
*DeNovo Q2 2016
FinTech ReCap and
Funding ReView*

&

**The un(der)banked
is FinTech's largest
opportunity**



*DeNovo: A platform to understand how disruption impacts
business strategy and what actions to take*

August 2016

About DeNovo

DeNovo is a platform to understand how disruption impacts business strategy and what actions to take. DeNovo cuts through the FinTech noise to deliver proprietary content, insights, and research married with access to your dedicated team of subject matter experts to help you design better business strategies built on innovation.

Our real-time content and analysis is developed and maintained by more than 50 subject matter experts, a dedicated team of research analysts, and contributions from more than 2,000 members of PwC's financial services practice around the globe.

The rapid emergence of disruptive technologies and new business models requires a modern way of delivering strategic advice, when and where you need it.

DeNovo offers five modules covering innovation

Banking services. *Commercial real estate, small and medium banking, small and medium lending, auto finance, cash and treasury management, deposit products, other retail lending, other wholesale lending, residential real estate, student lending*

Capital markets. *Advisory services, alternative investment exchanges, custody and asset servicing, inter-dealer brokers, market exchanges, market utilities, origination, sales and trading, trading and execution*

Insurance. *Auto insurance, commercial insurance, employee benefits, individual life and A&H, personal coverage (non-auto), reinsurance, retirement savings benefits*

Investment and wealth management. *Hedge funds and fund of funds, private banking, private equity and venture capital, retail wealth and brokerage services, traditional funds*

Transaction and payment services. *Card issuing and processing; funds transfer, remittance and bill pay; merchant acquiring and processing; payment networks; point-of-sale and online checkout solutions.*

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Executive summary



Trending now

The un(der)banked: FinTech's largest opportunity. Mobile money services have proven to be an effective gateway for financial inclusion among the un(der)banked, a demographic that could evolve into a US\$3 trillion payments volume opportunity. But mobile money services are a fraction of the opportunity and have converted only a small fraction of the unbanked population into users of additional services. For example, we see \$360 billion in unmet banking deposit demand, with insurance facing more than \$20 billion in uncaptured premiums in the U.S. market alone.

Mobile has been the enabling technology, and money services act as the entry point for the un(der)banked. Access, trust, and tapping into evolving consumer behavior will drive the sustainable conversion of this demographic to the formal financial system. With 42% of the global adult population still absent from the formal financial system, the financial services and FinTech industry is in a rare position to drive not only economic and innovation change, but also social change.

Innovators are starting to move beyond money services to address lending, insurance, and even the savings area. With innovation occurring in multiple functional banking areas aimed at the un(der)banked, incumbent financial institutions can now consider an aggregate financial inclusion strategy based solely around these emerging FinTechs.

A look ahead

Wealth management has lagged other areas of financial services in responding to change. With the ensuing \$30 trillion that will transfer to millennials over the next 30 years, these firms will need to consider the “socialization” of wealth management in order to capture the opportunity.

RegTech update

U.S. regulators released draft rules for payday and installment lenders, and innovation-focused forums were held in Washington, D.C., on the future of FinTech in financial services. The U.S. Supreme Court also let stand the *Madden v. Midland Funding LLC* ruling from a Second Circuit court, relevant for the marketplace lending space.

Horizontal look

We look at the blockchain ecosystem as several “stacks” are starting to form. Areas including standardization of communications protocol, maturity of the programming language, demonstration of business use cases, and ability to manage risk within regulatory adherence will be influential to adoption of the technology.

DeNovo FinTech funding recap

Funding of DeNovo FinTech companies continued to trend lower in the second quarter, with funding down 26% from the first quarter. InsurTech has been the outlier in the midst of aggregate FinTech industry downtick, with average sequential growth of 12% over the last two quarters, as the space is now attracting greater interest in addressing new methods of distribution among small-to-medium business and contract workers.

Stay current with DeNovo’s research series

In the DeNovo FinTech ReCap and Funding ReView research series, each quarter we do the following:

- Explore a current thematic trend and its relevant impact on the financial services landscape.
- Take a “look ahead” at a potential emerging trend that may not be widely known or discussed within the FinTech community.
- Provide a recap of current regulatory matters.
- Examine a select “horizontal” technology.
- Provide an update on the most recent investment activity in the FinTech industry.

Trending now:

The un(der)banked: FinTech's largest opportunity

Financial technology (FinTech) is becoming an enabler of economic inclusion. In addressing previously excluded consumer demographics, the industry is in a position to drive innovation and economic and social change. According to the World Bank Group (WBG), an estimated 2 billion adults,¹ or 42% of the global adult population, are absent from the formal financial system. Therefore, even modest strides in achieving economic inclusion present the single largest addressable opportunity in FinTech.

