to recreate granular views into an actual event or potential event. Enables 100% real-time, as-of any date/time position states for straight through non-stop processing, without cutoffs or offline operations.
- **Extensible.** Extensibility is the ultimate in future proofing. Modern design and novel engineering allows banks to rapidly and easily modify the Finxact Core as a Service with proprietary functionality. Finxact can modify and add components, data elements, generate new APIs, and create or enhance most system objects. Provides custom authoring features for a bank's proprietary functions and extensions. Build upon Finxact's API library and reuse our components or your own creations.
- **API First.** The Finxact Core is an expansive financial services model that encompasses thousands of banking functions exposed as API endpoints. All banking functions and core transaction data available via RESTful APIs. 100% wide and deep APIs for faster and less costly integrations and customization.

Figure 12: Finxact Core Features



Source: Company website.

Recent Adoption by Banks of Finxact's Core

- **September 2020:** It was announced that **Live Oak Bank** is utilizing Finxact's core and the bank now offers business savings and CDs on the Finxact platform. In addition, the bank is also using Finxact for its PPP loan portfolio that is helping over 10,000 small business customers.
- **March 2020:** It was announced that **One,** the new digital banking app launched by Chairman Bill Harris (former CEO of Intuit, PayPal, and Personal Capital) and CEO Brian Hamilton (former CEO of Azlo and Capital One executive) selected Finxact to power its service. One is designed to deliver full-suite banking in one simple account that allows users to save, spend, share, and borrow in a way that suits their lifestyle and financial goals.
- **March 2020:** It was announced that **FirstBank** (not covered by JPM), one of the largest privately held banks in the United States with over $19B in assets and 119 locations throughout Colorado, Arizona, and California, will launch new digital banking products and services on the Finxact core. In the coming months, FirstBank will develop and launch multiple products on the Finxact Core with the ultimate goal of full conversion to Finxact from its 35 year-old in-house core system.

One of the key features to the Finxact core is how it leverages technology that has been a great enabler to companies of all sizes: cloud technology. Cloud technology has enabled fintechs to have access to computing and data storage offered by third party providers without the burden of high upfront costs of buying on premise server hardware and the ongoing costs of maintaining the computers. In fact, in our conversations with regional banks' technology leadership, it was pointed out that leveraging cloud technology may be just as important as having a modern core banking system.

Cloud Strategy Another Critical Technology Component to Stay Ahead of the Curve

A Cloud Strategy Levels the Technology Playing Field and Enables Innovation and New Capabilities

On top of having a modern core, another critical technology for banks to leverage to stay ahead of the expectations curve with customers is through cloud technology to store data and applications. The benefits of leveraging the cloud for banks include significantly lower cost of computing and data storage than maintaining expensive private servers. This technology is used by fintechs as well as some providers such as Finxact, which enables the company to host its data and applications on the cloud and make it accessible, highly scalable, and cost effective. This concept of pay as you go (based on level of usage) for the cloud from providers such as Amazon Web Services, Microsoft's Azure, and Google Cloud, among others, is a huge value proposition for banks to use these services. The financial benefits of leveraging cloud for computing and storage are significant for banks. From a capital perspective, this reduces the need for banks to engage in upfront capital spending and instead allows the bank pay for the cloud services based on usage as needed. For banks looking to leverage the technology, there are different types of cloud platforms and service forms.

Types of Clouds:

- **Public cloud:** Increasingly, banks are leveraging the public cloud method which means banks can manage their computing resources remotely using a commercial provider's data center instead of the banks own physical servers.
- **Private cloud:** Companies which use private clouds maintains their own servers and infrastructure to host their own application and data on their own cloud (unlike the public cloud, private clouds can only be accessed by the company which owns it).
- **Hybrid cloud:** As the name suggests, the hybrid cloud is when companies use a mix of the public and private cloud where an organization manages its resources in-house while also having others provided externally.

Types of Cloud Services:

- **Software as a Service (SaaS):** This software distribution model uses a third party provider to host applications and is made available over the internet.
- **Infrastructure as a Service (IaaS):** IT infrastructure such as servers, storage, networks, and operating systems is rented out on a pay as you go basis. This model is effective for developing new software as it is generally more cost effective. The leading cloud provider is Amazon with over 1 million enterprise-cloud customers.
- **Platform as a Service (PaaS):** In this model, businesses can create their own custom applications by using on-demand cloud services.

The cloud offers the ability to scale up and down based on usage based on needs rather than owning servers with excess capacity in case of the need. For example, when BankUnited ran its NFL Super Bowl promotion online, the ability to leverage the cloud to scale up came from the usage of the cloud, rather than owning excess private server capacity, is an example of the financial benefits of using the cloud. Along with the benefits of a more flexible and transparent cost structure, the cloud can help banks increase their speed and respond to a rapidly changing environment such as bringing new products to market. Additionally, IT staff's time saved from a more efficient system can be spent on focusing on improving convenience for customers as well as employees for that matter. Meanwhile for the banks' customers, the benefits of the bank leveraging the cloud translates into a better experience with the bank and reduces friction points in many different processes, such as a seamless personal loan application.

One of the key concerns raised by banks since the early introduction of cloud technology is around security given the industry's access to sensitive banking information. This concern was one of the larger obstacles for bank management teams to adopt cloud technology for storing their data. However, over time as the adoption of the technologies by enterprises in all industries increased, there has been more comfort in the security aspect of the cloud. After all, the cloud providers invest heavily in security in amounts that individual companies are unable to invest in. In fact, even federal government agencies such as the Department of Defense trust the security of the cloud providers and use their cloud technologies. Over the past few years, the tone from banks (including their regulators) around the security concerns of cloud technology has changed and they are now more comfortable with the security of the cloud.

Access to the Cloud Enables Insights on Customers and Drive Business Opportunities

One important capability of the cloud is that it allows banks to access large data sets quickly, helping banks move away from siloed databases and manual processes. As more of the bank's massive data sets are combined onto the cloud, the bank can use the data to produce insights on the customer that can be used for business purposes. This access to customer insights is a powerful tool for banks to better serve the needs of their customers. This is an example of how cloud technologies are used not only to reduce costs but also to create business and top line revenue opportunities by seeing areas where they can offer customers certain products and services they may need. While banks have massive amounts of customer data, it may not be readily accessible and easy to combine to make sense of the data. However, as banks selectively migrate certain data sets and applications to the cloud, banks will have access to data from one source and in many cases use the services provided by cloud vendors and their partners.

In addition to storing data with these third party cloud providers, the banks can also leverage the technology companies' tools for data insights and their advice that would normally be costly and difficult to build in-house. Technology companies like Google and IBM are creating cloud software to sell to banks such as the recently launched mortgage program called Lending DocAI, which handles the imaging and extraction of information from mortgage documents. Cloud-based software can be less expensive than software run on the bank's own data center.

Our Banks Now at Various Stages of Migrating to the Cloud with All Acknowledging the Potential of Cloud Banking

The adoption of cloud technologies at regional banks is at various stages and has accelerated over the past few years with cloud being more widely adopted across more industries. While the upgrade or replacement of legacy on-site data centers may be a daunting task for banks, they can approach this with an incremental approach of moving to the cloud. In addition, banks can choose from using the public cloud, private cloud, or a hybrid cloud approach—and many banks end up choosing the hybrid approach. Choosing which applications to migrate to the cloud depends on many factors including which options make strategic sense to move and also which ones are up for renewal. As in the case of First Republic, some banks are migrating to the cloud while undergoing a core system upgrade which requires both strategy frameworks to work together. Examples of banks in our coverage universe undergoing different stages of leveraging the cloud include:

- **BankUnited** is further along with its cloud migration progress with the bank close to completely moving to the cloud and is expected to soon not own any servers. With the bank nearly fully migrated to the cloud, there are significant opportunities to improve the customer experience. The bank uses cloud solutions from Amazon Web Services including efficient tools to form data and analytics, as well as to improve the customer interface. With the data on the cloud, the bank is forming a data lab to leverage the data with the bank already employing several data scientists and engineers. Potential uses of the data in the cloud include predictive analytics as well as the ability to drive the next product features.
- **Eastern** has focused on laying out infrastructure for cloud over the past couple of years and is now in the process of moving major data assets into the cloud. Migration to the cloud would not only help Eastern realize cost savings but also support the company to stay on the latest and greatest technology. Moving to the

cloud-first infrastructure would involve the following strategies: (1) automation to manage systems at scale and ensure compliance with standards, (2) applications migrated to the cloud in phases, (3) expansion of cloud security, incorporating additional network-based tools (i.e. firewalls), (4) implementation of virtualized desktops, providing secure cloud workstations, and (5) easy access to a cloud datacenter for disaster recovery events. The company expects a vast majority of systems to be on public cloud in the next five years.

- **First Hawaiian** is in the process of upgrading its core systems while tying all of its bank data in the cloud-based customer data platform (to AWS), giving them the ability to pull transactional and customer behavior data being tied together through machine learning.
- **First Republic** embarked on its cloud strategy about 18 to 24 months ago as First Republic built the framework for migrating applications on the cloud and picking the ones that are most strategic and are up for renewal. The adoption of cloud banking will accelerate and expand First Republic's ability to roll out new products and features and respond to clients more quickly with technology.
- **KeyCorp** has spent the last 4-5 years on its cloud strategy and continues to migrate more and more onto the cloud. The bank has several applications on the cloud already and plans to move several more on to the cloud.
- **People's United** has some applications on the cloud while also having its own servers. People's does not currently have a cloud-first strategy but acknowledges that while there may be significant value in having a cloud-first strategy, not having one is not viewed an impediment to the firm's current technology strategy.
- **Silicon Valley Bank** is in the early stages of implementing a cloud strategy as a continued migration to the cloud can provide the company with a variety of advantages including (1) lower infrastructure costs, (2) usage of APIs that already exist on the cloud, and (3) a more robust testing environment for new products and features.
- **Umpqua** embraces the cloud-first strategy which allows the company to reduce its physical footprint and costs of running traditional data centers along with the opportunity to scale significantly. In fact, Umpqua was one of the first banks in the US to work with Microsoft Azure and has a transactional database sized at 2.4TB (which is sizeable for a bank of Umpqua's size) porting to Azure. With the company's replicated transactional data and account level data fully on cloud and operating under the Azure environment, Umpqua can run Python and use Snowflake services with this data, with this enabling attrition warnings as well as providing next best offer and credit insights.

With most banks now off to the races to migrate data and applications to the cloud, it is clear that banks acknowledge the significant potential of leveraging cloud technology. One consistent reason for banks to move their data into a cloud is to have data that is accessible and able to leverage the tools offered with the cloud, such as data analytics tools, customer relationship management systems, and customer insights tools. Having the ability to tap into and use the data that it has collected on its customers allows the bank to more effectively serve its customers' needs.

Regional Banks Also Using Quants and Tech Labs to Improve Client Experience

A Number of Our Banks Have Quants and Tech Labs in Place, Developing Innovative Tools and Platforms In-House

As we looked at regional banks and some of the initiatives that they're taking with respect to technology, we were surprised to see how some of the regional banks in our coverage are using data analytics and hiring quants to empower bankers as well as elevate the customer experience. In fact, what surprised us more is the fact that the regional banks are building these capabilities in-house as opposed to outsourcing them to a third-party vendor. Using technology in the form of data analytics to empower bankers and better understand client needs is the perfect recipe for banks to increase clients' perceived value of banks. With valuable data on customers in the bank, banks that provide access to data scientists and engineers to analyze the data can enable bankers to understand the needs of their customers better. This also allows bankers to provide a more personalized experience to the customer as well as offer more products and services when customers may need it. Some basic examples of how banks can leverage data is in the event a customer has a loan with the bank but not an operating deposit account, bankers informed with this insight may allow the banker to offer a deposit account to the customer.

We give a brief summary of how some banks in our coverage are using quants and data analytics to empower banks and/or improve client experience:

- **Eastern Bankshares:** Eastern has a dedicated tech lab (today comprised of five full time employees) called Eastern Labs. Founded in 2014, the origin and foundation of Eastern Labs traces back to Chairman and CEO Bob Rivers who was determined to drive innovation at the bank and ensure that Eastern can thrive for the next 200 years. Recognizing that there is a ton of whitespace around small businesses as it relates to technology, a team of fintech entrepreneurs at Eastern Labs worked side by side with different groups across Eastern to understand what bankers and customers need and come up with ideas and built a new digital lending platform, called Numerated, for small business customers that could support real time small business lending (which was spun out in 2017). The lab isn't trying to win just by building proprietary technology that can only be used internally, but rather, the secret sauce of Eastern Labs is its ability to plug in many different partners, such as fintechs, to create a differentiated experience. With that said, Eastern Labs is focused on driving innovation and connecting the bank to a broader fintech ecosystem through experimentation, investment, and partnerships. With small business lending a key strategic focus at Eastern, the company actively invests in and partners with a number of cutting-edge fintechs that are focused on enhancing the banking experience for small and medium-sized business owners, with a key example being Monit which is an app that leverages predictive technologies to forecast cash flows for small business owners.
- **First Republic:** At First Republic, there is a dedicated sales analytics department called Eagle Intelligence, which is focused on using analytics and technology to help bankers stay connected with their clients wherever they are and deliver high service to clients with ease and speed as the bank scales up in size. Eagle Intelligence has launched a number of tools and platforms that are developed in-house where bankers can access every day to understand what is going on in their

book of business and clients, customize settings to their liking, and receive actionable recommendations. Examples of proprietary technologies and products developed by Eagle Intelligence with the goal of empowering bankers include: (1) Customer Relationship Browser, (2) Quant for Banker, (3) Eagle Tearsheets, and (4) Natural Disaster Mapping/Emergency Response App.

- **KeyCorp:** With KeyCorp further expanding and streamlining its digital capabilities through Laurel Road in areas such as mortgage, Laurel Road is actually being utilized at KeyCorp as a business lab as well as a tech lab for the bank's overall consumer banking, where engineers and designers are working to create a more streamlined lending origination experience.

Even Though Regional Banks Appear to Be in the Catbird Seat, the Backdoor to Their Customers Is Still Open to Fintechs

Fintechs Disrupting Traditional Banking Industry by Offering Financial Products Without Common Pain Points

Looking at the current ecosystem of financial services, although a handful of banks are actively trying to create a unique experience for customers with a goal of improving customer satisfaction, there is one important and fast-growing subsegment of the financial industry that must be mentioned: fintechs. While it's difficult to pinpoint exact customer satisfaction scores for fintechs, given limited availability of this data, one of the key selling points that fintechs are making to their potential and existing customers is the elimination of common friction points, including overdraft fees, ATM usage fees, and monthly account maintenance fees, that still exist at many traditional banks today. With that said, we point to three fintechs that offer similar products as traditional banks (including checking/savings accounts and personal financial management tools) but do so by removing many of the friction points found across the traditional banking industry.

Varo Money: Online-Only Firm That Offers Checking/Savings Accounts and the First Fintech to Receive a Bank Charter

With over 1 million users, Varo Money offers to customers an online-only checking and savings bank account with a variety of features that remove friction points for customers. In addition to allowing customers to receive their paycheck up to two days early and instantly send and receive money with anyone else who uses Varo, the bank account comes with no monthly fees, no overdraft fees, and no minimum balance requirements. Additionally, Varo's savings account allows customers to earn a minimum of 0.81% up to 2.80% in annual interest if certain qualifying conditions are met. Finally, in July 2020 the OCC approved Varo's national bank charter application, the first such approval for a fintech company, which can allow it to reduce its funding costs, receive access to the Fed's payment systems, and operate across state lines.

Mint: A Personal Financial Management Tool That Uses Artificial Intelligence and Machine Learning and Helps Customers Avoid Overdraft Fees

Founded in 2006, Mint offers to customers a free tool to help customers track and manage multiple financial accounts on one single dashboard. With more than 15 million users today, Mint's secret sauce is its ability to not only automate the process

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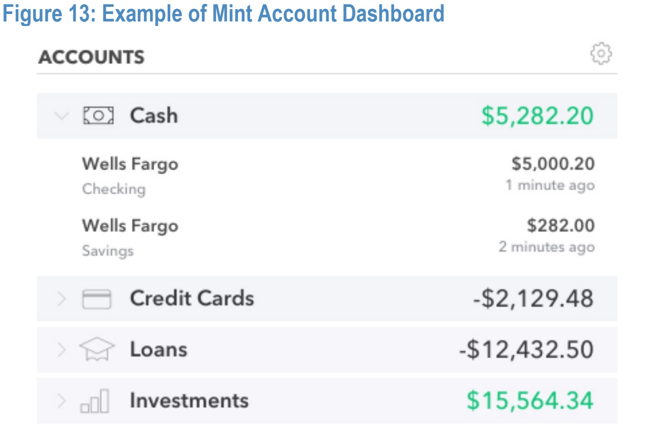
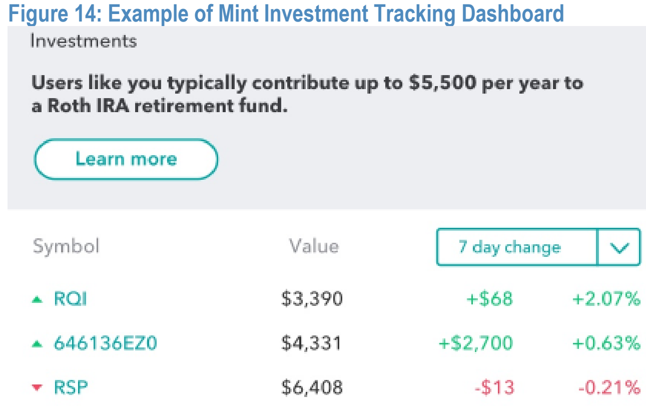
for customers to link financial accounts to a single dashboard but also to automatically categorize financial transactions, with each of these two tasks having historically been manual and cumbersome in nature from a customer point of view. At the end of the day, Mint allows customers to keep close track of their expenses as well as stay current on upcoming bills. Perhaps more impressively, Mint also has the ability to predict and automatically alert its customers when they are likely to incur overdraft fees *before they happen*, helping to alleviate a common friction point (and revenue stream with each overdraft typically bringing in more than $30 per incurrence) found at traditional banks. However, coupling Mint's secure access to its customers' financial data with artificial intelligence and machine learning, it is able to inform customers that they are likely to incur an overdraft based on a customer's historical spending patterns. As an example of the success of this feature, Mint has sent several hundred thousand individual alerts to its users, helping them save more than ~$900K per year on overdraft fees.

Figure 13: Example of Mint Account Dashboard



Source: Company website.

Figure 14: Example of Mint Investment Tracking Dashboard

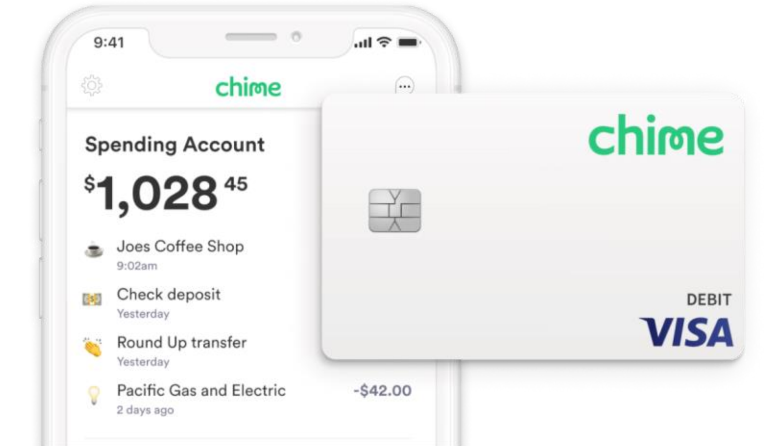


Source: Company website.

Spotlight Section: Chime Is an Example of a Model That Poses a Challenge to Incumbent Banks

Chime is a fintech company founded by Chris Britt and Ryan King in 2013 in San Francisco, California. The company was built as an alternative to traditional banks and operates only through a mobile app without any physical branches. According to Crunchbase, Chime has raised $1.5B in funding thus far and is valued at ~$14.5B. Although Chime does not have a bank charter, it partners with The Bancorp Bank and Stride Bank (formerly known as Central National Bank) to own and manage its accounts. The fintech offers bank accounts without any traditional fees such as overdraft and monthly minimum balance fees along with a debit card for clients to make purchases through their bank accounts. Additionally, these accounts are FDIC-insured up to a sum of $250K. Despite being founded in 2013, Chime managed to reach a million users by 2018 and went on to sign up eight million users by February 2020. A large part of the sharp growth in Chime users is tied to the convenience of no-fees attached with the fintech's bank accounts. Additionally, the mobile app developed by Chime manages all aspects of operating the bank account through the app and offers touch ID as a standard security feature for its accounts. To this end, the app has managed to garner more than 135K five-star reviews on the app store.

Figure 15: Chime Mobile App and Debit Card



Source: Company website.

Chime Offers Innovative Banking Products and Adds an Additional Layer of Convenience in the Form of Zero Fees

Chime offers multiple banking products that are innovative and add value to its customers. In fact, even something simple like opening a new bank account takes less than 5 minutes and can be done through the app by providing a social security number and home address. In fact, no opening deposits or credit checks are required to open a Chime bank account. One of the most innovative products offered by Chime is in the form of "SpotMe", a free service for Chime customers with more than $500 in their deposit account. The service allows the user to overdraft up to $100 with no additional fees and the overdraft is cleared with the next deposit made by the user, again with no additional fee for doing so. Another innovative banking product offered by Chime is "Early Direct Deposit" that allows users to access direct deposits up to two days in advance of receiving the actual deposit in their account. As an example, a Chime user can set up their paycheck as a direct deposit into their Chime account and access the paycheck nearly two days in advance of receiving the paycheck. Additionally, Chime offers this product without any additional fees to the customer adding an additional layer of convenience to the customer.

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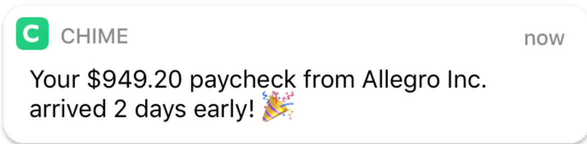
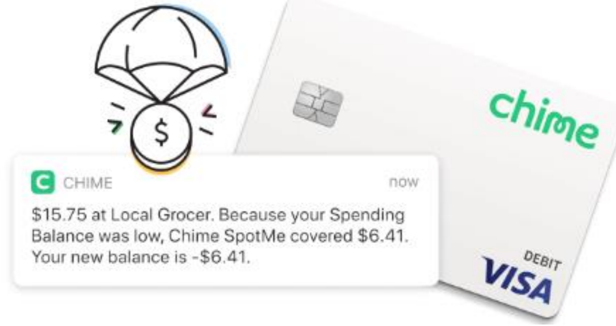
Figure 16: Chime Early Direct Deposit



Source: Company website.

Figure 17: Chime SpotMe Fee-Free Overdraft



Source: Company website.

Chime's Pandemic Response Highlights Its Ability to Provide Customized Yet Innovative Banking Products to Clients

As the pandemic spread across the country in March and April, most banks took a standard approach to offering relief to their clients by waiving fees such as deposit service charges and offering deferrals to their clients. Meanwhile, Chime took a customized and innovative approach to offering relief to their customers. In April 2020, the fintech announced that it was launching a pilot program for its clients where clients who had e-filed their tax returns with the IRS would be eligible to receive $1,200 in economic stimulus payments (as part of the CARES Act passed in March 2020) nearly a week in advance of actually receiving the deposit. This provided customers that were financially hit by the pandemic a much needed relief in the form of an earlier stimulus check. Post the implementation of the program, Chime announced that it had processed $375mm in stimulus payments a week before the scheduled government disbursement date. In our view, this is a solution that provides value to banking clients while being easy to implement for a fintech. In fact, Chime's pandemic response underscores the fintech's ability to be nimble and provide innovative banking solutions, which makes the fintech one of the strongest challengers to regional banks.

Fintechs' "No-Fee Model" May Provide a Backdoor for Fintechs to Disrupt Incumbent Banks

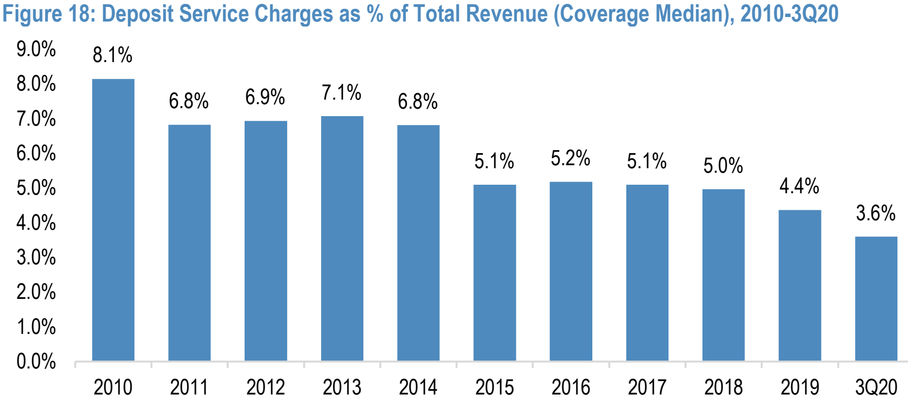
Neobank fintechs like Varo Money and Chime have a very simple value proposition—online banking with no hidden or overdraft fees. In fact, both Varo Money and Chime charge no monthly maintenance fees, have no transfer fees, and do not have a minimum monthly balance requirement which is a client-friendly approach to banking. In fact, the convenience offered by these fintechs through the no-fee model has led to a sharp surge in users for the fintechs. In fact, Chime, which was founded in 2013, reached one million users in 2018 and by February 2020, the fintech announced it scaled up to eight million users, adding seven million users in just under two years. Similarly, Varo Money, founded in 2015, has acquired two million users as of June 2020. In our view, the scale of growth for these fintechs is largely driven by the convenience offered by the fintechs' no-fee model for clients. Comparing this to regional banks which still charge upwards of $20 for overdraft fees, we see a wide difference between the overdraft fees charged by the regional banks and the no-fee model offered by the fintechs. As a result, it is our view that the convenience offered by the no-fee model of the fintechs might provide a backdoor for them to disrupt the regional banks.

As addressed by these fintechs, one of the major pain points that exist within the banking industry is the existence of nuisance fees in the form of overdraft fees, ATM fees, and account servicing fees. With the emergence of fintechs which are now offering many similar services without additional services without charging fees, the banking industry is taking a hard look at these fees charged to clients. In fact, the convenience that the fintechs offer compared to banks is the “low to no-fee” model that attracts clients. As an example, we take the case of Amazon. For Amazon, the value proposition of the company is not as much the ease of navigating the website as it is the ease of doing business with Amazon. Amazon’s policy of easy returns makes it very convenient for customers to return and replace their ordered products. Additionally, Amazon does not charge a customer for returning their products which further reduces pain points and elevates customer experience. In fact, the convenience offered by Amazon coupled with no additional fees increases the value offered by the company to customers. In the context of banking, the strongest value proposition that regional banks could offer clients is in the form of making it easy to do business with banks while reducing friction points such as removing fees to elevate the customer experience. In fact, as we note in the following section, banks such as Huntington and First Republic appear to be taking the lead in terms of removing the friction caused by banks charging additional fees to customers for low value activities such as overdraft and ATM fees.

Banks’ Reliance on Deposit Service Charges Has Been Steadily Decreasing Over the Past Decade

Deposit service charges typically form a material part of a bank’s fee income line item and represents the service charges and fees (including overdrafts) charged by banks on a deposit account. For example, there may be a $5 monthly charge for a certain bank checking account which could be waived if the account holds a certain minimum balance. However, the share of deposit service charges as a percentage of total revenue has been steadily declining over the past decade. In fact, deposit service charges constituted 4.4% of total revenue in 2019 which is a sharp decline from 8.1% in 2010. Earlier this year, as the pandemic struck the country, many banks began offering fee waivers on deposit charges. As a result, the share of revenue from deposit service charges for banks in our coverage declined further to 3.6% of revenue in 3Q20. Although many banks in our coverage have guided to an increase in fee revenue for 2021, we still expect deposit service charge contribution to revenue to remain well below historical levels.

Figure 18: Deposit Service Charges as % of Total Revenue (Coverage Median), 2010-3Q20



Source: SNL Financial.

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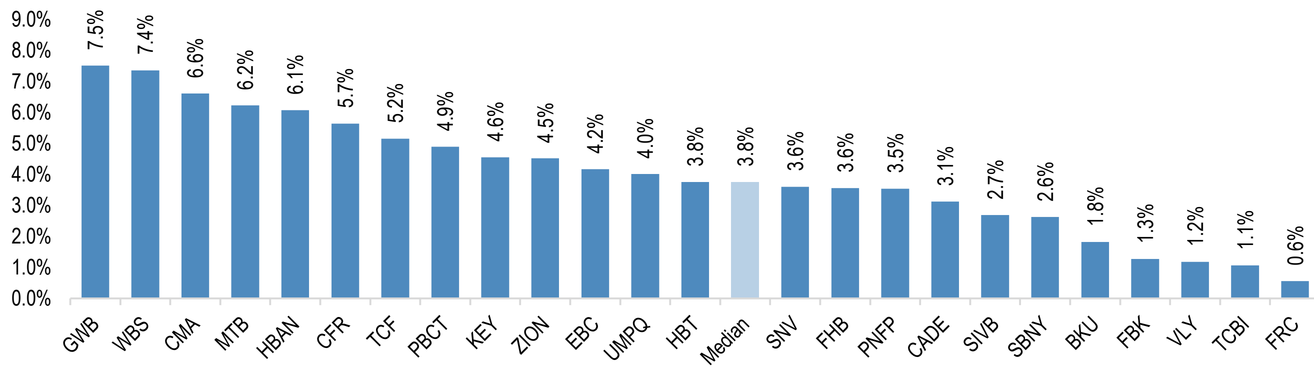
Looking across banks in our coverage, we look for banks that are more heavily reliant on deposit service charges as a percentage of total revenue. To this end, as of the latest quarter, we note that Great Western Bank, Webster, and Comerica have the most contribution of deposit service charges on revenue at 7.5%, 7.4%, and 6.6% respectively. On the other end of the spectrum, First Republic, Texas Capital, and Valley National have the lowest contribution of deposit service charges to fee income at 0.6%, 1.1%, and 1.2% respectively with the median at 3.8%.

Figure 19: U.S. Mid- and Small-Cap Banks Deposit Service Charges as % of Total Revenue, 3Q20



Source: Company reports. Note: WBS deposit service charges as % of total revenue excludes $17.4mm in HSA charges and other fees.

Huntington and First Republic Have Been Proactive in Reducing Fees to Reduce Friction Points for Clients

While most banks waived customer fees under the encouragement of regulators in response to COVID-19, some banks like First Republic and Huntington already had customer friendly fee processes in places. In response to the pandemic and in an attempt to further reduce pain points that clients face, through No-Overdraft Fee $50 Safety Zone, Huntington has increased the overdraft safety limit thresholds to $50 (from the earlier of $5) which allows clients a limit of $50 before they begin to incur an overdraft fee. Additionally, the bank has introduced 24-Hour Grace where the overdraft fee incurred is waived off if a deposit is made within one business day after drawing on overdrafts. Meanwhile, First Republic offers overdraft protection by linked account. First Republic links checking account with an associated savings/checking account and automatically transfers from one account to another to avoid overdraft fees and bounced check fees. In addition, First Republic's ATM Rebate Checking product already rebates its customers for ATM fees charged by other institutions. The measures taken by Huntington and First Republic are aimed at improving customer experience through reducing fees for clients, making it easier for clients to bank with them. Overall, we view Huntington and First Republic as having taken the lead among regional banks in elevating client experience through reducing friction points such as fees.

The Road Ahead

Our Digital Survival Handbook for Regional Banks

Having covered the bank sector for more than two decades, we've witnessed more changes in the past three years than in the prior seventeen years combined. A confluence of factors, including the impacts of the pandemic, are working to dramatically accelerate the digitization of the bank industry. As a result, if a bank isn't already well into its digital transformation, it will likely be left at the starting line. Having done our deepest dive yet into the digital capabilities as well as overall value proposition of the regional banks, we can confidently report back to shareholders that a new breed of regional banks is emerging, with many today positioned in the catbird seat as likely endgame winners. However, with competition coming from all angles including mega banks, foreign banks, fintechs, and technology platforms all vying for a piece of the banking pie, not only is the competition fierce but many regional banks have also left the backdoor open to new entrants tied to legacy friction points, primarily in the form of nuisance fees (but there are more). As a result, while we see the regional banks as being in a position of strength, it's still somewhat of a jump ball in terms of which companies will emerge as dominant in the bank industry in the years ahead. To this end, we provide our digital survival handbook which we believe could add enough jump to the regional banks' game to put many of them over the top and into a position of doing the disrupting rather than the one being disrupted.

Our digital survival playbook includes:

1. **Friction points need to be fully eliminated with the goal of joining the "Nifty Fifty" club.** In our view, the job of every bank CEO in the US is crystal clear: identify and then fully eliminate each friction point that is impairing the customer experience. Bank managements need an immediate action plan to create a "wow" level of service for customers. The convenience age of banking has begun (and that goes for employees as well as customers). To this end, in our view, banks must pull together an action plan to drive to an NPS in the 50+ range. With competition coming from all angles and new entrants focused directly on improving the client experience, if at least 50% of a bank's customers would not refer them to others, the bank will likely succumb to the same fate as retailers which failed to deliver a "wow" level of experience to customers. In fact, we think if a bank does not have a plan to achieve an NPS in the 50+ range over the intermediate-term, it's time for these banks to consider an M&A exit.

2. **M&A is a key tool to thrive in the digital age, but new metrics are needed**. To the degree that increased consolidation occurs, the key metrics being measured need to change. Whereas we historically would evaluate financial metrics such as EPS accretion and TBV dilution, the metric that now trumps all others is the friction points that will be eliminated because of the financial benefits of the deal. Rather than net cost savings, investors should be focused on net nuisance fee elimination. In fact, we believe all of the net cost saves should be invested back into the company in the form of eliminating nuisance fees that impair customer satisfaction as well as using cost saves to invest in areas needed to improve the client experience (with problem resolution for example a needed area of improvement for many banks today). Leadership needs to have everyone focused on the endgame—

or wowing customers with service—but this could be walking a fine line given the employee and customer friction points that are created by M&A transactions of all sizes.

3. **Warning for niche players: be as paranoid as the rest**. For many years now we have been recommending investors to position in niche differentiated banks. While we continue with this advice, particularly with many of the niche players currently topping the customer satisfaction scoreboards, these *currently* advantaged players need to realize that the environment is being completely reshaped which, in our view, will inevitably leave some of the niche players behind. This point is perhaps best exemplified by former darlings such as Toys R Us and RadioShack. The niche players need to be as paranoid as the rest to ensure that they are also investing properly and working diligently to reduce friction points.

4. **Every bank should now be working toward a new core operating system**. Switching to a new banking core is risky and expensive but what is even riskier and more expensive is being displaced by peers operating with a state of the art underlying technology platform. This point is best illustrated by many fintechs which are able to seamlessly offer the latest and greatest products and services to customers on a real-time basis. While we understand the hesitancy of moving to a new core operating system, time is no longer on the bank's side.

5. **Client-facing apps need to be state of the art**. Every product and service that customers interact with on a daily basis is forming their expectations. Whether it be using Amazon for purchases, TikTok for creating content, or Netflix for entertainment, each of these experiences is elevating the bar of what customers view as convenience. In fact, with fintechs already on board in terms of promoting an experience for customers that is a much more "fun" experience than traditional players, banks need to provide a client-facing product and service set that is modern and scores as high from a customer satisfaction view. Note that the expectations bar for customers, retail as well as commercial, is being raised everyday by technology platforms competing against one another for a bigger slice of the pie.

6. **The journey to the cloud is key toward pulling it all together.** Perhaps as important as a bank having a modern core, as well as state of the art client-facing apps, is that a bank must be on the journey to the cloud to pull it all together. In fact, the "off the shelf" tools available to banks from top cloud providers put into the hands of banks real time client data—to be used not only to improve the client experience but also to improve the internal employee experience. Another key selling point: it's much cheaper than what many banks are still using today!

7. **Larger players overly reliant on brand (and scale) could be vulnerable**. When a frog is placed in hot water, it jumps out. When the water gets warmer more slowly, however, it tends to be a worse outcome for the frog. For the larger banks which today benefit from strong brands and scale, in many ways the strong brand is masking how quickly the water is warming given top market shares in many business lines. However, banks of all sizes need to be very paranoid and drive to superior client satisfaction scores in order to thrive in the digital age. There is perhaps no better example of this than cable companies, which had dominant market shares for decades and

then once a better option presented itself, called Netflix, customers cut the cord in droves. The same could be said for Sears, which was an iconic brand for decades but did not have an action plan to deliver a "wow" level of service for customers in the digital age.

8. **Become as customer driven as Amazon**. Of all of the companies we study, the one that impresses us the most is Amazon given (1) its sheer size, (2) a continual expansion of verticals being served, and (3) its relentless focus on customer experience. The company has not only changed the game in terms of customer expectations, but it continues to disrupt itself to continue to drive a higher level of customer service. We view Amazon as the benchmark for which every bank should measure itself. To this end, however, the industry has thus far come up short. For comparison, we suggest investors read the Amazon annual shareholder letter (for any year) and compare it to the shareholder letter for most banks. Whereas one only talks about client obsession, many from the bank industry don't even mention it.

9. **Create a stickier product offering.** As banks modernize front and back office capabilities, this will unleash new capabilities. To this end, however, banks need to do more to not only eliminate friction points but also then create an even stickier environment for customers. In fact, we think every bank should offer a concept such an Amazon Prime or a Costco type membership. Something that rewards customers for loyalty, creates a sense of community, and treats them to unique perks (millennials love perks!).

10. **Think outside of the box to create brand awareness**. Many bank managements commented to us that one of their challenges was brand awareness. To this end, regional banks need to think outside of the box. Beyond naming rights on stadiums, for example, there are incredible opportunities for banks to create mutually beneficial partnerships with companies in other industries. For example, with the direct-to-consumer model moving full steam ahead in entertainment, products such as Disney Plus and now Discovery Plus are being offered initially for free to Verizon customers. Through a consortium such as Canapi, for example, regional banks could band together and start offering additional perks to customers. These types of partnerships are low hanging fruit for banks of all sizes to increasing awareness.

The road ahead for banks will be a tough one. Upon each new advancement in technology, legacy companies are displaced by new entrants. In fact, history has demonstrated time and time again that incumbents tend to lose tied to cultures that can't adapt quickly enough to a rapidly changing environment. Case in point, it appears that many retailers today have a better idea of what is needed to be competitive, but with many of them now in bankruptcy court, their time has passed. With that said, however, in our deepest dive to date into the regional banks' technology capability as well as overall value proposition, we are very encouraged. With many of the regionals not reliant on a strong brand, national scale, or well defined niche, the vast majority of companies in our coverage universe started on a transformative journey over the past 2-3 years that we believe actually positions them in the catbird seat as endgame winners.

The value proposition of regional banks is marrying high tech with high touch to create a convenience level for clients that we believe, if executed properly, will be very tough for new entrants, as well as players with much larger resources, to compete against. The bottom line of how regional banks are separating from the pack is by offering customized service to their customers delivered through a myriad of channels including, online, branches, ATMs, mobile, and human to human. Whereas many fintechs are focused on delivering a seamless digital experience for customers, it is often very difficult for the customers to interact with humans, which we see as the key point of differentiation for regional banks. Rather than banks looking to replace human to human connections, many are smartly using technology to empower employees to deliver a "wow" level of service. To that end, we now present what we learned from our deepest dive into the mid-cap bank sector yet.

Individual Regional Bank Capabilities

How Technology at Banks in Our Coverage Universe Is Translating to an Improving Customer Experience

For this technology disruption report, we interviewed executives at nearly all banks in our coverage groups to do a deep dive into each bank's technology strategy and how it translated into a better customer experience. The type of executives that we interviewed ranged from business heads, CTO/CIOs, marketing executives, CEOs, CFOs, head of IRs, as well as managers in newly-formed roles such as Chief Experience Officer or Chief Transformation Officer. The topics discussed included how the companies drove change at the banks with technology such as upgrading core banking systems and leveraging the cloud, creating new products and solutions for customers to reduce friction points, as well as how banks paired their relationship model with technology to empower their employees, to name a few. While some banks in our coverage universe appear to have more work to do on the digital front, overall we believe investors will largely be impressed by the collective value proposition now being offered by regional banks. In fact, with many still in the early days of their digital journey, the best is still to come.

Amalgamated Bank

Taking a Targeted Approach to Using Technology to Serve Unique Needs of Niche Clients and Deepen Relationships

At Amalgamated, we held a conversation with CFO Drew LaBenne and Chief Operating Officer Martin Murrell. Amalgamated is one of the outliers in the regional banking space to operate in a defensible niche, with these niche client cohorts including unions, nonprofits, and political organizations. By banking organizations such as the Democratic National Committee, the Biden Foundation, the Teamsters, and Planned Parenthood, the company has carved out a niche serving organizations that are not only largely mission-based, but more importantly, have a unique set of challenges and priorities that are distinct from what typical businesses face in running their businesses. In fact, with Amalgamated having spent nearly a century catering its services to this particular niche by (1) hiring bankers with deep understanding of and credibility within their area of expertise to become a “go-to” resource for niche clients and (2) actively executing on its mission to make themselves a bank of choice for its mission-aligned customer base, the reason these clients cater to Amalgamated is because of their expertise around serving the unique needs of these niche cohorts as well as who they are, which according to the company triumphs over a state of art technology. With that said, Amalgamated takes a more strategic and targeted approach to using technology to fit its niche business model by enhancing customization digital capabilities to meet the needs of its clients and ensuring system reliability.

Many of Amalgamated’s Niche Commercial Clients Place Higher Value on Personal Interactions and Service Tied to Their Unique Business and Needs

With Amalgamated primarily targeting niche clients who have unique needs and challenges, what’s typically on top of these niche clients' priority list is bankers’ expertise in the industry segment and human to human relationships. Given the differentiated value proposition for its client base, providing cutting-edge digital or mobile capabilities alone is not enough of a lever to deepen relationship with existing customers or bring in new customers into the bank. To this end, Amalgamated is focused on providing to customers what its customers prioritize and place higher value: (1) service (primarily through personal interactions and service as opposed to mobile/digital offerings) and (2) reliability along with (3) a comprehensive suite of banking capabilities. As a result, Amalgamated is laser focused on enhancing the quality of its bankers' relationships with customers and their understanding of the customers’ unique needs – which is the primary reason Amalgamated’s clients choose to bank with them.

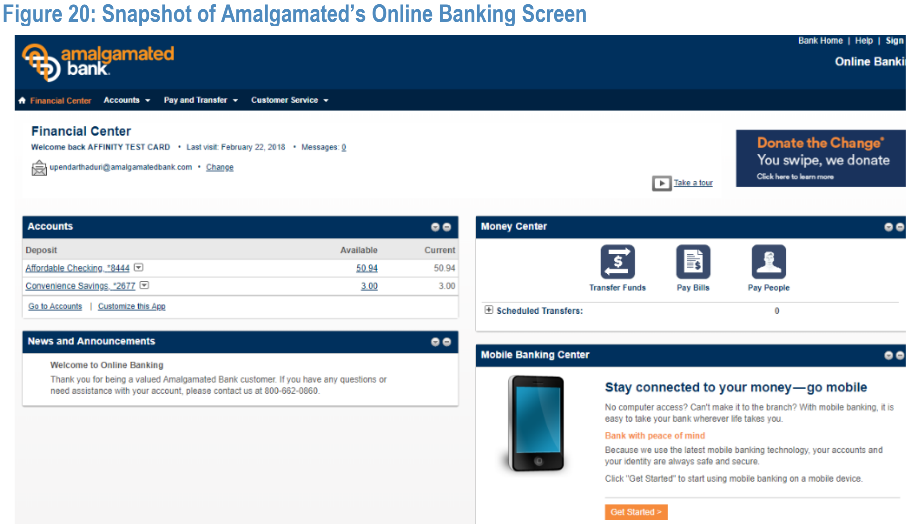
Tailoring Its Digital Banking Strategy to Serve the Unique Needs of Niche Client Cohort with Customization Capabilities Being a Key While Putting Emphasis on Operational Efficiency and Service Continuity

The company takes a more strategic and targeted approach as it relates to technology in a way it fulfills the needs of these customers. For example, Amalgamated will customize capabilities where the company can add incremental value to its client relationships. With some of Amalgamated’s commercial clients (which tend to be its longest and most valuable relationships) having specific requirements for data feeds, file transfers, integration and reporting, Amalgamated partners with them to build out custom functionality and create customized reports to serve their unique needs, resulting in stickier and longer lasting relationships. As such, Amalgamated has over 20 large client-specific applications that have custom file feeds, integration, and formatting. To this end, while we acknowledge that an increasing number of regional banks are pushing for enhanced technology offerings to create a differentiated digital experience for customers as a point of differentiation, the unique value proposition of Amalgamated remains the key factor for its customers. With that being said, however, the company expects increased adoption of new technology for its niche cohort over time and plans to continue making investments along the way. In addition, tied to the unique business model of these clients that the bank serves and the integral advisory/partner role that Amalgamated plays in their banking relationships, the one area where Amalgamated has put high emphasis on in terms of technology is around operational efficiency as well as service continuity and product delivery, particularly during critical business cycles. Tied to many of Amalgamated's niche clients having time-sensitive money movement needs (such as political organizations and unions), the company has made significant investments to ensure reliable and robust service during those times.

Invested Heavily in Consumer Online Account Opening, With Additional Investment in Digital Driven by Specific Business Needs

Overall, Amalgamated leverages an industry-standard core banking functionality in a "community core" architecture. On an overall basis, most of the new tech rollouts at Amalgamated are being carefully selected and implemented on an as-needed basis as add-ons to the underlying technology stack to supplement the standard functionalities available from its core banking platform. For instance, the company has invested heavily in online consumer account opening, which is the first step of the digital banking journey of a client. In order to provide customers a better and more secure experience around online account opening, Amalgamated partnered with a fintech called MANTL, and integrated it into the bank's online consumer account opening platform. This has not only enabled a modernized and seamless account opening process for its customers but also brought advanced real-time fraud and identity verification capabilities. In addition, the company is now using digital signatures to close residential mortgages for enhanced speed to delivery.

Figure 20: Snapshot of Amalgamated's Online Banking Screen



Source: Company website.

The Road Ahead: Uniquely Positioned to Stay Competitive with Technology Focused on Serving Unique Needs of Niche Clients, but More Investments to Come in Order to Stay Competitive in the Digital Age Over the Longer Term

With the company pointing to personal interactions/service and the bankers' expertise triumphing over cutting-edge mobile/digital offerings in terms of the niche clients' priority list, the company takes a strategic and targeted approach to leveraging technology in a way it serves the unique needs of its clients and focuses on areas where the clients place more value. As such, the real "core" of the bank is its ability and reputation as one of the very few banks in the country that understands a unique set of needs and helps solve the challenges of its target clients. Combining this with how Amalgamated has barely scratched the surface of the tremendous opportunity within its niche (i.e. having just 5% share of its targeted $97B of customer assets within its identified six metropolitan markets), our view is that Amalgamated is still positioned to drive growth and share gains for the next several decades, as long as Amalgamated continues to differentiate itself through the level of expertise of its bankers in its niche as well as service delivery—which is the key driver that determines the level of Amalgamated's customer experience/satisfaction. With that said, however, even though the company's clients today are not placing state-of-the-art technology ranked as #1 in value proposition, here we think of the now famous Henry Ford quote "If I had asked people what they wanted, they would have said faster horses." On that note, with management also expecting increased adoption of new technology for its clients over time, it is encouraging that the company's stance is to continue making investments into technology. In our view, this should provide Amalgamated with an edge over other peers in serving the niche client cohort, particularly when combined with its bankers' expertise and the company's mission alignment that resonates with their customers.

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BankUnited

Positive Results Already Surfacing With the Goal to Build a Customer Experience Centric Company; Much More Still to Come from BKU 2.0

BankUnited revealed its BKU 2.0 initiatives in early 2019 to drive revenue and expense synergies in the business and alongside this, the bank highlighted a new focus on driving digital transformation with the customer experience in mind. However, BankUnited's shift in focus on digital transformation started before that when the management team sought to change its strategic focus. One turning point for the bank was with the new leadership of CEO Raj Singh (named CEO January 2017 and Chairman January 2019), the bank shifted its focus to grow organically by investing in the business and brought in a technology strategy which focuses on customer experience while improving business efficiency. Additionally, under the leadership of Lisa Shim, Head of Consumer and Small Business Banking and Julio Jogaib, Chief Information Officer, who joined in September 2016, BankUnited has a new leadership team with a new vision for its technology strategy. The buy-in from senior management including CEO Raj Singh and CFO Leslie Lunak since the beginning was key to allow BankUnited to proceed with this new customer centric technology strategy. Since then, the bank has been focused on up-skilling its workforce and moving forward with its new strategy to thrive in the digital age of banking. As part of our research, we interviewed Lisa Shim, Head of Consumer and Small Business Banking and Leslie Lunak, CFO.

BankUnited Has a "Touch and Tech" Approach with Customer Experience

BankUnited's approach to technology is one that is centered around the customer experience by leveraging technology to enhance its bankers' ability provide a better experience. This compares to some banks which use technology to largely replace the human interaction and push the client experience into self-service channels. In the middle market and corporate space, clients prefer to work with a banker and have the technology available to make banking easier where appropriate. The bank is now in the process of a phased roll-out of a completely new consumer and small business mobile experience to enable customers to have the optionality of both an online experience as well as access to their bankers. BankUnited now has a brand new redesigned website which has a modern design, easier navigation, enhanced user experience, and adaptive screen optimization. One example of BankUnited improving the customer experience while lowering overall costs to service customers is in its pilot rollout of small business auto credit decisioning which reduces the amount of time spent to make credit decisions for loans under $250K from 45-60 days down to one week.

Another example of how technology is used to enable bankers to serve customers and instead of replacing the relationship is in the use of Zoom video conferencing to allow bankers to interact with clients virtually and conduct banking / provide advice during the pandemic. This allowed bankers to continue serving clients during the pandemic when face to face meetings were not an option due to health concerns. In addition, on the PPP loan program, while technology was a key component to processing a large quantity of loans, having bankers assist customers with the process was a differentiator as other banks may not have had the relationship or the capacity to handle large volumes of customer demand with a technology first approach. Adding on to ways that the company adapted to the pandemic, BankUnited rolled out appointment-based banking about 2-3 months into the pandemic, which provides customers the ability to meet with bankers in-person on a schedule and provides the bank with data on interactions. Areas that BankUnited is investing in now include faster and streamlined commercial account openings, while the banks has fast account opening on the consumer side already which can be opened in 5 minutes just like most other banks.

Customization of Commercial Client Needs Is an Area That BankUnited Can Differentiate and Win Business

Given BankUnited's commercial client focus, it competes less on the retail banking side and focuses its technology strategy on the commercial side of the business to differentiate. The goal is to compete in niches where BankUnited can differentiate themselves. The bank made a decision an early on to not compete in mass consumer market as this is largely an area where the largest banks have the largest scale. To do this, BankUnited has the ability to customize solutions for business customers to specific needs, particularly on the deposit business side. For example, in selected industry verticals, the bank customizes a suite of treasury management products to serve the unique needs for these customers. Recently, BankUnited selected Derivative Path to bolster its commercial interest rate derivative offering. Meanwhile, these customized solutions may not be readily available at other competitors. The bank is focused on building out leading capabilities in the treasury management and payment space to drive stickier commercial client relationships. As an example, BankUnited is making investments in the commercial payments space that will impact many verticals. BankUnited's Online Treasury Management web-banking platform features include:

- **Funds management**: account analysis, cash services, escrow account services, and zero balance accounts (ZBA).
- **Payables solutions**: ACH origination services, account reconciliation, online bill payment, control disbursement, and funds transfer.
- **Receivable solutions**: deposit reconciliation, lockbox services, merchant services, remote deposit capture (RDC).
- **Information reporting solutions**: BAI balance reporting, Electronic data interchange (EDI), and Check Imaging Solutions.
- **Fraud prevention.** ACH Alerts. Positive Pay. Online Security.

BankUnited Is Moving Full Steam Ahead with Cloud Migration

Technology has leveled the playing field for BankUnited to compete with other banks as the cost of new technologies have decreased over time. In the past, BankUnited was reliant on purchasing new technology vs. developing their own technology but today, BankUnited has more capabilities with developing new products as it is in the process of developing its own mobile app as an example. The bank has been building around its existing core banking system to meet the needs of new digital initiatives. Technologies like the cloud has allowed the bank to lower costs while being able to move faster with development. Unlike many competitors, BankUnited has pursued an all-cloud strategy and is close to no longer needing to own its own data servers. The migration to the cloud allows for lower costs and ability to access their cloud provider's tools for data and analytics and dashboards that would not have been possible if the company was not on the cloud. In addition, BankUnited is in the early stages of building a data lab as the bank already has staff that analyzes both internal and external data for the bank and is in the early stages of building the capability to do predictive analytics and be applied to a variety of use cases.

The Road Ahead: Early Innings Still but BankUnited Already Showing Some Signs of Growth with New Focus

BankUnited's transition to a new technology strategy over the past few years was enabled by a management team enabled by a new CEO. On January 1, 2017, Raj Singh was named President and Chief Executive Officer and set the company on a new journey to grow strategically to areas where the bank can differentiate and win. While the technology component of the transformation is still in the early innings as the company takes big steps towards improving the customer experience as seen in steps by the company already rolled out new treasury offerings to business customers as well as customized solutions for niche commercial relationships. In one measure of the progress of the bank's ability to improve technology and offer new products to clients, we point to the bank's ability to grow core operating deposits over the years and increasing the noninterest bearing deposits concentration from 15% of total deposits in 2017 and 2018 to 26% of total deposits as of 3Q20. This marked the early results from the focus of the bank to drive deeper relationships that result in low cost deposits for the bank. With the bank still in the early innings of the transformation of technology, as the bank's data is now almost fully migrated to the cloud and open the door for more products, insights (with the bank having staff specializing in data analytics), and fintech partnership opportunities, we see this also still early on for BankUnited's usage of technology to drive business performance and growth.

Cadence Bancorporation

Model Centered on Simplicity to Deliver High Service with Unique Technologies Also Supplementing Distribution Channels

Cadence's motto of "for same-day service, call by 8PM" primarily revolves around its bankers providing a high level of service and responsiveness to clients, where bankers are always ready to step in and support clients in any way. To this end, with such a high degree of focus on a relationship banker model that emphasizes same-day service, we concluded after our call with Cadence that from a technology point of view, Cadence's technology offerings are a key cog in the wheel that helps support the execution of this model. We would note that while Cadence offers tools including a mobile banking app for its retail customers (called Fluent) as well as online banking for its business customers (called Allegro!), much of what Cadence does related to technology is focused on simplicity so that the technology infrastructure that the company has can remain flexible (for example, to add new features and to avoid lengthy downtime).

Simplicity with Technology Starts from the Top

At Cadence, we interviewed Tom Clark, Chief Information Officer, Valerie Toalson, Chief Financial Officer, and Paul Woo, Director of Capital Planning and Corporate Development. Mr. Clark worked for ten years at USAA as an information security executive prior to joining Cadence in May 2015 in his current role. Cadence's focus on "simplicity" for its technology offerings comes from Mr. Clark's time at USAA, where he was focused on various aspects of design thinking and how to improve the overall user experience for its products. For example, a user's experience with a company's product is not just solely due to an easy-to-navigate website that a company has, but more importantly, the logistics that make performing certain tasks easier (a company like Amazon, as he put it to us, would fit this bill given the ease with which a customer can purchase and return an item). With this in mind, Mr. Clark brought this same "simplicity" thought process to Cadence and has expanded on it during his five years at the company.

Focus Goes Back to Delivering High Service to Customers, with PPP Program an Example of Success with Business Customers

With Cadence's client base primarily being businesses (rather than consumers), Cadence has been able to form new and enhance existing commercial relationships even throughout the pandemic due to its high service model. Case in point, as it relates to the PPP program, with many regional banks stepping up to the plate and finding a great deal of success in working with borrowers during this program, Cadence has been no exception to this trend. In fact, Cadence's success with the PPP program has led to the company ranking highly in 1H20 in a nationwide survey by Greenwich of banks' responsiveness to the COVID-19 crisis. Much of this success in the PPP program was attributed to Cadence having the right people in place (in fact, two-thirds of the company's employees) that were able to use Cadence's preexisting technology infrastructure to serve clients.

Supporting Multiple Ways of Working with Customers, While Providing Customers with Optionality with How They Want to Interact

It is important that a bank offers various ways that its customers can interact with its bankers. To this end, while the relationships between a bank and a business customer

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are still primarily face-to-face, the relationship between a bank and its retail customers is likely to involve technology, rather than humans, to a degree to perform certain financial tasks. Consequently, a bank's technology infrastructure should be well-maintained and kept up to date so as to avoid friction points from customers. As a result, Cadence has been looking for ways to support multiple views of reality (with technology evolving ever so quickly) for its retail customers. As an early example of what lies ahead, Cadence has purchased 40+ interactive ATMs that it will deploy across its network (after rolling out its first one in 2013) that will allow customers to video chat with live tellers during expanded business hours and help them perform financial transactions. What's important to note here, though, is that the interactive ATMs are simply an *alternative* way for customers to interact with tellers and is an example of providing an elevated level of convenience to customers, rather than technology taking away people from providing these services, with Cadence still maintaining a sizeable brick-and-mortar branch presence across its network to allow for in-person interactions.

Figure 21: Cadence Interactive ATM

Source: Company reports.

Cadence's Technology Offerings Help Complement the Relationship-Based Model

Cadence's business model is predicated on the deep relationships that its bankers have with commercial clients, which has been a key factor in the company's historical growth. With that said, however, in addition to the interactive ATM mentioned above, Cadence has rolled out a handful of other technology products that have helped enhance the relationships that bankers have with clients. Examples of these technology offerings include Fluent (mobile banking app) for retail customers and Allegro! (online banking portal for business customers):

- **Fluent by Cadence:** Cadence's mobile banking app for personal banking in real time
  - Full-service banking (text banking, mobile wallet)
  - One-stop money manager (track daily spending, create budgets, receive important account alerts)
  - Deposit checks with smartphone camera

  - Online bill pay

- **Allegro! Online Business Banking**
  - Single sign-on portal for business owners to access their bank accounts, bill pay, cash management processes and treasury management services. No new software required.
  - Process payroll and pay vendors online
  - Multi-tiered authority levels so that access can be given or restricted based on employee’s need-to-know
  - Up-to-the minute information to effectively manage daily cash position and liquidity needs

The Road Ahead: A Relationship-First and Same-Day Service Model Drive the Customer Experience with Technology Enhancing Relationships

Cadence’s same-day service model is built on the relationships that its bankers have with business customers, and this has helped contribute to the company’s historical growth. With that said, however, Cadence’s technology offerings have helped to deepen the relationships that bankers have with clients. As one example, Cadence has a dedicated digital marketing team that is focused on new revenue generation opportunities and improving the customer experience through Cadence’s digital platforms, and a new partnership with Google should help maximize the digital experience for customers. Looking ahead, new technology offerings in the pipeline for commercial customers include: (1) treasury management product improvements that provide to customers a unique experience around daily reporting and account analytics and (2) a new foreign currency portal that will allow commercial customers to initiate their own foreign exchange transactions through a system that is integrated with an automated foreign exchange back office. Moreover, on the consumer side, while millennials make up a small part of Cadence’s overall client base, the company has recently introduced services such as (1) a refer a friend program, (2) Zelle, and (3) extended hours at its branches that can each help reduce friction points and improve the customer experience that can help drive new consumer client growth, with the enhancement of frictionless channels also supporting new consumer client acquisition efforts. Additionally, a migration of the core platform as well as a migration of internally hosted applications to a hybrid software-as-a-service or private cloud environment will each likely occur in the next few years which should also allow Cadence to offer even additional technology products and better serve clients. Looking ahead, new technology investments should help the company’s bankers continue to carry out the company’s motto of “for same-day service, call by 8PM”, and coupling this with the deep relationships that its bankers have with clients, allow the company to drive further years of growth.

Comerica

Actively Making Technology Investments in Recent Years Has Helped Deploy New Products While Technology and Chief Experience Officer Position Fills Serve as Tailwinds

Many of the technology investments that Comerica has made to help improve internal processes as well as to offer new products and capabilities to customers started with the company's GEAR Up program approximately four years ago. While the implementation of this program is now complete, the journey of continuing to make technology investments and improve products and services has not stopped. For example, while Comerica started adopting cloud technology as part of GEAR Up to become more scalable and more rapidly deploy technology solutions internally as well as to clients, the company continues to embrace the cloud (with more than 50% of applications now on the cloud) and leverage its benefits to more efficiently offer new products and capabilities. Moreover, Comerica's core platform operates on an evergreen strategy, which means that the company regularly makes updates to its core platform to make sure it has current technology offerings. Outside of the cloud and the core, Comerica has in the past 12 months brought onboard new talent for positions including Chief Technology Officer, Chief Experience Officer (promoted from within), and Chief Information Officer to help with the journey of leveraging technology to improve the customer experience, not to mention that current Chairman, President, and CEO Curt Farmer was also relatively recently named to his position in April 2019.

Technology Investments Enhancing Efficiency and Providing Faster Service to Customers with Continuous Improvement of Processes Part of the Plan

At Comerica, we interviewed Jim Herzog, Chief Financial Officer, and Darlene Persons, Director of Investor Relations. Even with Comerica's technology spend as a percentage of revenue appearing to be comparable to peers, it was interesting to hear that the company has been greatly leveraging cloud technology (and has in fact been doing so for the past several years) for various purposes including storing data, removing duplicative applications, and offering products by plugging in with APIs. While the cloud journey and projects that use robotics, artificial intelligence, and nCino are still part of the in progress technology journey, Comerica has already completed a handful of technology projects to enhance the internal as well as the customer-facing experience, with many other projects still in the works, as part of "Digital 2025" which emphasizes continuous improvements of processes through digitization and intelligent reengineering. As a recent example of the success thus far of leveraging technology, with many millennials desiring to use digital ways of working with their bank, Comerica has recently revamped its online product opening tools for retail deposits and new loan originations, with the company opening up 11K new deposit accounts (checking, savings, and money market) since April and new accounts continuing to be added since that time. Outside of the financial products that leverage technology that Comerica offers today including web banking, mobile banking, mobile alerts, bill pay, and a mobile wallet, below we provide an overview of some examples of the more robust technology investments that Comerica has completed or are still a work in progress.

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Figure 22: Some Examples of Comerica's Technology Investments (Completed or In Progress)

Commercial	Consumer
✓ Credit process redesign	✓ Upgraded Banking Center infrastructure (WiFi bandwidth, tablets)
✓ Mortgage Warehouse upgrade	✓ Bots deployed in call center
✓ Business deposit capture	✓ Contact center voice biometrics authentication
✓ Commercial payments upgrade	✓ Charitable giving online portal
➤ Relationship Manager mobile products	✓ Online account opening and loan application
➤ Treasury Management experience	✓ Replaced teller platform
➤ Credit segmentation	➤ Small Business deposit account opening
	➤ Upgrade ATMs and interactive ATMs

Both Commercial and Consumer
✓ New CRM system
✓ Data analytics (for next best product)
➤ Migration of front and back office applications to the cloud
➤ Digital Marketing platform for automated customer experience management
➤ Leverage third parties to keep pace with evolving and emerging technologies (card, trust operations)
➤ Enable real estate optimization through CoWork

Source: Company reports. ✓ = completed. ➤ = in progress.

Several Ways of Measuring Customer Satisfaction with Room for Scores to Grow Following New Position Fills

Comerica obtains feedback from customers in a variety of ways, including through focus groups to understand what customers are looking for, client feedback, internal and external surveys, and other internal metrics. While Comerica's overall satisfaction score of 809 and net promoter score of 33 (according to J.D. Power) are each comparable with our coverage universe as well as the largest banks in the US, the recent senior positions on technology and customer experience that Comerica has filled should provide upside to these scores in the coming years. More specifically, in 2020 alone, Comerica has hired a new Chief Technology Officer, Chief Experience Officer (promoted from within), Chief Information Officer, and Domain CIO for Commercial Technologies.

- **Megan Crespi (Chief Technology Officer):** joined Comerica in March 2020 as EVP and Chief Enterprise Technology and Operations Services Officer after working at Ally Financial for 11 years, most recently as Chief Technology Officer, where she implemented a variety of transformational initiatives across the company and ran its cloud footprint, strategy, and infrastructure operations. Prior to Ally Financial, Ms. Crespi worked at General Motors and PwC.
- **Jim Weber (Chief Experience Officer):** named as Comerica's CXO in January 2020 where he will lead the roll out of a new Customer Experience Management practice to provide customer insight for Comerica's relationship-focused business model across all business lines (Commercial, Retail, and Wealth Management). Mr. Weber will continue to run Comerica's marketing, communications, and customer data strategy initiatives. Also part of Mr. Weber's team is Maria Adams, who was recently named SVP and Director of Customer Experience

Management, after previously leading Comerica's Brand Marketing Group. Ms. Adams brings decades of experience in customer insight to her new role.

- **Bruce Mitchell (Chief Information Officer):** joined Comerica in November 2020 after working at TD Bank for 5 years, most recently as SVP & CIO of TD Wealth and Insurance where he was responsible for the design and delivery of technology solutions. Mr. Mitchell has 25 years of total experience including at Lloyds, HSBC, and Mellon where he supported a variety of products and teams.
- **Steven Christopher (Domain CIO for Commercial and Small Business Banking):** joined Comerica in December 2020 after working at US Bank for 9 years, most recently as the bank's Head of Consumer Banking Technology. Prior to that, Mr. Christopher served as US Bank's Head of Enterprise Delivery Services and as SVP Enterprise Production Operations. Prior to US Bank, he worked at Wells Fargo for 8 years in a variety of technology roles.

The Road Ahead: Lot of Progress Made in Recent Years and New Senior Position Fills Can Help to Further Improve Customer Satisfaction Scores

Comerica has made many technology investments in recent years which have helped enhance the internal experience (such as providing customer analytics and dashboards to bankers and next best sale information) as well as improve the customer experience (through tools including online product openings for retail deposits and new loan originations, resulting in 11K new deposit accounts since April). Moreover, the usage of cloud, robotics, and artificial intelligence has helped accelerate new product offerings and capabilities with a handful of technology projects still in the pipeline that can help further improve the customer experience. Looking ahead, however, while there are many other technology projects still in the works, we believe that the company's recent position fills for multiple roles in areas including technology and customer experience will be beneficial to further enhancing customer satisfaction. With the individuals in these roles having many years (if not decades) of experience working in various technology and customer experience roles, we believe this provide a path for Comerica to further improve customer satisfaction scores for years to come.

Cullen/Frost

A Leader in Customer Satisfaction with Many Technology Offerings Complementing the Relationship Model

Among the top 50 banks (by asset size) in the US, Frost's net promoter score (NPS) of 61 (according to J.D. Power's 2020 U.S. Retail Banking Satisfaction Study) ranks only behind First Republic's company-disclosed NPS of 72, which are each well above our coverage median NPS of 37. In fact, Frost has been the number one ranked bank in Texas by J.D. Power for 11 consecutive years (according to J.D. Power) and received more Greenwich awards in 2019 than any other bank across the country (with 14 of these awards being in the middle market banking segment and 15 of these in the small business banking segment). We attribute this success to the deep relationships that Frost's relationship managers have with their customers with technology used as a tool that greatly enhances the relationships. In fact, by spending only a few minutes on Frost's website, one can very quickly see the numerous differentiated technology offerings that the company has beyond its mobile app and online banking portal that (coupled with the shift to digital channels due to the COVID-19 pandemic) have helped contribute to various statistics including: (1) online checking account openings up 57% y/y as of 2Q20, (2) 57% of account openings occurred online in 2Q20 vs. 34% in 1Q20, and (3) Zelle transaction volumes more than doubling from 2018 to 2019 with Frost being one of the banks that participated in Zelle's initial rollout. We highlight some of Frost's financial products that use technology in the following sections.

Figure 23: Frost Apple Watch Integration

Source: Company website.

Mobile Banking App Offers Integration with Apple Watch and One-Click 24/7 Access to a Banker!

Frost has perhaps two of the most impressive features among any banks' mobile app offerings: (1) integration with Apple Watch where customers can view account balances and the last 20 transactions and (2) one-click 24/7 access to talk to a banker. Beyond this very unique offerings, Frost's mobile banking app allows customers to freeze their card, login with biometrics, and pay bills, among other features.

Figure 24: Frost Mobile Banking App Product Features

Source: Company website.

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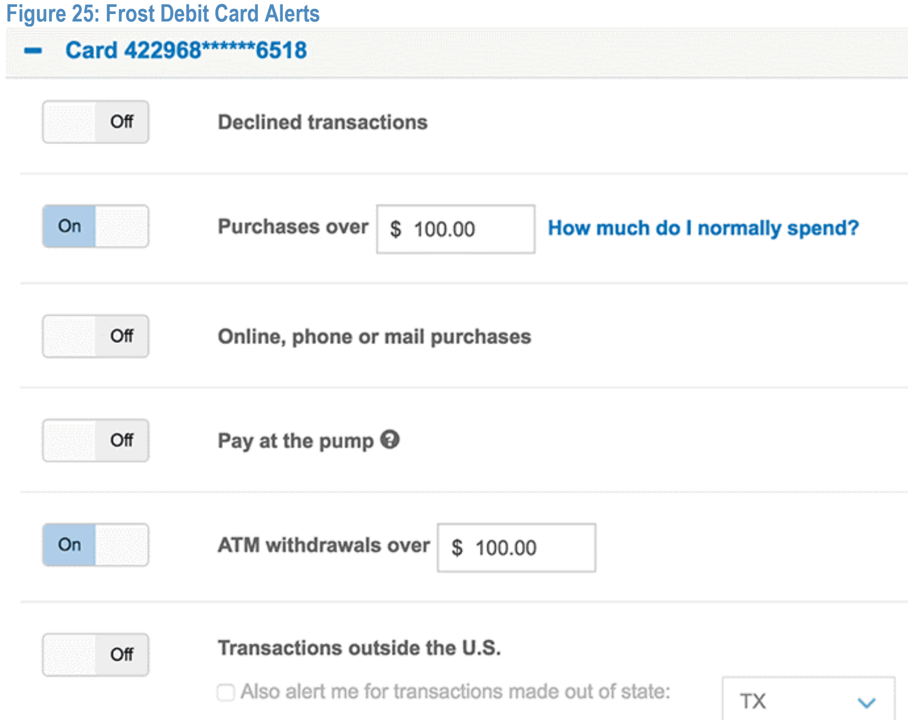
Frost's online banking portal has similar features to the mobile banking app including bill pay, send money anywhere in the US, and control access to a joint account. In addition, the online banking portal also allows customers to set customized debit card alerts that are sent in real-time to a customer to quickly detect potential fraudulent activity.

Figure 25: Frost Debit Card Alerts



Source: Company website.

Other Innovative Financial Products on Display for Both Commercial and Retail Customers

Outside of the mobile banking app and online banking portal, two other Frost products that leverage technology include (1) Cash Manager and (2) Personal Investments Online Services. First, Cash Manager is Frost's secure online banking portal that allows business customers to more efficiently manage cash flow. In addition, Cash Manager allows businesses to transfer funds, send and receive electronic payments, and create a customizable dashboard that displays only the features that are desired.

Second, Personal Investments Online Services is a collection of financial products for retail customers that are focused in the asset management space. These products include:

- **Wealth Connect**: a financial planning tool that includes advanced forecasting capabilities and an intuitive that allows a customer to:
  - Forecast to ensure that a customer remains on target to achieve financial goals
  - Aggregate all financial accounts in one place and monitor daily changes
- **Invest Online**: provides access to all Frost brokerage and managed accounts in one place

- Receive real-time order status updates
- Provides insight into market events including analytics and economic reports
- Real-time trading access on brokerage accounts
- Move cash between brokerage and bank accounts

- **TrustReporter**: securely view, print, and download investment and trust account information
  - Provides an overview of a customer's full portfolio or specific holdings
  - View allocation percentages
  - Search and monitor transactions
  - View tax lots
- **MineralWare**: this is Frost's mineral management software that provides visibility into a customer's mineral assets
  - Track mapped assets and documents in one place with the Geographic Information System
  - View activity on acreage of mineral assets
  - Supports integration with various platforms including the Texas Railroad Commission website and the US Lease Price Report

The Road Ahead: High Customer Satisfaction Scores Should Persist with Relationship Model Using Technology as an Enhancing Tool

With Frost having one of the highest net promoter scores across the US bank industry today, it is no surprise to us that the company has a wide array of financial products that utilize technology to enhance the relationships between bankers and clients and allow clients to perform certain tasks more seamlessly. Technology is clearly part of Frost's overall strategy, as evidenced by the unique features (such as one-click access to a banker) that the company offers to its customers. Moreover, Frost offers other differentiated products across the entire customer spectrum (commercial to retail) including Cash Manager and Personal Investments Online Services, each of which can help streamline existing processes for customers, enhance the relationship between a banker and a customer, and ultimately improve the overall client experience which should allow Frost to remain a leader in customer satisfaction rankings for years to come.

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Eastern Bankshares

A Hidden Gem and a Pioneer in Banking Technology to Lead Innovation in the Small Business Banking Space

At Eastern, we interviewed with Don Westermann (Chief Information Officer), Ashley Eknaian (Head of Eastern Labs and Chief Digital Strategist), and Jill Belliveau (SVP & Treasurer). Although $15 billion-asset sized Eastern is relatively small in size compared to most other regional banking names in our coverage, the company stands out as a pioneer in banking technology, particularly when it comes to the small business banking space. To-date, there has been a flurry of developments in banking technology, with various industry participants including fintechs, mega banks, and regional banks developing and adopting new technologies to meet rising customer expectations in the digital age. With that said, however, a majority of banking technology today has been largely focused on consumer banking. With Eastern specializing in small business lending—in fact, the bank is the top SBA lender in New England—the company has witnessed firsthand that there is a lack of technology in the banking space to serve these small business customers with an opportunity to significantly improve not only this cohort's customer experience but also its bankers' experience in serving these clients. In fact, Numerated Growth Technologies (Numerated), a leading fintech that helps banks to deliver a better customer experience through a digital banking/lending platform for small to medium-sized businesses, is a spin-out of Eastern Labs, a technology incubator inside Eastern, which is focused on driving innovation, building an innovative culture, and connecting the bank to the broader fintech ecosystem.

Eastern Chairman & CEO Bob Rivers Starting Eastern Labs to Lead Innovation by Hiring Fintech Entrepreneurs, Leading to Birth of Numerated

Eastern is one of the few banks in our coverage that has a dedicated tech lab (today comprised of five full time employees), called Eastern Labs. Founded in 2014, the origin and foundation of the lab traces back to Chairman and CEO Bob Rivers who was determined to drive innovation at the bank and looked for talent who could spearhead this effort. The ultimate question that Mr. Rivers posed was around if they are moving fast enough and doing enough, and the launch of the labs was really about Eastern challenging themselves and making sure that they don't get disrupted by other players so they can continue to thrive for the next 200 years. After having meetings with fintech entrepreneurs, Mr. Rivers encountered Dan O'Malley, a CEO and a co-founder of PerkStreet Financial, one of the first challenger / virtual banks in the US (which was followed by players such as Moven). Mr. Rivers hired Mr. O'Malley as Chief Digital Officer as well as the co-founder and Head of Eastern Labs, which is a tech lab that is responsible for driving innovation at the bank and developing new, emerging banking technologies, with Eastern funding ~$4mm annually to advance development of new technologies.

Since its early days, the Eastern Labs team aimed to solve the challenge that many banks face, which is centered on how to sell more products and serve customers without requiring customers to make in-person branch visits—which would increase productivity of its bankers as well as improve customer experience. Recognizing that there is a ton of whitespace around small businesses as it relates to technology, a team of fintech entrepreneurs worked side by side with different groups across Eastern, colleagues, and customers to collect ideas, research and perform a series of experiments and built a new digital lending platform, called Numerated, for small business customers that could support real time small business lending. The platform was rolled out in December 2015 and has been continuously developed with new features and capabilities since then. Given the success of the platform at Eastern, there was a strong interest from other banks in licensing the platform. As Eastern saw the opportunity with the platform to the broader banking industry, Eastern spun out Numerated in 2017 with the company retaining a partial ownership position in Numerated. Not to mention, Eastern was a partner with Numerated in the build out of their PPP processing module.

Numerated Growth Technologies: Automating and Streamlining Small Business Lending Process for Enhanced Customer Experience and Empowering Bankers

Digging deeper into Numerated Growth Technologies, Numerated applies machine learning and AI technology from inside and outside of banks, automating many processes of small business lending (such as pre-qualifying businesses for loans) and enabling small and medium-sized businesses to have convenient real-time borrowing experiences that could provide financing in as little as three minutes. Numerated provides the bank's customers with an improved customer experience by offering them (1) simple business loan applications by leveraging rich data integrations with pre-filled digital applications, (2) fast decisions with digital account opening and lending solutions, and (3) personalized offers with sales/marketing tools that will identify product eligibility and customer needs. In addition, it also helps to enhance its partnering banks' relationship model by empowering their bankers so the bankers know where to best spend their time. Below are some examples of how Numerated empowers bankers:

- Automates some of the credit decisioning processes with credit decisioning logic being defined by segment with 100+ parameters and five external credit scores with configurable decisioning (i.e. giving the bankers ability to control levels of decisioning automation by product, from manual review to end-to-end automation).
- Helps bankers with sales and marketing efforts by driving qualified businesses into credit application based on eligibility and needs (i.e. credit pre-screening, creating targeted list of prospecting and marketing campaigns, and email marketing automation).
- Analyzes a bank's transaction to identify relationship expansion opportunities (i.e. customers with loans, credit cards or treasury management services with competitors)

With Eastern continuing to partner with Numerated for its small business lending business, Eastern indicates that through Numerated, the bank has been able to provide its small business customers an opportunity to get a loan of up to $100K in as little as five minutes from application to funding through a completely digital process. In our coverage, People's and Pinnacle Financial Partners are also partnering with Numerated to streamline their digital business banking and lending solutions for its business customers. Not to mention, Numerated played an important role in processing large volumes of PPP loans during the pandemic (with Eastern being a partner in the development of the PPP processing module), as it helped banks speed up and scale PPP loan approvals as well as forgiveness requests through its automated lending solution. In fact, Numerated's automated lending solution for PPP was used by over 100 banks to distribute PPP loans to over 190K small businesses and their 2.3mm employees.

Eastern Labs: Driving Innovation and Connecting Eastern to Fintech Ecosystem, with the Goal of Finding and Solving Pain Points for Its Bankers and Customers

The mission of Eastern Labs is to develop the building blocks for a new, digital Eastern and pave the path by studying and identifying emerging technology trends that can be applied to Eastern, engaging with bank employees and customers to come up with new ideas, and accelerating the adoption of new technologies. The labs evaluates projects through each stage of its project pipeline (collect and ideate; research and evaluate; test; proof of concept and pilot; and adopt and transfer) to determine which ideas advance to the proof-of-concept and pilot phase, with the lab using five evaluation criteria (need to check off at least three criteria), including: (1) emerging tech trends and customer preferences; (2) digital capabilities and skill best practices that Eastern should adopt; (3) alignment with Eastern's mission (doing what's right and smart); (4) enhance culture of Eastern internally; and (5) support growth in areas of business priority. While Eastern Labs is a tech lab, it isn't just focused on developing proprietary technology but rather about identifying major friction points and coming up with ideas and solutions for bankers and customers. The lab further assesses whether there is market potential such that going external, primarily through investment or partnership with fintechs. Put differently, the lab isn't trying to win just by building proprietary technology that can only be used internally, but rather, the secret sauce of Eastern Labs is its ability to plug in many different partners, such as fintechs or large core providers (i.e. Fiserv and FIS), to create a differentiated experience. With that said, Eastern Labs is focused on driving innovation, building an innovative culture, and connecting the bank to a broader fintech ecosystem through experimentation, investment, and partnerships. With small business lending a key strategic focus at Eastern, the company actively invests in and partners with a number of cutting-edge fintechs that are focused on enhancing the banking experience for small and medium-sized business owners. Below are a couple of other examples of Eastern's technology projects besides Numerated:

- **Pinkaloo:** Eastern partners with Pinkaloo, a fintech that provides a product that enables customers to donate securely and easily to a charity of their choice. Its platform uses modern APIs to enable banks, employers, community foundations, and their partners to incorporate charitable giving into their projects while creating the best donor experience possible for individuals by finding the right organizations to support and making the donation process transparent, easy, and modern. Eastern provides Pinkaloo services to its customers for free with no transaction fees incurred as Eastern picks these up.
- **Monit:** One of the key investments that Eastern has made is Monit, a fintech that provides a financial platform for small business owners which leverages predictive technologies to forecast cash flows as well as PPP features including automatic monitoring of transactions and guidance to optimize PPP forgiveness. Eastern provides to its small business customers Monit's cash-flow forecasting and monitoring features 100% for free. Eastern Labs initiated an idea about 18 months ago as it saw that the primary issue that many small business customers face is predicting future cash flows. Eastern did research but did not want to develop internally inside Eastern but rather get other investors involved (with Eastern also being one of the investors) and partnered externally with research partners developing the fintech Monit. It moved to piloting Monit with Eastern being the first customer to roll out to the bank's small business customers. The Monit app allows small business owners to connect to their existing accounting software, such as Quickbooks, and would provide timely and actionable insights

into small business customers' cash flow position and predict where their cash position will be down the road, easily available on their phone, tablet, or desktop.

Innovating Around the Existing Core by Building a Cloud-Native API System That Connects All Fintechs and Moving to Cloud-First Infrastructure

One of the key initiatives undertaken by Eastern is around the core. Eastern technology team innovated around the legacy core and built an in-house a cloud-native API management system that connects all of its partnering fintechs and app providers, such as Stripe and Pinkaloo. To this end, Eastern can plug in different apps and providers (around 25-30 providers) without needing to work with the legacy core provider, with the system allowing for enhanced real-time analytics/alerts capabilities, early detection of ongoing issues, and increased efficiency (as compliance and risk management is built into products as opposed to layering in weeks or months later). Turning to the cloud, Eastern has focused on laying out infrastructure for cloud over the past couple of years and is now in the process of moving major data assets into the cloud. Migration to the cloud would not only help Eastern realize cost savings but also support the company to stay on the latest and greatest technology. Moving to the cloud-first infrastructure would involve the following strategies at Eastern: (1) automation to manage systems at scale and ensure compliance with standards, (2) applications migrated to the cloud in phases, (3) expansion of cloud security, incorporating additional network-based tools (i.e. firewalls), (4) implementation of virtualized desktops, providing secure cloud workstations; and (5) easy access to a cloud datacenter for disaster recovery events. Looking forward, the company expects that a vast majority of systems to be on public cloud in the next five years.

The Road Ahead: Positioned to Further Pull Itself Away from the Pack on the Technology Front with Eastern Still in the Early Innings of Its Digital Journey

In our view, despite Eastern pulling ahead of its peers on the technology front (particularly as it relates to the banking technology for small business lending), the company describes that it is far from being done with this being a never-ending journey as customer expectations continue to evolve. Eastern is committed to continuing to make its journey using the agile process. As the company has built a core competency in managing digital channels with agile principle and practices (leading to a highly customized and improved experience for its customers as well as Eastern bankers), this should continue to support Eastern's ability to push new features and technologies to its customers at a rapid pace and result in an enhanced customer experience. In fact, according to J.D. Power, Eastern's 2020 net promoter score of 54 is already well above the peer median of 37, with only a few banks such as First Republic, Cullen Frost, and Pinnacle being ahead of Eastern. As the company continues to push for innovation and leverage its advantages of being nimble (note that Eastern pushes new features and fixes into its consumer and small business platform every 4-6 weeks while real-time analysis alerts teams of potential/current issues prior to its customers facing degradation in service), it is our view that the Eastern is well-positioned to benefit from these initiatives, translating into acceleration in growth metrics over the longer term.

FB Financial

Recently Converted Consumer Online and Mobile Banking Platform to Improve Customer Experience

In 3Q20, FB Financial converted their consumer online and mobile banking platform to improve the online banking and mobile experience for customers. FB Financial has been investing in technology over the past few years and consumer online and mobile banking was the last remaining significant platform that was due for enhancements. As part of the Farmers National Bank conversion in 1Q20, these customers were placed on these systems and initial feedback was positive on the user experiences and capabilities. In July 2020, theses platforms were converted and feedback from customers was positive on the new application and the process of conversion. Online banking features include: customizable dash boards, add accounts from other financial institutions, view and tag transaction details, to name a few. Outside of the recent conversion on to consumer online and mobile banking, FB Financial also converted to its new treasury platform in 2019 that helps relationship managers drive customer deposit growth. Another key milestone for FB Financial was in 2016 when the bank converted its core operating platform to Jack Henry.

Figure 26: FB Financial Online Banking Features

Mobile Banking App Features		
Check balances	Locations	Simplify your finances
Make payments	Add, manage and pay bills	Travel notices
Transfer funds	Deposit checks	Deposit card controls
Tag transactions		

Online Banking Features		
Customizable dashboard	Add accounts from other financial institutions	Set account alerts
Syncs with mobile banking	Get account balances	Set travel alerts
Pay bills online	View and tag transaction details	Be safe and secure
Quick action buttons for faster banking	Move money between accounts	Get advanced encryption technology
Lock and unlock debit cards	View checks	Access eStatements

Source: Company website and J.P. Morgan.

The Road Ahead: With Consumer Digital Offering and Business Treasury Offering in Place, FB Financial Now Has Enhanced Tools to Serve Clients

With FB Financial completing the conversion of its consumer online and mobile banking platform as well as the treasury management system for business customers, the bank now has modern offerings for the bank to compete on relationships in their respective markets. With the pandemic accelerating the shift to digital for customers, this upgrade is timely to enhance the customer experience. In fact on the business side, the bank has cited growth in non-interest bearing deposits attributable to treasury management sales which leads to more operating deposits accounts for the bank.

First Hawaiian

Full Steam Ahead to Embark on a Digital Journey Starting with Core Upgrade and Cloud Migration Now in the Works

At First Hawaiian, we interviewed with Chairman, President, and CEO Bob Harrison, CFO Ravi Mallela, EVP of the Digital Banking & Marketing Group Chris Dods, and Head of Investor Relations Kevin Haseyama. When it comes to the starting point for a digital transformation journey, First Hawaiian was initially somewhat constrained as compared to its mainland peers, largely due to the operating structure the company had been under (with BNP Paribas as a parent) where PTPP income growth and the additional dollar of pretax income was the primary focus at the time. With First Hawaiian now being fully separated from BNP Paribas, however, the company is now going full steam ahead to fully embark on a digital transformation journey, which has started with a core system upgrade (that is now being implemented). As part of the core modernization process, First Hawaiian is also building the API structures while migrating data to cloud with this likely to serve as an enabler for the company to fully control and make smart usage of their data. Overall, we view that First Hawaiian's ongoing digital initiatives including the core upgrade and cloud migration that are underway should position the company to have a better insight into customer data as well as the ability to roll out new, innovative products, allowing the company to further improve customer experience down the road.

Alongside Core Upgrade, It's Building API Structure Underneath and Migrating to Cloud with First Hawaiian in the Driving Seat for Data Control

As is the case for most banks (large and small) in the US, First Hawaiian has been on the same core (with FIS) for over 20 years. At the end of the existing contract, however, First Hawaiian has recently made the move to upgrade its core (while deciding to stay with FIS for a new core but upgrading to a much more modernized version). As First Hawaiian is now working on core upgrade implementation, it is also building the API structure underneath to support additional features while ensuring that the company is in the driving seat in controlling the data. With that said, a key focus of First Hawaiian is data and making sure that every digital iteration and journey they are undertaking is centered on the smart use of data. Along the way, the company is tying all of its bank data in the cloud-based customer data platform (i.e. Amazon AWS), giving First Hawaiian the ability to pull transactional and customer behavior data which is being tied together through machine learning. First Hawaiian's core modernization will allow the company to have a holistic view of customers and help with market intelligence and customer behavior mapping. Full implementation of its digital initiatives including a new mobile bank app is expected in early 2021.

MoneyMap: A New and Improved PFM Tool That Leverages AI-Driven Personalized Insights to Deliver a More Seamless Experience to Customers

While First Hawaiian has provided personal financial management (PFM) tools which had run on the Fiserv platform, the company has recently converted into the MX's MoneyMap. Digging deeper, MoneyMap is a free PFM tool that all consumer banking customers of First Hawaiian can access, which is currently available in FHB online banking (with this expected to be rolled out in the mobile app at a later date). With that said, while First Hawaiian has just made a soft launch of the program, the company saw a 40% increase in sign-ups within just a few weeks post launch even with zero advertising done on this product. One of the major differences between

MoneyMap and the prior version that First Hawaiian had is that MoneyMap (1) offers a simple, intuitive, visual experience that allows customers to easily monitor their overall spending across different financial accounts including those that outside of First Hawaiian and (2) leverages AI-driven technology to provide real-time, personalized insights and financial guidance to customers. For example, First Hawaiian customers can connect to other apps such as Zillow to add their property value, which will be populated in the Property section of MoneyMap, enabling customers to view a complete and dynamic view of their current net worth which would incorporate and capture any fluctuations in values of properties they own. With that being said, MoneyMap not only acts as a one-stop-shop that provides a 360 degrees view of customers' finances but it goes a step ahead serving as a financial advisor on an app (i.e. leveraging predictive analytics to automatically create budgets on behalf of customers based on their past spending behavior as well as making predictions on future spending). Below is the summary of key features of First Hawaiian's MoneyMap:

- **360° View of Finances:** Provide a consolidated 360° view of finances from one dashboard by allowing customers to add multiple accounts from other financial institutions.
- **Categorize Transaction:** Automatically categorize all transactions with the option to customize.
- **Visualize Spending:** Visualize spending by category to inform where customers are spending and where they can improve.
- **Set Budgets Based on Spending Behavior:** Track how close customers are to hitting their budget throughout the month and automatically create budgets based spending behavior over the last 90 days.
- **View All Debt and Advise Best Payment Option:** Show all of customers' outstanding debt and calculate different payment options to help customers make the best decision.
- **Calculate Net Worth:** Calculate customers' actual net worth by linking as many accounts as possible, including customers' property and debts. MoneyMap will also update the figures as customers spend, get a raise, or pay off loans.
- **Help Manage Goals:** Help customers manage multiple goals like buying a home and saving for retirement by visualizing them on a simple timeline, which automatically get updated as the customer save more money or pay off debt.
- **Predict Future Spending:** Comb through customers' historical transactions and predict future spending.