Banks are reevaluating their respective strategies following years of global expansion. The top U.S. and U.K. retail banks operate in 80 countries on average, yet 77% of assets and 65% of branches are derived or located in their single respective home country. Despite differing views on global expansion, massive opportunity remains. There is long-term potential in new markets in part from the network effect that allows banks to cross-sell multiple products. There also is significant customer acquisition potential.

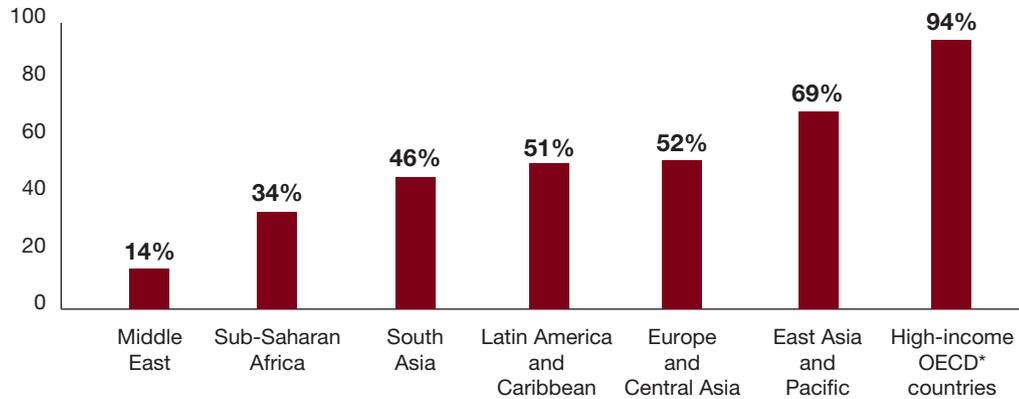
The largest opportunities rest in developing areas, such as the Middle East and sub-Saharan Africa where 86% and 66% of adults, respectively, do not have traditional bank accounts² (see *Exhibit 1, next page*). In terms of absolute population, 55% of the global un(der)banked — 1.1 billion individuals — reside in Asia-Pacific countries, primarily China and India, per PwC analysis of the World Bank's Global Findex report.³

The unmet deposit demand of the un(der)banked demographic is at least US\$360 billion. For context, this is three times the \$120 billion capital shortfall that six of the eight globally systemically important banks must cover under a total loss-absorbing capability regulation imposed by the Federal Reserve in November 2015. This \$360 billion figure is derived considering only a single product — a bank account — and relies on conservative assumptions, including a three-month savings buffer at the minimum poverty living expense. Because money movement is required for any other more formal financial service, such as credit, insurance, or savings, money services have become the most likely starting point to begin to achieve economic inclusion and add to this addressable opportunity.

Even modest strides in achieving economic inclusion present the single largest addressable opportunity in FinTech.

Exhibit 1

Percentage of adults with traditional bank accounts (by geography)



* Organisation for Economic Co-operation and Development.

Source: Global Findex database

Many of these basic banking services also help the un(der)banked avoid high fees. Fee reduction or elimination, according to the Federal Reserve, is the single largest benefit of having a formal bank account in markets where alternatives already exist. In the U.S. market alone, the un(der)banked spend 2.5% to 5.0% just to access payroll funds. Further, with a lack of cards or checks, the un(der)banked incur additional fees when they use money orders or other noncash payment methods; these fees often exceed average bank fees.

Mobile is the essential enabling technology for financial inclusion.

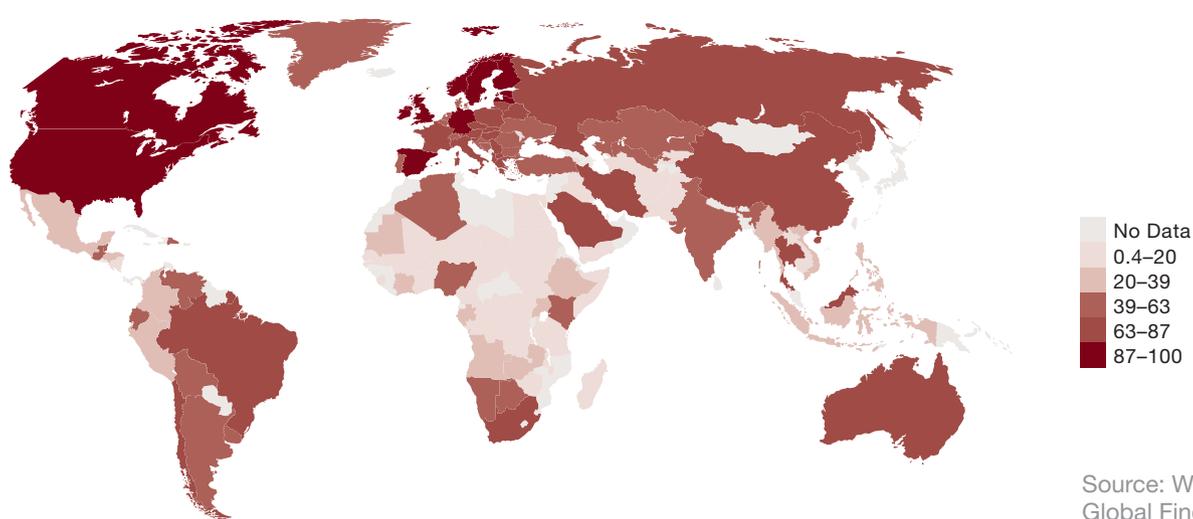
To begin to reach the un(der)banked, ubiquitous reach or access is needed, and mobile has proven to be the answer. Mobile has moved beyond being a new delivery channel and now provides basic banking services to un(der)banked populations in remote areas that lack financial services infrastructure.