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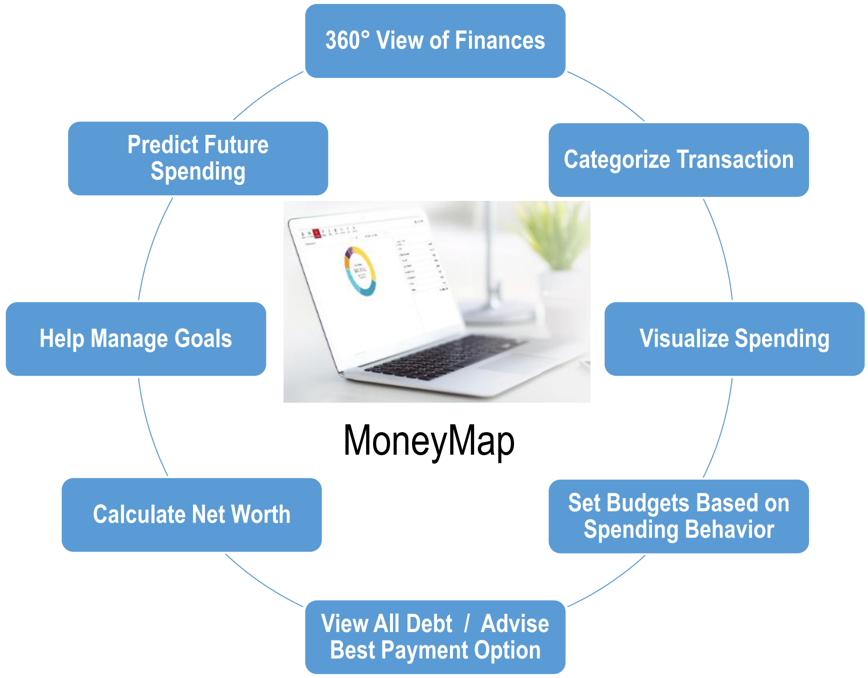
Figure 27: Key Features of First Hawaiian's MoneyMap



Source: Company website and J.P. Morgan.

First Hawaiian Is the First Bank on the Island to Roll Out Voice Banking Services to Customers

In September 2018, First Hawaiian became the first bank in Hawaii to roll out voice banking services to customers. First Hawaiian customers can use their voice to access their accounts through the First Hawaiian Bank skill for Amazon Alexa. By simply speaking a command language, customers can check their account balances and their recent transaction history for checking, savings, and credit card accounts. First Hawaiian's introduction of voice banking expanded the choices of its customers have in how they want to bank with the company, which is an illustration of First Hawaiian's efforts to make banking simpler and more convenient for customers.

The Road Ahead: At the Starting Line for Digital Transformation Journey That Should Position First Hawaiian to Separate from the Pack

With First Hawaiian having fully embarked on a digital transformation journey, it appears that the company has exciting days ahead with core system upgrade, API integration, cloud migration, and development of quants now in the works. With First Hawaiian's business model being predicated on its relationship managers building long-term relationships and trust with clients, its digital transformation efforts focused on the smart use of data should not only directly improve customer experience but also empower its relationship managers so they can have a holistic view and understanding of their customers while also freeing up their time to focus on high-value client interactions (as opposed to manual, back-end processes). Coupling this with how there is not a particular outperformer to point to in terms of technology offering among banks operating in Hawaii, the bar doesn't appear to be too high for First Hawaiian to become the leader on the technology and customer experience front in the market over the longer term.

First Horizon

New Platforms in the Works (Even Before Full Iberiabank Systems Conversion) Include Continued Migration to Cloud and API Rollout

Despite the backdrop of ongoing COVID-19 pandemic, First Horizon closed its MOE with Iberiabank in early July 2020 and the systems integration and conversion is scheduled to close in September/October 2021. With the combined company now working through the systems conversion, this conversion, coupled with the COVID-19 pandemic, has presented a unique opportunity for First Horizon to work on and roll out new technological capabilities not only in areas such as online banking but also on systems including new accounting and treasury platforms which have been recently introduced or will be rolled out in early 2021 (well before the systems conversion from the MOE is completed). With this in mind, while First Horizon currently offers tools such as online banking and a mobile app and allows new customers to enroll in these digital banking tools in under five minutes, other financial tools revolve around budgeting and planning and an automated savings service.

Rolling Out New Platforms to Improve Customer Satisfaction with Chief Information Officer and Chief Experience Officer Driving These Efforts

At First Horizon, we interviewed Ellen Taylor and Aarti Bowman (First Horizon Investor Relations) and Mary Lakey (Iberiabank Investor Relations). Even with First Horizon's technology spend as a percentage of revenue being similar to peers in the ~7-10% range, it was interesting to hear the various efforts now underway at the company to leverage technology to improve not only the client experience but also the experience of internal bankers. With this in mind, although First Horizon now has $83B of assets (following the MOE completion), there is still a focus around picking specific areas of technology spending rather than trying to be the bank for every single type of client. As a tangible example of picking a specific niche to focus on, we point to treasury solutions, which is an important area of focus for First Horizon, with the company planning to roll out a new treasury platform using Bottomline Technologies as a provider. Additionally, as another example, First Horizon is rolling out Dovenmuehle (DMI) for its new mortgage platform, which is a flexible platform that helps to optimize performance and lower costs. At First Horizon, these efforts are spearheaded by Mohan Sankararaman, Chief Information Officer, and Jeff Pollard, Chief Customer Experience Officer. In addition to the examples provided above, in the section that follows, we provide an overview of some of First Horizon's financial tools that use technology.

- **Mohan Sankararaman (Chief Information Officer):** named as First Horizon's CIO in April 2020 after serving as the bank's Head of Strategic Initiatives for about two years. Prior to that, Mr. Sankararaman led the integration of First Horizon with Capital Bank, including the systems integration for the merger. Prior to his time at First Horizon, he worked at Wachovia in various technology roles.
- **Jeff Pollard (Chief Customer Experience Officer):** joined First Horizon as Chief Customer Experience Officer in June 2019 where he will look at the end to end process for how to improve user experience, reduce the number of hand offs, and improve workflows. Mr. Pollard has over 25 years of experience working in

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design- and innovation-based roles at companies including Marriott, Lowe's, and McDonald's.

Digital Banking Tools Allow Customers to Perform Tasks Through Online/Mobile; "Digital Delegates" Available in Branches to Assist Customers

First Horizon's online banking and mobile app seamlessly allows customers to perform a handful of financial tasks and customers can enroll in these tools in under five minutes. Of note, the mobile app also supports integration with Apple Watch and allows customers to view account balances and their ten most recent transactions.

Figure 28: First Horizon Online and Mobile App Product Features

Source: Company website.

Embedded in both First Horizon's online banking and mobile app products are a budgeting and planning tool and an automated savings service. The budgeting and planning tool allows customers to:

- Automatically categorize transactions or create customizable categories to best suit a customer's needs
- Monitor and analyze spending across many categories
- Create a financial budget to keep spending under control
- Establish savings goals and stay on top of progress each month

Separately, the automatic savings service (also offered in both the online banking and mobile app) is a free service that automatically moves money for customers between their linked First Horizon bank accounts. This service also allows customers to automatically transfer a part of his or her paycheck to a savings account or even a child's account.

One of the more interesting technology offerings that First Horizon has are "digital delegates." Simply put, digital delegates are First Horizon employees that work in the branches to help customers get the most out of their digital banking experience. If a customer is experiencing an issue with a First Horizon digital tool (such as online banking or the mobile app), he or she can visit a branch and talk to a digital delegate to receive assistance on items such as:

- Set up and update bill payees
- Pay multiple bills at once
- Customize account dashboard view (add or hide accounts)
- Use Zelle to send money quickly and seamlessly

Continuing to Modernize Legacy Systems and Actively Migrating to the Cloud to Help Improve the Customer Experience

Even though the full systems conversion, which will use the legacy First Horizon core platform, for the Iberiabank MOE is not scheduled for completion until late 2021, First Horizon has been modernizing various platforms across the company (including middleware) and has been moving some systems to the cloud which will support the usage of cloud-based products and provide a more seamless customer experience. In fact, First Horizon was able to enhance a lot of platforms while integrating the Capital Bank transaction. Looking ahead, First Horizon disclosed (at a recent conference) the following actions that it has taken thus far and will continue to take in the coming quarters as it relates to various platforms and the cloud:

- In April 2020, First Horizon moved its consumer small business platform to the cloud
  - Beyond this roll out, there is a 9 month roadmap of how First Horizon will continue to improve this small business platform from a customer experience and capability standpoint
- In January 2021, First Horizon will roll out the FIS ACBS loan accounting platform which will give the company more capabilities to lead deals and be the agent on lending transactions
- In Spring 2021 (no later than Memorial Day), First Horizon will roll out a new treasury platform which will support the usage of APIs

The Road Ahead: Rolling Out New Platforms Even Before Full Iberiabank Systems Conversion, Which Should Help Improve the Customer Experience

Although First Horizon is still working through completing the Iberiabank MOE systems integration, the company is still powering through with modernizing existing systems which, in some cases, involves migrating legacy systems to the cloud. This should allow the company to provide innovative products to customers which will help clients perform certain tasks more seamlessly and improve the customer experience. Moreover, First Horizon's involvement in Canapi and the dozens of quants the company has that are part of the core technology team can also be areas that help drive new technology investments to offer new products and services. With this in mind, First Horizon has already rolled out or will plan to shortly roll out (in early 2021) new accounting and treasury platforms. In addition, Iberiabank's "Virtual Bank" offering (a digital bank) while still small and new to the company could be a source of new deposits once the MOE integration is complete. With the MOE providing First Horizon with an opportunity to upgrade and modernize existing systems, this should serve the company well for years to come especially once Iberiabank customers are onboarded onto the combined company's systems (expected in late 2021) which should ultimately improve the overall client experience.

First Republic

Shattering Perceptions as First Republic Emerges as One of the Most Digitally Savvy Banks; Empowering Employees to Scale Its Service Model

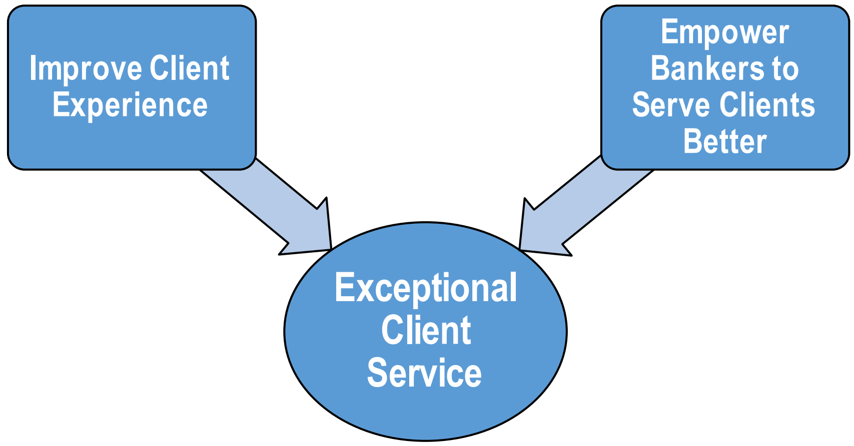
When we speak with investors on First Republic the perception from many investors is that while the company delivers unmatched service levels to customers it does this *despite* having inferior technology relative to peers. After conducting our deepest dive into the technology approach at the company, however, we can report back to shareholders that, contrary to popular opinion, First Republic is emerging as one of the *most digitally savvy banks in the US*. In fact, with the combination of high touch and high tech, we have a very high degree of confidence that the best years for First Republic remain fully in front of the company rather than in the rear-view mirror.

It is no secret that First Republic's business model is centered on its high service culture, with the company focused on empowering its employees to deliver an extraordinary service to clients. With that said, First Republic's approach to technology goes hand-in-hand with its overarching model, with the company using technology to elevate—and never replace—human relationships and to empower its trusted bankers to deliver exceptional service to clients. Put differently, at First Republic, technology is a means to scale its service model. While First Republic has for a long time invested in technology, its definitive strategy and efforts around technology have accelerated and evolved into its current form—which closely mirrors First Republic's overall culture—over the past 3-4 years under the leadership of President Gaye Erkan. At First Republic, there are three pillars to technology: (1) create a high performing team, (2) develop mining and prospecting habits (with embedded quants playing an important role here), and (3) adopt open-architecture technology platforms to drive productivity and efficiency (with First Republic rolling out tools and features even faster than bankers are adopting them, with the company also helping its bankers to help adopt). When it comes to the metric the company uses to measure whether they're doing enough on technology, the firm looks at not only net promoter score (NPS) trends but also the growth of individual banker's books as measured against the NPS to ensure that both metrics are headed in the right direction.

Any Technology Investments at FRC Meet Either of These Two Criteria: (1) Improve Client Experience or (2) Enhance Bankers' Ability to Serve Clients

At First Republic, we interviewed President Gaye Erkan, Chief Operating Officer Jason Bender, Chief Digital Officer Scott Finder, Chief Information Officer Jim Hughes, Chief Data Officer Jared Souter, Head of Deposits (East Coast) Fatema Arande, Head of Investor Relations Mike Ioanilli, and Investor Relations Senior Associate Allie Hoffman. With First Republic's growth driven by its exceptional client service (which leads to its satisfied clients doing more business with First Republic and making more referrals), the company also invests in technology to empower its bankers with a specific, targeted purpose: to scale its differentiated service model. With that said, for any of First Republic's technology investments, they have to always meet either of these two categories: (1) technology that improves the client experience and/or (2) technology that enhances bankers' ability to serve clients.

Figure 29: Two Criteria of Technology Investments at First Republic



Source: Company reports and J.P. Morgan.

On the client experience front, this primarily involves First Republic clients' digital/mobile banking experience. Below is a select list of client-facing features that enable enhanced customer experience:

- **"Contact team" button:** This is a unique feature in First Republic mobile banking app where clients cap simply tap the gold icon to reach their bankers (more on this later). Since the onset of the pandemic, around 50K customers have used the contact team button feature.
- **Stealth View:** This is a proprietary, trademarked feature that allows for a mobile banking interface with privacy controls to fulfill the unique needs of First Republic's clients who tend to travel a lot and are highly sensitive around privacy. The Stealth View feature would blur the sensitive account data / information on the mobile screen (which the client can tap to view) so others cannot look over their shoulder in a public setting and take advantage of the client's sensitive information.
- **Card controls:** Although, the card control feature itself is a standard mobile offering that is offered by other banks, this is uniquely built and customized with self-service capabilities that are tailored to the company's client base. First Republic clients can see all cards on their mobile app and manage their debit cards with the ability to (1) lock and unlock cards, (2) set custom purchase limits (temporary or permanent), (3) customize transaction alerts, (4) set travel notification, and (5) receive a notification on potential fraud situations.
- **Personal finance management tools:** The personal finance management tool helps clients better manage their financial lives, monitor transactions across all of their accounts (both First Republic and other banks), categorize spending, and customize transaction tracking.
- **Digital mortgage process:** First Republic clients can submit mortgage application online. Now over 75% of mortgage applications at First Republic are submitted online.
- **Mobile check deposit:** Whereas most other banks put a low limit on mobile check deposits, First Republic's mobile check deposit feature has been customized to allow for higher limits by replicating the same service model with

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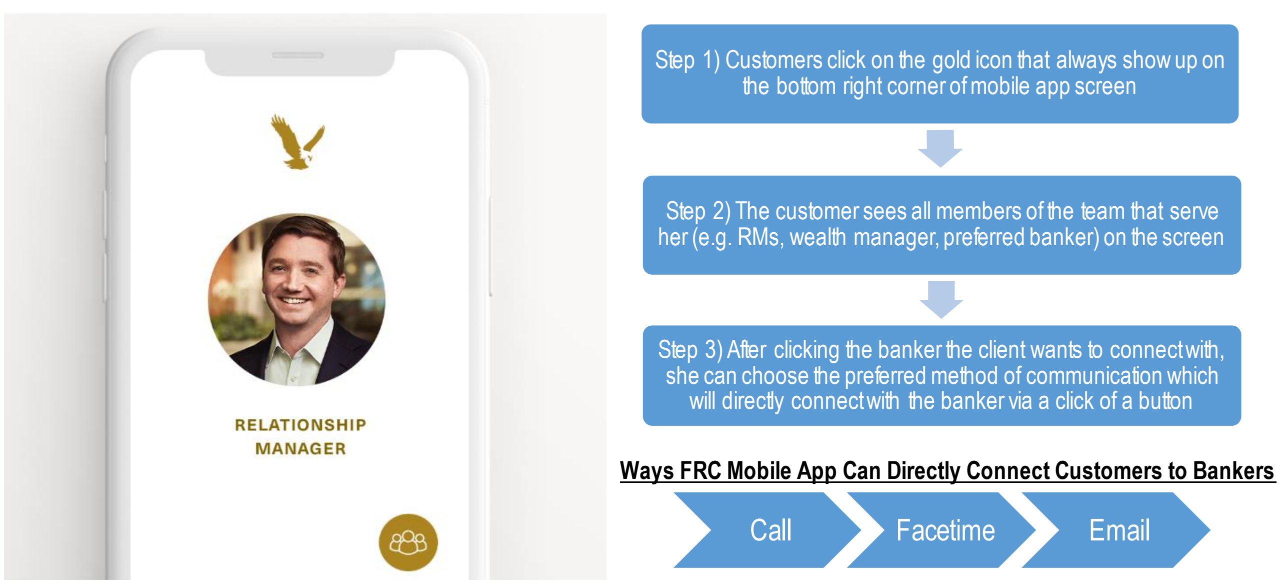
dedicated, trusted bankers allowing for greater flexibility to clients. First Republic has a disciplined back-end process ensuring when funds should become available based on the company's deep knowledge of clients, which enables the bank to provide the same kind of flexibility and service through a digital channel.

Turning to the latter point about using technology to empower bankers, this is an evolving, behind-the-scenes process for First Republic that is focused on helping bankers be more productive to serve clients better, stay closer to clients wherever they are (which has become more important than ever during the pandemic), and grow their book of business. With First Republic investing in technology to not only improve the client experience but also its bankers' experience as well as their ability to serve clients, all of these are pointing to one overarching goal: better client service.

Personal Service Digitally Delivered: Through a Single Tap Button on Mobile App, First Republic Clients Can Access Personal Banker Anywhere, Anytime

Whereas many banks tend to try to build a mobile app in a way that is self-sufficient (with the goal often being to replace the work that involves personal touch with the technology itself), First Republic takes a completely different stance. As such, First Republic's mobile app exemplifies the company's philosophy around technology in terms of how it's a means to empower its trusted bankers as opposed to replacing them. With that said, a unique feature embedded in First Republic's mobile app is a "contact team" button. In every screen of the mobile app, there is a gold icon on the bottom right corner of the screen, which allows for clients to connect with their personal banker (via call, video chat, or email) whom they have built trust and relationships with. This feature proved particularly helpful for its clients during the pandemic—when virtually every bank customer had to rely on digital/online banking with branches being closed. While many other banks' customers ended up having to call a 1-800 number and were put on hold for a long time given the surge in volumes (until a call center representative who has no knowledge about the customer eventually picks up the line), First Republic's customers were able to connect with their bankers (who already know them as a person as well as their financial situations) through just one click of a button who can fulfill their needs right away.

Figure 30: Contact Team Button Feature in First Republic Mobile App



Source: Company reports and J.P. Morgan.

Eagle Intelligence: Using Data Analytics, Insights, and Technology to Enable First Republic Bankers to Stay Close to Clients and Serve Them Better

At First Republic, there is a dedicated sales analytics department called Eagle Intelligence – which is one of the two main pillars of First Republic's empower program along with continuous process improvement (more on this later). Eagle Intelligence is focused on using analytics and technology to help bankers stay connected with their clients wherever they are and deliver high service to clients with ease and speed as the bank scales up in size. Eagle Intelligence has launched a number of tools and platforms that are developed in-house where bankers can access every day to understand what is going on in their book of business and clients, customize settings to their liking, and receive actionable recommendations. With that said, the ultimate goal of Eagle Intelligence is to empower bankers to deliver better service to clients and ultimately grow the bank, which is the cornerstone of the company's ability to grow at a pace that is 3-4x faster than the peers while maintaining the net promoter score that is more than double the industry average.

- **Customer Relationship Browser (CRB):** It's a proprietary, internally-developed client insights engine that utilizes data analytics to empower First Republic bankers with important client information and recommendations. The tool is designed to enable its bankers to deepen existing client relationships by providing actionable insights that are easy to execute, such as (1) which clients to call, (2) when to call, and (3) why. For example, it alerts when it's a client's birthday or when it seems there will be a potential liquidity event, with the tool prepopulating the email template with the option to customize. This actionable intelligence engine is also a self-learning tool that over time will further improve the functionality that is available to First Republic bankers and gets customized to the banker's liking.
- **Quant for Banker:** Launched in June 2018, Quant for Banker is a personalized analytics concierge that leverages the expertise of quants that are partnered up with bankers. Quant for Banker uses data analytics and artificial intelligence technology to help First Republic bankers be more efficient, prospect new clients more easily, and deepen relationships with existing clients. Examples include:
  - On capital call lending, quants have created a dashboard that helps bankers monitor capital call line activity from clients. Through this dashboard, bankers are alerted ahead of time if a capital line is being drawn on repeatedly, which could signal that additional funding maybe needed.
  - The dashboard also shows monthly cash burn for startup companies and First Republic is able to offer relevant products including cash management solutions and access to First Republic's venture capital network ahead of time.
- **Eagle Tearsheets:** It provides First Republic bankers with "tearsheets" that help with client prospecting efforts. For example, it offers insights into which nonprofit organizations to target and which missions they care about, so First Republic bankers can smartly target new clients.
- **Natural Disaster Mapping/Emergency Response App:** Launched in 2019, the Natural Disaster Mapping/Emergency Response app is another proprietary platform developed by First Republic, which identifies potentially impacted clients and guides targeted outreach during crisis (such as wildfires, storms, and flooding) to help clients, communities, and colleagues. During 3Q20, approximately 700 First Republic bankers reached out to over 6,000 clients after which the bankers identified clients who could potentially have exposure to the impacted areas as identified through the app.

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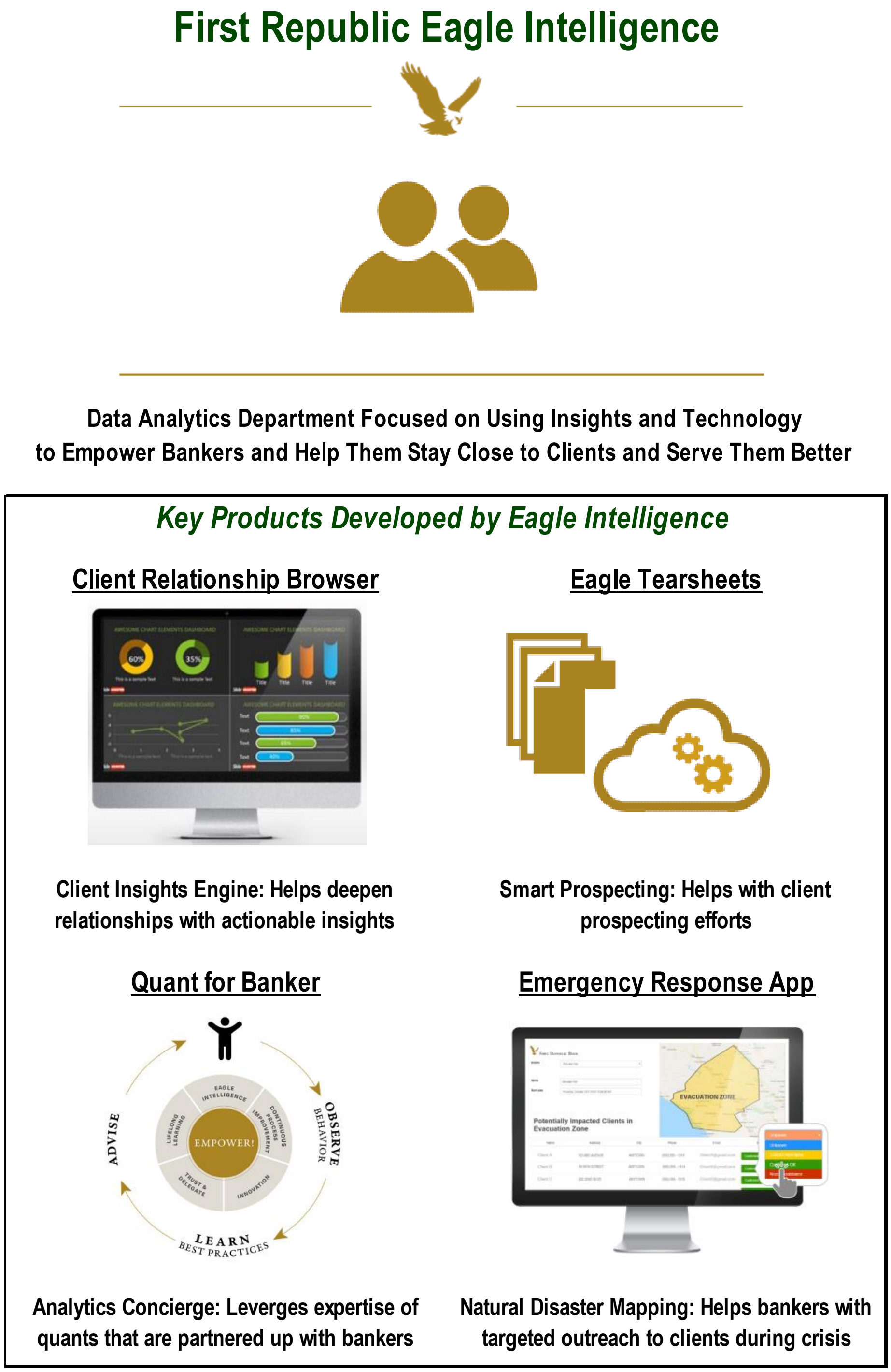
Figure 31: First Republic's Technology Investments with Goal of Empowering Bankers



Source: Company reports and J.P. Morgan.

Continuous Process Improvement (CPI): Another Pillar of Technology as a Means to Empower Employees at First Republic

Along with Eagle Intelligence, another pillar of First Republic's technology as a means to empower its high touch service model is continuous process improvement (CPI). With that said, First Republic empowers its service teams by streamlining

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processes and removing bottlenecks so the bank can ensure continuous delivery of its high service to customers. Below are a couple of examples of how First Republic used technology for CPI that has helped enhance its bankers' productivity:

- **Robotic Process Automation (RPA):** First Republic is a big proponent of robotic process automation (RPA). By using bots, the bank can streamline routine tasks and processes and therefore free up time for bankers, enabling them to spend more time interacting with clients. For example, First Republic's bot, called "Hemingway", auto-generates a loan pre-approval letter (which is typically a very manual process that can take up to 24 hours) for relationship managers, which they can just e-sign and send to the client/prospect from their phone right on the spot. Approximately half of relationships have used Hemingway for loan pre-approval letters. We note that Hemingway is not substituting robotics for the credit decision process (with this being the responsibility of a relationship manager) but it simply automates the process to send preapproval letters "right now" instead of taking 24 hours.
- **Deposit Client Onboarding:** President Gaye Erkan spearheaded the company's effort in revamping, optimizing, and digitizing the entire workflow around the deposit client opening system, taking a total of 8 systems down to 1 fully integrated system. Ultimately, the new deposit client onboarding system resulted in 50% time savings for bankers for opening accounts.

One way to reinforce CPI at First Republic is through EMPOWER! Ideas, which is an in-house idea generation platform. A few years ago, First Republic launched the platform, where employees can submit online their ideas that can improve internal processes at the company. Put differently, it's an idea sharing platform where every employee can submit, review, vote for, and comment on the posted ideas that are focused on process improvement at First Republic, with the company actively using the feedback and ideas from the employees to help save their time to do their work more productively. Since 2017, employees have submitted over 900 ideas (with the ideas coming from employees from all the different channels, especially the front-line) and over 200 of these have been implemented, freeing up time for bankers that can be better spent with clients. From the 2019 investor day, First Republic indicated that there were a total of 2,100+ unique visitors with 4,600+ votes being casted.

Figure 32: First Republic's Empower! Ideas Platform

Source: Company reports.

In fact, all of these efforts focused on continuous process improvement have bared fruit at First Republic, total process improvements over just last twelve months have resulted in recurring time savings that are equivalent to 1.6% full-time-employees (FTE) expansion. On a cumulative basis, within just over 2 years since launch, the firm achieved recurring time savings that equates to ~4% FTE expansion.

Design an Important Currency at First Republic, With the Company Putting an Emphasis on Importance of Custom Design for Its Unique Client Base

First Republic says that an important currency that is often overlooked in banking technology is design, with custom design being a rare commodity which it's becoming increasingly difficult to find places where it's deliberate. As needs and preferences of individuals can vary, and particularly given First Republic identifying itself as a service organization in the banking space, the company sees a "one size fits all banking experience" approach as not viable. With that said, the company incorporates the functionality of custom design in digital products and features they develop. In fact, the option to customize embedded in their technology offerings is not solely aimed at improving the experience of its clients but also targeting its bankers as well. In addition, the emphasis on design is not just referring to the ability to customize but also the overall design of the product. With that said, First Republic owns and develops much of the front-end client interfaces, with Q2 (a financial experience company dedicated to providing digital banking solutions to banks) only being the partner that provides the underlying technology that is powering the digital banking functions, in order to ensure that the digital experience its clients have resonates with and is aligned with the First Republic brand.

Marriage Between Carefully Selected Partnerships (with Open-Architecture Providers) and In-House Development for Service Features

From a systems point of view, First Republic has put significant efforts into key infrastructure upgrades to support its growth strategy, such as ACH system, single family mortgage loan origination system, wealth management performance reporting, debit processing system, and conversion to modern core banking system, just to name a few. In its technology strategy execution, the principle has been to (1) strike partnerships with a best-in-class open architecture technology provider with open, flexible systems, coupled with (2) an in-house development capability that incorporates client service features. This tech execution strategy has allowed First Republic to be nimble and agile and be very responsive to client needs. Case in point, First Republic has launched one new digital feature every week during the pandemic.

With Organic Growth Model (Without M&A) Allowing for a Simple System, First Republic Can Be Agile and Attract Tech Hires from Silicon Valley

A unique aspect of First Republic is its organic growth model which is in contrast to the vast majority of regional banks that have grown via M&A. First Republic's organic growth history has contributed to the company maintaining a simple and clean architectural system, whereas its peers have multiple layers of systems being stacked together as a result of their history of pursuing many bank acquisitions. Its simple system allows for First Republic to be much more nimble and agile when it comes to developing new digital products or integrating new features into the system. The old, complex system at peer banks that went through a series of M&A and integrations is often a bottleneck for developers and engineers as it diverts their attention and efforts from building new and innovative products. With that said, First Republic's mainframe system that is simple, agile, and flexible places the company at a significant advantage over peers, with the simplicity of the environment playing an important role in attracting talented hires from Silicon Valley. In fact, over 50% of

First Republic's developers and quants are hired out of tech firms and fintechs located in the Silicon Valley.

Cloud Strategy in the Works Alongside New Core Upgrade

First Republic embarked on its cloud strategy about 18 to 24 months ago, which started with President Gaye Erkan leading the discussion on choosing the framework around the company's cloud strategy including how to secure information in the cloud. Once the framework around the cloud security strategy was adopted, First Republic built the framework for applying applications on the cloud and picking the ones that are most strategic and are up for renewal. Importantly, First Republic has coordinated the cloud migration strategy carefully with core conversion integration strategy (with the company expected to complete its core conversion to FIS IBS in 2021 and operate under a single, modernized core). First Republic sees that there are three primary benefits to adopting a cloud strategy:

- **Application availability:** There are many new applications and systems being designed for the cloud. If a bank doesn't have cloud, the bank likely won't get access to these new tools.
- **Capacity:** Cloud has a bigger capacity for data storage and processing (i.e. cloud has a superior computing power for running model simulations vs. old core).
- **Resiliency:** With more critical applications moving to the cloud, it becomes much easier and safer for the bank to fail over with backup systems in the cloud vs. physical machines.

Not to mention, cloud will accelerate and expand First Republic's ability to roll out new products and features and respond to clients more quickly with technology. In addition, the cloud will not only allow First Republic to work with cleaned up data but eventually it will also get artificial intelligence tools to get more insights (such as predicting net promoter score) that the company couldn't do before.

The Road Ahead: First Republic's Poised to Double Its Balance Sheet and Stock Price Over Next Five Years, as Technology Further Widens Its Service Moat

In our secret sauce report (click here), we put forth a view that the key points of differentiation at First Republic were first, unmatched treatment of employees, which leads to unmatched treatment of customers. To this end, it was very encouraging to hear now the company is very smartly using technology to further improve the already above peer experience for customers (as well as for employees). In fact, after having deep conversations with President Gaye Erkan and her team on the company's strategy and philosophy around technology, we firmly believe that the company's moat is poised to *widen further* in the years ahead. Not to mention, with President Gaye Erkan having spearheaded the bank's technology and execution for the past 3-4 years in a way that mirrors the bank's overall business model that reinforces and enhances its high service culture, we also have more conviction that First Republic is positioned to gain significant additional market share in the years ahead (which is still modest at just 5%), which should lead to the company continuing to grow at a pace that is multiples of peers. In fact, since the bank fully embarked on its tech efforts since 2018, we note that First Republic reported its market share (of high net worth households in its markets) increased by 77 bps—which is by far the largest increase as far as the data is available—from 4.21% at year-end 2017 to 4.98% at year-end 2019. In fact, we now view First Republic's technology as another key growth pillar that will help the company to drive its assets toward $250B over the next five years with its stock price following suit.

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Great Western Bancorp

Strategic Initiatives to Become More Efficient Through Increased Investments in Technology Now Underway

Great Western has historically focused on having a strong efficiency ratio, which was primarily a function of the company's disciplined expense controls. With new CEO Mark Borrecco taking the helm in 1Q20, Mr. Borrecco has emphasized the significant opportunity that lies ahead for the company to become even more efficient specifically through making targeted investments in technology, which would involve automating and reducing a lot of manual and administrative processes, and therefore helping to drive efficiency for the bank's employees as well as improving the customer experience. The illustration of the company's effort in driving efficiency through technology is its fintech partnership with Fundation (slated to go live by 1Q21), which should help the company automate and streamline the origination process for small business loans and ultimately free up horsepower for Great Western to grow its middle market/small business lending segment, which is one of the company's new strategic focus areas.

Fintech Partnership with Fundation to Drive Efficiency by Streamlining and Modernizing Small Business Loan Origination and Monitoring Process

Under the new CEO Mark Borrecco, one of the new strategic focus areas for Great Western is to drive operational efficiency through technology investments, with small business lending being one of the key areas. Historically, Great Western has originated and made credit decisions on all of its commercial loans—regardless of size, business, and complexity—using the same process. In an effort to revamp and grow this line of business, Great Western has recently established a new small business center of excellence which will leverage new technology to make the small business loan origination and monitoring process more efficient while at the same time significantly improve the customer experience. As part of the company's initiative to reinvent its small business segment, Great Western has partnered with a fintech called Fundation as its third-party loan origination provider (with the pilot program expected to launch by March 2021). Digging deeper into Fundation, it is a fintech that has re-engineered the credit delivery process for small businesses via technology and advanced analytics, making the origination process much more efficient for the partnering lenders. By using the modernized digital lending platform tailored specifically for small businesses, Great Western will be able to (1) simplify and improve the application and fulfillment experience for its small business customers as well as front-line employees while also (2) drive cost efficiency into originating new customer relationships by automating the origination process. As such, its partnership with Fundation is expected to free up resources for Great Western to engage in middle market opportunities within its footprint while delivering improved customer experience in the small business lending space.

Money Management: Allowing Customers to Monitor Spending Habits, Create Budgets and Forecast Cash Flows to Manage Their Finances in One Place

As part of its online and mobile banking services, Great Western offers a free money management tool that allows customers to have an intuitive and visualized experience for managing their finances in one place. For example, customers can link different accounts including checking/savings accounts, investments, loans, credit cards, or other lines of credit from other financial institutions, and therefore provide a holistic view of customers' net worth and finances. In addition, the tool provides a variety of options to customize as well as the capability to predict future cash flows

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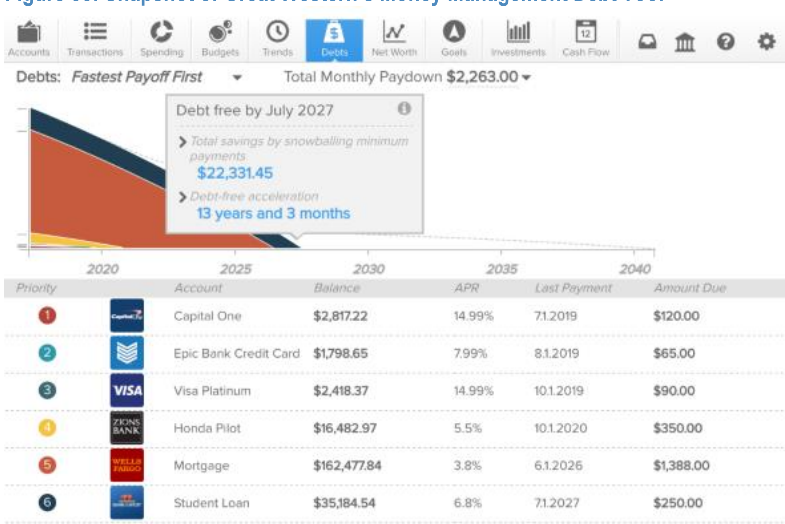
based on spending patterns and help customers prioritize debt and pay down faster. Below we summarize some of the key features of Great Western's money management tool:

- **Transactions.** It provides an overview of a customer's spending across all of accounts. While transactions are pulled from different accounts into Money Management, they are automatically categorized but the tool provides customers an option to customize, filter, and reorder transactions (with the customer's preference being remembered and applied going forward).
- **Monitor spending.** It provides a spending wheel view of a customer's expenses by category, which makes it easy for the customer to identify biggest spending.
- **Create budgets.** Customers can create customized budgets by categories, with the bubble budgets feature making it easy to track the status of each budget, as well as compare the size of each category relative to the rest of the budget.
- **Trends.** The Trends chart paints a picture of a customer's spending habits by tracking spending in each category over time. It plots the spending history vs. income each month, indicating whether the customer is living within their means.
- **Debt.** The Debt tool helps customers prioritize debt and pay it down faster, so they can save on the money they would otherwise have spent on interest.
- **Net worth.** The chart calculates and keeps track of a customer's net worth.
- **Set goals.** It allows customers to establish financial goals for short and long-term objectives, with the customer having the option to create three types of goals: savings, debt payoff, and retirement.
- **Forecast cash flows.** This function searches customers' transactions to identify recurring deposits and payments to show their historical spending and planned future spending. This feature allows customers to easily see the impact of upcoming payments and plan ahead for future expenses.
- **Alerts.** The Alerts tool will notify customers of important updates such as a low balance or upcoming debt payment via email or mobile.

Figure 33: Snapshot of Great Western's Money Management Debt Tool



Source: Company website.

The Road Ahead: In Early Innings of Digital Transformation But Headed in the Right Direction Under New Leadership in Place

While Great Western is in the early innings of its transformation, it appears to us that the company is headed in the right direction to realize an improved operational efficiency through the use of technology investments. In particular, Great Western's small business lending initiatives bolstered by partnership with Fundation is expected to make it much easier for its front-line bankers to manage smaller business credits with improved efficiency and allow them to spend more time on identifying their middle market commercial growth opportunities and growing their book of business. While Great Western has historically been focused on keeping the efficiency ratio low through a disciplined expense control, with the company starting to make targeted investments in technology as a means to drive efficiency, although this may translate into an uptick in expenses over the near to intermediate-term, our view is that the company is taking the necessary steps to position itself to compete in the digital age of banking over the longer term.

HBT Financial, Inc.

Technology Offerings Across Multiple Lines of Businesses Complement the Relationship Model in a Geography Where Heartland May Be the Only Bank of Choice

Even though Heartland is the smallest bank we cover, at just $3.5B of total assets (as of 3Q20), the various technology offerings at the company across multiple segments including personal banking and business banking (including treasury services and merchant services) appear to complement the bank's relationship model. Even with Heartland's relatively smaller size vs. our coverage universe, while Heartland's business model is centered on the relationships that its bankers have with their customers across downstate Illinois and the Chicago MSA, the company's technology offerings appear to help enhance the relationships between bankers and customers, particularly with a sizeable portion of its customers located in rural areas where Heartland may be the only bank of choice. We highlight some of Heartland's financial products that use technology in the following sections.

Wide Range of Business Banking Product Offerings Span from Treasury Services and Merchant Services Products

Outside of the online business banking product, which offers comparable features with the online personal banking product (we highlight the various features in the subsequent section), two areas where Heartland uses technology on the business banking side as part of its product offerings are in treasury services and merchant services. Treasury services offers many different products in areas such as collections, disbursement, and managing funds, to help customers efficiently manage their businesses' cash flow. We highlight the various offerings in each of these areas of treasury services below:

- **Collection of funds**
  - Remote deposit: allows customers to electronically make deposits right from their businesses, without having to visit a bank branch
  - Lockbox services: Heartland gathers financial data from stubs and checks which can be easily uploaded into accounting software to help save time, maintain record quality, and lower the risk of fraud
  - ACH direct debit: electronically collect recurring payments to save trips to the bank and on processing fees
  - Merchant services: offer customers an assortment of payment options including debit/credit/gift cards and checks
- **Disbursement of funds**
  - ACH credit origination/online bill pay: make vendor payments and easily pay bills online
  - Online wire origination: electronically transfer funds to a domestic business quickly and securely
- **Managing funds**
  - Commercial account manager (CAM): simplify and securely complete banking transactions. Verifies each user's identity before access to an account is given.

CAM allows businesses to view account balances, view transaction history, set balance alerts, process electronic tax payments, pay monthly bills, export reports to accounting software, and facilitate domestic wire transfers.

- Electronic data interchange reporting: verify and post incoming ACH payments quickly using its attached invoice and account numbers, helping to save time and money
- Fraud prevention: positive pay helps to catch a duplicate check and find incorrect dollar amounts before a check posts, ACH Block places a block on accounts that have not had ACH activity, and ACH Filter automatically filters out ACH transactions that are unwanted and only accepts authorized ACH transactions
- Sweep accounts: moves excess funds from a Heartland business checking account and automatically transfers them to an interest earning sweep account
- Account analysis: calculates monthly activity charges and provides a monthly statement that summarizes balance and activity information

Separate from treasury services, Heartland's merchant services practice also provides a variety of payment solutions to help businesses streamline payments processing. These products that leverage technology include:

- **Terminals and point-of-sale solutions**
  - Accept chip cards with EMV-capable products
  - Leverage cloud-connected and tablet-based systems to support payment processing
  - Analyze customer data to better understand customers and help increase sales
- **Mobile Solutions**
  - Support payment processing through an encrypted card reader that connects to a personal smartphone or tablet
  - Quickly and safely process card payments at a very low cost
- **Online Reporting Portal**
  - One-stop shop where businesses can access financial statements and export these into other software for easy reconciliation
- **Internet Solutions**
  - Increase sales, improve customer satisfaction metrics, and reduce the risk of fraud through by accepting payments online
  - Facilitate payments electronically, browse customer data, customize email receipts, establish recurring payment schedules, and set up fraud tools to help prevent unauthorized transactions

Personal Digital Banking Product Offerings Include a Personal Financial Management Tool and Digital Payments Capabilities

Heartland's digital banking offerings on the personal banking side of its business are centered on four areas: online banking, mobile banking, personal financial management, and digital payments. We highlight each of these offerings below:

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- **Online banking (comparable product also offered for business customers):** manage accounts, transfer funds, export financial data to accounting software, view statements, pay bills online, and set account alerts
- **Mobile banking:** check account balances, pay bills, make loan payments, deposit checks remotely, set account alerts, transfer funds, and view statements
- **Funds tracker:** free personal financial management tool to monitor spending and savings
  - Customizable dashboard
  - Cash flow management to keep track of income and expenses
  - Retirement tools to set goals for retirement
  - Set account alerts
  - Split transactions to more effectively manage expense tracking
  - Automatically categorize transactions
- **Digital payments:** make payments in a store, online, or in person using Apple Pay, Samsung Pay, and Google Pay

The Road Ahead: Technology Offerings for Both Business and Personal Banking Complement Heartland's Relationships with Customers

Despite Heartland's relatively smaller size compared to the rest of our coverage universe, the company appears to offer some products that leverage technology that help to support the human relationships between bankers and customers. For example, on the business banking side, Heartland offers a variety of electronic tools to help customers efficiently manage their cash flow so they can spend more time running their businesses. Similar tools are provided on the merchant services side to help businesses simplify their payments processing needs. On the personal banking side, Heartland offers a personal financial management tool to help customers keep track of their spending and savings habits and make adjustments as appropriate. Overall, these products provide the tools that customers need to help run their businesses or customers manage their personal finances, which helps support the relationships that the company's bankers have with clients across the bank's footprint, particularly in a geography where Heartland may be the only bank in town with there being few, if any, larger competitors in downstate Illinois.

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Huntington Bancshares

A Hidden Gem: At the Forefront of Using Technology to Elevate Customer Experience

Following our deepest dive into technology and customer experience, we came to a conclusion that Huntington is a potential hidden gem as well as an eventual industry leader with the company at the forefront of successfully using technology to improve customer experience through various customer-friendly digital offerings and services that are tailored to reduce friction points in banking and enhance customer convenience. For example, Huntington's digital banking/personal financial management (PFM) platform, The Hub, takes customers' digital banking experience to another level, incorporating features such as a digital messaging platform that provide customers real-time insights into their spending and saving as well as an AI-powered automatic savings tool that scans customers' accounts and looks out for money that can be set aside without missing it. Not to mention, in a direct response to customers' feedback amid the COVID-19 pandemic, Huntington rolled out a couple of overdraft fee relief programs in September 2020, which we view as an epitome of how a bank should be using technology as a means to improve customers' banking experience. We have followed Huntington for nearly twenty years and through several CEOs, following our deeper dive into the company, about the only thing in common today with the Huntington that we initially launched coverage on in 2001 appears to be the name. In fact, the transformation of the company under CEO Stephen Steinour has been remarkable. In fact, we have no doubt that Huntington will emerge over time as one of the endgame winners in the digital age.

Integrating Technology with Customer Experience to Deepen Relationships with the Bank

At Huntington, we interviewed Andy Harmening, Consumer and Business Banking Director, and Mark Muth, Head of Investor Relations. While we've known for a while that Huntington is ahead of most regional bank peers when it comes to innovative digital banking product offerings, it was music to our ears to hear the company's philosophy and approach to using technology as a means to improving customer experience at the bank as opposed to an end goal itself (which we agree with). With that said, Huntington measures three things to determine whether they are doing enough on technology, which are comprised of: (1) the bank's capability to sell digitally (i.e. online account opening), (2) a deepness of that relationship, and (3) the bank's client satisfaction score. All of these measures are headed in the right direction, with Huntington's online checking account openings being one of the top in the industry, over half of new household acquisitions coming through digital, and being ranked #1 in mobile app satisfaction (by J.D. Power) for the past two consecutive years, just to name a few. With the company actively rolling out new digital products and features to the market, about 1.5-2 years ago Huntington has started hiring digital coaches and champions who are power users of these technologies and are responsible for getting them in the hands of customers. Currently, there are a total of ~150 digital coaches and champions in every branch in their markets.

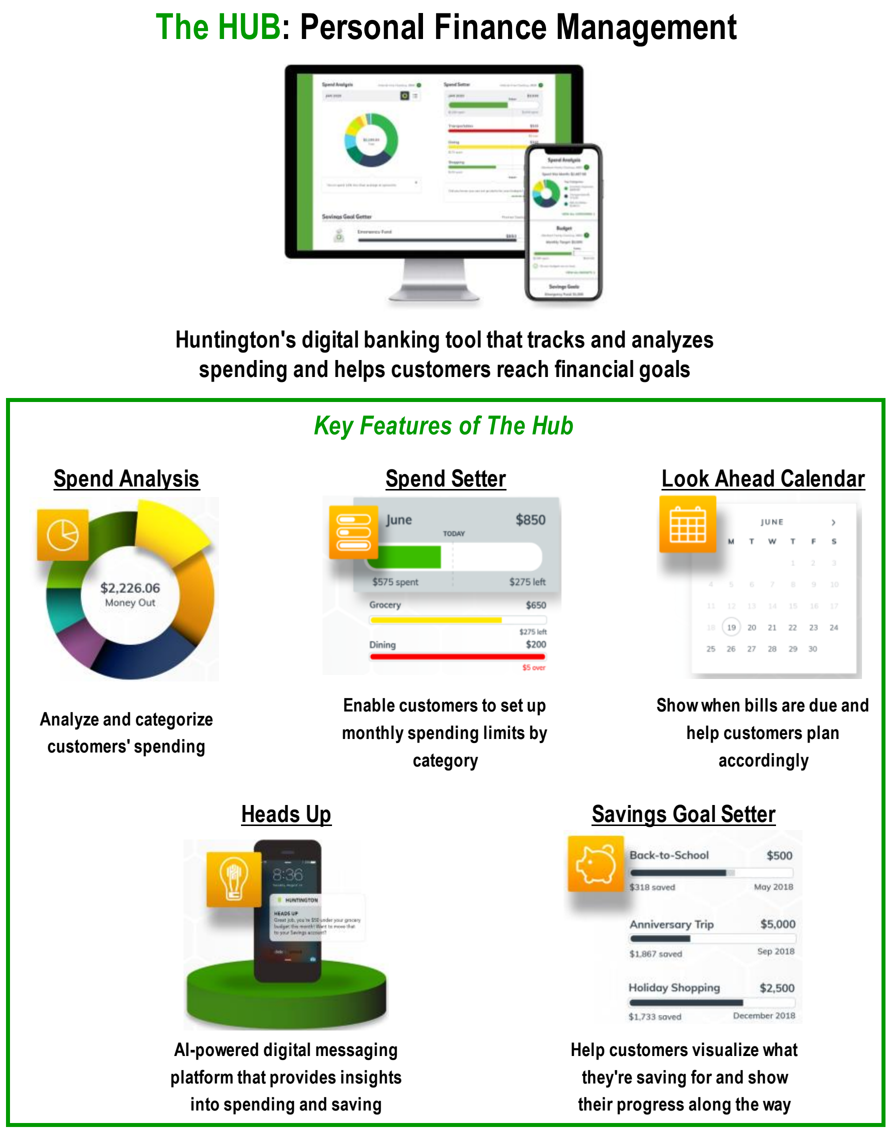
Huntington's The Hub a One of a Kind Service That Takes Customers' Digital Banking Experience to Another Level

With Huntington fully recognizing the rapid pace at which bank customers' expectations change, the company has been reinventing themselves constantly and emphasized collaboration across multiple business lines (between client-facing consumer/business banking teams that hear customer feedback and IT teams that develop technologies and execute the needs of customers). Over the past couple of years, Huntington has actively rolled out over 100 innovative digital projects that we view as cutting-edge in the industry. One of the key contributing factors that has enabled Huntington to roll out new, innovative features is the core modernization process that has been underway, which primarily involves building the interfaces to bridge from the core to various APIs (with there being much more to come on for next year to continue supporting innovation at the bank).

A primary example of Huntington's differentiated banking technology and innovation tailored for improved customer experience is The Hub, which is at the center of the company's new digital banking experience. In December 2018, Huntington began the journey to develop a new digital banking platform, The Hub, by taking a road trip to their customers' homes and sitting around their kitchen tables to discuss finances, but more broadly, what they need in their lives. This experience inspired the company to develop The Hub, Huntington's new digital banking/personal financial management platform. With that said, The Hub was built to look out for Huntington's customers and their financial future by helping them save more money, manage their spending, and reach their financial goals, with all of the key features being born out of direct feedback from customer conversations (and are 100% free!). Below is the list of key features of Huntington's The Hub and how they help elevate customer experience:

- **Heads Up:** leverages AI technology to let clients know real-time where their money is being spent and provide personalized and proactive insights to help them make more informed financial decisions. For example, Heads Up (1) alerts on customers' progress on savings, (2) monitors customers' subscription transactions and lets them know when free trials end or when they're coming up for renewal, and (3) actively monitors cashflows and alerts customers if it requires customers' attention such as duplicate charges, returned checks, or refund notifications.
- **Spend Analysis:** tracks and categorizes customers' spending to show exactly where their money is spent and help them understand how they can change spending habits.
- **Spend Setter:** a budget planning tool which enables customers to set budgets for categories where they'd like to tighten up their spending.
- **Look Ahead Calendar:** provides a complete financial view of the month including upcoming transactions (such as income and payment patterns) before they happen so customers can plan accordingly.
- **Savings Goal Getter:** helps customers visualize what they're saving for and shows their progress along the way.
- **Money Scout:** While this is not part of the Hub, as an upgrade to the Savings Goal Getter feature, in September 2020, Huntington newly launched Money Scout, an automatic savings tool that uses AI technology to analyze customers' spending habits, income and upcoming expenses to find money they're not using in their checking account and automatically move that money to their savings accounts up to three times a week.

Figure 34: Key Features of Huntington's Digital Banking/PFM Tool, The Hub



Source: Company reports and J.P. Morgan.

24-Hour Grace and No-Overdraft Fee $50 Safety Zone Demonstrate How Huntington Proactively Finds and Reduces Friction Points for Customers

In terms of friction points that hurt bank customers' satisfaction score, the first answer that comes up most often is overdraft. With the pandemic having swept across the country and putting many consumers and businesses in financial hardship, Huntington rolled out two new features in its overdraft-protection lineup to help customers navigate the crisis and manage financial health: (1) 24-Hour Grace and (2) No-Overdraft Fee $50 Safety Zone (for both consumer and business customers). Through these programs, when Huntington's customers overdraw on their account, they have a $50 safety zone before incurring an overdraft fee (an increase from the prior $5 limit). If they overdraw their account by over $50, then the bank will automatically waive the overdraft fees as long as the customer makes a deposit during the next business day. All of these features, which are also 100% free and available to both consumer and business customers, were developed in direct response to the customers' feedback, with these efforts leading to higher customer engagement and satisfaction as well as lower customer attrition.

Learning from and Working with Fintechs to Build Technology for Better Customer Experience

Over the past years, Huntington has used data more aggressively to understand what customers want and built internal talent to develop new technologies to compete in the marketplace. With that said, one of the key questions that we posed on Huntington is which cohort they fear the most: mega banks or fintechs. Interestingly, Huntington's answer was neither. First, on mega banks, although these big banks have a lot of money to spend on technology, their products are not differentiated and perhaps more importantly not translating into a better client experience, with the company highlighting how none of top 5 banks have a higher customer satisfaction score than Huntington. Turning to fintech, Huntington does not see fintech as a competitor to fear, but instead the company sees them as a partner who they can pair with and learn from, acknowledging that fintechs are ahead of many traditional banks when it comes to (1) their focus around customer experience, (2) their willingness to differentiate in order to survive, and (3) the speed to market on delivering innovation. In fact, Huntington has partnered with a number of fintechs, with their technologies being incorporated into Huntington's digital offerings to enhance customers' banking experience and accelerating the bank's speed to market. Below is a list of select examples of fintechs that Huntington partners with to push out differentiated digital products to customers:

- **BillGo**: a fintech that takes the hassle out of paying bills by centralizing and simplifying bill payment
- **Personetics**: a fintech that provides customer-facing AI solutions with the goal of enabling self-driving finance, such as providing real-time insights to personalized recommendations and automated money management
- **Strands**: a fintech that leverages big data and AI to develop innovative and personalized digital banking experience in the personal financial management space

The Road Ahead: Digital Initiatives Are Translating to Higher Customer Satisfaction and Lower Attrition, Which Should Ultimately Lead to Growth

Thanks to Huntington's differentiated approach to technology (and more specifically around how it's being integrated with an ultimate goal of enhancing customer experience), the company has seen strong digital sales and customer acquisition while its customer attrition has decreased in each of the last three years. Putting numbers around this, digital usage has increased significantly over the past year, with digital logins increasing 45% y/y to top 139 million users, while new households acquisition through digital channels (for consumer checking) increased from 25% of total in 2Q19 to 52% in 2Q20. Not to mention, its fast-growing mobile banking platform has been ranked #1 in mobile app satisfaction by J.D. Power for the past two consecutive years. With that said, with Huntington's serious push for digital transformation being a relatively recent initiative (which kicked off in 2018), the company is still early in its innings to see these initiatives translating to growth. Looking far out, however, we view that Huntington is very well positioned to drive further market share gains and achieve faster growth with its customer-first technology strategy positioning the company as a long-term winner in the digital age of banking. In fact, whereas many view fintechs as the greatest threat to regional banks, we see Huntington as emerging as one of the greatest threats to fintechs.

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KeyCorp

Investing Technology in Targeted Spots Where KeyCorp Chooses to Win by Actively Partnering with Fintechs

At KeyCorp, we interviewed with Victor Alexander, Head of Consumer Banking, Jamie Warder, Head of Digital Banking, and Vern Patterson, Head of Investor Relations. With KeyCorp being focused on building a targeted scale, it was clear throughout our conversations that the company takes the same targeted approach when it comes to investing in technology. With that said, KeyCorp focuses on making technology investments in a few places that are carefully selected where it thinks it will win as opposed to trying to be everything for everyone. With the company spending on technology that is roughly around 10% of total revenue (which is roughly in line with the industry average), KeyCorp does not see the pure size and scale of the bank as being a deterrent that prevents the company from making tech investments. As such, its tech spend is focused on a few targeted areas where it's winning as a business, including its relationship-driven middle market franchise in targeted industry verticals (such as healthcare and technology), small business lending, as well as consumer lending (which have been the key growth drivers at KeyCorp in recent quarters through Laurel Road and mortgage), with the company actively using partnership with fintechs that have distinctive platforms and technology to deliver enhanced customer experience. On the other side, segments like indirect auto is not an area of KeyCorp's focus given that it's a non-relationship business and the company recently announced plans to exit this business. While KeyCorp has accelerated digital initiatives and deployed a number of new technologies to elevate customer experience over the past few years, the company's stance on technology is that it is never done investing and always looking for something new with its digital transformation journey being an ongoing process.

Partnering with Fintechs to Deliver Innovation Solutions to Market and Providing Distinctive Platforms and Technology to Discrete Client Segments

KeyCorp has invested significantly in building strategic partnerships with a number of fintechs whose solutions align with the company's broader strategy of delivering innovative solutions to the market for improved client experience. KeyCorp has taken a targeted approach when it comes to forming fintech partnerships and tailoring those in specific areas where the company targets for growth and expansion. For example, in 2019 KeyCorp acquired the digital lending business of NYC-based Laurel Road, which offers a student loan refinancing platform (with the business model targeting a clientele primarily comprised of advanced degree professionals such as doctors), which has complemented KeyCorp's strategic focus. The acquisition of Laurel Road has also accelerated growth in household acquisitions as well as acted as a significant loan growth driver (more on this later). Below we provide other detailed examples of some of KeyCorp's major partnerships with and investments in fintechs/software companies:

- **Bolstr:** Bolstr is a Chicago-based fintech that provides a digital lending platform for small business owners, which KeyCorp acquired in June 2018. Bolstr took a crowdfunding approach by enabling individuals to invest in small businesses in their communities, with one of the innovations being a deal structure wherein small business owners could repay funders with near-term payouts based on the sales success of the business (more on this later).

- **HelloWallet:** In May 2017, KeyCorp announced the acquisition of HelloWallet, a fintech that offers a personal financial management (PFM) product which KeyCorp has provided to its customers since 2015 through a partnership. HelloWallet scores its users' financial healthy by assessing factors, such as their credit card balance and the amount of equity built in their home. In addition, the app provides advice on how to improve their score. HelloWallet was later integrated into KeyCorp's proprietary PFM tool, called Financial Wellness, which is available online and on a mobile app (more on this later).
- **Snapsheet:** In the commercial payments space, in November 2017, KeyCorp partnered with a fintech Snapsheet to provide new, self-service insurance claims payment solutions. KeyCorp's investment followed the joint launch and announcement of Snapsheet Transactions, a payment platform on the back-end of Snapsheet's existing claims solution, which provided carriers with a wide array of payment options without adding complexity or risk to carriers' back-end processes. The partnership with Snapsheet provided KeyCorp's insurance carrier clients a competitive advantage by enabling them to handle claims faster while leveraging KeyCorp's commercial payments platform to process transactions efficiently and quickly.
- **Billtrust:** In August 2017, KeyCorp formed a strategic partnership with and made an equity investment in Billtrust, a fintech pioneering in payment cycle management and automated accounts receivable solutions. Billtrust leverages robotic process automation (RPA) to eliminate repetitive manual tasks throughout the accounts receivables process and employs supervised machine learning to improve the effectiveness and efficiency of cash application. KeyCorp's investment in Billtrust allowed for the company's corporate clients to improve operational efficiency during the invoice-to-cash process utilizing electronic invoicing and payments in a flexible, cloud-based solution while also accelerating cash flow by automating invoice delivery and payment and cash application.
- **Kubernetes:** KeyCorp has partnered with Google to co-create an on-premises open-source cloud services platform, Kubernetes, which provides the company with an opportunity to enable faster and more resilient delivery of new features while minimizing potential disruption to clients.
- **MasterCard:** KeyCorp partnered with Mastercard and became one of the first banks in the US to add contactless cards.

Investing in Small Business by Partnering with a Fintech Bolstr That Enables Streamlined Processes for Small Business Loan Online Applications

One of the business areas that KeyCorp is focused on is small business lending (particularly the SBA 7a). The company's initiative to grow this business was bolstered by its acquisition of a Chicago-based fintech, Bolstr, which was a digital lending platform for small businesses. Digging deeper, Bolstr is a digital lending and SaaS platform, which has allowed for KeyCorp's small business clients to streamlines the process of applying for small business loans online by leveraging robotic process automation (RPA) technology and providing small business owners with a better lending experience. In turn, the platform enables KeyCorp to digitally accept and process loan applications at a pace that's significant faster and also at a lower cost. At the time of acquisition in June 2018, it was estimated that the Bolstr acquisition would help KeyCorp fulfill plans to originate $2.5B in loans to small business clients over the next five years. In fact, KeyCorp's focus and investment in small business lending also bore fruit and was well-demonstrated through its success with PPP, with the company being the top 2 lender in the nation (by the number of PPP applications processed) in the first wave and taking in more than 40K digital

PPP applications in the first week and being able to process these applications within 24 hours (totaling over $8B in funding). Not to mention, the company has continued to make investments in the small business space, such as rolling out Small Business Wellness, a finance management tool for small business clients.

Laurel Road: Online Student Loan Refinance Platform with the Credibility of a Bank and the Capability of a Fintech

KeyCorp is one of the few outliers in the regional banking space that is focused on the consumer lending segment as an area where they can win, with Laurel Road being one of them. In April 2019, KeyCorp acquired Laurel Road's digital lending business, which is an online student refinancing platform that was launched in 2013. Based in NYC, Laurel Road has built a student loan refinancing platform that offers customers an intuitive, transparent, and streamlined customer experience with customized products. In 2018, the company introduced the platform for mortgages using the same secure lending technology for home buyers as well (and now expanded into other areas such as graduate loans and personal loans with the same goal of simplifying lending for customers though technology and personalized service). Through the acquisition, KeyCorp was able to meaningfully enhance its digital capabilities with Laurel Road's customer-centric technology while benefiting from Laurel Road's ability to attract professional millennial customers. With that said, KeyCorp's targeted scale philosophy also applied to its Laurel Road acquisition, as from the start, Laurel Road was created with a unique business model of making student loan refinance online to primarily young professionals with advanced degrees such as doctors, lawyers and graduate students. As such, Laurel Road boasts a high-quality client base that is primarily comprised of healthcare professionals with an average FICO score of 790 with the average income of over $200K.

A key differentiating aspect of Laurel Road is that it takes a digital-first but not digital-only approach. In other words, it enables borrowers to apply for student loan refinance online with the customer having the option to make their lending experience 100% digital (if they choose to) from start to finish, making the process fast and convenient for the millennial cohort. However, if the customer needs a human assistance, they can easily access human experts with a customer service team that has 19 average years of experience. With that said, Laurel Road leverages its differentiated technology to earn a strong reputation for providing high-quality customer service (with the NPS for Laurel Road at 70+ which is nearly 2x above the average for financial services). The reasons for Laurel Road's high NPS is a function of: (1) the platform being completely intuitive and fast, and (2) if a customer needs to talk to someone, they can just click to call, enabling a seamless experience for its customers. Since KeyCorp's acquisition in 2Q19, Laurel Road has been a major growth engine of KeyCorp over the past year, with total originations from Laurel Road topping $3B in just over a year and adding 31K net new households with an opportunity for further integration. Not to mention, KeyCorp is further expanding and streamlining its digital capabilities through Laurel Road in areas such as mortgage (another growth driver for KeyCorp).

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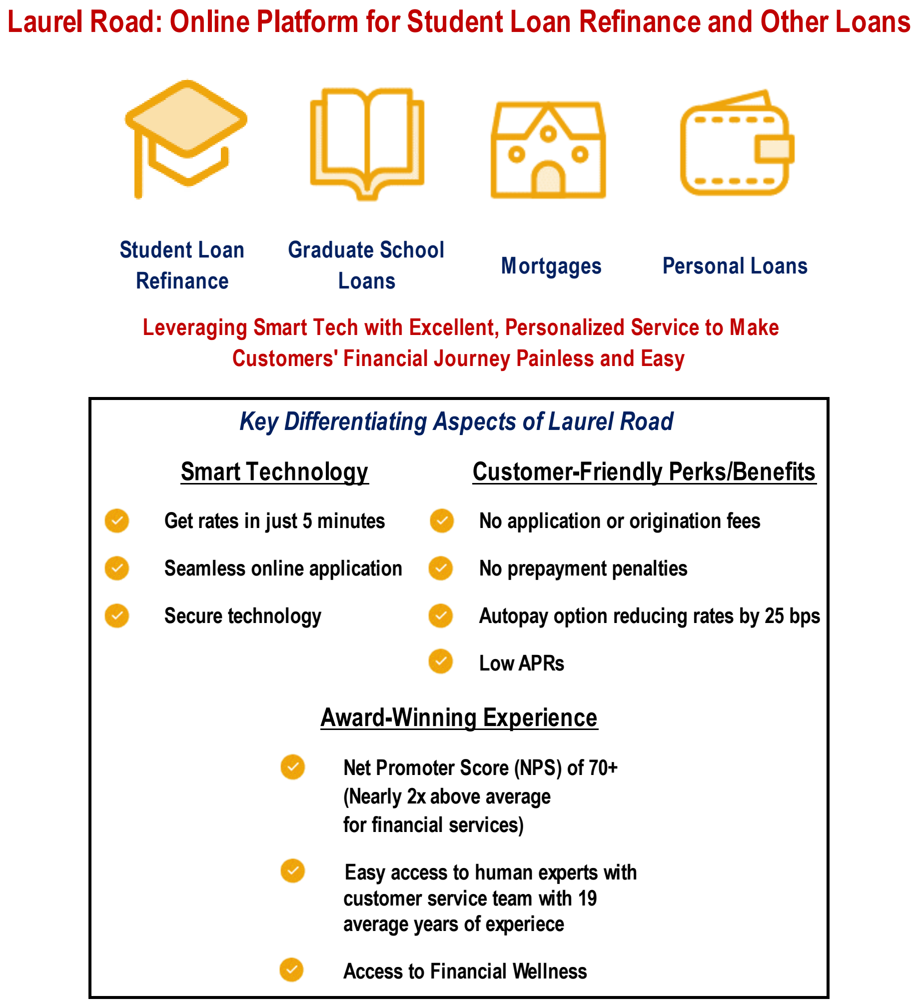
Figure 35: Key Aspects of Laurel Road



Source: Company website and J.P. Morgan.

Financial Wellness: Personal Financial Management Fintech HelloWallet Integrated into KeyCorp's Platform for Consumers and Small Businesses

While a number of banks provide some sort of personal financial management (PFM) tools, in many cases they are often lost in a tab of the company's online banking website. It is different at KeyCorp, however, with this being not only a major area of investment but also a representative of the company's stance on how KeyCorp thinks about its customers. In 2017, KeyCorp acquired HelloWallet, a fintech that provides a PFM platform, which the bank has provided to its customers since 2015 through a partnership. HelloWallet gives its users financial health score by taking into considerations a variety of factors including their debt, spending, and net worth and stacks them against their peers. From there, the app provides personalized financial guidance to improve their scores while utilizing behavioral economics to incentivize users to implement its advice. Since then, KeyCorp has integrated HelloWallet to its proprietary PFM platform, Financial Wellness, which are available both on KeyCorp's mobile banking app as well as within online banking, with services including various quizzes that help assess customers' financial health and create a customized financial plan. Furthermore, through Key Financial Wellness Review, KeyCorp connects customers to experienced bankers (via branch visits or Zoom)

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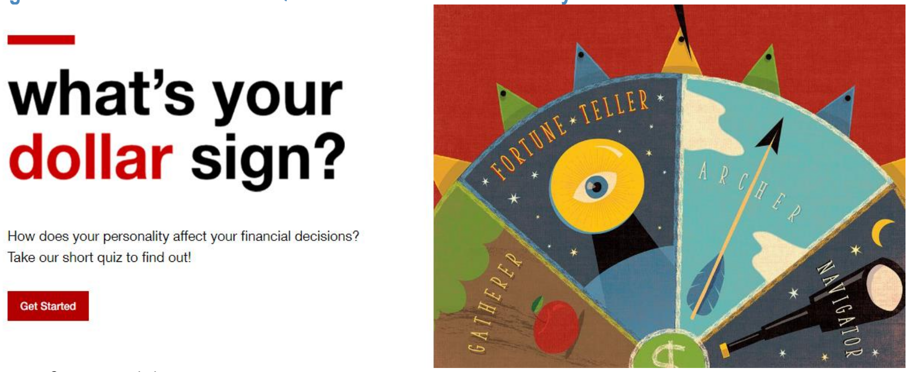
who would offer additional insight into where customers' finances stand today, provide in-depth advice on how to improve their financial health, and create a personalized and comprehensive plan to reach their goals.

Figure 36: Financial Wellness Quiz to Assess How Personality Affects Financial Decisions



Source: Company website.

The Road Ahead: Digital Initiatives Led by Laurel Road Poised to Further Translate to Higher Customer Satisfaction and Household Acquisitions

Unlike many of its regional banking peers that are heavily focused on commercial banking, consumer banking is a big focus at KeyCorp with its technology investment in Laurel Road already bearing fruit. Putting numbers around this, since the company's acquisition of Laurel Road in 2Q19, total loan originations from Laurel Road have exceeded $3B, bringing in an additional 31K net new households into the bank (which is a high-quality, millennial customer base that is primarily comprised of young healthcare professionals with high income), with the company also planning to launch a fully digital national affinity bank targeted specifically to healthcare professionals in 2021. With KeyCorp further expanding and streamlining its digital capabilities through Laurel Road in areas such as mortgage, Laurel Road is actually being utilized at KeyCorp as a business lab as well as a tech lab for the bank's overall consumer banking, where engineers and designers are working to create a more streamlined lending origination experience. Moreover, with KeyCorp remaining laser-focused on serving a few areas particularly well, rather than trying to be the bank for everyone, the core platform that the company has today supports all of the desired capabilities, with there being few incremental features that would be highly valued. As such, with digital initiatives focused on improved customer experience being underway, and coupling this with a strong leadership in place with a goal to make KeyCorp in the first quartile in digital experience, we see the company as headed in the right direction to drive further market share gains and achieve stronger growth in consumer banking as an outlier in the regional banking space.

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Metropolitan Bank Holding Corp.

"The Entrepreneurial Bank" With a Long Track Record of Being a Key Partner to Fintech Companies

For our research, we interviewed Mark DeFazio (CEO), Greg Sigrist (CFO), Dixiana Berrios (COO), Ram Puppala (CIO), Nick Rosenberg (Head of Global Payments Group), and Glen Solimine (Head of Global Payments Ops). At $4.0B in assets, Metropolitan is one of the smallest banks but also one of the fastest growing banks in our coverage universe. While the bank is known as a commercial bank focused on the New York metropolitan market, there is another key business within the bank that is focused on providing global payment services to fintech companies. As a smaller bank with limited resources, the bank made the choice to partner with fintechs instead of competing with them early on in the bank's history. In a way, Metropolitan is an "access" company for fintechs to have access to financial products and services to manage their businesses.

Living up to its name as "The Entrepreneurial Bank", in 2004, the bank issued its first self-branded general purpose reloadable (GPR) debit card—CashZone Gold Card—to help New York's unbanked and underbanked families access alternative financial services. One year later in 2005, Metropolitan issued its first network-branded GPR debit card—CashZone Visa Card – which increased the underbanked's access to alternative financial services. In 2008, the bank launched its Check2Card program, which allowed unbanked individuals to load payroll and government checks directly onto CashZone Visa Cards with no check cashing fee. Then in 2010, Metropolitan became an issuing bank for third party debit card program managers and since then has served as the issuing bank for dozens for firms including several Fortune 1,000 companies. Today, Metropolitan offers end-to-end bank issuer and sponsor services spanning all verticals including debit, General Purpose Reloadable (GPR), incentive, gift, payroll, government benefits, healthcare, and peer-to-peer and cross-border payments. Metropolitan's global digital payments offering include:

- Administer domestic and international digital payments settlement
- Deliver critical financial infrastructure—gateway to payment networks
- National third party debit card issuer
- Custodian of deposits on behalf of clients and their customers
- Merchant acquiring services for the banked, underbanked, and unbanked
- Execute e-commerce 2.0 digital payments
- Regulatory oversight by experienced MCB bankers with the expertise to deploy and manage regulatory compliance across a broad spectrum of client sectors including fintech, digital payments, and money services businesses
- Sponsorship for select clients as an extension of MCB's expertise and legal authority (i.e. money transmitter, issuing bank, acquiring bank, and lending activities)

The Global Payments Group Delivers Digital Global Payments Capabilities

In October 2018, Metropolitan announced that Nick Rosenberg was named Head of Global Payments, a newly formed group at the bank focused on relationships with fintech companies, and will be responsible for the bank's debit card, digital currency, global remittance, and foreign exchange settlement businesses. The Global Payments Group (GPG) serves 160 clients (as of 3Q20) with client offices within 6 continents, which includes a large underlying 1.5 million active client customers across 200 countries. By serving these 160 clients, Metropolitan is also serving a client customer population that has a total of over 40 million domestic and international transactions 3QYTD totaling $5.3B in 130 fiat and digital currencies. Metropolitan's Global Payments Industry Expertise Covers:

- **Healthcare:** Prepaid and Debit cards issued to consumers for prescription needs.
- **Payroll cards:** Prepaid and Debit cards issued through Program Managers or Payroll Companies.
- **Disbursement of government payments:** Prepaid and Debit cards issued to both state and federal government beneficiaries, early payment of federal benefits, For Benefit of (FBO) Accounts.
- **OCT push payments:** Almost real-time card to card credit transactions.
- **Decoupled debit cards linked to other accounts:** General purpose, gift, and rebate cards
- **Cross Border and Domestic money remittance:** Businesses and consumers sending money to family and friends.
- **Legal online gambling and sports betting:** Prepaid, Debit, and E-Wallet issued to consumer for winnings.
- **E-Wallet for purchase of digital assets:** Multi-player gaming
- **E-Wallet and push payments for sellers in online marketplaces:** Allows Businesses and Consumers to purchase goods and services
- **Correspondent banking for limited purposes:** ACH/Wire and other business banking services.
- **CBD Acquiring:** Providing acquiring bank sponsorship for CBD merchants.
- **General Acquiring:** Providing acquiring bank sponsorship services for select ISOs
- **Crypto currency exchanges, OTC/Prop Desks, Hedge funds:** General spend cards linked to crypto digital currency

The Global Payments Group (GPG) has a diverse digital product offering totaling 16 different products with the largest: ACH Processing (25.9% of total), Card Present Debit Card (16.1%), Digital Asset Settlement (11.5%), Mobile Payment Settlement (9.8%), Peer-to-Peer Payments (5.7%), and Virtual Debit Card (5.2%). The digital industries that Metropolitan serves total 20 different industries, with the top industries being crypto currency (22.2% of total), mobile banking (17.8%), financial services to the unbanked/underbanked (14.4%), and correspondent banking (7.8%). The products that Metropolitan's GPG group offers and the industries that it serves is quite diverse.

The Road Ahead: Global Payments Group a Key Differentiator for MCB to Partner with Fintech Companies and Drive Deposit and Fee Income Growth

On top of Metropolitan's fast growing commercial bank, the bank has a global payments business that has been partnering with fintech companies and providing them with access to financial infrastructure. As this client group has grown, Metropolitan has built up deposits and fee income from serving this niche. In fact, deposits in this segment have grown from $26mm in 2014 to $401mm in 3Q20, or at a 61% CAGR. This low-cost deposit base provides the bank with funding for its commercial lending. Meanwhile on the fee income side, the global payments group has grown from $1.6mm in 2014 to $6.3mm in 3Q20YTD, or a 29% CAGR. Looking ahead, Metropolitan is serving only a small portion of the market with a large runway for the business to drive deposit and fee income growth for the bank with this differentiated business.

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M&T Bank

M&T Enhancing the Community Bank Model with Modern Technology to Elevate the Customer Experience

After several years of focus at M&T Bank on the BSA-related regulatory agreement and building a new risk management infrastructure starting in mid-2012, the bank exited the regulatory agreement in 2017. With the BSA-related regulatory agreement behind the bank and a new risk management infrastructure in place, management was able to shift part of its focus and resources towards investing elsewhere in the bank, in particular in technology. In addition to that, the bank is now less active on the M&A front and is more focused on investing and driving organic growth in their communities. Alongside the firm's shift in focus, new leadership was also introduced as René Jones stepped into the CEO role in late 2017 and under his leadership, M&T has increased its focus on investing in technology and competing in the digital age of banking. Half a year after René Jones stepped into his new leadership role, Michael Wisler joined M&T Bank as CIO in May 2018 and became a key player in driving the change in technology strategy at the bank and was a catalyst to start focusing on modernizing the bank's technology infrastructure. Mr. Wisler was previously at Capital One for 11 years as Managing Vice President of Technology. With a new leadership team with a focus on modernizing the bank from the front office to back office, this provides the bank with the platform to leverage technology along with their relationship model. M&T believes in being focused on the bank's strategic intent and how technology supports this. In recent years, the bank has pivoted to an agile method of product development which has changed the culture of the staff and how they work together in cross-department teams to create solutions in faster speeds.

M&T's Core Mission Remains Intact but Now Leveraging Technology to Modernize Solutions and Elevate the Customer Experience

As part of our research, we interviewed Rich Gold (COO), Michael Wisler (CIO), Peter Olsen (SVP, Commercial Banking), and Don Macleod (Director of Investor Relations). M&T's mission is to leverage who they are in the communities that they serve and be better in these communities. Instead of viewing digital only from a customer facing perspective, the bank views digital as a back to front capability to change the way the bank conducts business. To achieve this mission, the bank looks to:

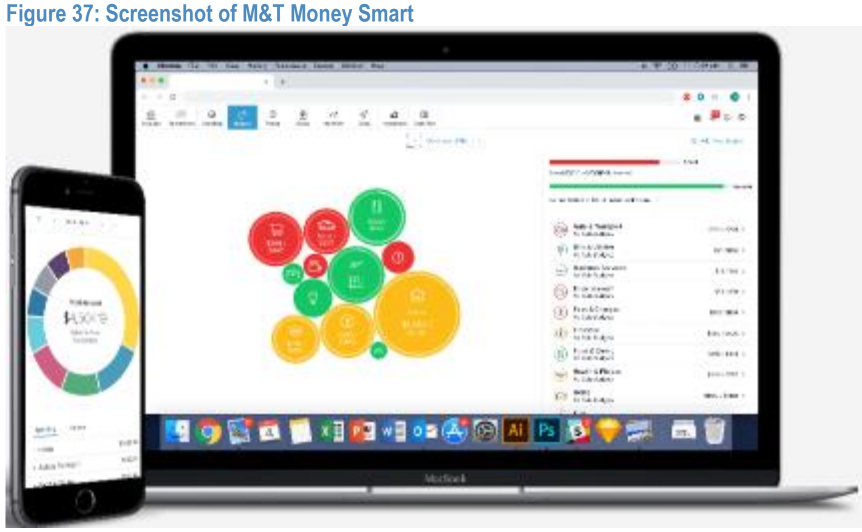
- differentiate the customer experience
- grow new customers and develop new markets
- achieve a level of operational effectiveness
- build a scalable risk management infrastructure

M&T is focused on providing customers with options to choose how they interact with the bank and conduct financial transactions. Consequently, an area the bank is in the process of upgrading is its digital online account opening to enable customers to onboard online. Retail online account opening was rolled out early in 2020 and towards the end of the year, M&T made it available for small business accounts. M&T also has a DASH in-branch one stop shop tool for helping customers with their account opening and servicing needs and taking account opening times from 40+ minutes down to 6-8 minutes, while reducing the numbers of systems needed to complete service transactions. The new online account opening process continues to improve with more features such as to handle joint accounts better. The phased rollout of this product and continuous improvement represents the benefits of the bank's new agile approach to product development which rolls out a product quicker to customers and the team improves the product over time.

The bank is actively piloting/testing new ways to offer chat and messaging capabilities to allow customers to interact with M&T. For internal chat, the bank implemented real-time chat functionality for bankers to resolve customer issues with dedicated Customer Service specialists. To empower customers, the bank partnered with a learning company, EverFi to provide financial literacy across consumer and business banking topics. These education services can be customer self-service on any device or through live virtual seminars for larger audiences. The bank also offers digital demos for bankers and customers to highlight various ways to engage with the bank and use its services and capabilities. These demos can be viewed with a banker or at a customer's choice of viewing (the bank forwards the URL to them). Additionally, M&T launched M&T Money Smart in 2019 which provided customers with a free digital tool in the bank's digital banking platform and mobile app to help users manage finances. Money Smart allows customers to combine all of their accounts (both M&T accounts and those from other banks) into one dashboard. With the tool, customers can create budget and use spending visualizations to help set financial goals and track every dollar while also forecast debt payoffs to project a date when the customer might be debt free. Key features of Money Smart include:

- Cash Flow feature to see daily spending power
- Combine non-M&T financial accounts like Venmo, PayPal, Acorns, and other bank accounts with your M&T accounts to view them all in one location
- Create a budget and track spending
- Forecast debt pay offs
- Set savings goal for emergency funds or for a vacation

Figure 37: Screenshot of M&T Money Smart



Source: Company website and J.P. Morgan.

Instead of only comparing the bank's customer experience with other banks, M&T also views technology companies like Amazon as elevating expectations for customer service in all aspects of the customers' lives including banking. Tied to this, the bank formed a new customer experience group with M&T hiring Aarthi Murali to lead the new customer experience group at the bank. Ms. Murali previously led client experience for J.P. Morgan's Commercial Bank and was with the firm for 17 years. The M&T customer experience (CX) team consolidated staff across the company into one team that includes UX designers and market researchers on customer satisfaction.

M&T Active with Fintech Partnerships and Is Plugged Into the VC Community to Have Access to Latest Technologies

Looking at the bank's core system, while M&T does not have a modern core, M&T is taking steps to make things more real time and shrink the core while being focused on two areas: data management and connectivity to plug and play into modern APIs (using cloud). In the past, M&T Bank was an active bank acquirer and was disciplined with integrating the banks onto a single system for each product such as for deposits and loans, which reduces the complexity of having multiple legacy systems. M&T is active in partnering with fintechs as well as being plugged into the VC community to be up to date on the latest technologies for banking. The bank seeks to scan the environment for emerging technologies, partners, and fintechs. For example, M&T is involved in the Canapi venture fund and NYCA Partners. The bank has an Enterprise Transformation Office team to focus on partnership with fintechs.

Currently, M&T has partnerships with companies such as nCino and Blend. Over the past several years, M&T undertook a project to build and implement a new commercial loan origination and administration tool for commercial lenders which was built on the nCino platform. In fact, success with the PPP is an example of M&T's ability to pair its banker model with technology to enable the bank to serve 35K PPP loan customers which included both existing and new clients. The bank was able to leverage an existing partnership with Blend Labs (a fintech company) and utilize services from Salesforce to create an interface for the PPP loan process in a short amount of time. In addition M&T also worked on a project with a group of engineers at the Cornell Business School to develop a small business analysis and valuation app that's in Beta with a small group of M&T customers.

Nota, an M&T Homegrown Fintech to Build a Bank for Lawyers

A prime example of the progress M&T has made in the fintech space is in the unveiling of Nota, a fintech solution to help lawyers manage trust accounts by using information directly from their bank accounts. This fintech was created to solve a specific problem of simplifying trust account management for a targeted niche of small law firms and solo attorneys. For this client niche, the challenge with managing trust accounts is that due to the smaller size of these clients, they lack the resources to manage these accounts effectively and as a result, M&T created a solution for them. Powered by M&T Bank, Nota is currently available only to customers who have an M&T Interest on Lawyer Accounts/Interest on Lawyers Trust Accounts (IOLA/IOLTA) account and an M&T Online Banking account. Within a few months, nearly 200 attorneys across 8 states were using Nota. Nota was conceived, developed and implemented internally at M&T and represents the capabilities of the bank to tailor technology solutions towards specifics needs of niche customers, where the bank can provide a differentiated customer experience.

Recruiting Technology Talent a Key Piece of the Puzzle and Community Approach a Differentiator with the Tech Hub in Buffalo, NY

In recent years, the bank has moved from a heavily outsourced model that relied on third parties to develop code to one that owns and develop the bank's own code. In fact, the bank has moved from a technology model that was about 40% in-house three years ago to one that is 85% in-house today. One key investment the bank has been making is in technology talent and the bank is attracting talent in many including building the Tech Hub in Buffalo, NY as well as emphasizing campus recruiting with a technology focus. M&T Bank has not been just hiring technology talent for the bank but rather has been building a community in downtown Buffalo with the Tech Hub to attract talent for other companies in the Seneca One building. M&T signed a long-term lease for an initial 330,000 square feet of space in Seneca One, with options to expand. M&T's plans to hire 1,000-1,500 developers within three years and other technology staff for the Tech Hub over time is to share the building with other likeminded technology people to create an ecosystem of technology talent. Having the technology hub would make Buffalo, NY more competitive in attracting and hiring more talent for the community. In fact, over the last two years, the bank has hired ~400 technology professionals to the bank. A key pipeline for technology talent was in the bank's campus program. To date, the bank has recruited ~130 technology program grads and is expected to recruit ~75 program grads per year going forward.

M&T's Success with PPP Provides a Glimpse of Capabilities of New Agile Approach to Creating Solutions Combined with the Relationship Model

The pandemic has supercharged the move towards digitizing banking and improving the customer experience. As an example of this, the bank adopted digital appointment setting in the midst of the pandemic and social distancing policies to allow its clients to set appointments to meet virtually or in-person in an efficient and safe way. Another way M&T has been staying in touch with customers during the pandemic by adopting Zoom and Webex video conferencing to access clients virtually and do business. The bank offers virtual appointment setting to bring account opening to a digital space and provide an opportunity for customers to open accounts while being assisted virtually through the process. For the bank, the goal with new technology is not for bankers to change behaviors but rather to provide them with more empowerment and ownership capabilities. On the customer side, digital solutions won't be a replacement for the vast majority of ways customers want to interact with the bank.

Alongside having an interface for customers to apply for PPP loans, the bank's relationship model was on full display as it offered clients a banker that understands the specific needs of the customer to guide them through the process. In one example of this model, a story was told to us of how a business banker went to a client struggling with the PPP process at night (9PM) to the client's kitchen table to walk through the process. While some competing banks may have the technology and portal for customers to apply for a PPP loan, due to the complexity of the process, customers may still need bankers to walk them through the process. This is a differentiating point for M&T which has a culture where business bankers are empowered to go and assist customers around the clock. Due to the massive volumes of PPP loans in a short time frame, the pairing of M&T's bankers with the appropriate technology was critical in being able to serve its clients effectively in a short time frame with limited resources. In addition to the ability to handle the volumes of applications from clients, the bank was one of the few banks that was initially able to automatically load PPP applications to the SBA website due to code written by the bank to streamline the process.