There are several examples where mobile-delivered services have improved financial inclusion. The most notable is in Kenya, where regulatory exemptions permitted mobile network operators (MNOs) such as Safaricom to enter the payment market with an agent-based banking model. There are now more than 26.2 million mobile money accounts in Kenya,⁴ roughly equal to the adult population of 26.8 million.⁵ However, transitioning to the next step, a formal account, remains elusive in many developing nations (*see Exhibit 2, next page*).

Mobile has moved beyond a delivery channel to now provide basic banking services.

Exhibit 2

Percentage of adults with an account at a traditional financial institution (2014)



With the development of technologies such as blockchain and initiatives such as ID2020 and WBG’s Identification for Development Initiative (ID4D) and Universal Financial Access (UFA), we expect to see significant progress in reaching the un(der)banked. Arguably, this will be achieved largely through FinTech innovation (see Exhibit 3, page 11).

How can financial innovation begin to achieve economic inclusion for the un(der)banked population?

For this report, we define unbanked consumers as those who do not have a formal bank account — checking, savings, or other. We also touch on the underbanked: consumers who have a formal bank account but, because of factors including lack of funds or poor credit history, may rely on ancillary services such as payday loans.

Barriers to reaching the un(der)banked: lack of trust and changing consumer behavior. Existing mobile money services, such as M-Pesa and Smart Money, have enabled the underserved to access financial services. However, for providers to further engage these consumers, they will need to address a significant pain point associated with cash, achieve trust, and adapt to changing consumer behavior. Comfort with the ease of mobile payments builds an initial trust level, which in turn can create entry points for ancillary savings products, credit access,

insurance, and other services. Ultimately, access is important, but establishing trust to utilize these services is even more so.

With an estimated 2 billion un(der)banked individuals in the world today and the UFA goal of reaching 400 million with banking services by 2020, establishing trust is clearly critical for industry growth.⁶ One challenge is the public's adverse view of the financial system. For example, in the U.S., 62% of the un(der)banked population does not consider banks trustworthy.⁷ A different set of challenges exist with the unbanked because of the lack of infrastructure and physical access to consumers and because of extreme poverty. Still, options for gaining trust exist.

Delivering traditional services through nontraditional channels is a highly successful way to earn consumer trust and achieve access. Nontraditional channels that are aligned with newly forming consumer behavior or with established and trusted consumer brands have proven to be most successful in converting consumers in both under- and unpenetrated markets.

Here are two examples of nontraditional channel alignment that develop trust:

- 1. Tapping into newly forming consumer behavior.** Venmo, a digital wallet service, leveraged the growing use of social media with a simple design for a user-friendly application. Facebook and Square have since taken similar approaches. Success through changing consumer behavior can be seen in the two or three times per week that consumers open the Venmo app, many prompted by “likes” or comments posted with payments from friends, according to the company, proving that peer trust is invaluable.
- 2. Establishing partnerships with trusted consumer brands.** These types of partnerships are still developing. M-Pesa's successful association with mobile carrier Vodafone is one example of effective distribution through an established brand. Major consumer brands, such as Apple, Google, and Samsung, are aiming to insert themselves into the traditional financial institution–consumer relationship, with modest success thus far. Consumer behavior arguably has not seen the significant change from traditional card swipe in payments that is needed to declare success with mobile wallets, and trust with these brands also may not exist in emerging markets.

Among the un(der)banked, peer recommendations are a significant factor, and prospective service providers can take advantage of this. According to a recent Nielsen survey, 83% of individuals in 60 countries said they trust recommendations from friends and family above all else when considering financial products.⁸ Financial services

The UFA has set a goal to reach 400 million unbanked adults by 2020.

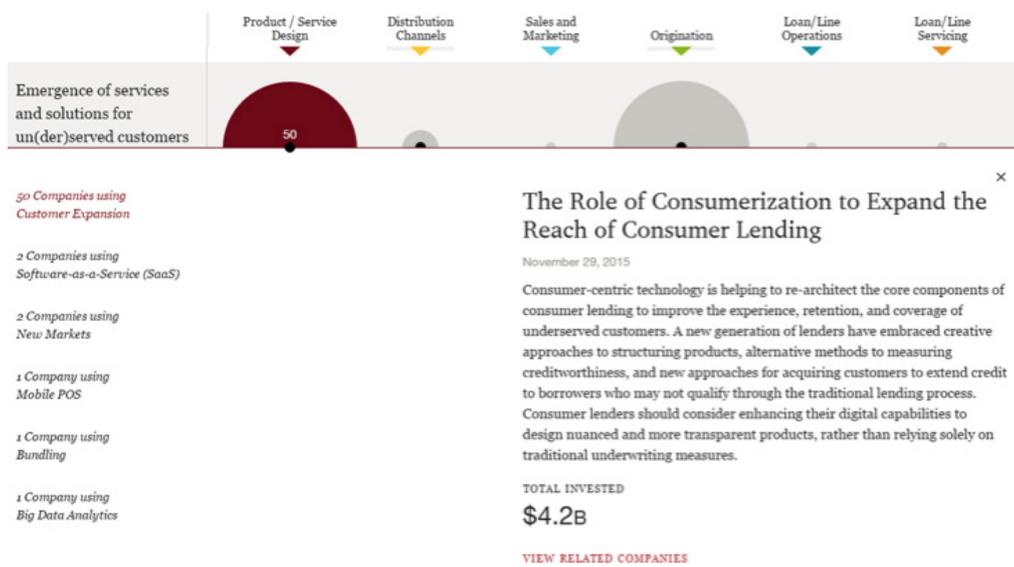
and FinTech companies can leverage these peer recommendation networks via trusted brand partnerships, community outreach programs, and distribution through consumer-favored methods in order to establish trust and expand their brands.

Existing peer-to-peer financial services models also may help. In developing countries, many consumers borrow money from friends and family or other sources of short-term credit outside the traditional financing world. Interestingly, aspects of this “communal lending” are the exact characteristics that underlie the burgeoning peer-to-peer (P2P) insurance model and could serve as a strategy for lending in un(der)banked populations. Many P2P insurance models rely on the formation of groups that share common attributes — this is a proxy for social responsibility in the model. Communal P2P lending models may achieve the stated goals of gaining trust and tapping into consumer behavior and could emerge as a conduit to migrate the un(der)banked beyond payments.

Exhibit 3

Emergence of services for the un(der)served is a core trend within DeNovo

DeNovo helps firms identify where innovation can impact their business, as well as the potential downstream industry change. Below is a screenshot from the DeNovo consumer lending industry subsector site. We can immediately identify the trends relevant to this subsector — in this case, the emergence of services and solutions for the un(der)served — along with the technologies, business models, and related startups at this specific intersection.



Source: Strategy& analysis

It is ultimately up to banks, FinTechs, and the partnerships they form to establish trust so as to reach these consumers and convert them to the formal banking system. Many examples involve nontraditional partnerships with retail or telecom outlets to supplement aspects such as physical locations, and in some instances this requires a cooperative regulatory framework. For example, the financial innovations pillar of the Bank of Uganda's Financial Inclusion Project interacts with financial services companies and mobile network operators to prioritize mobile money and agent-based banking in order to promote financial innovation.

When provided with responsible financial products, such as microfinance transactions, low-income individuals have joined the formal banking economy. Responsible use of banking services provides an economic benefit as well as a social benefit by eliminating the underserved population's use of costly alternatives to the formal financial system.

Increasing demand from the financially underserved in developed countries

In developed markets, the target group for both banks and new FinTech entrants is low-income populations. This demographic likely has some level of savings potential and demand for lending products with a greater ability to repay than those below the global poverty line of \$2 per day. These individuals are the most obvious candidates for being underserved financially. In 111 countries in 2011, there were 4.4 billion individuals who fell into this category, earning between \$2 and \$10 per day.⁹

Any initial success in conversion of the un(der)banked would see small transaction balances, but the likelihood of repayment and the profitability of small balance loans will increase as data models improve and costs fall with the

emergence of new financial technologies. The overall lending demand is difficult to size, but there is undeniably a huge demand for short-term, unsecured credit at the small business and consumer level, not only in the U.S. but also globally.

In developed markets, much of this demand is expected to be met by the rise of marketplace lending, which PwC has projected could reach \$150 billion or higher by 2025, a massive increase from the \$16 billion originated in 2014.¹⁰ Small businesses and the consumers who own them stand to benefit the most from the increased proliferation of unsecured, shorter-term credit products, as these products have fallen out of favor with larger incumbent institutions because of smaller loan size and profitability, as well as risk aversion.

Mobile money services are the entry point

Mobile money services (money transfers and payments) have begun to establish financial inclusion and could be expanded over a multiyear or decade time frame to include lending, savings, and insurance. Factors including digital distribution (mobile), nontraditional competition (MNOs), and regulatory changes (exemption of select financial products) have combined to influence the industry to serve the unbanked. As a result, companies such as bKash, Easypaisa, and M-Pesa are now viable competitors.