The Road Ahead: With the Talent and Culture Groundworks Now in Place, M&T's Relationship Model Now Paired with Agile Technology Teams to Create Solutions and Elevate Customer Service

At $140B in assets, M&T continues to operate one of the largest community bank model with the sole mission of serving its local communities. Along with this core mission that has remained the same for the last several decades, the bank under the new leadership of CEO Rene Jones and his management team has shifted to modernize the bank to compete in the digital age of banking. Some of the strategic shifts in the bank include changing the culture of the bank and move to an agile model to develop new products to elevate the customer experience. Alongside this change, the bank has hired technology talent aggressively with ~400 technology staff recruited in the past 2 years. The bank has partnered with companies like nCino and Blend to create products and solutions for its employees and customers. The bank's recent success in serving massive demand from PPP customers, both existing and new, totaling $7B in loans for 35K businesses. In addition, M&T ranked #1 by Greenwich in their Crisis Response Index (PPP) which showed a glimpse of the success of pairing M&T's relationship model with modern technology solutions. Tied to this we are more bullish on the long-term prospects for organic growth at the company as it moves forward with a strategy to marry its traditional community banking model with a modern infrastructure.

New York Community Bank

Separating from the Pack of Traditional Thrifts with System Upgrade Now Positioning for New Capabilities

Unlike the majority of banks in our coverage universe, New York Community is a mortgage thrift with NYC multifamily loans as its bread and butter asset class largely funded by higher cost time deposits and borrowings. The bank's depositor base is less representative of transactional accounts and instead largely older CD customers looking for the highest rate in its markets. Tied to this, technology for mortgage thrifts like New York Community are not perceived to be at the cutting edge as customers are more focused on interest rates rather than other banking features such as digital. However, with New York Community recently completing its core system upgrade in August 2020 (not to mention with everyone working from home), we find that the bank is now taking big steps towards modernizing its infrastructure. As part of our research, we interviewed Sal DiMartino, Managing Director - Director of Investor Relations and Strategic Planning.

NYCB Upgraded Core System to Enhance Digital and Payments Capabilities

As the digital banking needs of customers advance, New York Community has taken steps to position itself to remain competitive in offering digital capabilities to its customers by upgrading its outdated core platform. The bank announced in February 2019 that it had partnered with Fiserv to move to its DNA core platform which is built on an open architecture and adds digital solutions such as retail banking, commercial lending, commercial cash management, business banking, and payments to name a few. The bank moved from in-house processing to an application service provider (ASP) model hosted by Fiserv to enhance efficiency and lower technology costs. This customized platform created for New York Community allows the bank to modernize its technology and improve the customer experience. In one example of this, New York Community now processes all rent payments thru a 3rd party product (thru Fiserv) that they bolted on to their core. Another example is an improved account opening process which used to take 40-45 minutes under the old system and the goal is to reduce this down to 15 minutes, dependent on the account type. Some updates to New York Community's technology infrastructure and offering include (see table):

Figure 38: Updates to New York Community's technology infrastructure and offering

Updates to New York Community's technology infrastructure and offering	Moving to Fiserv's DNA, a continuously available real-time core platform built on an open architecture
	Adding integrated digital solutions from Fiserv including Commercial Center for commercial cash management and business banking
	Adding the open, real-time Dovetail Payments Platform
	Moving existing in-house solutions including the Corillian Online and Mobiliti digital banking solutions from Fiserv to the Bank's new outsourced environment

Source: Company reports and J.P. Morgan.

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New York Community Modernizes Online and Digital Offerings

One example of the company's modernization is the improvement of the account opening process under the new technology which makes it easier and faster for branch employees to sign up customers for accounts. New York Community also now has an improved mobile app and offers Zelle and other key features to customers. Even with investments in upgrading the core system, while the bank does not disclose its technology spend as a percentage of revenues, this ratio is likely below peers due to the efficient cost structure of the bank. For reference, as of 3Q20 New York Community's efficiency ratio of 43% is well below peers at 56%. New York Community follows a wait and see approach towards new technologies rather than be first in line to create innovation technology solutions for its customers. Consequently, while New York Community Bank may not have advanced offerings like robo-advisors, it now has an updated core system and can now focus on offering a competitive digital product offering including a better online and mobile experience. To date, New York Community offers online and mobile banking to its retail and business customers with functionalities such as NYCB Money Center which pulls in all of its customers' financial data from external accounts and includes their home values to see their complete financial picture.

Figure 39: Key Features of New York Community's Online and Digital Capabilities

NYCB Online	NYCB Mobile	NYCB Business+ App
View account balances Pay bills Send money with Zelle Transfer funds Pull in financial data from external accounts Access electronic documents	Instant Balance - No need to log in Fingerprint Login and Face ID Mobile Alerts Check Account Balances Pay Bills Pay People with Zelle Transfer Funds Mobile Deposit e-Statements and check images Find Locations	24/7 Account access from your mobile or tablet device View pending transactions Transfer funds between your accounts Originate ACH and / or Wire Transfers Approve or Cancel ACH and / or Wire Transfers Make mobile deposits Approve Positive Pay transactions

Source: Company reports and J.P. Morgan.

In addition to the online and mobile platform for retail and business customers, the bank also has the NYCB Debit+ App for NYCB debit cards. With the app, customers can turn on and off their credit cards, establish transaction controls such as dollar amount limits, merchant categories and geography, and receive alerts. These features enable fraud protection, spending controls, and business use such as ensuring employee spending adheres to company policy.

Figure 40: New York Community's Debit + App

Source: Company reports and J.P. Morgan.

Leadership with Decades of Experience at the Bank Driving Modernization

The drive towards modernization of the bank's core systems is led by Chief Operating Officer Robert Wann and Assistant Chief Operating Officer Barbara Tosi-

Renna. Mr. Wann joined New York Community in 1982 and has nearly four decades of experience at the bank. Meanwhile, the bank's Chief Information Officer, Robert Brown, is a home-grown leader with over 30 years of experience at New York Community and has grown as the bank increased in size through organic growth and acquisitions. This contrasts many peers which have CIOs that join from other industries such as the technology sector. Meanwhile the bank also hires talent from outside of the bank industry such as for the role of Chief Data Officer who is in charge of creating a data warehouse.

The Road Ahead: A New Technology Infrastructure Allows for the Bank to Equip Employees to Expand Relationships and Improve Deposit Franchise

In the past, New York Community has used the M&A lever to acquire lower-cost deposit franchises to fund its lending opportunities but in recent years when M&A opportunities have been more limited, it has become increasingly important for the bank to acquire lower cost deposit relationships by acquiring more non-CD deposit relationships. Competition against other thrifts today will still be driven by offered rates, but newer, younger customers won't be coming to NYCB for CDs like its legacy older clients, but rather for online banking and convenience and that's where NYCB is more focused now. When combining New York Community's new technology infrastructure and offering with an update to the sales culture in the firm to focus more on deposit relationships outside of CDs, New York Community has the potential to improve its deposit franchise and improve its net interest margin profile over time. While the systems upgrade was only recently completed in August 2020, the bank is now training its employees on new systems and positioning the bank to be more competitive in acquiring deposit relationships both on the retail side and from existing customers which were traditionally lending only relationships. In one example of how New York Community is focused on getting more operating relationships from its borrowers, when borrowers requested loan deferrals in response to the pandemic, the bank made it a requirement for borrowers to also bring over its operating accounts in order to receive a loan deferral. While it is still the early innings of New York Community's modernization, this is one area where the progress is worth monitoring in the years ahead. As a glimpse of the potential for the bank to modernize and leverage new technologies, the bank already has quant and data teams in New York and Cleveland (Business Intelligence team) to provide insights using customer data and to drive business decisions.

People’s United Financial

People’s Business Transformation Office Highlights New Focus of the Bank to Adapt to a Changing Landscape

As part of our research for this report, we interviewed a several leaders of People’s management team including Sara Longobardi (Head of Retail Banking), Mark Herron (Chief Marketing Officer), Ravi Vakacherla (Chief Transformation Officer), and Andrew Hersom (Head of Investor Relations). In August 2020, People’s United formed the Business Transformation Office, a new specialized team to focus on digitization, process optimization, and fintech partnerships in addition to supporting product strategy and management. Notably, this team is separate from the roles of the Chief Technology Officer and Chief Information Officer and is charged with identifying new products and services along with improving employees’ ability to use technology. To lead this new team, Ravi Vakacherla was appointed EVP and Chief Transformation Officer in August 2020. Mr. Vakacherla has been with People’s United for more than 15 years and has held various roles, starting in information technology, holding the role of Chief Architect, before transitioning to Head of Digital, Product Management, and Banking Operations. Among regional banks that we cover, People’s United is the only bank to have a dedicated team for business transformation and highlights the focus the bank is placing on ensuring it is well-positioned for the changes in the digital age of banking. From our conversations with the management team, one clear benefit of having the new Business Transformation Office is the ability for the key members of the management team such as the Head of Retail Banking, Chief Marketing Officer, and Chief Transformation Officer to work together regularly to remove siloes and address customer needs. The new Business Transformation Office has the goals of:

- Digitization
- Process optimization
- Fintech partnerships
- Identifying new products and services by looking at emerging trends and offering this to customers

Shift in Data Strategy Several Years Ago Became a Platform for the Bank to Modernize Its Technology

People’s United reached an inflection point about four years ago when it focused on a new data strategy which eventually transitioned to a fuller technology strategy to propel the bank into the digital age of banking. The digital strategy allows for the bank to have a 360 degree view on customer data. This process included consolidating data across hundreds of systems. As People’s acquired multiple banks over the years, the bank has been disciplined with keeping the technology stack simple and has reduced the number of systems for the consolidated company to only one system per product such as consolidating into one mortgage system and one deposit system, as an example. People’s uses the FIS IBS platform for its deposits which also provides the company with API capabilities. For large commercial loans the bank uses the ACBS offering. People’s has some applications on the cloud while also having its own servers. However, People’s does not currently have a cloud-first strategy and acknowledges that while there may be significant value in having a cloud first strategy, it is not an impediment to the bank’s technology strategy. The company is in the process of developing its customer decision hub and expected to rollout in 2021, which will be an engine with artificial intelligence and machine learning that looks at data online and offline and suggesting the next best action.

Partnerships with Fintechs Have Been Ongoing at the Bank to Enhance the Customer Experience

For People's to bridge the gap between itself and bigger banks on technology, the bank has leaned on the strategy of partnering with fintechs to create new solutions for customers. While the bank had already been doing the tasks that are now the responsibility of the Business Transformation Office, including partnering with fintechs to bolster the customer experience, People's now has a dedicated team focused on partnering with fintechs and aligning it with the rest of the firm's strategy. People's United was a relatively early adopter of Blend Labs' technology in originating mortgages, which shows the banks' willingness to partner with fintechs and experiment with new technologies. Meanwhile, on the business lending side, People's partnered with Numerated in December 2018 for its digital business lending solution to speed up the process for business customers to apply and receive credit. During the pandemic, the partnership with Numerated helped People's serve its business customers with PPP loans. As of 3Q20, People's had $2.6B in PPP loans which represented 4.2% of total assets. The bank also partners with Horizn to create digital simulated tools and allows bankers to send demos to customers on how to do things on its mobile app. These efforts are early signs of how PBCT is bridging the gap between large banks with the fintech partnerships they're doing.

People's Now Rolling Out New Products Across the Bank Including AlwaysChecking for Free Digital Identity and Credit Protections

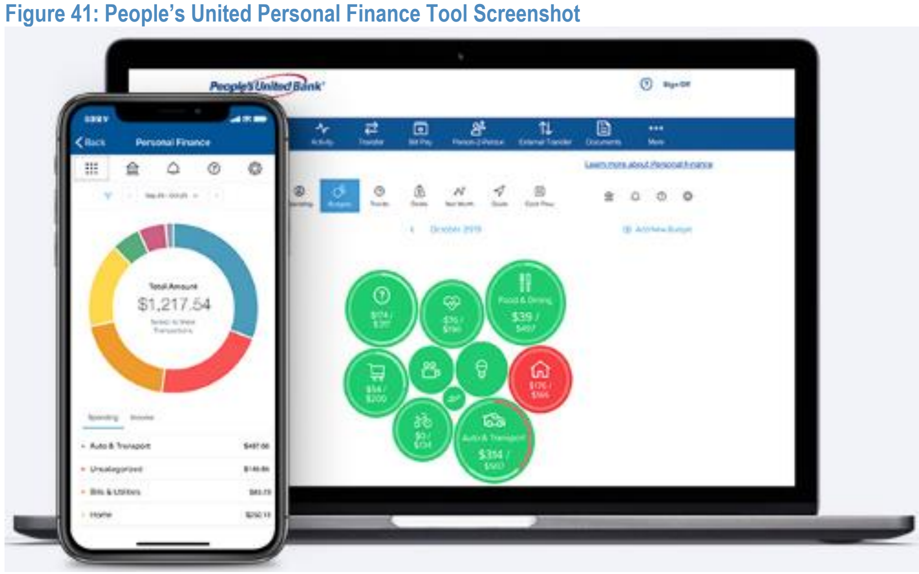
The bank's focus on improving the customer experience is seen in its rollout of new products for the customers that peers may not have. One differentiated product that People's rolled out in July 2020 was a free digital identity and credit protection service called AlwaysChecking in partnership with Experian for all personal checking account customers. With fraud being a top concern in a digital environment as customers migrate digitally due to the pandemic, People's new product provides customers with a way to monitor their online, credit, and family information from one centralized dashboard. To do this, customers can register their credit cards, their family's internet profile, and even their license and passport and monitor it in real-time. The rollout of this product shows People's ability to offer products to improve the customer experience and in this case, for free.

Other consumer offerings from People's include its free "Personal Finance" tool which is an online money management tool that gives customer access to view transactions and balances across all of their accounts (such as retirement, other investment accounts, mortgages and loans, and even non-bank assets) at multiple financial institutions. While this is a tool that the bank has offered for a while, it shows the bank's focus on improving the customer experience with free services. The tool enables the customer to track spending, customize budgets, and plan against financial goals, with insights. Personal Finance features include:

- **View multiple accounts** across multiple financial institutions
- **See all transactions.** Transactions are categorized (groceries, gas, utilities and more).
- **Track spending.** Visual snapshot of spending habits (with transactions categorized) compared to expenses to help you meet budget and savings goals.

- **Set budgets.** Tools to set budget based on categories and colorful visuals to track spending versus budget.
- **Monitor trends.** Compare spending in different categories month to month and identify areas of overspending.
- **Pay off debt.** Get detailed insights to help you plan how you'll pay off your debt, including timelines and payoff scenarios.
- **Estimate net worth.** Estimate net worth by linking non-bank assets or equity like vehicles, property and income-earning assets that contribute to your overall net worth.
- **Meet savings goals.** Create savings goals for important life events like getting married, buying a house, saving for college or vacations, as well as goals to pay off debt.
- **Cash flow.** See recurring spending and payments and compare against regular earnings to better understand and plan for regular expenses and plan ahead for additional ones, including planning for the unexpected.

Figure 41: People's United Personal Finance Tool Screenshot



Source: Company website.

Meanwhile on the business banking side, the bank offers tools such as Business Online Banking with eTreasury+, which enables businesses to manage cash flow and transactions online or on mobile. People's United recently enhanced its treasury management technology suite with the addition of electronic billing and payment capabilities. Key features of the Business Online Banking include:

- **Centralized controls.** Manage daily cash flow across accounts with a single sign-on and multi-user functionality.
- **Payments.** Schedule ACH payments and initiate domestic and international wires.
- **Receivables.** Initiate ACH collections and schedule recurring collections.
- **System security.** Secure access with multi-factor authentication and data transmission encryption.

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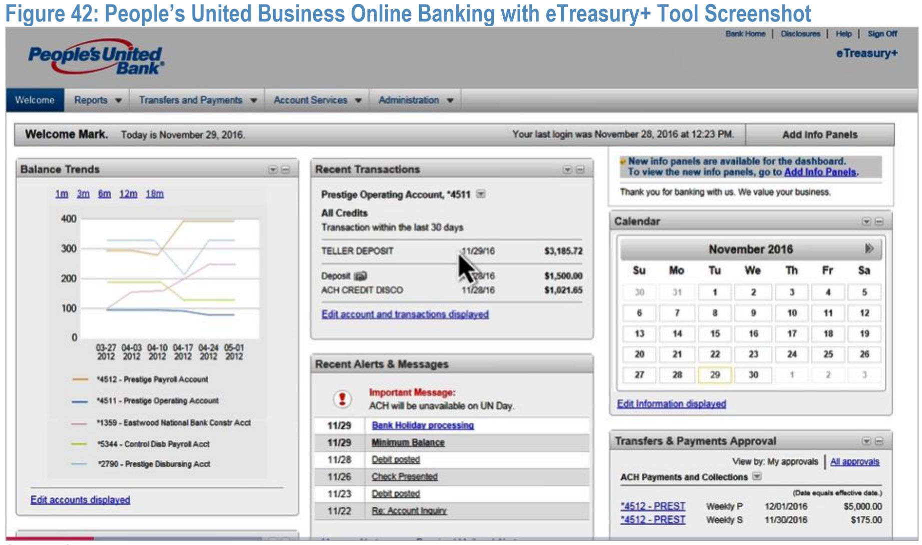
Figure 42: People's United Business Online Banking with eTreasury+ Tool Screenshot



Source: Company website.

The Road Ahead: With New Business Transformation Office, People's United Now Focused on Adapting to the Digital Age of Banking

People's United has undergone transformation over the past few years with a focus on adapting to the changing environment of the digital of banking. Over the years, the bank has been relatively early to partner with fintechs to provide an improved customer experience like with Blend for mortgage lending and Numerated for business lending. On top of that, the bank has also been creating new and differentiated products for consumers such as its new AlwaysChecking tool. On top of the change that has already been taking place at the bank, a newly formed Business Transformation Office was recently formed with a dedicated mission of digitization, process optimization, and fintech partnerships. The partnership of this newly formed team with the rest of the organization should allow for increased adaptability to changing customer expectations but with it still being in the early innings of rolling out new and differentiated products for the bank, the end goal is to acquire more households as well as retain customers.

Pinnacle Financial Partners

We Were Impressed with Pinnacle: Actively Partnering with Fintechs to Enhance the Relationship Model and Remain a Leader in Customer Satisfaction

Over its 20-year history since its founding in October 2000, Pinnacle has had a business model that focuses on creating deep relationships between the company's experienced bankers and their local borrowers. Importantly, while there is still a high degree of personal touch and human interaction in these relationships, technology plays a very important role in helping to execute this business model. For example, while Pinnacle has a company-wide strategic plan that focuses on all aspects of the franchise, there is also separately a technology strategic plan that is augmented based on the firmwide strategic plan. Moreover, beyond Pinnacle leveraging technology in areas such as (1) having a 24-hour call center that can help customers resolve essentially any issue they have, (2) overhauling call center technology and implementing more interactive technology (using chat/video) to better serve clients, and (3) enhancing fraud early detection and prevention capabilities, the company has rolled out a host of new treasury management products. More specifically, an active partnership with Apiture, a company that helps to deliver innovative digital solutions using technology for the financial industry, should result in additional enhancements to a variety of financial products including treasury management, account opening, online banking, and the mobile app. With Pinnacle combining its high touch relationship model with a handful of fintech partnerships that have allowed the company to provide the latest technology offerings to its customers to help improve the customer experience, it is no surprise that Pinnacle's net promoter score (NPS) of 60 ranks as the third-highest NPS across our coverage universe (median NPS of 37).

Industry-Leading Customer Satisfaction Scores Driven by Experienced Bankers and Simplicity of the Company's Technology

At Pinnacle, we interviewed Hugh Queener, Chief Administrative Officer. One of our initial questions was how Pinnacle is able to generate such a high net promoter score and customer satisfaction scores relative to the rest of the industry. In fact, beyond just overall customer satisfaction, Pinnacle ranks well ahead of other banks' scores in many other areas including problem resolution, communication and advice, and online banking. To this end, the response to our initial question was that there are three reasons that have helped drive Pinnacle's impressive satisfaction scores:

1. **Hiring model** of only hiring experienced bankers and technicians
2. **Simplicity** of the company's technology and easy to use interface (from a user's perspective). Many of Pinnacle's customers are local companies that do not require or seek advanced technology for their banking needs.
3. **Mistake-free operations.** Pinnacle has dozens of metrics that it tracks internally on a monthly basis that are able to pinpoint areas of improvement.

To this end, Pinnacle uses technology as an enhancing tool that complements in-person interactions between bankers and customers which helps to create longer-lasting relationships. We would note, however, that much of Pinnacle's technology offerings come in the form of partnerships with (and even investments into) fintechs that have a similar value proposition as Pinnacle and leveraging their technology, rather than having in-house programmers build the technology from scratch. Moreover, investments into fintech funds (that invest in a variety of companies that

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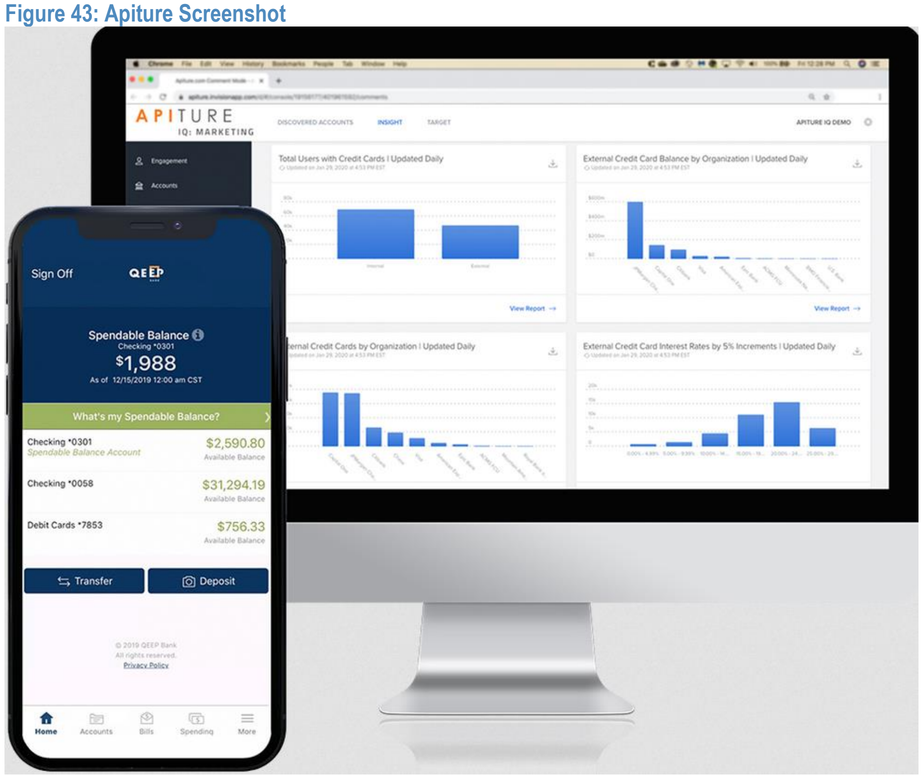
range from early stage to mature stage) can also allow Pinnacle to stay on top of the latest technology and give them some early looks at potential new opportunities. While two examples of fintechs that Pinnacle is involved in include Five Iron Technologies (provides Pinnacle with a way to source information security professionals and scale their service offerings) and Corserv (leading a major enhancement for purchasing cards; Pinnacle is an account issuer for 25-30 other banks), as a prime example of one fintech partnership, Pinnacle has partnered with Apiture, which we provide more context into in the following section.

Partnership With and Investment Into Apiture Provides Enhanced Digital Banking Capabilities While Easing Pain Points for Customers

Founded in 2017 as a joint venture between First Data and Live Oak Bank, Apiture provides its digital banking solutions to over 400 banks, insurance companies, and other players in the financial industry. Apiture uses APIs to deliver innovative cloud-native platforms and products to its financial institution customers, in areas including online and mobile platforms that assist customers with processing vendor payments, sending money to friends and family, and enabling mobile check deposits. Apiture also assists financial institutions with the digital onboarding process and allows customers to open a financial account (either through the web or through a mobile app) in a few minutes, all without ever setting foot in a branch.

Figure 43: Apiture Screenshot



Source: Company website.

As for Pinnacle's involvement in Apiture, as publicly disclosed a few months ago, Pinnacle was one of the participants in a $20mm fundraising round into Apiture in July 2020 after being a customer of its digital banking offerings for many years. One of the reasons for this investment, rather than simply using Apiture's suite of products, was for Pinnacle to have a much closer relationship with Apiture rather than it being a vendor-like relationship. Moreover, even though Pinnacle has strong customer satisfaction scores, another reason for the investment actually dates as far back as Pinnacle's acquisition of BNC Bancorp (completed in June 2017) where at the time, it was evident internally that investments in technology was needed. Fast forward a few years and Apiture has helped in a variety of areas. Thus far, Pinnacle has leveraged or will leverage Apiture's digital banking platform in the following ways:

- Introduced new treasury management products
- Rolled out online banking and mobile banking offerings
- Upgrading the ACH system
- Significantly enhancing entitlements across financial products (to control permissioning across financial products for user approval of transactions)
- Simplifying the online account opening process

In addition to leveraging Apiture's digital banking technology to enhance the customer experience for a handful of financial products, Pinnacle also had a great deal of success with the PPP program with much of this success due to the company's partnership with Numerated.

Leveraging Numerated's Technology to Drive Success During the PPP Program

As a specific example of how Pinnacle has used technology to drive success, we point to Pinnacle's involvement in the PPP program earlier in 2020. When the PPP program was launched, Pinnacle did not have an easy-to-use solution to deploy this program to its commercial customers. However, Pinnacle had already been using Numerated (an early stage company) and its lending platform for another small business program that it had been involved in and ultimately decided to end up leveraging Numerated's platform which it was able to set up in a few days and automated the entire PPP origination process. The usage of Numerated's platform, which offers prefilled digital applications, automated decisioning, and various sales and marketing tools, helped Pinnacle originate $2.4B in PPP loans to over 14K businesses across five states. We would note that relative to regional bank peers, the $2.4B of PPP loans that Pinnacle originated represents ~8% of the company's total assets, which is above the peer median of ~5% in PPP loans as a percentage of assets. The involvement with Numerated does not stop at the PPP origination process, however. Looking ahead, Numerated will also help with the PPP forgiveness process and will allow PPP borrowers to interact more directly with the Numerated platform when applying for forgiveness, thereby allowing the Pinnacle banker to get involved only at the very end (and avoid much of the administrative work).

Could Move to a New Core in the Coming Years with Migration to Cloud Also a Possibility

One of the outcomes of Pinnacle's acquisition of BNC Bancorp (completed in June 2017) was that a core provider had to be chosen for the combined company as legacy Pinnacle was running on the Fiserv Premier core and BNC was on a Jack Henry core. Ultimately, Jack Henry was chosen as the combined company's core provider which required the legacy Pinnacle franchise to be migrated over to Jack Henry. However, with the current Jack Henry platform not a modern core, the company could upgrade its core platform in the next 3-5 years, which would allow Pinnacle to offer additional capabilities for its financial products, with Finxact one upgrade option (among other providers) as this is more focused on the core processing side (although does not have the servicing side). Additionally, while Pinnacle currently has some

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applications on the cloud (including Apiture which uses Amazon Web Services for its online banking product), the company's data (currently on site) could migrate to the cloud as well (offering lower infrastructure costs and enhanced security).

Looking to Leverage BHG's Data and Analytics Group on the Pinnacle Side

While Pinnacle does not have an analytics group or in-house programmers, it does have access to an analytics group through its investment in Bankers Healthcare Group (BHG), a direct lender that provides loans to high income professionals (primarily those in the healthcare industry) used for items including term working capital needs, consolidation of outstanding debt, or financing long-term investment projects. Pinnacle owns 49% of BHG. Similar to Pinnacle, BHG also has high customer satisfaction scores (for both its external client base as well as its downstream bank partners on the funding side) which is in part driven by its robust customer service platform that uses analytics to understand what BHG customers want and improve the customer experience. In fact, BHG has about 40 people in its analytics group (with a handful of these employees being PhDs) that assist in various data-driven decision making efforts, including predictive analytics, production analytics, and data management.

Figure 44: BHG Areas of Data-Driven Decision Making

Source: Company reports.

Through the predictive analytics segment, BHG has been able to determine that about 20-30% of its business is coming from repeat customers which can help create more targeted marketing efforts. With this in mind, Pinnacle is able to leverage BHG's data analytics group to help with analytics for its business, with a joint agreement for BHG's credit card an early example of this partnership, and the two companies continuing to look other products and lines of business that can leverage each other's strengths.

The Road Ahead: Fintech Partnerships Position Pinnacle Well for the Long-Term to Drive Years of Continued Growth and High Customer Satisfaction

Pinnacle's approach to partner with fintechs is unique in that the fintechs that the company partners with are not necessarily viewed as vendors but rather full partnerships (and even investments at times) as the company's contacts are high level individuals at these fintechs. This dialogue helps to ensure that the fintechs know exactly what Pinnacle wants when rolling out a new product or feature. With this in mind, while Pinnacle has already made some investments into fintechs, continued investments into fintech funds can allow the company to remain a leader in getting a first glimpse at and adopting new technology before peers, which can help drive an improved customer experience. Moreover, on the rollout of new technology, Pinnacle has an in-house learning and development group that acts as a training department and creates programs for bankers to quickly get up to speed with interacting with the company's systems and processes (including new technology). Taking all of these items together, Pinnacle's technology offerings help to empower the company's experienced bankers to quickly solve customer problems, and this combination has resulted in customer satisfaction scores that should remain well ahead of the industry for years to come and contribute to a growth level in the company's Southeast footprint that is ahead of peers.

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Signature Bank

Signature's Relationship Model the Primary Driver of Customer Satisfaction

Signature's business model is one that focuses heavily on their relationship managers and their high touch service levels as opposed to leading with technology offerings. The relationship managers own the customer experience and the CIO and CTO implements the best solution to meet client needs. Signature's strategic focus is on the market of privately held business owners which is a specific niche that is more reliant on the relationship model. Signature Bank's priorities on technology is driven by feedback from bankers and the needs of their customers. As part of the bank's strategy to hire veteran bankers from other institutions, the bank also learns from the new employees about technology and best practices from their prior institutions. When there are common themes from the bankers, Signature would know to prioritize these issues. With Signature being a relationship bank focused on commercial customers where the veteran relationship managers are the primary driver of customer satisfaction, the bank relies more on high touch service than differentiating on technology offerings. This relationship model provides a consistent and direct feedback loop on direct client needs via the bankers and the relatively flat organizational structure at the bank allows banker access to top management and key groups to address customer needs and provide customized solutions. Tied to the bank focusing on operating an efficient banking model that is branch light and do not rely on marketing to drive business growth, the bank also has an industry low efficiency ratio. Given that Signature's model has a low efficiency ratio, Signature is also below peers which typically spend 10% of revenue on technology. For our research on the Signature model and how it uses technology to improve customer service, we interviewed Eric Howell, EVP - Corporate and Business Development and Brian Wyremski, Investor Relations & Corporate Development Manager.

Commercial Focus Result in Less Demand for Technology than Consumers

For its core banking system, the bank uses FIS Systematics. Existing technologies include remote deposit capture and remote official check, where the bank can print out official checks at closings. Other commercial products include monogram escrow and 1031 exchange products to serve unique client needs. For CRE relationships, the bank has product segment support for products to complement this niche of customers including invoice repayment services and rent security handling. In terms of new technology solutions, the bank is in the early innings of developing a "tear sheet" on customers and contact management. This ability to view insights on customers empower the bank's relationship managers to be more effective in serving customers effectively. Signature also uses fintech nCino for a new frontend lending system to streamline the lending process. Tied to Signature's commercial customer focus, this clientele rely on their relationship managers for all banking services with there being no "1-800" number as clients call their Signature bankers directly when in need of help. As such, investments in technology at Signature leans towards helping relationship managers better serve their customers.

Leveraging Blockchain Technology for Payments Platform a Key Differentiator

One area where Signature differentiates on the technology front is with the rollout of its Signet payments platform in partnership with trueDigital (recently changed name to Tassat) which uses blockchain technology. The usage of blockchain technology allows for real time payments between Signature's commercial clients in US dollars 24/7. This compares to traditional corporate payments using the SWIFT interbank platform or the Automated Clearing House (ACH) network which can take as long as three days and are generally not available on weekends. For customers, transactions made on the Signet platform incur no transaction fees. Introduced January 1, 2019, the Signet platform is the first of its kind to be approved for use by the New York State Department of Financial Services and on June 23, 2020, the bank announced the launch and integration of the full functionality of its Signet platform with Fireblocks, a client and an enterprise-grade platform delivering a secure infrastructure for moving, storing and issuing digital assets. New Signet APIs allow clients like Fireblocks to integrate their systems with the Signet platform to access full transactional capabilities.

In the use case of the first customers to sign up was power supply company American PowerNet which chose to use Signet to facilitate real-time payments within the renewable energy sector and to purchase power for Pennsylvania. Signet allowed American PowerNet to settle with power generators on a daily basis once schedules are confirmed, as compared with the traditional 30-day payment structure that has long been the industry standard. The Commonwealth of Pennsylvania through its electric supplier relationship with American PowerNet is the first entity in the country to purchase its power using Signet. Additionally, the Lancaster County Solid Waste Management Authority has also begun to incorporate Signet into its regular transactions of buying and selling power via American PowerNet's Verde Blocks platform, a blockchain technology that provides large retail electric buyers direct access to sustainable power generators.

The Road Ahead: Growth Opportunity at Signature Bank Driven by Relationship Managers Rather Than Technology Model

Signature Bank continues to be one of the best positioned banks to drive outside growth due to the bank's model of acquiring veteran bankers with significant business opportunity. Contributing to this growth potential is the bank's expansion into funds banking, venture banking, specialized mortgage banking, and the West Coast expansion which accounts for a large number of new teams at the bank. Certain technologies like Signet for commercial payments are innovative and have the ability to drive low cost deposits as commercial clients utilize the product. Other products the bank is looking to offer to clients include foreign currency, particularly for clients in their new West Coast market. Meanwhile on other technologies in the pipeline, the bank is targeting on rolling out tools for its bankers to be more effective in serving its customers.

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SVB Financial Group

Combining Its Differentiated Niche of Serving Startups with Technology to Create a Frictionless Experience for Clients

Silicon Valley Bank is a unique bank in that not only are its customers primarily commercial-oriented (rather than retail), but also its commercial customers are predominantly tied to the startup ecosystem and include venture capital firms, private equity firms, and startup clients across the entire lifecycle ranging from seed stage to late stage. With this in mind, Silicon Valley Bank has been able to carve out a niche client base across the globe since its founding in 1985 and today commands a 50% market share for banking US VC-backed startups. While the success of the company's business model is in part tied to the deep expertise that its bankers have on clients (including in industries such as technology and life science), the role that technology has played is that it acts as an enabler that helps create a more seamless experience between bankers and clients, helping to drive overall customer satisfaction. More specifically, the financial products that Silicon Valley Bank offers to its clients that use technology include products on global payments, foreign exchange, API banking, and an idea-generation community that brings together different functions including finance and operations that can help startups further develop their businesses and reduce friction points, ultimately enhancing the overall client relationship.

The Desire to Reduce Friction Points on Areas Such as Onboarding Using Digital Efforts Is a Simultaneous Need by Both Employees and Customers

At Silicon Valley Bank, we interviewed Dan Beck, Chief Financial Officer, Meghan O'Leary, Head of Investor Relations, and Anna Vu, Investor Relations Director. An overarching theme we heard in our discussion was that while Silicon Valley Bank works with many technology startups that are actively innovating new technology products, it was interesting to hear that these clients do not necessarily need the latest innovative features for their financial products. With this in mind, one of the areas around the banking experience that is important to customers as well as employees is around the onboarding process with the goal of this process to be as smooth as possible. As far as ongoing efforts to improve this experience, the company is in the process of rolling out a fully digitized client onboarding experience to try and take some of the administrative aspects out of the equation.

Technology Investments Revolve Around the Company's Strategic Plan Priorities Which Have Helped to Accelerate Client Acquisition

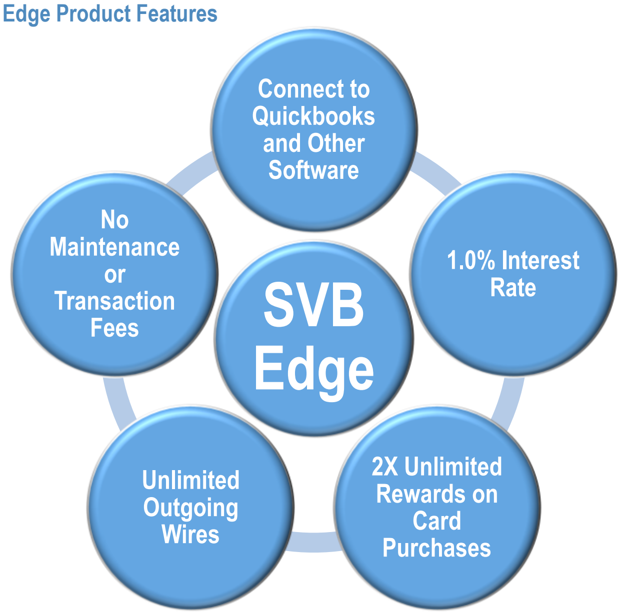
Many of the investments (in both technology and other areas including people) are focused on executing the company's strategic priorities to drive long-term growth through a combination of (1) enhancing the client experience, (2) improving employee enablement, (3) driving revenue growth, and (4) enhancing risk management. These investments have helped drive new client acquisition with the rollout of new products for clients helping to improve areas such as client onboarding and provide more client insight. Over the past five years, Silicon Valley Bank has invested in areas such as (1) end-to-end digital banking (including creating a new platform for clients that can make it very easy to access lending products), (2) APIs, (3) strategic partnerships to expedite product delivery, (4) technology platform upgrades, (5) mobile and collaboration tools, and (6) a credit onboarding platform through nCino, just to name a few. Outside of these products and services, many of the company's other efforts reach multiple parts of the company and do not necessarily break down into specific products. We highlight in the following section, though, some of the products that Silicon Valley Bank does offer to its clients.

Products Are Catered to the Unique Needs of Silicon Valley Bank's Startup Clients

With Silicon Valley Bank serving startup clients as opposed to traditional commercial customers, the financial products that it offers are unique in that they offer features that are geared to the differentiated needs of these clients. We provide a sample of these products below:

- **<u>SVB Edge:</u>** a business checking account catered towards startups (especially pre-Series A round companies)

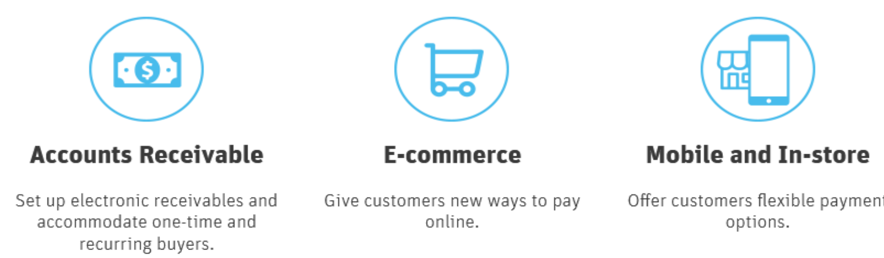
Figure 45: SVB Edge Product Features



Source: Company reports.

- **<u>SVB Global Merchant Services:</u>** a global payment acceptance solution that offers an integrated and seamless global payments platform

Figure 46: SVB Global Merchant Services



Source: Company website.

- **<u>Global Digital Banking:</u>** access accounts and services through an online banking portal and mobile app
  - Make global payments electronically and simplify payment processing
  - Foreign exchange services support receipt of global payments in local currencies

- Real-time view into cash flow through customized reports
- Receive alerts on transactions, account updates, and approval reminders

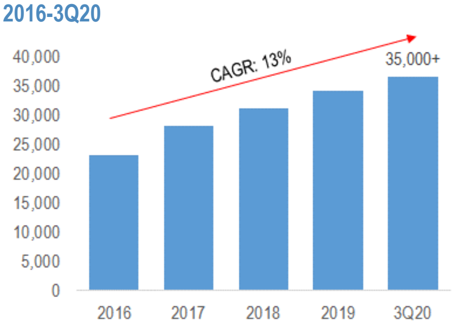
- **Other banking services:**
  - Bill Pay Plus: manage bill payment process online (supports integration with a network of over 600,000 vendors)
  - Transact Gateway: streamline payment processing and account reporting by integrating with accounting tools
  - API Banking: API solutions provide to developers access to data and payment operations that allow for integration with their platforms
  - Innovator Toolkit: connect to a network of finance, operations, human resources, and accounting services

- **Private Bank and Wealth Management:**
  - Improving the onboarding process (including reducing the time it takes to onboard a client and moving away from paper)
  - Creating a digital-like and frictionless experience that is easy for clients to use (but combining this with a human touch)
  - Investing in collaboration tools (including tablets) so bankers can access CRM systems remotely
  - Foreign exchange transactions: simplify a multi-step process of converting funds to another currency into one easy transaction
  - Offering debt products through third-party platforms for limited partners that are interested in investing in the innovation economy (through debt)

Current Core Platform Suitable But in the Early Stages of Migrating to the Cloud

Silicon Valley Bank's existing core platform appears to be sufficient, at this stage, to support the technology that its financial products use. Moreover, Silicon Valley Bank has "only" 35,000+ clients as of 3Q20, compared with several million clients for some of the largest regional banks. With these items in mind, a core platform replacement (which can take years and is expensive) is unlikely given the cost benefit analysis of the project. While a core replacement can result in some incremental benefits in terms of products and features that the company is able to offer to clients, from Silicon Valley Bank's point of view, these benefits are likely to be outweighed by the cost and risk that is involved with implementing a new core. Rather, it is likely that new features are compatible with the company's existing core platform and technology dollars are spent on building additional products (rather than a core upgrade) with the real focal point being on not just the core itself but rather the interconnectedness of different products that the core is linked to, including on areas such as data and analytics.

Figure 47: Silicon Valley Bank Number of Clients, 2016-3Q20



Source: Company reports.

Instead of undergoing a wholesale upgrade to the core platform, one area of ongoing focus on technology is on the cloud strategy. While Silicon Valley Bank's cloud efforts are still in the early stages, a continued migration to the cloud can provide the company with a variety of advantages including (1) lower infrastructure costs, (2) usage of APIs that already exist on the cloud, and (3) a more robust testing environment for new products and features.

The Road Ahead: Network Effect in the Startup Ecosystem Remains Strong Which Positions the Company Well for Years of Continued Growth

Silicon Valley Bank has established itself over the past three decades as *the* bank of the innovation economy (with a 50% market share for US VC-backed startups). This dominant position has allowed the company to navigate through a challenging environment that will likely continue facing headwinds on rates over the next several quarters. With Silicon Valley Bank using technology as an enabler to help reduce friction points for both bankers and clients, coupling this with the deep knowledge that bankers have with clients, it's unlikely that another bank will be able to pick away at Silicon Valley Bank's client base solely by using technology (with startup clients typically not demanding very sophisticated financial products for their banking needs). More importantly, the network effect of Silicon Valley Bank's highly differentiated platform has made it more difficult for competitors to take away market share. Coupling this strong network effect with reducing friction points to help free up time for startup entrepreneurs to run their businesses, Silicon Valley Bank remains a dominant player in the regional banking industry which should lead to years of continued growth.

Synovus Financial Corp.

We Were Very Impressed with Synovus: Relationship-Driven Model with Technology an Enabler That Helps Drive Stronger than Peer Customer Satisfaction

The relationship model at Synovus is predicated on its bankers building a deep level of trust through personal relationships. Technology, in this regard, is viewed as an enabler that helps to improve the human relationships that bankers have with their customers. With that said, however, after our deep dive into Synovus, it appears that the company recognizes that technology spend is the means, rather than the endgame itself, to driving customer experience. As an example of this, one of the more interesting points that the company shared with us is that while technology expenditures as a percentage of revenue at Synovus is about in line with peers, it's unlikely that moving this concentration a few percentage points higher would lead to a material impact at the company. With that said, however, much of the incremental technology spend should come from modernizing existing systems and investments in new platforms rather than continued spending on legacy platforms. Overall, while Synovus offers a mobile banking app to its retail customers and an online business banking portal to its commercial customers, the company has a few unique products including its Synovus Inspire offering which is targeted to mass affluent customers. Importantly, however, the business model at Synovus is led by its bankers providing advice to customers with technology used as a means to help accomplish this and improve the client experience (helping to contribute to higher than peer satisfaction scores).

Focus on Providing Advice to Create Solutions for Customers with Technology Helping to Improve Customer Relationships

At Synovus, we interviewed Kevin Blair, President and Chief Operating Officer, Jamie Gregory, Chief Financial Officer, Zack Bishop, EVP of Technology, Operations, and Security, and Kevin Brown, Senior Director of Investor Relations. One of the overarching themes in our conversations was that with Synovus' business model primarily driven by the relationships that its bankers have with clients, this strategy is enhanced with technology acting as a means to help deepen these relationships. Moreover, outside of organically growing existing relationships, Synovus has also been a destination for new talent—with some new teams joining following recent bank M&A transactions. To this end, Synovus uses technology as a *channel* that complements face-to-face relationships and helps to build trust between a banker and a customer as the banker works to (1) provide financial advice, (2) craft customized solutions, and (3) deliver a financial plan to a customer, that all ultimately leads to driving higher customer satisfaction scores. Diving deeper into this, with different customer segments seeking different financial solutions, it's important to understand the unique situations that customers are involved in. For example, retirees may be looking for wealth management products, savers may be looking for budgeting tools, and commercial clients might be seeking debt capacity models based on their underlying company's financial position. As a specific example of an achievement on the commercial side, Synovus had a great deal of success with rolling out the PPP program to its commercial customers as the company already had the technology infrastructure in place to be able to accept PPP applications quickly after the program was launched, allowing the company to achieve success with the PPP program.