JPMorgan is the largest recent visible example of a large financial services company responding to these competitors by disclosing that it will untether its money transfer app (QuickPay) from its Chase Mobile banking app and institute a new name and branding for the P2P service. This move can be seen as a shift to address competitors, such as Facebook money transfer, Square Cash or Venmo, in developed markets. But it is also a subtle shift in customer acquisition strategy from the traditional branch-based approach — this distinct mobile money app is emerging as the new entry point to formal banking services.

The dominance of mobile is clear. Over the last 15 years, the number of mobile money services has increased from one to 271 globally, and these services now reach 85% of the countries in which less than one-fifth of the population holds a bank account.¹¹ This massive mobile-enabled distribution reach is arguably accelerating the rate at which the un(der)banked are achieving economic inclusion; as a result, the landscape is evolving in terms of competition and breadth of services.

Competition should help commoditize aspects of the market. Two-thirds of countries with mobile money services now have two or more services competing for the same audience. Further, many of these services are unable to expand outside their respective home markets for regulatory and operational reasons. Market saturation is beginning to materialize, as demonstrated by the declining number of new mobile money services in each of the last three years. This will help commoditize basic financial features, which is a needed component in the goal of economic inclusion.

The natural next steps for basic money services providers involve either vertical or horizontal expansion. This healthy competition in the market will force money services providers to pursue one of these strategies:

- **Achieving massive scale at low-to-free price points:** Scale will be achieved through an expansion of the local acceptance footprint of cash-in/cash-out locations through partnerships with regional businesses, such as supermarkets and gas stations.

- **Increasing the value proposition via more sophisticated financial services:** The delivery of these services begins to move into the trend of delivering traditional financial products through nontraditional channels.

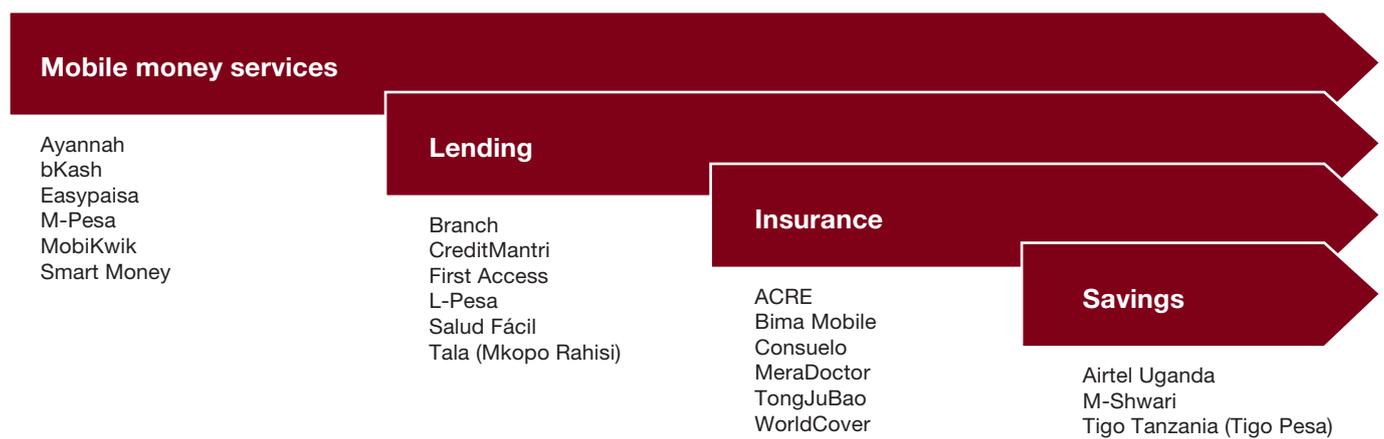
The pathway for economic inclusion is paved by emerging FinTechs. Innovators are moving beyond the money services opportunity to begin to address lending, insurance, and savings. We view this as the pathway for economic inclusion (see Exhibit 4). With innovation occurring in several functional banking areas aimed at the un(der)banked, incumbent financial institutions can now consider an aggregate financial inclusion strategy based solely around these emerging FinTechs. Consolidation within each functional area is likely, and a horizontal strategy across the pathway could provide incumbents with a broad customer acquisition strategy — starting with mobile money services — that also includes additional solutions for the financial inclusion journey.

Increasing breadth of services will include integrated delivery of banking products. The migration beyond mobile money services to more sophisticated services relies on addressing a significant pain point and attaining trust. As trust is established, money services providers

Incumbent financial institutions can now consider an aggregate financial inclusion strategy based solely around these emerging FinTechs.

Exhibit 4
A financial inclusion model solely from FinTechs

Representative list of companies



Source: Strategy& analysis

will look to establish partnerships to deliver enhanced services, and incumbent financial institutions will play a larger role in the un(der)banked markets. Those companies that can align the delivery services with evolving consumer behavior will be in a stronger position to migrate the formerly un(der)banked consumer from simple payment activity to the traditional banking system.

Within the evolving competitive landscape, mobile network operators also face change

The ease with which applications are now distributed and used also is a consideration. MNOs are shifting away from “closed loop” strategies and ceding control of the application and product features to third parties. It is now commonplace for MNOs to sign reciprocity agreements, which is leading to further fragmentation of the payment or money services ecosystem.

The initial phase of mobile money services involved tight integration of capabilities into phone services with predeveloped services or applications resident in the SIM cards. The evolution and, more important, adoption of the smartphone could loosen the grip that MNOs have over the services that reach consumers through their respective mobile networks. Many MNO-operated money services act as gatekeepers for amenities provided to mobile phone users, requiring direct integration, revenue sharing agreements, and other hurdles for partners to deliver new financial services to a captive un(der)banked audience.

The broader use of application program interfaces (APIs) is also contributing to the fragmentation of basic services. As open APIs continue to increase in use, the cost burden and time-to-market for new financial services will be substantially lower. Third parties can more seamlessly build new products on top of core mobile money services and can replicate the impact of app markets on smartphone adoption. This provides the potential to skip the process of working directly with MNOs and build new products, such as e-commerce shopping tools, international remittance, and bill pay, for anyone with a smartphone. However, many apps provided by either money services companies or MNOs have been relatively primitive.

Many mobile money providers have not yet offered banking services beyond basic money transfer, even in countries with substantial mobile phone adoption. For example, although 91% of Ghanaian adults own a mobile phone, only 5% have used a phone to pay bills, and 1% have used a phone to pay for goods in a store.¹² At this stage, mobile money providers have not succeeded in selling services beyond basic money

transfer and airtime top-ups for mobile phone usage, with the exception of some markets, such as Kenya, where 20% of adults have used M-Shwari, a personal loan service.¹³ Mobile channels significantly reduce the cost of new customer acquisition and provide substantially better interface with which to improve the user experience and tap into consumer behavior. Functionalities such as video and biometric capabilities are seeing success in providing help to illiterate and financially challenged populations.

Insurance companies have a different opportunity

Penetration of the un(der)insured remains stubbornly low and possesses a different set of challenges. The overall penetration of insurance within developing markets (defined as premiums as a percentage of GDP) remains paltry at 2.7%, according to 2015 data from Swiss Re.¹⁴ Not all is lost, however, as coverage has seen an uptick — premiums from developing markets represent 18% and 16% of total nonlife and life premiums, compared with 7% and 4%, respectively, in 2000 (see Exhibit 5).

What is important to consider is the nonlinear relationship between the need for insurance and the growth in GDP. As development occurs, the necessity of insurance rises much faster than the underlying GDP of the market.

Clearly, penetration of the un(der)insured in developing markets has seen progress over the last 15 years. But the economic growth in developing markets — which has increased at twice the rate of that in developed markets over the last 45 years — has, to a degree, muted the impact. As such, a material opportunity remains to capture what is still a greenfield opportunity in developing markets.

Exhibit 5
Developing markets’ share of total global premiums and GDP

	2000	2015
Share of nonlife insurance premiums	7.0%	18.0%
Share of life insurance premiums	4.0%	16.0%
Premiums as a percentage of GDP	2.0%	2.7%

Source: Swiss Re

The un(der)served likely do not see the benefit of the insurance. In contrast to the un(der)banked, the un(der)insured are not concentrated in developing markets. For example, only about 60% of U.S. adults have life insurance coverage, compared with the 94% who have bank accounts. There are a multitude of factors behind the low coverage rate, namely the uncertain benefit to the covered and the misconception of the cost of a policy. A 2015 study by Life Happens, a nonprofit focused on insurance planning, showed that millennials overestimated the cost of insurance by 213%. In looking at all respondents, the overestimation was 80%.

In essence, insurance has a public relations problem. Some may view it as a tax or a burdensome payment with uncertain benefits, whereas basic banking services can bring immediate convenience with low to no fees. Life insurance coverage in the U.S. has decreased precipitously over the past five decades, with the aforementioned 60% life insurance coverage rate equivalent to levels last seen in the 1960s.

To put the U.S. opportunity into perspective, there are approximately 165 million adults ages 25 to 64. Depending on the type of life insurance policy (whole or term, length of the term, the total value, and health statistics), policy price can vary significantly. However, with an annual baseline price of \$1,000, a \$16 billion opportunity exists if life insurers can increase policyholders by 10%. The \$16 billion figure accounts only for those who are currently uninsured and not for those who are underinsured. With the two groups combined, there is likely well in excess of \$20 billion of uncaptured business remaining in the U.S. market.