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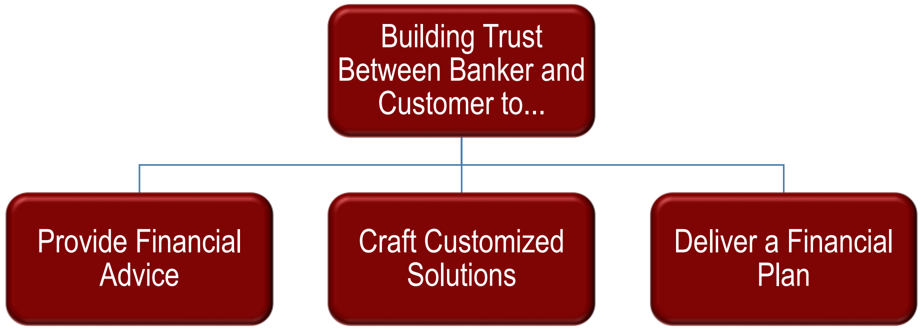
Figure 48: Synovus Uses Technology as Channel That Complements Face-to-Face Relationships

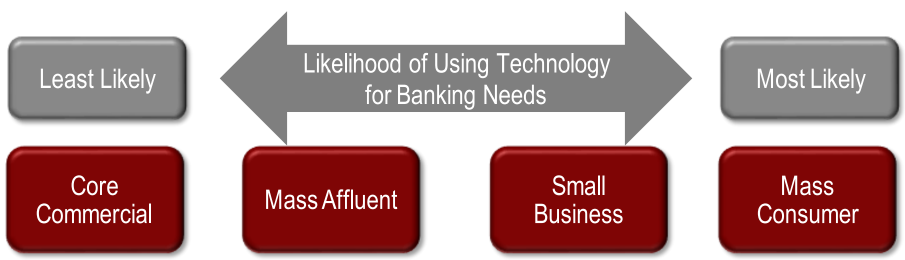


Source: J.P. Morgan.

Leveraging Technology to Empower Bankers to Improve Customer Relationships, With Technology Preferences Differing by Customer Segment

Outside of the PPP program, however, while Synovus' core commercial customers may be hesitant to leverage technology to perform their financial transactions as they would rather talk in-person with a relationship manager, technology is used to enhance (rather than replace) commercial relationships. Contrary to this, however, mass consumers might be satisfied with just dealing with a bank through technology only with branch locations serving only for certain financial transactions including obtaining coins and currency. Outside of core commercial customers and mass consumer, a small business customer that is run by an entrepreneur who is working all day and does their banking at night might be more willing to transition into using technology as he or she is looking for round-the-clock access to a bank account. Beyond this, the mass affluent customer segment is more bifurcated in that one set of customers in this segment might be more willing to use technology while another set might still want to work with a banker in-person. To this end, however, we were satisfied to hear that the financial products that Synovus already offers to its customers leverage technology to some degree to appropriately cater to differing customer needs.

Figure 49: Technology Preferences Differ by Customer Segment at Synovus



Source: J.P. Morgan.

Technology Offerings Start with What Customers Really Need, Rather Than Trying to Offer Everything Under the Sun

Following our discussion, we concluded that Synovus' technology offerings are centered on products that customers really need as opposed to offering every potential financial product. This is important to help ensure that there is little customer attrition from its core clients due to a lack of offering certain technology products or features. With this in mind, however, products such as cryptocurrency or tokenized money might not be "needed" and only end up being used by a very small percentage of the overall customer base, and moreover these products (if offered) would have to be continuously improved so that customers can perceive that the

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underlying technology is getting better. For products that are "needed" though (including checking statement balances, moving money around, and mobile/online banking capabilities), with customers likely to make a decision based on perception and simply ensuring that a bank's offerings can provide similar functionality as other banks, Synovus' product offerings on both retail and commercial leverage technology to enhance customer the customer experience.

Figure 50: Examples of Synovus' Product Offerings That Leverage Technology

MySynovus (Mobile/Online Banking App)	Synovus Inspire (Mass Affluent Product)	Synovus Gateway (Mobile/Online Business Banking)
✓ Bill pay and money transfers	✓ Tailored advice from a personal advisor	✓ Recently introduced platform
✓ Customizable account alerts	✓ Higher rates on Synovus deposit accounts	✓ Access all Synovus accounts through a single dashboard
✓ Mobile check deposit	✓ ATM withdrawal fees refunded for non-Synovus ATMs	✓ Pay vendors
✓ Manage credit card account	✓ Bonus rewards points on credit card spending	✓ Process receivables
	✓ Access to Priority Customer Care	
	✓ Synovus Asset Navigator: interactive dashboard to analyze financial situation	

Source: Company reports.

Bar Continues to Be Raised as There's Always a Way to Do Something More Efficiently Using Technology (Which Helps Improve the Customer Experience)

Simply offering products that are comparable to the rest of the industry is not sufficient in an industry where some customers may have dozens of different banks to choose from for their financial needs. Rather, there are three areas as it relates to technology that Synovus focuses on to improve the overall customer experience:

1. **Cut the cycle time:** reduce the amount of time it takes for customers to perform certain tasks, which provides to customers immediate gratification. For example, if a bank is at a point where a deposit account can be opened in three days, try to reduce this opening process down to two days. Reducing the cycle time is a critical focus point at Synovus.

2. **Self-service options:** providing to customers the right technology that allows customers to perform financial tasks through their desired method (give customers optionality through a branch, ATM, and a mobile platform). Choice and ability is important to customers.

3. **Touchpoints for mortgage application process:** at Synovus, about 60% of the company's mortgage applications are now going through Blend Labs, a fintech firm that simplifies the mortgage application process. Not only does Synovus utilize the Blend Labs platform which makes it easier for customers to fill out and submit mortgage applications, but the company also adds an outbound call from a mortgage loan officer and a servicing representative (called the emotional call of delight). These outbound calls are done to ease customers' nervousness that is typical as they are filling out the paperwork for a mortgage application. These outbound calls, combined with the digital mortgage application process through

Blend Labs, create just the right level of personal touch between Synovus and customers that help to drive an improved customer experience.

Modernization of Core Platform Should Allow Synovus to Offer New and Innovative Products, with Ongoing Cloud Journey Also Acting as a Lever

As it relates to its core platform, Synovus is now in the process of slowly modernizing its legacy core using the Finxact platform which will allow it to offer more innovative products. While the onboarding of new products and solutions with a modernized core will occur before the legacy core upgrade, some of these new products that could be introduced include (1) new treasury solutions for small business and commercial customers including integration of a payables and receivables platform (this platform has slowly started to roll out in tiers to existing business customers), (2) additional online account originations with mortgage already active on this front (through the Blend Labs platform), and (3) continued investments in specialty businesses particularly those that are national in scope (as they heavily leverage technology) including premium finance. Beyond the modernization of the core platform, cloud is another area that can help support the offering of new products or features. With new systems or the replacement of existing systems, including the replacement of technology infrastructure which moves to the cloud once fully depreciated, now being cloud-based, the ongoing cloud journey (which began a little over a year ago) that uses multiple cloud providers should allow Synovus to offer new products and leverage data and analytics tools to enhance the relationship between a banker and a client.

The Road Ahead: Model Centered on Consultation and Advice with Technology Offerings Supporting Continued Growth Across Southeast

Compared with regional bank peers, Synovus ranks ahead of peers for customer satisfaction scores. Looking ahead, one area of focus to further improve customer satisfaction scores include the bank’s ability to leverage data and analytics to proactively offer solutions that can help customers achieve their financial objectives, which can help Synovus capture additional business. Moreover, the usage of data and analytics can help the company enhance its relationship model with technology playing a critical role in helping to successfully execute this model to drive overall growth at the company. With Synovus continuing to operate its advice-based business model and modernize its existing technology infrastructure, coupling this legacy business model with hiring bankers externally should translate into Synovus driving a faster level of growth. With the targeted usage of technology as the means, rather than the end, helping to drive an improved client experience through its relationship-first model, Synovus is well-suited to capture additional market share gains and drive overall growth in its Southeast footprint.

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TCF Financial

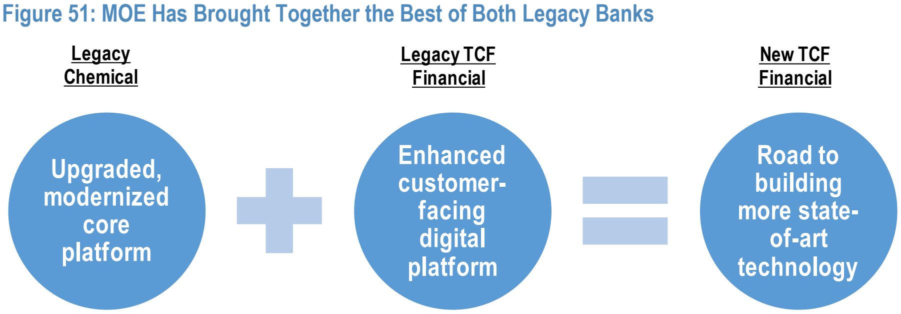
MOE Has Brought Together Strength of Each Legacy Bank, with Merger with Huntington Further Positioning TCF to Improve Customer Experience

While we've been a big advocate of the MOE between TCF and Chemical, throwing quite a bit of cold water on our vision for the company to emerge as a Midwest banking powerhouse was that its customer satisfaction scores, per J.D. Power, are among the lowest in the group (both for overall satisfaction as well as NPS). Although the customer satisfaction results thus far are rather disappointing, we see that there are some notable tailwinds that lie ahead for TCF as it relates to the potential improvement in customer experience – particularly with the recent announcement of Huntington who is at the forefront of using technology to elevate customer experience – including: (1) the MOE has brought together technology strength of each legacy bank with an upgraded, modernized core platform from the legacy Chemical and the enhanced customer-facing digital technology platform from the legacy TCF, and (2) customer experience has become a key strategic priority for TCF post-MOE (with the company now being laser-focused on identifying and resolving customer friction points, for that matter).

MOE Combined Complementary Technology Investments of Both Legacy Banks: Upgraded Core from Chemical and Enhanced Customer-Facing Digital Platform from TCF

On the technology front, the MOE between the legacy Chemical and the legacy TCF has brought together the complementary technology investments of both legacy banks, with the modernized, upgraded core banking platform coming from Chemical and enhanced customer-facing digital technology platform coming from TCF. Given the streamlined and scalable core from the legacy Chemical, combined with the enhanced digital customer experience from the legacy TCF, post-MOE with Chemical, TCF has obtained improved ability to: (1) deliver enhanced digital banking offerings to customers (including in areas such as artificial intelligence, location experience, and APIs), (2) deepen personalization capabilities, (3) identify and assess emerging customer experience and preference trends, (4) design based on customer behaviors, and (5) reduce customer friction points. With that said, all of these factors, combined with TCF now merging into Huntington – who is at the forefront of using technology to reduce friction points and elevate customer experience – should help minimize existing customer attrition and attract new customers as well as increase speed to market in terms of testing and rolling out new digital features.

Figure 51: MOE Has Brought Together the Best of Both Legacy Banks



Source: Company reports and J.P. Morgan.

Upgraded Core Banking Platform from Legacy Chemical

Digging deeper into the core platform, the legacy Chemical had made investments in upgrading its core banking platform prior to MOE. With that said, in addition to the ~$180mm of cost save opportunities outlined when the MOE was announced in January 2019, a hidden benefit on top of these savings was that the legacy Chemical has already gone through a core systems conversion following its switch to FIS IBS (which went live in the summer of 2018). With this in mind, while the legacy TCF had not yet upgraded its core prior to MOE, the combined company has avoided needing to upgrade the legacy TCF to a new core, as Chemical has already undergone this upgrade. In fact, with the legacy TCF likely having needed to replace its core in the next few years, TCF was able to avoid this progress altogether by using Chemical's FIS IBS core. Moreover, with First Republic also announcing plans in January 2020 to use the same FIS IBS platform that TCF is on, this helps validate the choice of this platform, with a bank more than twice the size of TCF also choosing this platform, not to mention that we see First Republic as one of the leaders in technology in the regional banking space.

Enhanced Customer-Facing Digital Platform from Legacy TCF

Turning to the legacy TCF, the company had made investments into enhancing the customer-facing digital technology platform prior to the MOE. Starting with its rollout of a new digital platform in 2017, TCF has invested in adding new digital features and capabilities to its technology stack to improve its customers' digital experience, ranging from lock & unlock card features and image-enabled ATMs, to Apple Watch app (i.e. giving customers to access their account via Apple Watch app). Post MOE, on top of TCF completing its core system conversion to Chemical's scalable and streamlined FIS IBS core, the combined company has also layered in a handful of customized applications (i.e. the legacy TCF's digital efforts). With this also being rolled out to the legacy Chemical franchise earlier this year, the legacy Chemical customers have been also enjoying a far more improved digital banking experience than in the past. Besides, TCF is now using Salesforce CRM across its branches and call centers, which provides the company with better insights into its customers, helping bankers provide a more customized service experience to customers. Not to mention, with TCF now having a stronger technology stack along with a stronger core platform post MOE to support continued digital transformation, another key initiative that TCF is focused on is partnering with fintechs on different solutions that can be white-labeled to improve the customer experience.

The Road Ahead: With MOE Putting Together Technology Strengths of Both Legacy Banks and TCF Now Merging with Huntington Who Leads in Smartly Using Technology to Elevate Customer Experience, We See Better Days Ahead

Over the past year since the MOE announcement, TCF has integrated its technology systems (completed in August 2020) in order to provide customers with an excellent digital experience on multiple channels while simultaneously upgrading the back-end systems to meet the company's needs and serve customers better. Looking ahead, as the MOE has brought together the complementary technology investments of both legacy banks, but perhaps more importantly, with TCF now merging with Huntington – who we see as a hidden gem who is at the forefront of combining cutting edge technology with very customer friendly policies – we view that TCF is better positioned than ever to further enhance customer experience, with this merger transaction moving TCF another step closer in creating a Midwest banking powerhouse as well as positioning them to thrive in the digital age of banking over the longer term.

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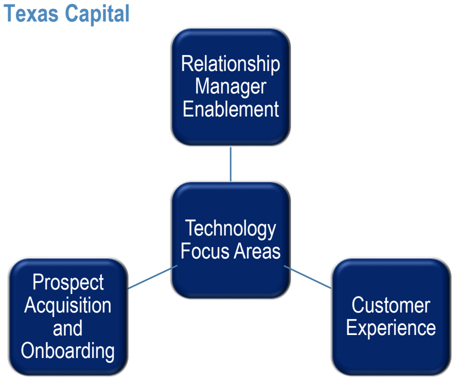
Texas Capital Bancshares, Inc.

Technology Empowering Relationship Managers with Agile Framework While Bask Bank Also Keeping TCBI on the Cutting Edge

With Texas Capital being almost exclusively a commercial bank (with only about a dozen branches across its Texas footprint), its business model revolves around the deep relationships its bankers have with commercial customers. To this end, the role that technology plays is that it acts as an enabler that allows the company and its bankers to create longer-lasting and more meaningful relationships with customers. More specifically, there are three main areas that are of focus as it relates to using technology to support the overall company, including: (1) relationship manager enablement (including reducing the amount of low value activities that relationship managers have on their plates), (2) prospect acquisition and onboarding (with the onboarding experience being a very important item for customers), and (3) customer experience (mostly around digital). With this in mind, while Texas Capital provides to its customers financial products including online banking and a mobile app, beyond this, the company has been using APIs that plug into its modernized core platform and has rolled out differentiated products, with one example of a new product being Bask Bank (introduced in January 2020) which is a fully digital savings account available nationwide that allows customers to earn airline miles instead of traditional interest. Even with the company's usage of APIs, however, it is important to remember that the cornerstone of the business model is led by the human relationships the company's bankers have with clients with technology used as a means to expand on these relationships and improve the client experience.

Figure 52: Three Main Focus Areas for Technology at Texas Capital



Source: Company reports.

Agile Transformation Emphasizes Speed to Delivery and Has Helped to Introduce New Products and Features on a Much More Condensed Timeframe

At Texas Capital, we interviewed Julie Anderson, Chief Financial Officer, Matt Quale, President of Bask Bank and Head of Marketing for Texas Capital, and Hina Shamsi, Chief Information Officer. One of the recurring themes in our conversations was that many of the technology projects at Texas Capital use the agile framework (which focuses on speed to delivery) which has allowed for tasks to get done and projects to be completed on a faster timeline as opposed to a waterfall framework which has a more stretched out timeline. As a specific example of this, the rollout of Bask Bank earlier in 2020 was the first time the company had completed a project primarily using the agile framework, which yielded a lot of positive feedback by the bank's employees given the speed with which deliverables were able to be completed. Given the success of rolling out Bask Bank using an agile framework, most new projects and tasks at the company are now structured using the same methodology which allows for rapid testing and learning and for quickly eliminating ideas that do not work. As another example of the success of using an agile framework, one of the biggest pain points by customers used to be during the online onboarding process where customers hit a roadblock as there were limited instructions on how to proceed while navigating a certain webpage. Customers ended up closing the process and Texas Capital remedied this pain point by rolling out a fix (in just two weeks) and resolve the issues that customers were having. Moreover, the PPP program is yet another example of the success of the agile framework whereby the company created small squads of 10-12 person teams to execute on this program and determine what will and will not work in a fast changing environment. The bottom line is that with the agile framework being a continuous testing and learning environment that focuses on the execution and the delivery of a final product where

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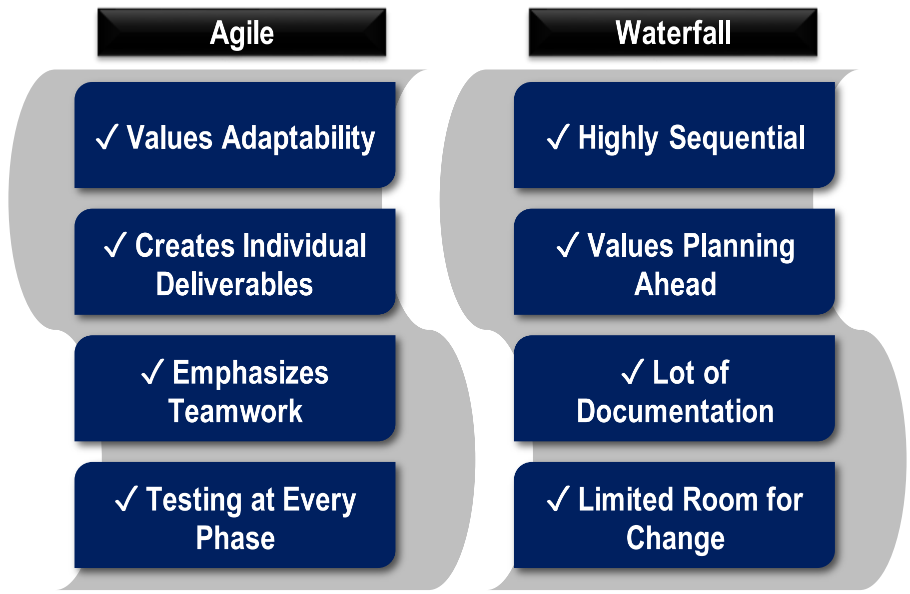
team members are willing to accept failure (fail fast but fail quickly), it creates an environment where problems can be solved very rapidly.

Figure 53: Agile vs. Waterfall Methodologies

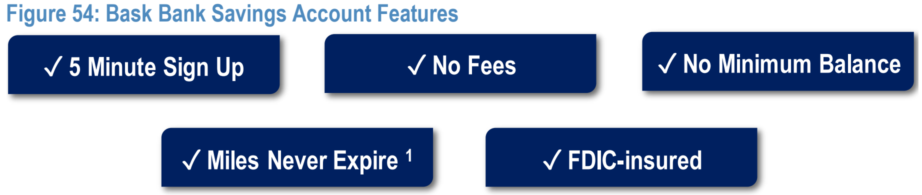


Source: J.P. Morgan.

Bask Bank Is a Unique Product Among Our Coverage Universe and Is an Early Example of Using an Agile Framework to Deploy a New Product

As a prime example of Texas Capital's usage of an agile strategy to deploy a product, we point to Bask Bank which was introduced in January 2020 and is the company's national digital bank that rewards savers with American Airlines miles in lieu of traditional interest. Bask Bank uses the same core deposit banking platform (Fiserv Signature) as Texas Capital's traditional financial product offerings. We note that Bask Bank is the only example of a bank in our coverage universe that currently has a national online deposit product. Moreover, Bask Bank is unique across the financial industry in that its savings account allows customers to earn airline miles *without* the use of a credit card. We list other features of Bask Bank's savings account below.

Figure 54: Bask Bank Savings Account Features



Source: Company website. (1) Miles expire if there is no earnings or redemption activity for 18 months. Otherwise, miles never expire.

WarehouseNow Is Another Differentiated Product That Caters to the Company's Unique Mortgage Finance Segment

Another unique product at Texas Capital is WarehouseNow, which is the company's online mortgage warehouse platform. Texas Capital is one of the largest nationwide warehouse lenders across the industry although is only one of the few warehouse lenders across our coverage universe. The WarehouseNow platform, which is provided by the vendor SitusAMC its ProMerit product, allows customers to:

- Speed up fundings and allow users to observe daily operations and obtain on-demand reports to better manage warehouse facilities
- Upload new funding requests and confirm in a few minutes that wires were sent

Modernized Core and Migration to the Cloud Should Allow for Quick Integration with the Latest APIs and Provide Additional Customer Insights

One of the reasons (besides the usage of an agile framework) of why Texas Capital has been able to roll out a product such as Bask Bank is because the company is currently running on a state of the art Fiserv Signature core platform for deposits and FIS ACBS for loans which serve as the building blocks for rolling out innovative products. Moreover, a modern core also supports integration with a variety of APIs and third party fintechs, which is one area that Texas Capital can further differentiate itself in as we look ahead given that many regional banks are not yet running on a modernized core platform. A modern core also allows Texas Capital to move with speed with offering new products to customers and allows for continued investments into data analytics and customer insights which can allow relationship managers to better understand their customers and provide them with customer data right at their fingertips. Moreover, a modern core supports a revamped and expedited onboarding process that has yielded positive client feedback thus far.

Looking beyond the modernized core, an ongoing migration of the company's data to the cloud should support a deeper ability for relationship managers to better understand their customers. As a specific example, the usage of Azure for enterprise data offers various capabilities including data reporting and insights across lines of businesses so bankers and functional staff can better understand customers. Additionally, a Salesforce-based cloud further allows bankers and other staff to deepen customer relationships by offering real-time visibility into client data.

The Road Ahead: A Relationship First Model But Usage of Technology and an Agile Strategy Should Support Continued Growth Across Texas Footprint

While the usage of an agile strategy has helped Texas Capital roll out new products including Bask Bank earlier in 2020, it is important to note that the "agile" terminology does not extend to the relationships between relationship managers and their customers. Said another way, relationship managers are still fully dedicated to their customers with the goal of an agile framework being how Texas Capital can make its relationship managers more productive and help them spend more time on client-facing activities rather than on troubleshooting administrative issues for customers, with relationship managers being the ultimate benefactors of the agile process. Coupling this agile process with Texas Capital's ability to invest and scale appropriately (from a technology point of view), the company's usage of technology (including cloud-based products) to empower relationship managers should help drive an improved client experience and contribute to additional market share gains and continued growth in the company's Texas footprint, with Bask Bank an early example of the cutting edge technology that Texas Capital now offers through its modernized core banking platform.

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Umpqua Holdings Corporation

A Pioneer in "Human Digital" to Provide Customers Convenience of Technology and Human Touch Point

At Umpqua, we interviewed with Cort O'Haver, Chairman and CEO, Ron Farnsworth, Chief Financial Officer, and Drew Anderson, Director of Investor Relations and Chief Data Officer. While we have been a big advocate of Umpqua over the past few years when it comes to technology, our conversations with management reaffirmed our view that Umpqua is indeed at the forefront of leveraging technology to stay ahead of the digital curve. Not surprisingly, technology/digital initiatives have always been at the top of Umpqua's strategy agenda (such as Next Gen 2.0). In fact, with Umpqua being the pioneer "human digital" (with Umpqua being the first bank to coin this phrase), the company was early to realize that the way to leverage technology is to empower relationships with the goal being to provide customers with a convenience of technology and human touch point. In addition, Umpqua leads the pack in a wide array of digital initiatives ranging from the cloud-first and API strategy and strategic partnerships with fintechs to using advanced data & analytics to empower its bankers.

Early in the Game to Leverage Technology to Enhance Relationships with Umpqua Go-To a Prime Example of "Human Digital" Strategy

While many of our banks have indicated that technology is leveraged as a means to enhance (not replace) human-to-human relationships, what's impressive about Umpqua is that the company was so early on to realize that it should differentiate by using technology to empower human relationships between customers and bankers (as opposed to AI and robots replacing human interactions). In 2015, Umpqua created Pivotus Ventures, which was the bank's digital banking innovation subsidiary and in-house fintech incubator (which was sold to fintech Kony in October 2018), and the first thing that Umpqua did was conduct experiments and test theses to figure out what customers want in banking technologies. The results of the experiments were that most people liked convenience of technology but they still wanted to have human touch points. To this end, Pivotus created in-house the Engage human digital banking platform where a customer can select a dedicated banker of its choice to engage through chat capabilities, which has evolved into Umpqua Go-To. Digging deeper into Umpqua Go-To, which has 90K customers now after rolling out ~1.5 years ago, this is an app that Umpqua customers can download and use for free where the customers can simply press a button and chat via text with a personal bank of their choice (whether by the area of bankers' expertise, location, and interests). While the service was initially available via video chat, the vast majority of customers did not want to video chat with texting an overwhelmingly popular choice of the Umpqua Go-To users. Subsequently, Pivotus designed and created a new secure texting architecture as part of the Umpqua Go-To app, and Go-To banker is now available through text. Today, Umpqua Go-To is available for consumers, but the company is now working on rolling out Go-To for Business to serve its business relationships as part of its Next Gen 2.0 initiatives. In addition, while the current Go-To app is purely a service vertical for now, the company is in the process of building plans around data mining and how to use the channel for cross-selling and account opening capabilities.

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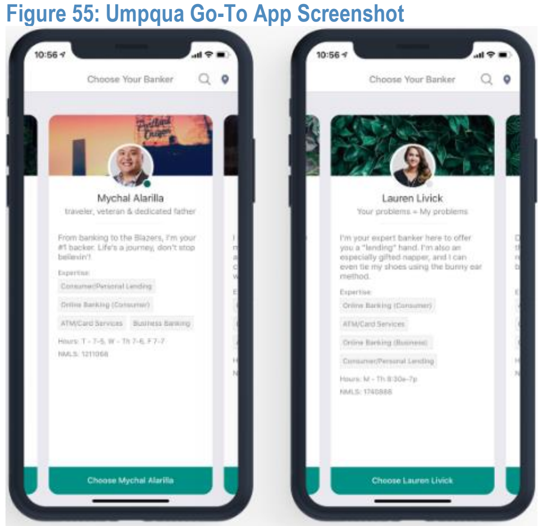
Figure 55: Umpqua Go-To App Screenshot



Source: Company website.

Embracing Cloud-First Strategy with Umpqua Being One of the First Banks to Work with Azure While Continuously Upgrading and Modernizing Core

One of the key technology initiatives as part of Next Gen 2.0 is the cloud-first strategy, with the starting point being Chief Information Officer's Ken Nagel and his partnership with Microsoft. Umpqua's cloud-first strategy allows the company to reduce its physical footprint and costs of running traditional data centers along with the opportunity to scale significantly. Digging deeper into its cloud-first strategy, Umpqua was one of the first banks in the US to work with Microsoft Azure and has a transactional database sized at 2.4TB (which is sizeable for a bank of Umpqua's size) porting to Azure. With the company's replicated transactional data and account level data fully on cloud and operate under the Azure environment, Umpqua can run Python and use Snowflake services with this data, with this enabling attrition warnings as well as providing next best offer and credit insights, just to name a few examples. Turning to the core, Umpqua has moved to a modern core after completing the integration with Sterling six years ago and is now on a FIS core. The company uses Q2 for its mobile digital banking platform and has made a big upgrade with Q2 about 60-90 days ago with the company now on the latest version of its offering. On business banking, Umpqua will be upgrading its platform next year using Business Online Banking through FIS, which should impact Positive Pay, integrated receivables, and remote deposit capture offerings among others.

Actively Using Advanced Data and Analytics to Empower Umpqua Bankers

Umpqua also leverages technology to empower its bankers, with the company actively using advanced data and analytics to provide its bankers with actionable insights. Umpqua Smart Leads and Credit Insights—which are both proprietary—use transactional data, analytics, and custom algorithms to provide bankers with next best offer leads and help with identifying risk management activities. Digging deeper, on Umpqua Smart Leads, Umpqua partnered with a niche data company to run algorithm through data and automatically push the next best product offers to Umpqua bankers and treasury management sales professionals. A very simple example of this is if a customer deposits 100 physical checks at a teller line, the algorithm will auto-pitch remote deposit capture with the customer not needing to come to the store. Another example is looking at last twelve months to alert for potential fraudulent activity. Turning to Umpqua Credit Insights, this uses the same 2.4TB transactional data in the cloud and breaks it down into customer cash-in and cash-out, comparing pre-pandemic vs. post-pandemic by month/quarter, and ranking businesses that are performing better pre-pandemic and post-pandemic.

Focused on Building Strategic Partnerships with Fintechs Than Developing Technology In-House As It Had in the Past

In the past, Umpqua's technology strategy was centered on building technology in-house (i.e. Pivotus). However, with the company recognizing the efficiencies coming out of fintech partnerships (both cost and time), Umpqua is now more focused on building strategic partnerships with fintechs for the adoption and introduction of new technologies to customers (although the company continues to build some technologies in-house, such as Umpqua Smart Leads and Credit Insights). With that said, Umpqua has a number of relationships that allows the company to leverage its technology expertise efficiently and deploy it with increased speed. Below we provide a few examples of Umpqua's strategic partnerships with fintechs:

- **nCino:** Umpqua is implementing nCino, a cloud-based commercial loan origination and treasury management onboarding system which is laser-focused on customer service and product innovation, in 2021. With Umpqua going upmarket in the commercial space and attracting bankers from larger competitors, this will likely be a value unlock. In addition, the company is processing PPP forgiveness through an nCino channel.
- **MineralTree:** Integrated payments and receivables was a gap at Umpqua about 2 years ago, so the company partnered with MineralTree, which is an end-to-end accounts payable (AP) automation software that digitizes and streamlines AP process. By partnering with MineralTree for integrated payable for commercial customers, it took only ~90 days with MineralTree vs. 3-4 y years if they built internally. This is a white-labelled product that Umpqua sells to customers (with the revenue being shared on the back-end with MineralTree). Integrated receivables is coming online in 2021.
- **Snowflake:** Snowflake is cloud-based data-warehousing company. In Snowflake's architecture, compute and storage are completely separate and the platform provides an enterprise solution that makes collecting, processing, and using big data easy. Snowflake is part of Umpqua's cloud-first strategy.
- **DocuSign:** Its PPP team created a loan origination system overnight using DocuSign and 0365 tools (which couldn't have happened without agile). It used to process 100-125 applications/year vs. 17K in 3 months during the pandemic.

The Road Ahead: Investments in "Human Digital," Cloud, and Data Analytics Positioning Umpqua in a Good Spot to Further Improve Customer Satisfaction

Although we were impressed by its "human digital" strategy and technology offerings at Umpqua, with its net promoter score (according to J.D. Power) of 36 being just about in line with peers, it was a bit surprising to us that the company didn't have much higher customer satisfaction scores. With Umpqua's Go-To offering gaining significant customer traction during the pandemic (which may not yet have been incorporated in the NPS results) and Umpqua continuing to invest in "human digital," cloud, API, and data analytics as part of the company's key strategy, while we fully acknowledge that there's more room to improve the scores, we see that the company has all the right recipes in place to further improve the customer experience. Combining (1) investments the company has already made in technology along with what's in the pipeline with (2) management that is focused on improving customer experience, we see that Umpqua is well positioned to drive a meaningful improvement in customer satisfaction in the years ahead.

Valley National Bancorp

Valley Is Now Leveraging Technology Infrastructure and Fintech Partnerships to Improve the Customer Experience

At Valley, the bank's technology strategy is focused on enabling its workforce to be more productive and do more to deepen client relationships, rather than technology being a tool to replace the human relationship. One recent example of this model of pairing the relationship model with technology capabilities is in Valley's success in serving 13,000 Paycheck Protection Program customers which included ~3,000 net new customers during the pandemic when business customers were in need of financial assistance. The bank's ability to handle a large volume of PPP loan activity was due to the bank streamlining the technology aspect of the process while pairing each customer with a dedicated banker to walk each client through the process end to end. This was an example of the bank's strategy of pairing its bankers with the technology that they need to effectively improve the customer experience. One structural change that has been occurring at the bank is seen in the bank moving towards an agile product development model which focuses on product iterations and improvement at a faster pace to realize value, as compared to prior models of developing products through a waterfall framework which tends to be less efficient and slower. One key driver of the increased focus on technology investments has been with the change in leadership. On January 1, 2018, Ira Robbins became CEO of Valley and led the bank into the digital age. In 2016 when Bob Bardusch joined Valley as CIO, he created a three year technology roadmap to digitize the bank and Mr. Bardusch was later named COO in 2018, adding operations and marketing to his responsibilities. As part of our research, we interviewed Justin Black, Chief Experience Officer, Stuart Cook, Chief Digital Product Officer, and Travis Lan, SVP – Director, Corporate Finance & Business Development.

Being Everything to Some People, Rather Than Being Everything to Everybody

Valley's customer satisfaction levels differ between the two customer segments that the bank serves: the commercial client and the consumer client. In the commercial customer space, Valley has a higher customer satisfaction level than the consumer side. With commercial client relationships, there is more reliance of the bankers' ability to service the client with providing solutions and result in Valley providing a high level of customer service. In the consumer banking side, the segment where the bank is able to provide a differentiated experience is in situations where the customer has more complicated financial needs and the banker is able to provide solutions such as for a mortgage or for investments. Valley has a strategy of competing for customers in areas where the bank can differentiate and win business. One example of a market where the bank is able to target and differentiate in is in certain segments of the Home Owners Association (HOA) market which is an estimated $90B niche market opportunity where assessments and dues have historically been collected each year by humans, rather than digitally. Valley was able to create a website dedicated to serving the HOA customer market (www.hoavalley.com) and offer clients access to HOA deposits (CD, money market, and checking), treasury services, loans and accounting packages and payment collection services. On the website, HOA customers are able to apply online for Valley products and services while having access to a banker to help clients with their banking needs. In addition, the bank leverages the cloud to offer a website provides customers with case studies and articles that provide advice to HOA customers. Valley now has a way to find HOA customers, acquire them, and convert them all online. This is one example of Valley targeting a specific niche market and building products and services around the needs of this segment of customers.

One area of friction for its customers that the bank is focused on solving include the process of onboarding clients, which the bank is now targeting to create an onboarding experience that is seamless for the customer. The bank is looking to create a real-time multi-channel and multi-product onboarding experience for customers so they can open up different product account types easily with the bank. This online account offering is being developed and expected to be available in 2021. This capability should enable customer accounts to be opened in 5 minutes or less and allow the bank to expand the relationship with customers quickly and offer more products to customers while avoiding to ask for customer information twice. This would help customers open more than one product with Valley through a single process.

Valley Is Leveraging Cloud Technology to Improve Customer Experience

Valley is leveraging cloud computing technology to enable new products and capabilities such as the Valley HOA website mentioned earlier as one example. The bank uses third party cloud services such as the Financial Services Cloud from Salesforce in partnership with nCino's Loan Originations System to transform its operations and digitize its commercial lending business and online deposit account opening process. Since deploying these products from third parties at Valley, the bank has been able to create a single view of its customers across its retail and commercial businesses which increases the productivity of its employees while offering customers a more personalized experience across digital channels. In addition, Valley is using Salesforce's Sales Cloud, Experience Cloud, and Marketing Cloud to engage customers across every channel, including email, digital advertising, and social media. Another packaged app on the Salesforce ecosystem that Valley uses is Terafina for account opening.

Valley also announced that they have chosen SAP S/4HANA Cloud to power its digital transformation journey, obtain more meaningful business insights, and eliminate the current extensive manual workflow processes and reconciliations. As a result, customers enjoy a more personalized experience across digital channels and have the opportunity to interact with the bank in any manner they choose. In addition, Valley is benefitting from increased employee productivity by having a digitized process from customer lifecycle management through deposit account opening and beyond. Looking ahead for cloud, the bank is using machine learning through Azure to try to find the optimum way of converting people to arrive on their site, but is relatively early on with the technology so far. Valley is also building a data hub that's cloud-hosted and the intent is that Valley uses a multi cloud approach with products on both Azure and Salesforce. Valley utilizes three remote data centers that operate on private cloud infrastructure which allows for more flexibility, scalability, and efficiency across the IT organization. For workloads better suited to SaaS / Cloud, Valley uses cloud solutions to reduce overhead associated with managing additional infrastructure and this enables the bank to take advantage of the rapidly evolving fintech ecosystem where the bank continues to evaluate potential partnerships to capitalize on innovation in the space

Partnering with Fintechs to Be Early Adopters of New Technologies

Valley has the ability to be an early adopter of new technologies due to newer and scalable technology like cloud banking as well as technology available through partnership with fintechs. One thing we learned from our interviews with Stuart

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Cook, Chief Digital Product Officer, is that prior to joining Valley, he spent 15 years at fintech companies and offers the bank unique insight at the management level. In fact, Valley has been active on the partnership front with fintechs with the bank using technologies from fintechs such as:

- **Vikar** to automate their commercial loan onboarding process
- **Ciphertext Solutions'** IssueDirect for a self-service solution for consumer debit cards
- **Authoriti** to authorize its customers' wire transfers
- **Docusign** to enable e-signatures. As an example this is important to HOA clients as they don't need to go to a branch and physically update signature cards
- **Plaid** to enable applications to connect with users' bank accounts
- **Alloy** for real-time KYC/AML, which is important for account opening.
- **Terafina,** a digital account opening and unified sales platform
- **BillGO,** a bill payments engine that offers real-time payments, efficient routing, and security to its customers.

The Road Ahead: Early Innings of Technology Capabilities with Much of the Groundwork Being Already Laid

Over the past few years, Valley has undergone the process of both building the culture and technology infrastructure to enable the bank to modernize and compete in the digital age of banking. Since then, the bank has hired new talent, changed to become more agile with product development, and leveraged vendor and fintech technologies and capabilities to enhance the customer experience. Early results of these initiatives include a more complete view of customer relationships to enable a more personalized experience while the bank has leveraged the cloud and built a tailored experience for niches where the bank can differentiate and compete in as seen in its efforts in the HOA market with a unique digital experience. With the groundwork being laid to enable more capabilities, this marks the early innings for Valley's technology capabilities with the bank already targeting niche segments with tailored products and solutions, as well as the bank rolling out a seamless multichannel online onboarding process.

Webster Financial Corporation

Market Based Offering in Community Banking with the Focus to Differentiate in HSA Bank and Commercial Banking

At Webster Bank, we interviewed with John Ciulla (CEO), Karen Higgins (Chief Information Officer), Glenn MacInnes (CFO), Kristin Manginelli (Director of Marketing), and Terry Mangan (Head of Investor Relations). We found the bank is taking a targeted approach to technology across its three business segments: HSA Bank, Commercial Bank, and Community Bank. Overall, it appears that Webster is taking the approach of offering at-peer level technology on the consumer side (with some differentiation such as the recently rolled out ITMs), while the key point of differentiation for the bank is in the HSA Bank as well as the Commercial Bank, where Webster has a niche market that it can compete very effectively with its operating model. Meanwhile, in the retail banking space which is very competitive in terms of technology given mega banks investing heavily in consumer digital products for mass markets. Overall, Webster spends about 10% of its revenues on technology which is in line with regional bank peers, but with Webster having differentiated niche businesses in its HSA Bank as well as the Commercial Bank, it can maintain a competitive edge when combining face to face relationship with targeted investments in technologies and capabilities.

Looking at Webster's technology infrastructure, the bank is in the process of upgrading a customized version of FIS Systematics core banking platform. The upgrade is supported by data and integration services architected independently of the core to allow the bank to decouple front-end digital development from the core while the bank re-architects core-dependent back end services in line with priority customer journeys. Additionally, the bank leverages multiple cloud providers and in the process of migrating workloads to the cloud with the goal of retaining only required specialized compute on premise (i.e. to support ATMs).

Newly Renovated Customer Facing Website and Highly Rated Application for Personal Banking

As of 3Q20, over 51% of Webster's consumer households are digitally active. In Community Banking, a solid digital offering is a must-have to compete for retail customers. Webster has a highly rated mobile app (4.6 stars on App Store). The mobile app offers basic functionality to customers such as viewing account balances, depositing checks, receive notifications, make payments and transfer money. Webster also rolled out a newly renovated and customer friendly website which allows for online new account openings. While it is very difficult for regional banks to compete with mega banks with massive technology and marketing budgets in the retail consumer space on technology, having the key technology offering such as online and mobile allows for Webster to compete on service to win retail relationships. On top of the key technology offerings, Webster also looks for targeted ways of applying new technology to customers such as its recent rollout of Interactive Teller Machines (ITMs) to allow customers to do their banking outdoors virtually with a live banker.

Community Bank Rolls Out Interactive Teller Machine in Midst of Pandemic to Serve Clients with Banker Virtually

As the pandemic changed how banks branches operate as well as customer preference for other channels to interact with banks, Webster differentiated itself from peers in its market by rolling out Interactive Teller Machines (ITM). While most peers in Webster's markets are reliant on customers using indoor bank branches, Webster is offering customers an alternative to the face to face interaction with a virtual experience with a real banker. The new technology allows customers to drive to an ITM and speak to a banker and do banking transactions 24/7. This allows customers that prefer to access a banker outside of a branch setting to do banking in the comfort of their own car and outside at hours outside of normal branch hours. Webster refers to the technology as "Humology Banking" which combines a human connection with user friendly technology. By accessing an ITM, Webster customers can do a variety of things including:

- Conduct transactions such as deposits and withdrawals
- Receive exact change
- Choose denominations of bills
- Get an official check at select locations
- Make loan payments
- Speak with a banker about any questions you have

Businesses of Different Sizes Have Different Tiers of Technology Offerings

For different sizes of business customers, there are three different tiers of offerings: Webster Online (for sole proprietor and small companies), Webster Cash Flow Pro (For growing businesses with Value or Complete Business checking accounts), and Webster Web-Link (for larger companies with complex cash management needs). Meanwhile small business / sole proprietor customers have access to online and mobile banking, as well as have access to functionalities such as stop payment, tax payments, assign access to employees, export to QuickBooks/Quicken, Bill Pay, and Mobile Deposit. These offerings allow business customers to review account activity, pay bills, initiate transfers between Webster accounts, receive alerts for a variety of transactions, depositing checks and viewing check images. As the size of the business customer and the complexity of its needs increases, Webster offers solutions to handle these needs. For the next tier up for businesses, Webster offers the Cash Flow Pro product and for larger businesses, the Webster Web-Link product includes more complex offering such as liquidity management, reporting and enhanced security. Outside of the online offerings, Webster's Commercial Bank has the ability to create solutions to improve niche commercial customer's experience banking with Webster. Unlike consumer banking customers, commercial customers tend value the interaction with a banker more due to their tailored needs.

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Figure 56: Webster Cash Flow Pro and Web-Link Offerings For Businesses

Webster Cash Flow Pro	Account reconciliation / analysis
	Account Receivable: ACH, FEDI reporting
	Fraud protection: Positive Pay
	Mobile
	Accounts Payable: ACH origination, Wire transfer, Account transfer, Business Bill Pay
	Administration: Add new users, Assign users' entitlments and limits
Webster Web-Link	Enhanced security
	Account Receivable: Send payments to one or more post office boxes
	Accounts Payable: Domestic and international wire transfers in USD and foreign currency
	Liquidity Management: Excess balance into sweep accounts
	Reporting: Real-time access to balances and daily activity
	Self-Service Administration: Control who logs in, what they see and what they can do

Source: Company reports and J.P. Morgan.

Prior Investments Made in Small Business Lending with FastTrack a Timely Tool for PPP Loans

Webster has invested in business banking automation tools to speed up processes by automating credit files and underwriting processes and reduced turnaround times significantly. In 2018, Webster launched a new service that allowed select customers to complete home lending and select business loan closings remotely, utilizing video chat and e-signature features. At the time of 2018 annual report, Webster noted that nearly half of all small business applications were originated through its digital end-to-end FastTrack lending program, which provides credit decisions in as little as 24 hours. In the recent pandemic, Webster used the FastTrack underwriting tool to accept and process PPP loans.