Revisiting Insurance 101 — education for both consumer and insurer. In developed markets, a simple lack of education about insurance is creating opportunity. Within the aforementioned Life Happens survey, 38% of those who lack life insurance gave as a primary reason that they were unsure what type of insurance was appropriate. Insurers, though, need to go back to school too. They must study their potential customers — buying habits, customer loyalty, awareness — in order to gain outsized market share. P2P insurer Lemonade recently created a new chief behavioral officer position to combat the perceived unfavorable experience currently associated with insurance. Insurers need to recognize changing consumer behavior and educate themselves about best practices when selling into a shifting demographic market.

The overall goals for insurance coverage capture are far lower than those in primary banking. In traditional banking, goals are lofty and include initiatives such as the WBG's UFA by 2020. In contrast, goals within the insurance industry are lower, yet still provide a significant opportunity even in developed markets.

Products and services that lead with insurance education are an expanding trend within DeNovo.

These opportunities require different strategies for incumbent insurers and InsurTechs. Two trends are growing to capture the un(der)insured:

- 1. Highly data-driven customer targeting.** Mobile and other technologies have enabled customer targeting beyond that possible in the traditional market. This has forced incumbent carriers to move beyond traditional intermediaries and coverage programs to better understand evolving consumer behavior.
- 2. Product bundling.** In developing markets, carriers have skipped the traditional agent/broker model and leveraged mobile and nontraditional partnerships. Several examples exist where carriers have formed partnerships to access an existing customer base for the cross-sell opportunity. Consumer trust is also a factor here when considering the trust of partner brands. In some instances, carriers are also able to develop a deeper understanding of the purchasing habits of this untapped customer base.

Across both trends, digital delivery is the enabler of developing market success. By integrating the sales activity into an existing digital purchase made via mobile, carriers can mitigate the cumbersome nature of shopping among multiple carriers and try to overcome the negative consumer attitudes toward insurance products.

A secondary reason for nontraditional partnerships is to target developing markets where physical infrastructure is lacking. In addition to mobile partnerships, companies as varied as the Chinese search engine Baidu and Jumia, Nigeria's online retailer, have formed partnerships to bundle products and essentially become a channel for insurance sales. Customer acquisition through these channels is more effective from both the physical infrastructure and agent network sides. Integration of the insurance purchase at the point of sale should allow for insurance purchases to become more relevant and commonplace.

New approaches to close the gap ultimately revolve around costs. Blockchain, the technology that enables a decentralized ledger of all transactions across a peer-to-peer network, and P2P models are emerging as approaches to closing the insurance protection gap by reducing the overall cost and simplifying the process (*see Exhibit 6, next page*). Scalability will remain a critical factor for efficiently priced insurance, and the insurance product will still have complex actuarial work on the back end. However, the perceived ease of transaction should lead to increased penetration of the un(der)insured. Blockchain, for example, enables seamless integration into various sales channels, potentially creating the ability to rapidly expand a customer base.

Bima, an InsurTech company based in Stockholm, is an example of novel product bundling. The company delivers microinsurance in conjunction with the topping up of mobile devices.

Exhibit 6

Blockchain vs. P2P: emerging approaches to close the insurance gap

	Blockchain	P2P models
Description	Distributed ledgers are creating a more efficient insurance process by reducing the need for transactional intermediaries, and they can reduce the cost and time of moving funds between parties, particularly in cross-border transactions.	P2P models will introduce additional flexibility within the insurance product by better matching a broad investor base with coverage demand. This could support a more cost-effective product globally, and ultimately increase coverage.
Risk transfer	Smart contracts, which are computer programs that execute the transfer of digital currencies or assets under certain conditions, shift risk from the individual to the carrier without a middleman. The immutability of the transaction is then verifiable for both parties.	P2P models essentially transfer and diversify risk across a group, which often consists of similar social communities. The models also introduce unforeseen moral circumstances.
Use cases	Blockchain solutions are starting to be used to combat fraud and implement microinsurance, two aspects needed in developing markets.	In developing markets, P2P may be leveraged in a way similar to microfinance (lower-limit products) to enable broader business development. In developed markets, P2P insurance may allow for the creation of new types of coverage, such as microinsurance for small commercial farmers.
Other considerations	The regulation of insurance and the eventual backstop of government entities likely create additional regulatory considerations for insurance use cases based on blockchain. Smaller permission-based implementations are likely to appear, at least initially.	P2P operators are unlikely to retain risk, so immense scale is probably needed for any P2P model to see success. P2P models also stray from the long-standing actuarial and historical data framework, which may require regulation to ensure adequate consumer protection.
Select companies	Consuelo, Everledger	Dynamis, Friendsurance, Lemonade, Teambrella, WorldCover

Source: Strategy& analysis

Within these emergent areas, the more likely near-term reality rests with smart contracts. The clear benefit in the adoption of smart contracts is an almost immediate reduction in administration cost and human error. For example, in the healthcare sector, administration costs amount to roughly 10% of insurers' revenue with an additional 8% spent on billing and insurance-related functions. Reducing these costs, therefore, is significant.