HSA Bank Technology Is a Key Differentiator for Webster

Webster has a unique perspective in the HSA business where technology is a key tool in serving HSA customers. Among the offerings to help HSA customers manage their healthcare savings, HSA Bank offers myHealth Portfolio – a self-service dashboard, expense trackers, payment managers and Online Bill Pay, as well as the HSA Bank mobile app (4.7 stars on App Store) and member website. In the myHealth Portfolio dashboard, HSA customers can:

- Store health expense data and receipts.
- File claims or distribution requests.
- Initiate a provider payment.
- Consolidate health expenses and claims from multiple insurance providers.
- View an easy to read snapshot of their healthcare finances with charts and graphs.

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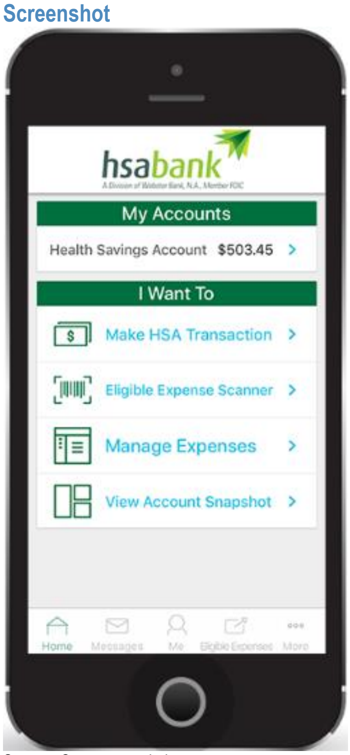
Figure 57: HSA Bank myHealth Portfolio Dashboard Screenshot

Source: Company website.

Figure 58: HSA Bank Mobile App Screenshot



Source: Company website.

The HSA Bank mobile app provides customers to manage their HSAs. Features include the ability to:

- Check account balances.
- View account activity.
- Move money to your HSA by scheduling a contribution.
- Schedule an HSA distribution to pay a provider or reimburse yourself for an IRS-qualified medical expense.
- Review and verify IRS-qualified medical expenses.
- File FSA/HRA claims with receipt images.
- Enter a new health expense into the Expense Tracker.
- Easy access to the Client Assistance Center.

The Road Ahead: Targeted Uses of Technology in Niches in HSA Bank and Commercial Bank Provide the Bank with Growth Opportunities

Webster has three objectives to driving growth at the bank including (1) accelerate growth in Commercial, (2) drive HSA Bank growth, and (3) strengthen Community Banking in core markets. To achieve success in these three initiatives, the company requires different approaches to technology to improve the customer experience and retain/growth customer relationships. In Community Banking, products offered across banks are largely commoditized including the digital and mobile offerings which has led to Webster developing technology that is on-par with peers and the key point of differentiation in its markets is its service and brand. On the other two businesses of Commercial Banking and HSA, Webster has an opportunity to carve out a niche in these segments and gain an advantage over peers. Investments in products and capabilities are targeted to the specific needs of the specialty customers that they serve. Meanwhile in the HSA business, great customer service, customer portal, technology, and education are key to improving the customer experience and winning new relationships.

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Zions Bancorp NA

Technology Transformation in Full Swing: Helping to Empower Bankers with PPP Program an Early Sign of Success

Unlike many of the banks we interviewed, Zions' ongoing technology transformation actually started several years ago, as far back as when the company sought to upgrade its core platform in 2013. While this upgrade is still a work in progress (final platform is expected to be completed in 2023+), several new digital experiences have already been rolled out that have helped improve the customer experience in areas such as online account opening and digital applications. While there is still a lot more to come by the time the full core conversion is completed, it appears that thus far, customer satisfaction has been positive specifically for Zions' core customer base of small businesses. Putting numbers behind this, according to the 2019 BAI Banking Outlook, the net promoter score (NPS) for Zions' small business customers is at 54 which is more than double the industry's NPS for small businesses at 24. For reference, according to the same study, Zions' NPS on the consumer side is at 51 which is above the industry's NPS for consumers at 43. Looking ahead, with a handful of new investments coming online in the next several quarters, these could help even further improve the NPS metrics.

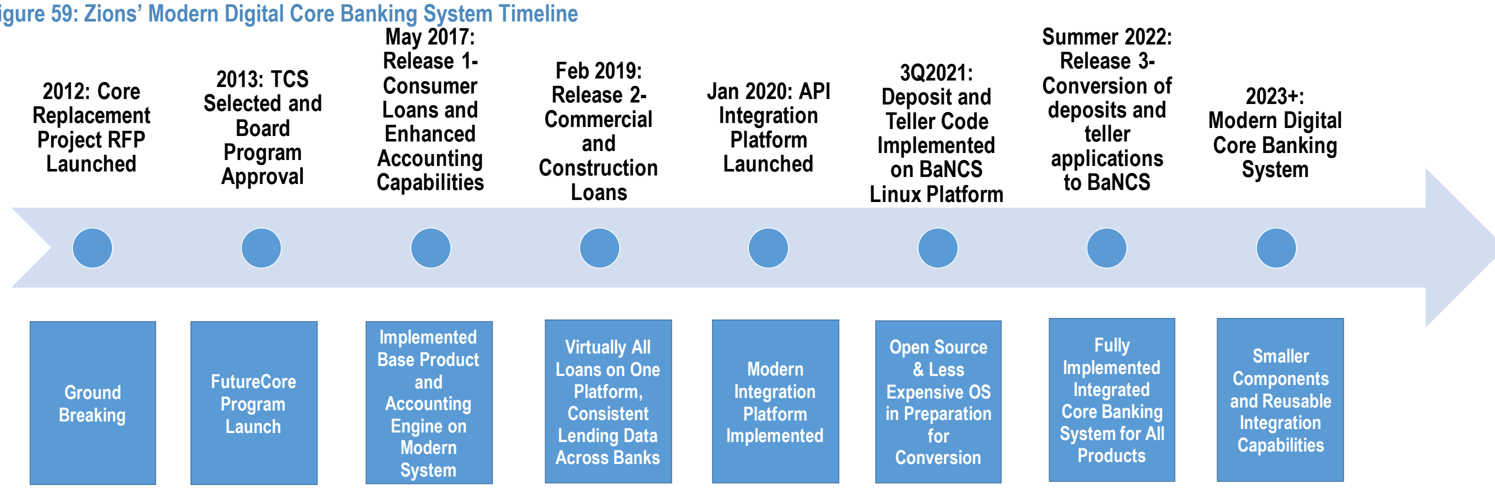
Standardizing Products Across Affiliates Helps Streamline Product Offerings and Reduce Customer Friction Points

At Zions, we interviewed Jennifer Smith, Chief Information Officer, and James Abbott, Director of Investor Relations. One of the first questions we asked is how the company is able to operate a technology infrastructure with there being several different affiliates, or "companies", that make up the consolidated Zions company. For background, Zions has several different affiliates that operate with local management teams and different brands to serve the local customer base across an 11 state footprint. With this in mind, while the local decision making for how to run each affiliate (including on items such as growing the local business, gaining local market share, and generating an appropriate ROE) may sit with that affiliates' local management team (rather than centralized across the company), the response to our initial question was that one area that is in fact standardized across the Zions franchise are the financial products. Put differently, Zions offers a standard set of financial products to its customer base across each affiliate which simplifies the technology maintenance and upkeep that is needed for these financial products. In fact, while local affiliates do have control on areas such as product pricing and the ability to not offer certain products, the standardization of products across the company was actually driven by customers, as the company found, as customer needs do not vary widely across each affiliate. With this in mind, over the past 3-4 years, Zions has taken a customer view (rather than an affiliate view) for its product offerings on areas including account opening, and these investments have been ramping ever since, which ultimately helps to reduce friction points for customers.

Rolling Out New Digital Experiences Through Core Platform Upgrade with Many New Programs Still in the Works

Since 2013, Zions has been in the process of fully upgrading its core (for commercial and consumer) using Tata Consultancy Services' (TCS) BaNCS technology. While TCS has implemented its core platform for many non-US banks as well as some small US community banks, Zions was the first time its core platform was being used for a US bank of Zions' size. With this in mind, there was a lot of standardizing of legacy systems and learning that took place in the first few years after TCS was chosen as the new core provider. Since that time, Zions has successfully converted its loan systems for consumer, commercial, and real estate which were previously on three different platforms, and deposits is the largest final piece that remains with expected completion in 2022.

Figure 59: Zions' Modern Digital Core Banking System Timeline



Source: Company reports.

With the loan systems now on one modern core platform, Zions has been able to provide new products and services to customers including digital loan applications and online account openings. A modernized digital platform has allowed Zions to seamlessly offer these products to customers. The benefits of moving to a modernized platform is twofold in that the platform helps customers perform financial tasks online (at any time) and Zions is able to reduce costs while providing these services with more modernized technology. Ultimately, a modernized core provides customers with a more seamless experience which helps to reduce friction points, create longer-lasting relationships between a customer and his or her bank, and drive higher levels of customer satisfaction. Coupling the continued rollout of a modernized core platform with the implementation of a digital banking platform from D3 that provides the company with scalability and flexibility to roll out new features, we highlight below some of the products and services that Zions has rolled out and the years when they were introduced:

- **Treasury Internet Banking 2.0 (2018-2019):** provides treasury customers more flexibility in managing multiple accounts while offering additional functionality that was asked for by users. Digital onboarding is now available for more than 16 treasury management products and turnaround time has been reduced by 75% for the setup of new treasury products.
- **Digital Business Loan Application (2019):** simplifies business loan applications that prospective borrowers can fill out in a branch or online. Also supports e-signature capabilities. So far, $2B in loan balances have been processed for over 4,000 applications. Moreover, Zions has moved from 100% paper applications (as long as seven pages) to 60% of applications being completed digitally in less than one year.

- **Digital Mortgage Loan Application (2019):** through Zip Mortgage, Zions offers clients the ability to automate certain processes of mortgage applications as well as provides digital verification of employment status, deposits, and income levels. The application process takes only 10-15 minutes to complete and offers a 24-hour automated underwriting system. Zions' digital mortgage applications as a percentage of total applications rose from zero in September 2018 to 86% so far in 2020. Moreover, 3Q20 was the second best quarter ever for mortgage applications, at $2.2B (slightly below 1Q20 which was the highest quarter ever at $2.6B).
- **Mobile Positive Pay (2019):** a verification service that helps businesses locate and report fraud and unauthorized payments for both checks and electronic ACH transactions. Also allows reconciliation of accounts and easy integration into payment systems. Mobile Positive Pay supports 50% of Zions' treasury customers.
- **Small Business and Consumer Digital Account Opening (2016-2019):** a simplified way for small businesses and retail customers to open deposit accounts, credit card accounts, and apply for consumer loans online. Today, Zions is able to open accounts online in as little as five minutes (vs. prior of 3-5 days) and Zions' customer satisfaction score for digital account opening capabilities ranks 9 out of 10.
- **Deposit Product Simplification (2018-2019):** historically at its peak, Zions offered as many as 547 different deposit products across its franchise. These hundreds of deposit products were created by design in the 1990s and into the early 2000s as Zions told its affiliate banks that it would be able to create any deposit product they needed. With so many deposit products, however, this required support staff to be well-versed in each of these product offerings. As a result, the company decided to reduce the number of deposit products that it offers to just 100 which was completed in 2019 for 1.5 million accounts.
- **Relationship Manager Mobile Enablement (2019-2020):** a toolkit that provides customer insights for Zions' bankers allowing for higher productivity levels while working with customers in the field. Using artificial intelligence, a Zions' banker is able to view critical customer touchpoints all from one screen on his or her mobile device.
- **Public Website Relaunch (2018-2019):** centralizes a lot of features on Zions' public website and internally provides to Zions back-end benefits that help analyze customer usage. Zions' website receives about 3 million monthly visits to its website.

Looking ahead, some of the technology investments that remain in the pipeline and should further improve customer experience include:

- **Small Business and Consumer Online and Mobile Banking Replacement:** this covers $35B in deposits and ~750K accounts (625K consumer and 125K small business) and will create a refreshed user interface with easy navigation for clients and the backbone architecture allows the company to be more agile and deliver new customer features every two weeks (vs. every quarter today)
- **Treasury Management Digital Entry Point:** this covers ~25K customers
- **Affluent Strategy Implementation:** this covers $8.4B in deposits

- **Digital Branch Experience:** enhance branch features such as Wi-Fi, eSignature, customer technology demonstrations, and account opening
- **Digital Account Opening: Lines of Credit:** this covers revolving, secured, and unsecured lines of credit

Cloud Usage Should Help to Further Streamline the Banker-Customer Relationship

In addition to fully modernizing the core platform, a cloud strategy could be used to offer additional applications and further enhance relationships between Zions' bankers and their customers. One example of this is through Zions' usage of the Financial Services Cloud (expected to roll out in 2020-2021), a Salesforce platform which allows banks to quickly increase the scale of their banking products and more rapidly process transactions. Moreover, the Financial Services Cloud should also empower Zions' bankers with the ability to quickly pull up customer information to make conversations with customers flow more seamlessly, which is a critical element to improving the overall customer experience.

Usage of Technology Not Only Client-Facing But Also Helps Empower Bankers Through Modernized Platforms

While the examples provided above are primarily ways that Zions has used technology to support customers, there are also a few ways that the company has used technology solutions internally to reduce manual work hours and improve the experience of bankers. Putting numbers behind this, the technology investments that Zions has made thus far in automating internal processes has resulted in 300K+ in manual human work hours saved so far in 2020 vs. ~100K in all of 2019. Below we provide some of the ways of how Zions has empowered its bankers through technology.

- **Intelligent Real-Time Interactive System (IRIS):** implemented in the last six months, IRIS is an internally-developed artificial intelligence sales platform that provides Zions' bankers with the ability to suggest product recommendations through information located in a data warehouse. A banker is not only able to view customer data such as outstanding loan and deposit balances but is also able to recommend new products that a customer may use by examining the products that other Zions' customers in similar industries currently use.
- **Auto-spreading tool**: automatically records a customer's financial statements data into Zions' databases (without the usage of a human). A potential customer's financial statements data can also be examined in 2-4 minutes to inform him or her the amount of funding that he or she may borrow. This quick decisioning ability is important as a banker does not have to leave a potential borrower's office (which would be an opportunity for a borrower to find another bank to use).

The Road Ahead: PPP Program an Early Indicator of Zions' Success of Combining Technology to Enhance Customer Relationships and Drive High Customer Satisfaction Scores

Although Zions is still in the process of upgrading its core platform, it has introduced many new products and services in recent years as part of the core upgrade journey. As the journey of rolling out the core platform nears its end in the coming years, we would note that some of the products that Zions has already rolled out include online account opening, digital loan applications for mortgage and business loans, enhanced mobile banking, and a new website. Technology investments that have empowered its own bankers have also helped improve efficiencies across the organization and create a more seamless relationship between bankers and customers. While these investments have been met with positive feedback, as measured by a net promoter score for Zions' small business customers at 54 which is more than double the industry at 24, another indicator of positive feedback has been through the PPP program which demonstrated the company's ability to punch above its weight and rapidly roll out this new program to quickly provide PPP loans to borrowers. What was most noteworthy, though, was that with Zions having a new core loan platform, this enabled the company to provide PPP loans to *new* borrowers that found difficulty obtaining PPP loans from other banks.

Zions' success with the PPP program was not only tied to the technology it already had in place prior to the program being rolled out but also due to its experience as an SBA lender as well as shuffling hundreds of bankers to assist PPP customers. Specifically, Zions was able to create a new lending platform for PPP loans in only three weeks by using automated API workflow processing systems that linked to other systems and included a digital signature capability to make the PPP process even easier for borrowers to submit PPP applications. In total, Zions' PPP loan approvals totaled ~$7B (or ~9% of total assets) which was the ninth-highest among all banks in the US. Of the 48K in total PPP loans that Zions originated, *~14K of these PPP loans came from new relationships* (from customers that did not previously bank with Zions), and looking ahead, Zions is working on converting these relationships to more complete customers that use more products from the bank, which should be additive to the company's overall growth profile.

While the PPP program was an early sign of success of how Zions has used technology to enhance the customer experience, there are still several projects in the pipeline. In addition to the technology investments discussed above, Zions recently announced plans to build a 400,000 square foot technology campus in Midvale, Utah, which will serve as the company's primary technology and operations hub and house more than 2,000 employees once it opens in mid-2022. This new hub should help Zions' bring in new technology talent which will be important in allowing the company to remain well-positioned for success from a technology point of view. As we look ahead, these investments should yield further long-term benefits to improving the customer experience and ultimately driving additional growth.

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Appendix: Individual Reports on Detailed J.D. Power Client Satisfaction Scores

In this appendix section, we provide one-page summaries for the banks in our coverage universe of customer satisfaction scores from J.D. Power's 2020 U.S. Retail Banking Satisfaction Study. For each company, we provide the NPS Score, Overall Satisfaction Score, and performance in factors including: Product and Fees, Convenience, Communication and Advice, New Account Opening, Transactions, and Mobile. For the satisfaction scores, the scale is from 0 to 1,000 and for NPS, the scale is from -100 to +100. This data set excludes any survey score that has less than 100 survey respondents. We note the data set excludes BKU, CADE, and FRC due to fewer than 100 survey respondents. In addition, AMAL, FHB, MCB, SBNY, SIVB, and TCBI are not included in the J.D. Power survey due to the banks having fewer than 50 nationwide branches or other reasons.

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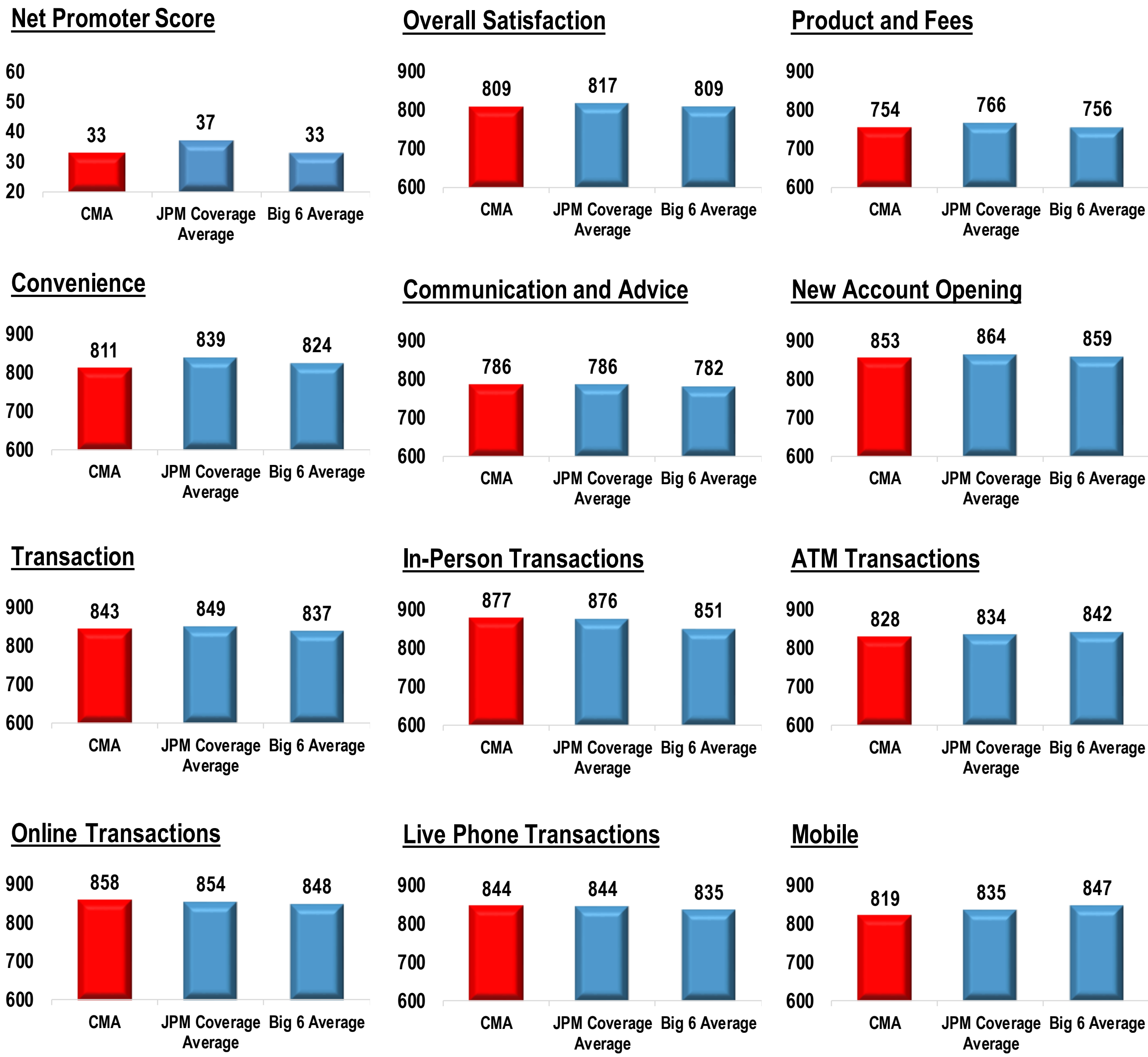
Comerica 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



Source: J.D. Power. Note: Big 6 banks include BAC, C, JPM, PNC, USB, and WFC. NA is due to fewer than 100 survey respondents. Index score ranges from 0 to 1,000. Net promoter score ranges from -100 to 100.

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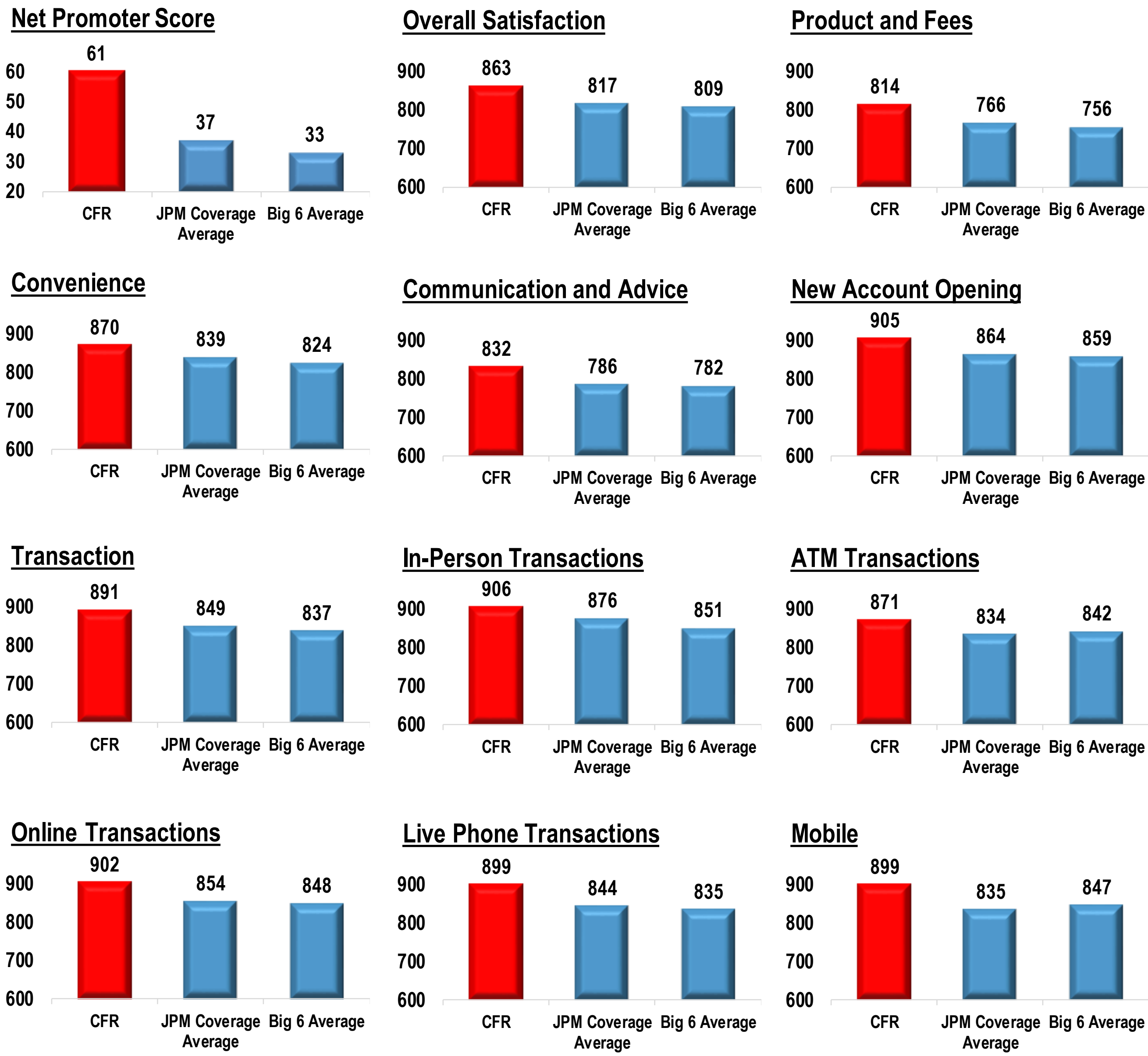
Cullen/Frost 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



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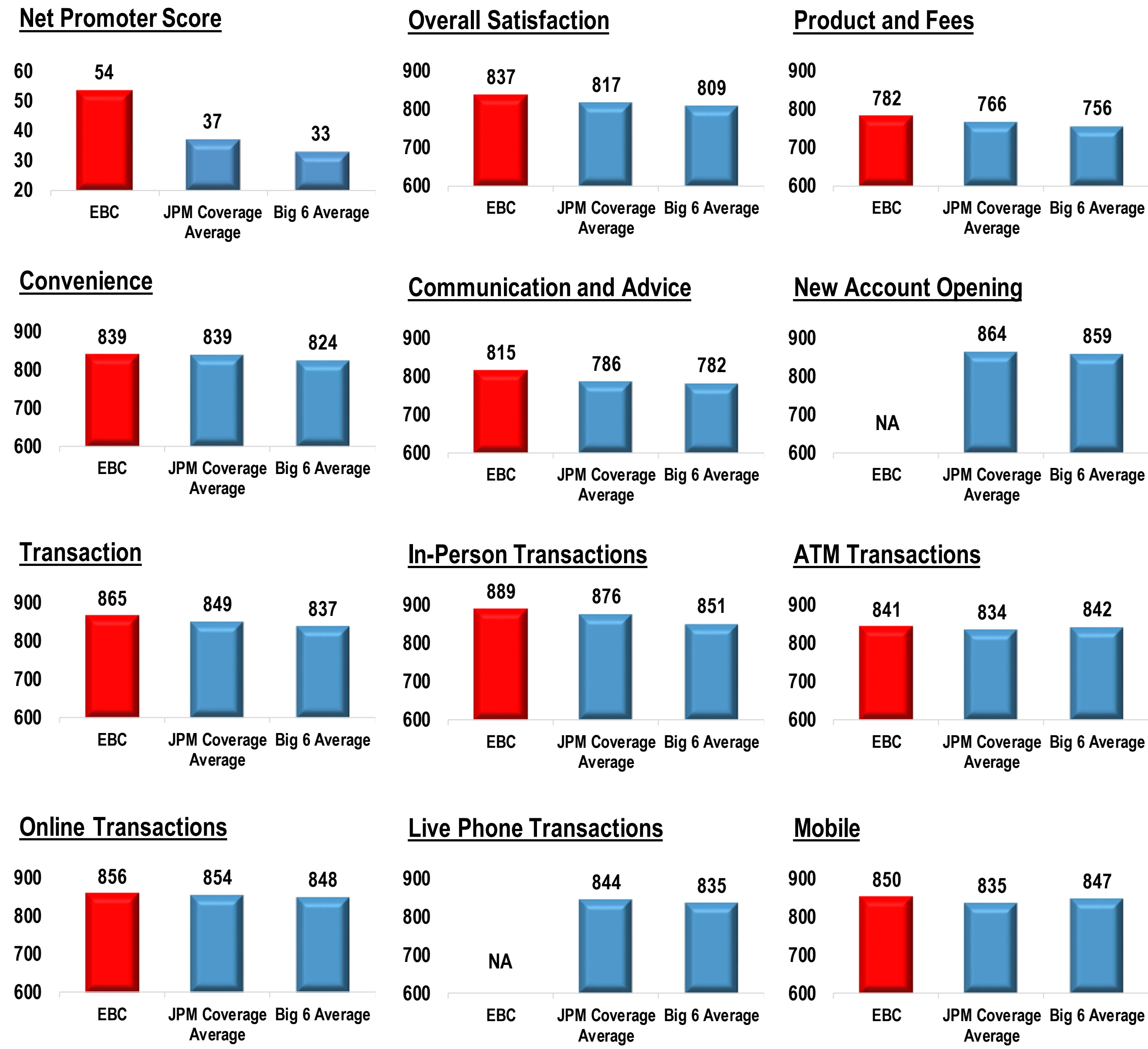
Eastern Bankshares 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



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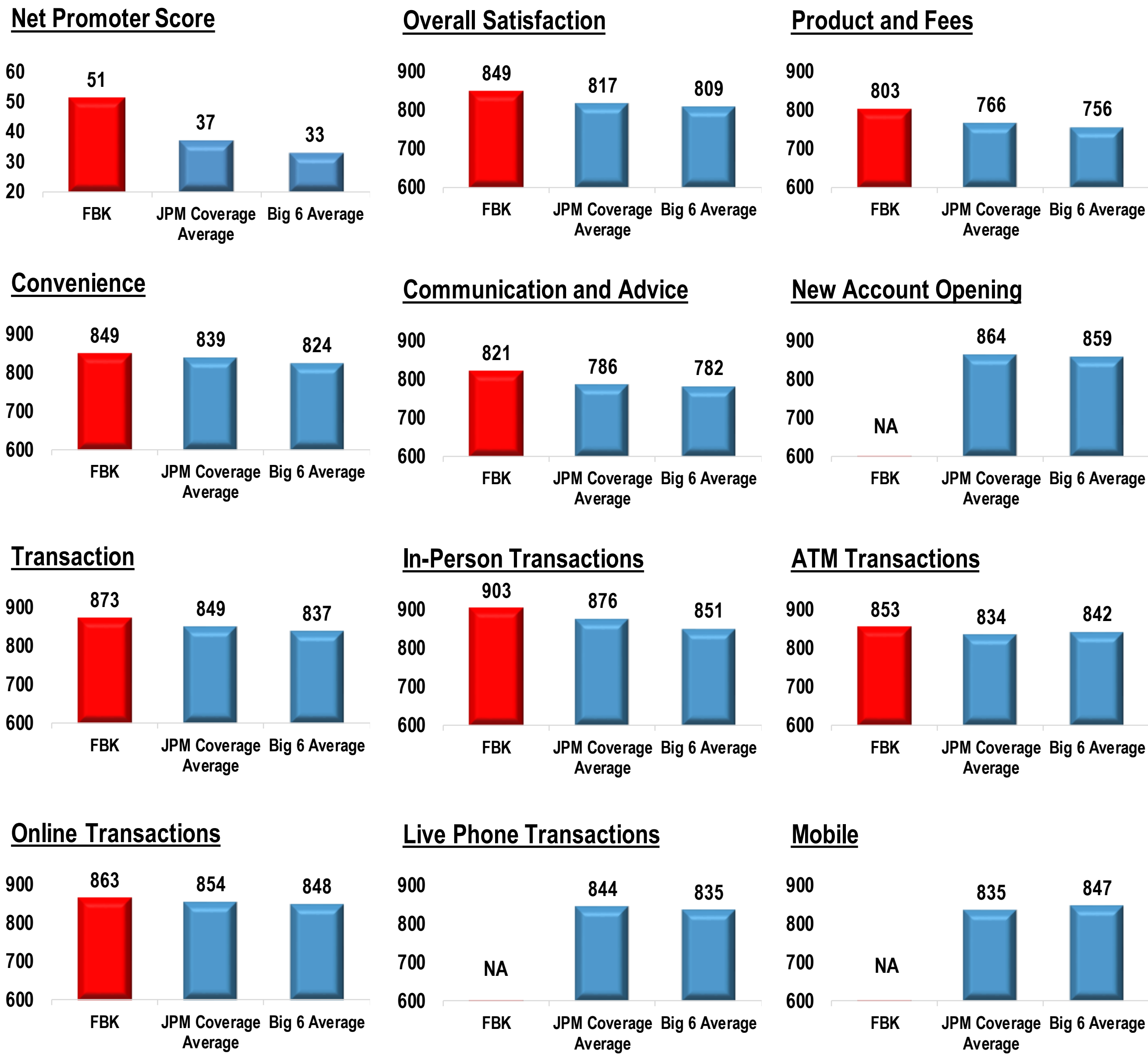
FB Financial 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



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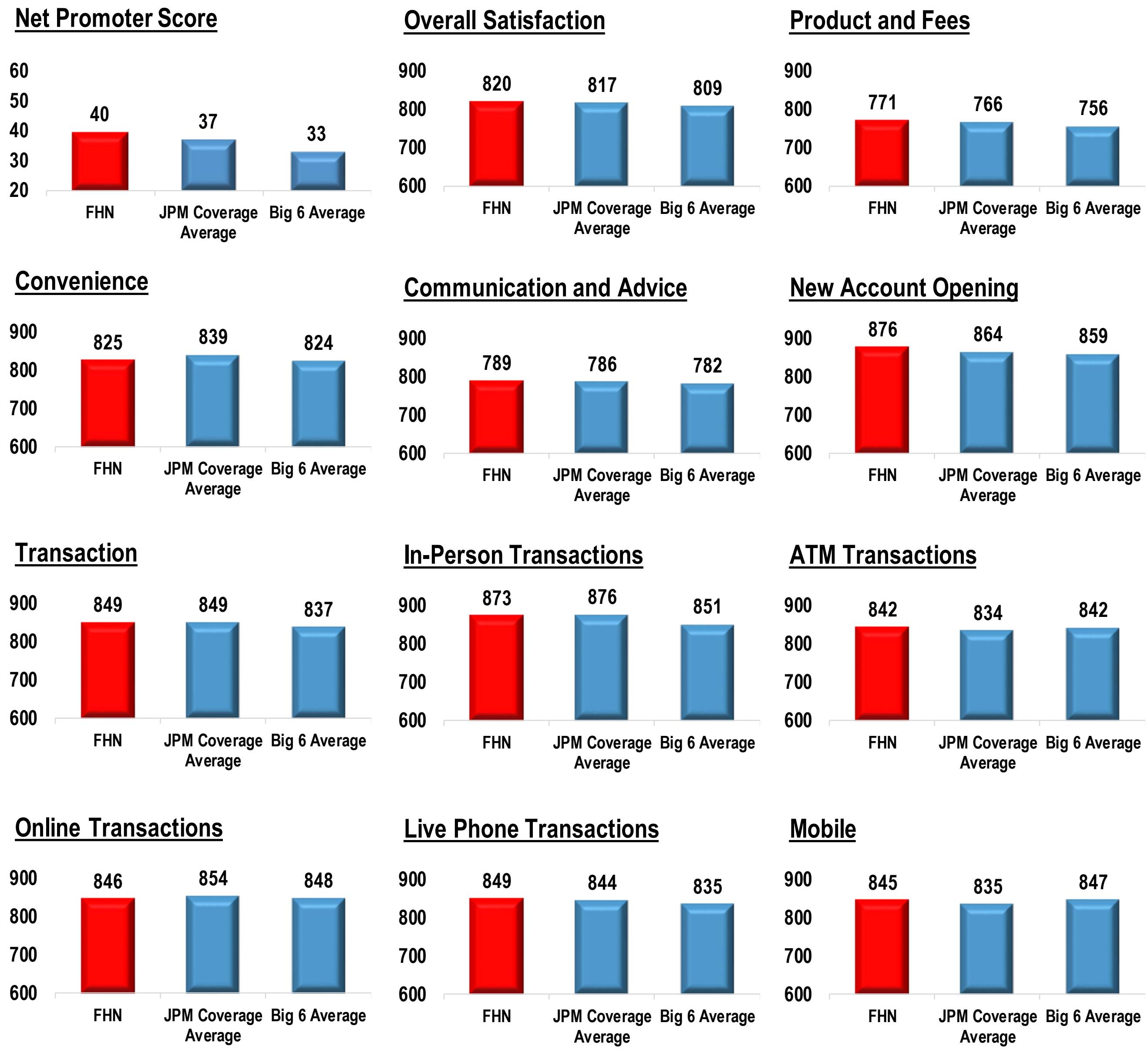
First Horizon 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



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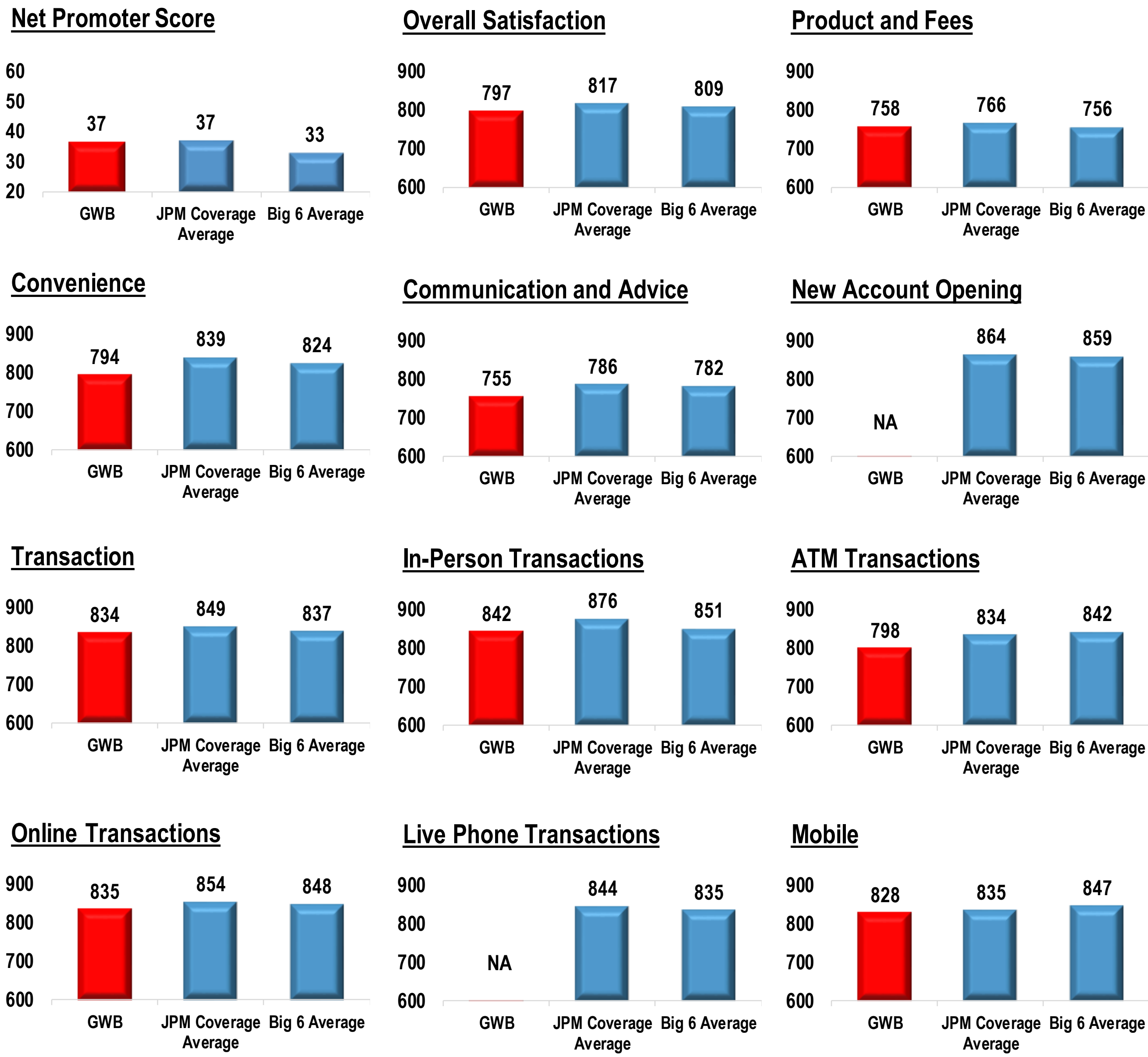
Great Western Bancorp 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



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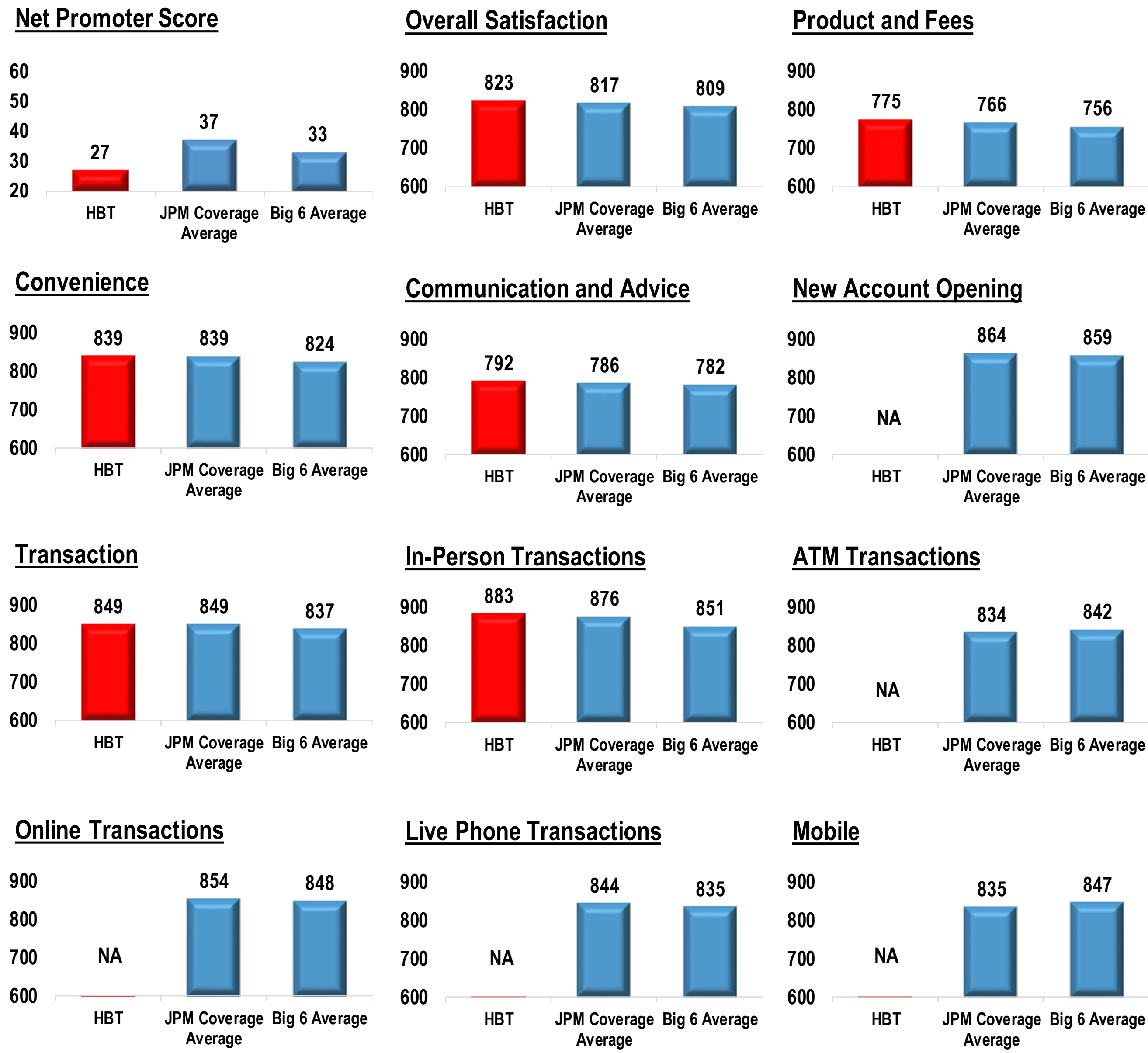
HBT Financial, Inc. 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



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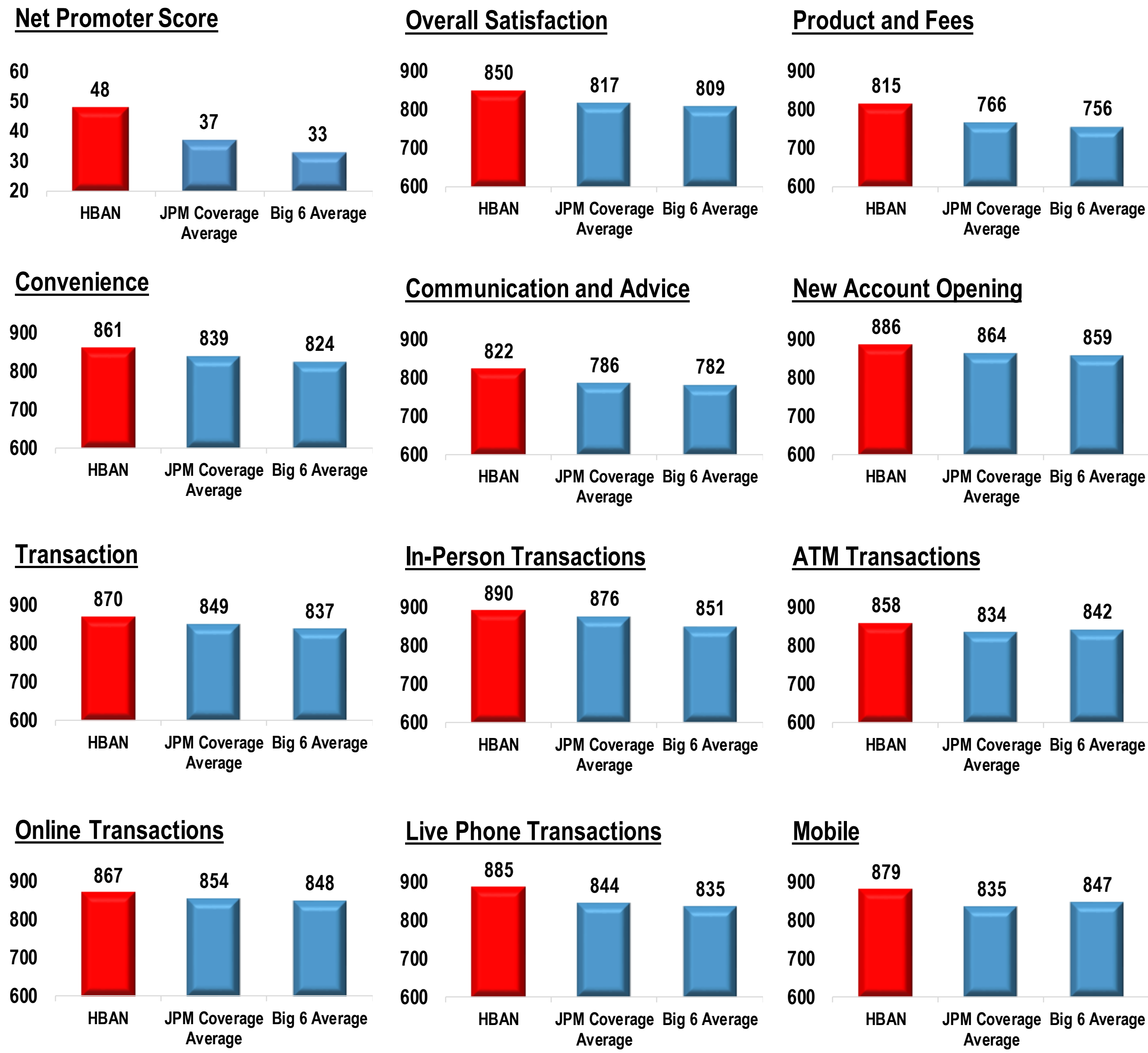
Huntington Bancshares 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



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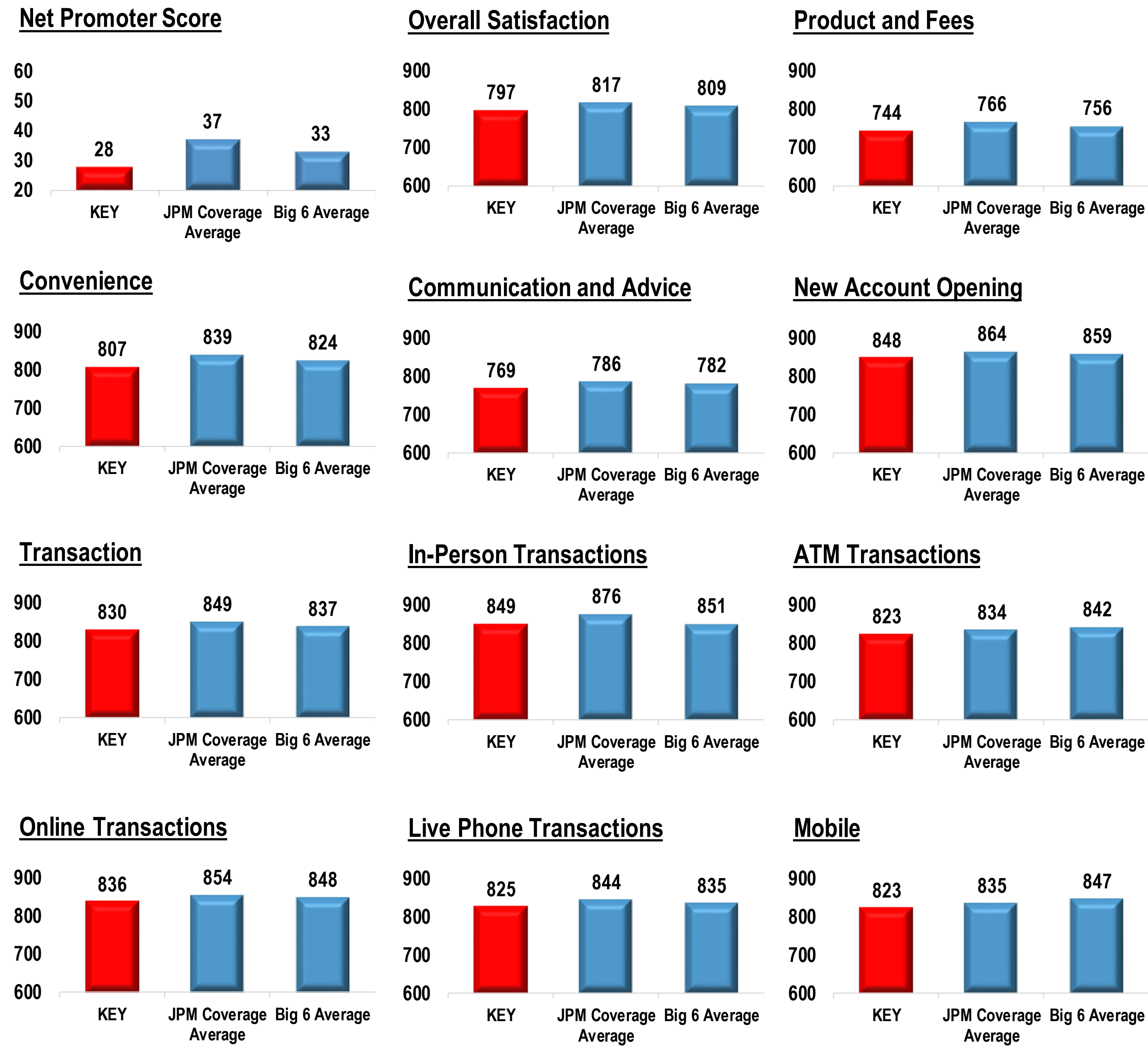
KeyCorp 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



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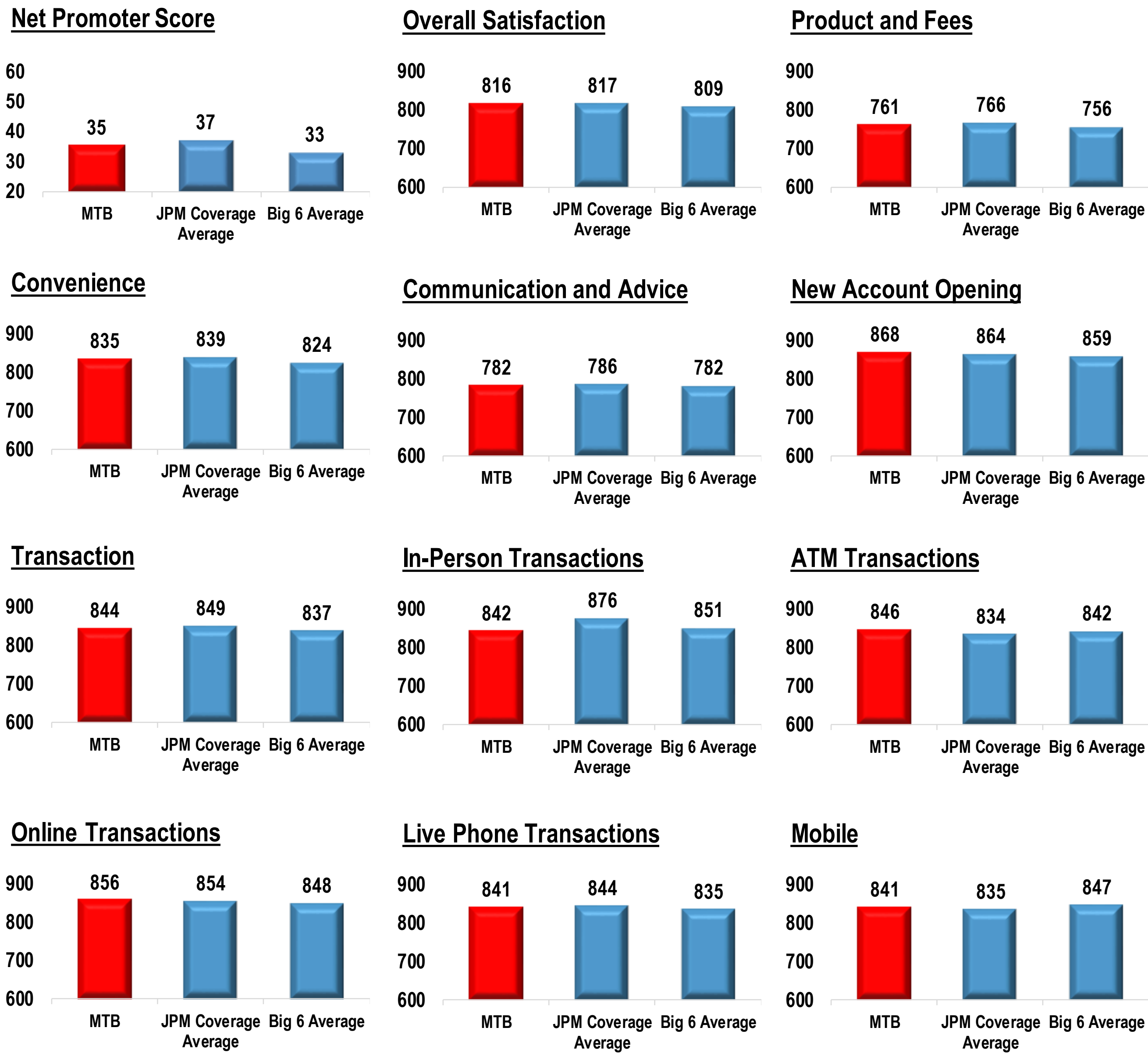
M&T Bank 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



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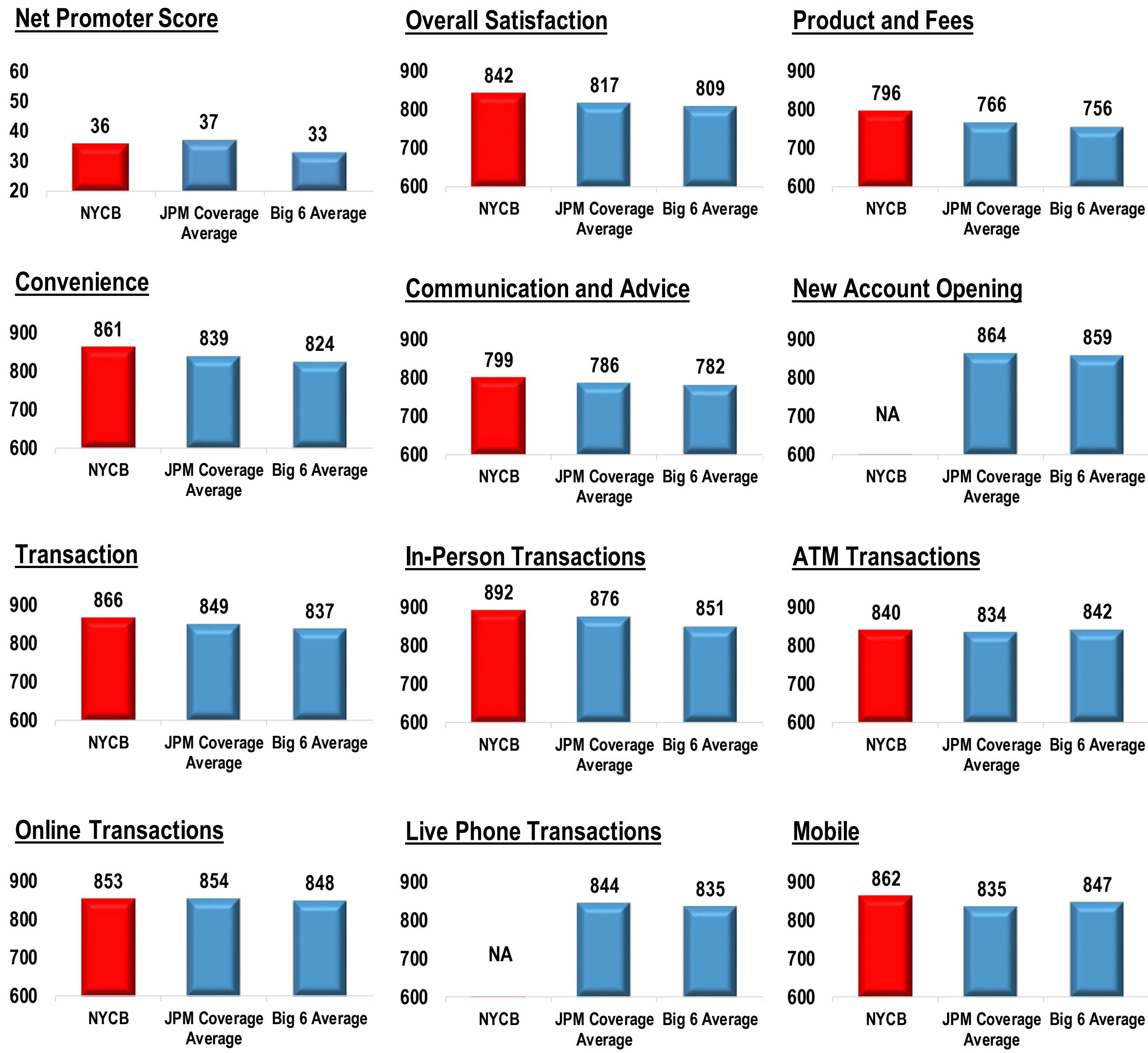
New York Community 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



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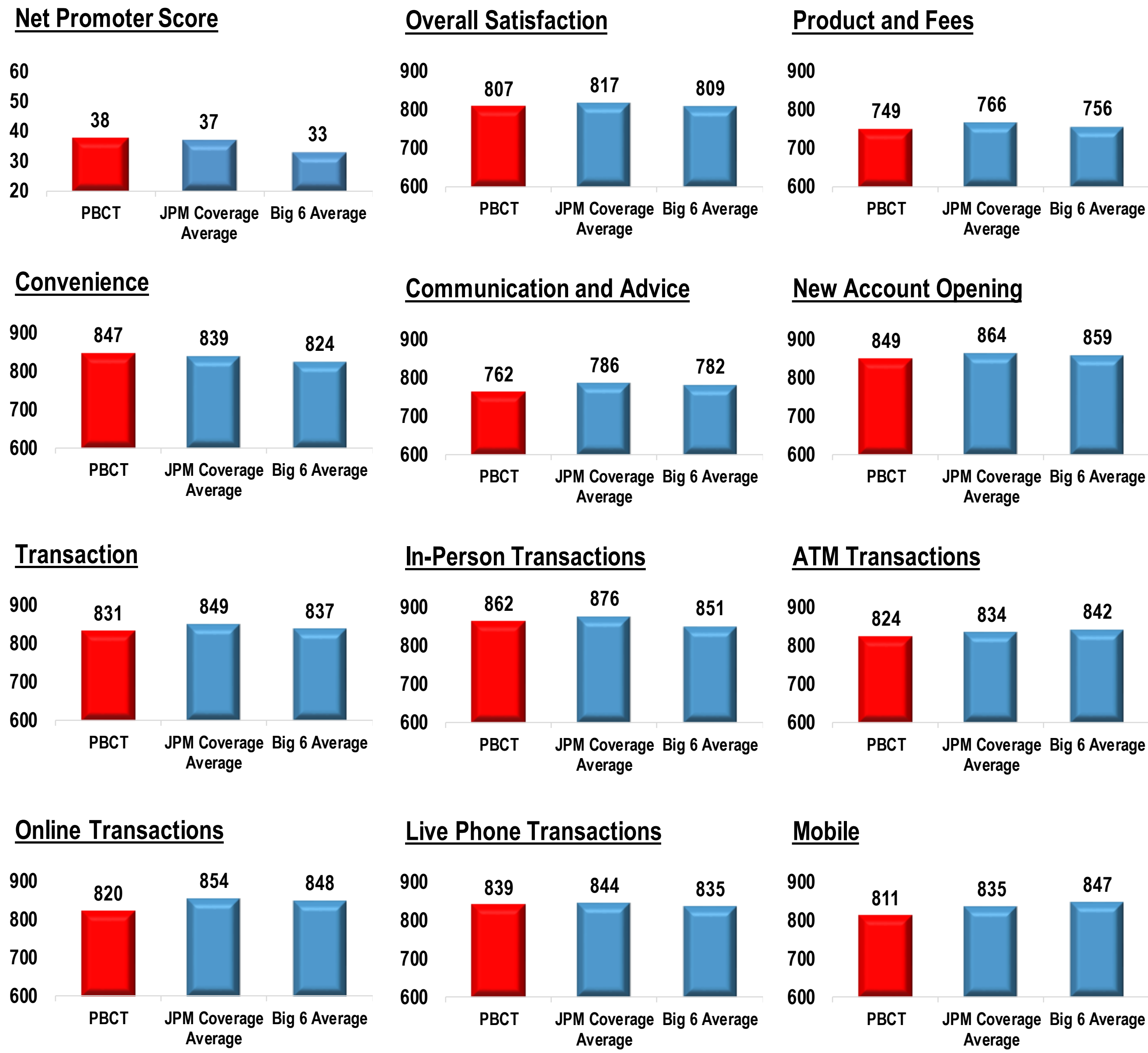
People's United 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



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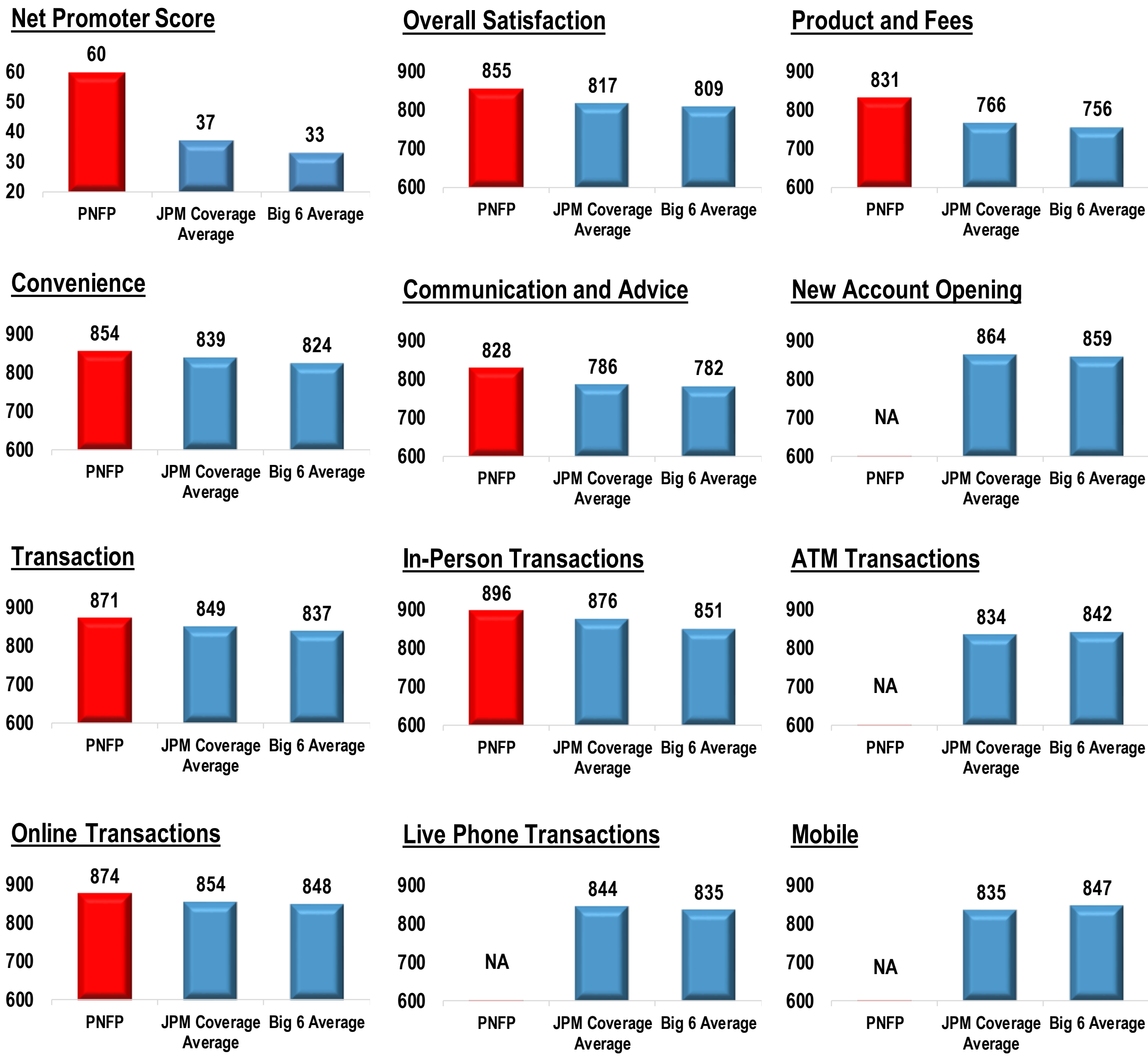
Pinnacle Financial 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



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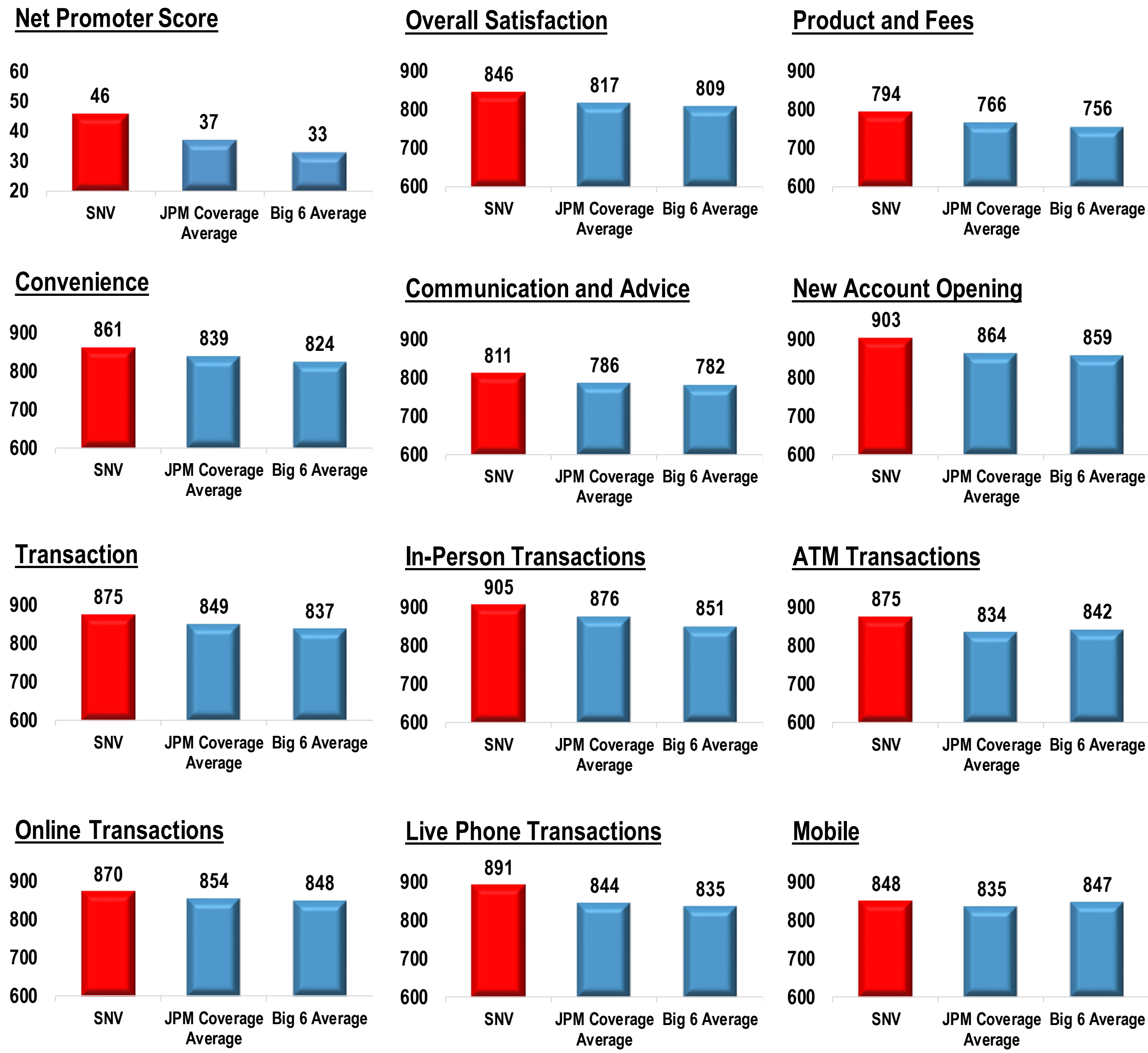
Synovus Financial Corp 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



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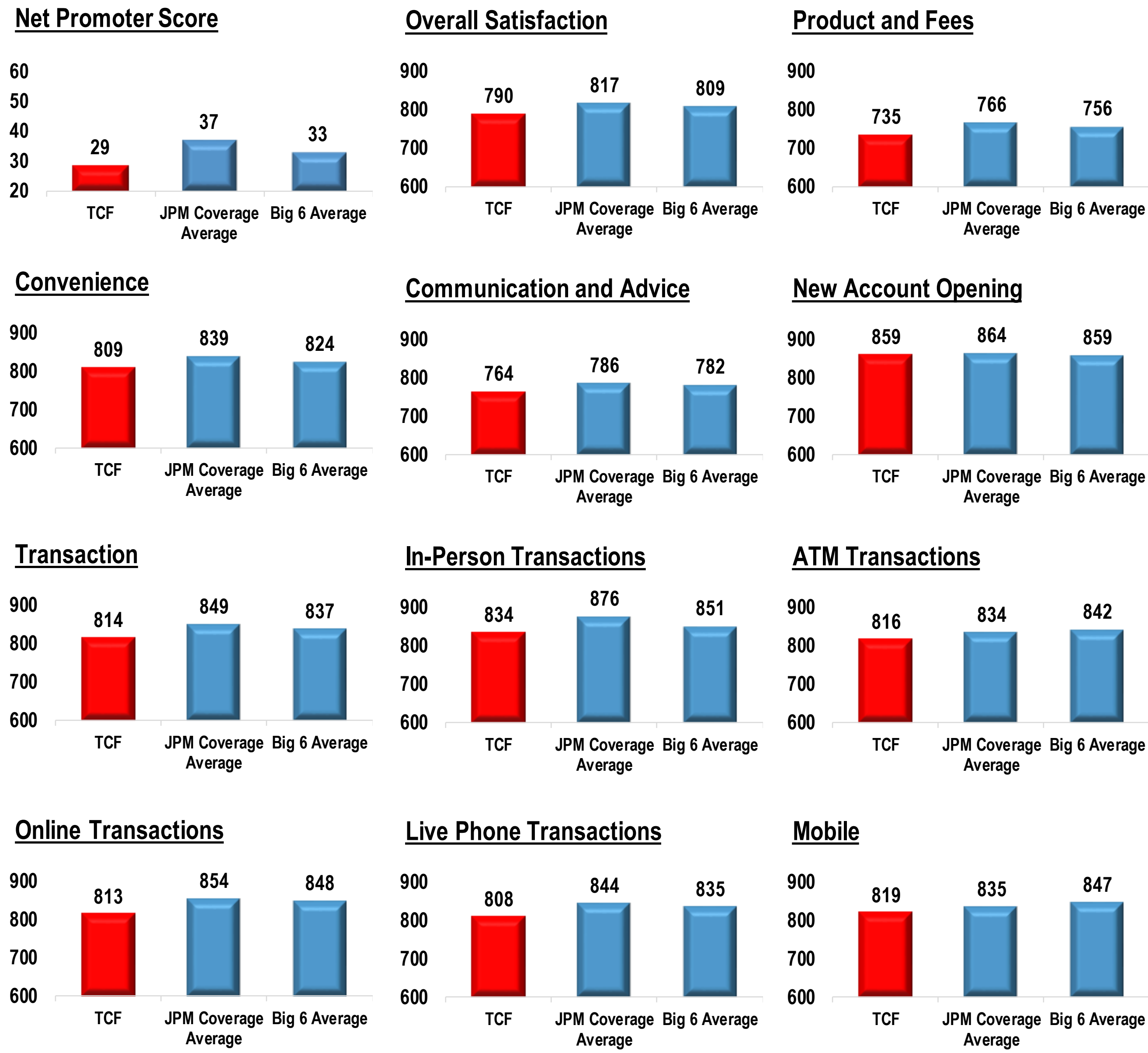
TCF Financial 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



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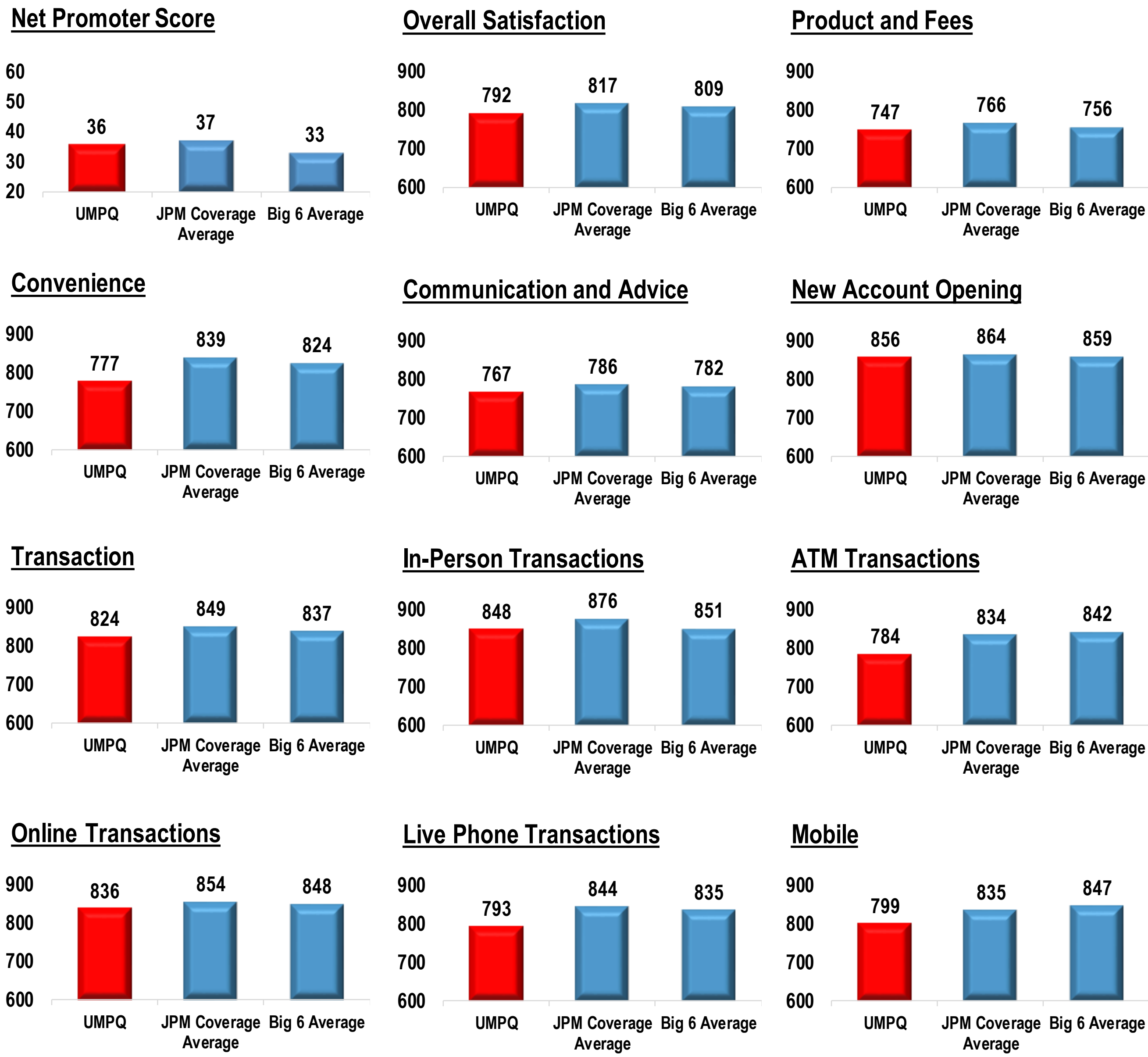
Umpqua 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



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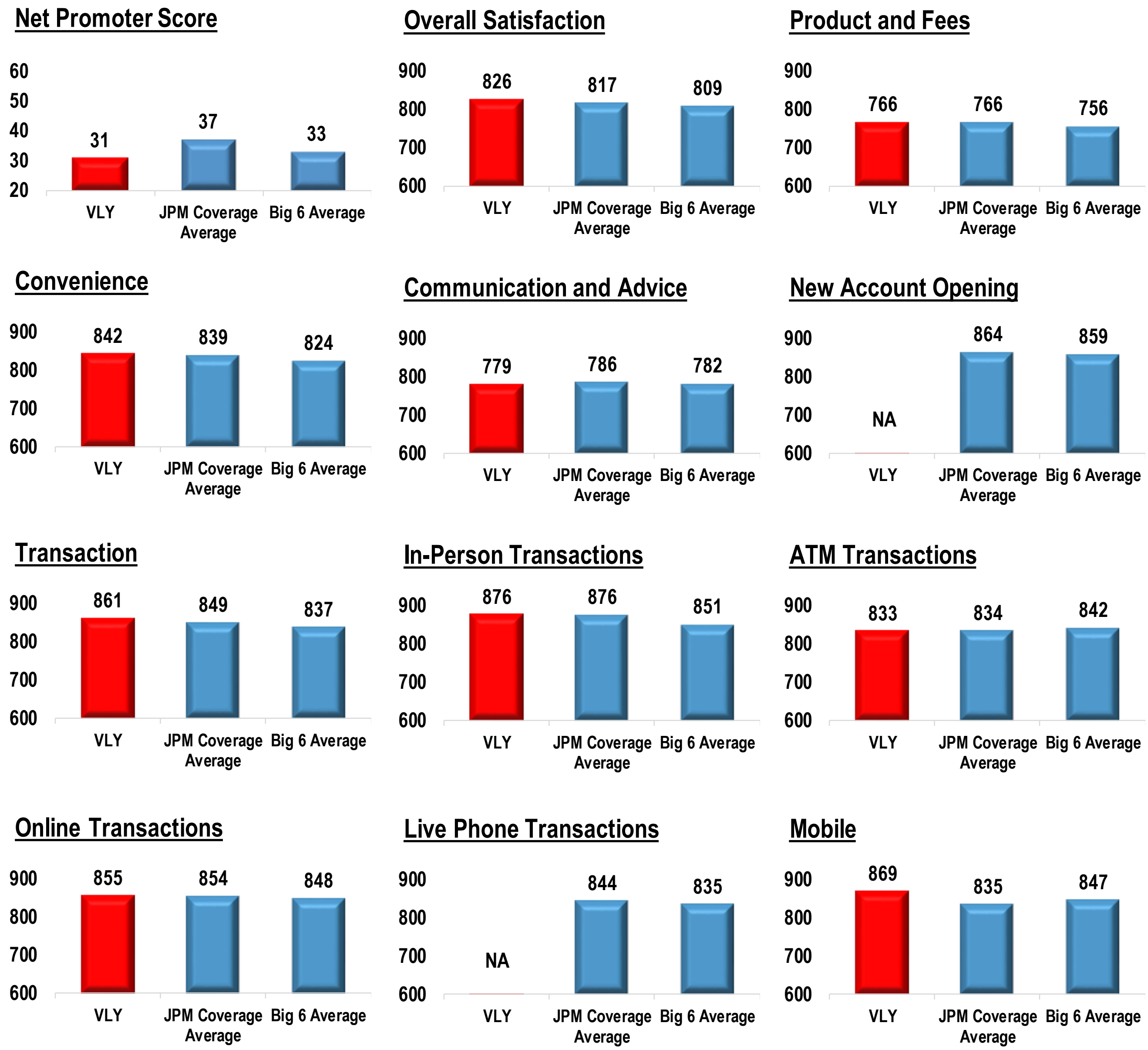
Valley National Bancorp 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



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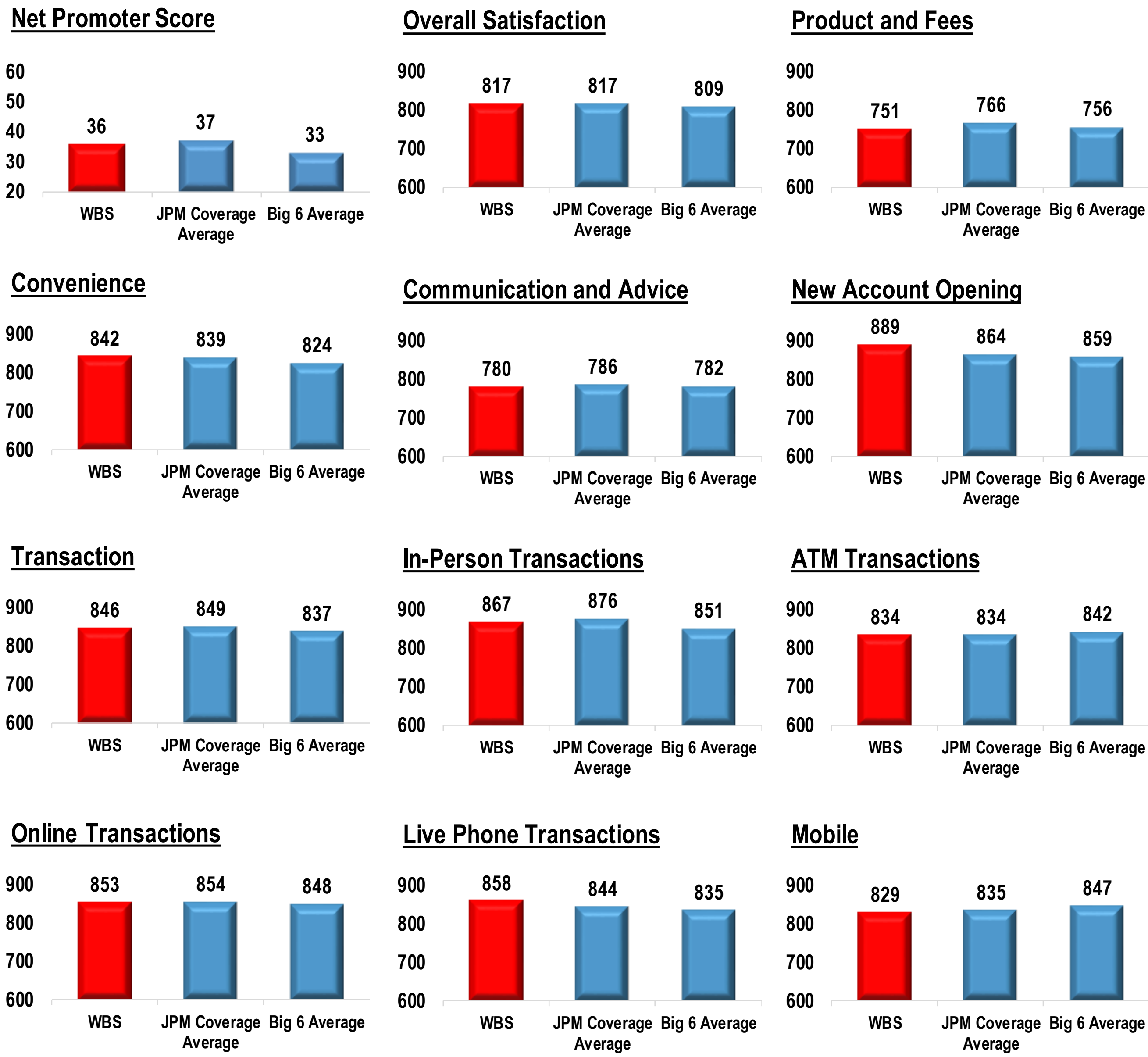
Webster Financial 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



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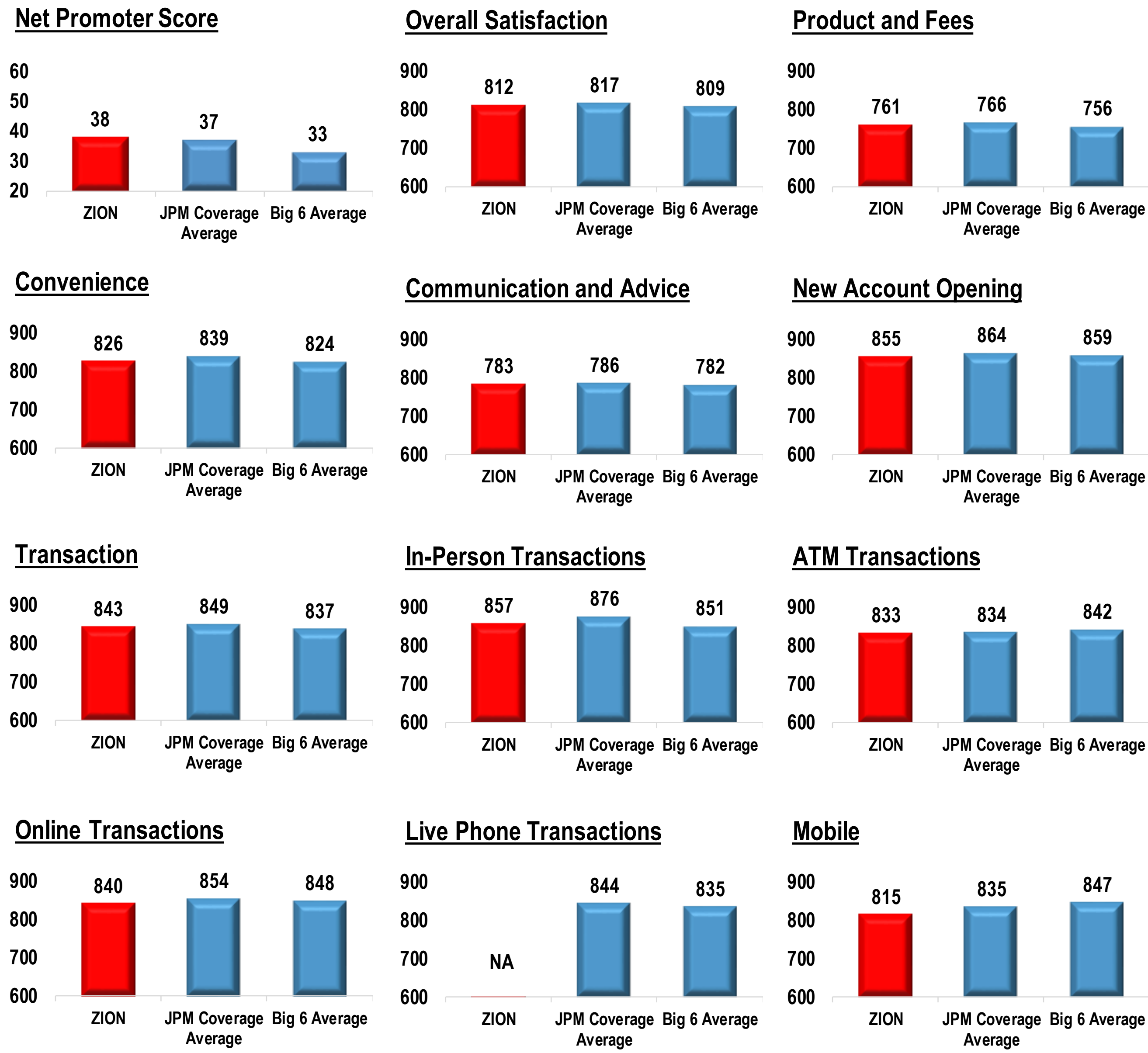
Zions Bancorp NA 2020 J.D. Power U.S. Retail Banking Satisfaction Study Scores



Source: J.D. Power. Note: Big 6 banks include BAC, C, JPM, PNC, USB, and WFC. NA is due to fewer than 100 survey respondents. Index score ranges from 0 to 1,000. Net promoter score ranges from -100 to 100.

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