Smart contracts aim to simplify and automate the setup and execution of policies. The contracts could also be used to facilitate claims payments, reducing the time and transaction fees of traditional channels. Cost is a considerable factor to help close the insurance protection gap in both developing and developed markets. Smart contracts squarely address excessive cost burden without significant risk or business model change, potentially enabling nearer-term adoption.

Blockchain's greatest contribution may rest with identity verification

A structural limitation for the un(der)banked is verifiable identification. The lack of identification is a choice for certain individuals, but the numbers indicate it is clearly a global systemic concern. About 1.5 billion individuals (30% of the global population) lack verifiable identity documentation, according to WBG.¹⁵ And this issue will persist as 50 million children (38% of total global births) are born each year without a birth certificate or other form of legal identity.¹⁶ There are clearly greater social concerns that come with undocumented individuals than financial services. But individuals are also limited in their ability to improve their respective socioeconomic status without identity, as many services such as social welfare, job training, and basic bank accounts are out of reach without valid identification.

Though blockchain has the potential to transform basic money services by providing an efficient infrastructure to deliver low-cost money transfers, its greater role may rest with identity.

Intergovernmental organizations (such as the United Nations), government agencies, technology companies, financial institutions, and regulators have begun to build digital identity solutions on distributed ledgers. Several organizations, including the ID2020 corporation (affiliated with the U.N.) and ObjectChain Collab, are focused on developing interoperable standards to encourage and monitor progress in global digital identity initiatives. Microsoft, on the other hand, leads a technology-centric approach through a partnership with ConsenSys and Blockstack to develop an open source cross-chain platform. By

\$30 trillion is expected to be transferred from baby boomers to generation X and millennials over the next 30 years.

creating a developer-friendly platform, Microsoft intends to facilitate the creation of market-specific solutions to meet regional demand. Many FinTech companies, such as WISeKey, Netki, and Ping Identity, are also in early stages of digital identity platform creation.

Identities maintained by distributed ledgers would create immutable records. Smart contracts could also then be used to retrieve additional personal information and send aid in the form of vouchers for goods and cash. Paired with other authentication technology such as biometrics, iris scans, and/or USB keys, blockchain solutions can decentralize identity storage credentials on a global distributed database and reduce the risk of identity theft. With a platform on which digital identities can be stored, unbanked individuals gain the ability to access humanitarian aid, basic money transfer, and alternative banking services.

Digital identity is the natural complement to areas such as mobile money services in that it empowers individuals to complete a one-directional transfer of monetary funds and also provides an ability to document asset movement and ownership. Clearly, asset ownership is a path to higher ranks of society for the un(der)banked and will define economic inclusion. Taken together, with no clear global standard or proven business model for blockchain-based digital identity platforms, incumbents should evaluate potential partnerships based on technological interoperability and flexibility.

A look ahead: For millennials, wealth management is social

Wealth management is ripe for disruption, arguably lagging behind other areas of financial services that have witnessed major change. This has been partially triggered by the additional scrutiny allowed by the increased transparency of management and performance fees. With the pace of technology innovation and evolving consumer behavior added in, the wealth management industry is quickly finding it will need to adapt to fulfill these changing needs.

Given the anticipated \$30 trillion wealth transfer from baby boomers to millennials,¹⁷ wealth managers will have to cater to the younger demographic differently to stay relevant. But the industry lags in adopting service delivery methods that appeal to this increasingly affluent generation. PwC's June 2016 report "Sink or swim" states that "wealth management is one of the least tech-literate sectors of financial services."¹⁸ The idea that technology cannot yet replicate the superior ability of humans to generate alpha and custom-tailor solutions to address a client's profile — which is how the industry justifies its fees — is changing, first with the onset of "robo advisors" and now with social aspects of investment management.

Understanding consumer behavior: it's about scale

Millennials are the first digital native generation. They have a distinct set of expectations, such as enhanced communication, transparency, convenience, and readily accessible products. Furthermore, millennials generously share private information and expect in return a customized experience at low cost, if not free. Considering the scale of this demographic — millennials now represent 25% of the U.S. workforce and are estimated to reach 50% of the global workforce by 2020¹⁹ — it is critical for incumbent wealth managers to understand the general idiosyncrasies of the market in order to capture the opportunity.

The U.S. Census Bureau states that millennials represent more than a quarter of the U.S. population, at 83.1 million individuals, having overtaken the second-largest group, baby boomers, at 75.4 million.^A

Traditional wealth management is at a pivotal moment as the personalized investment advisor is falling out of favor.

Complicating the relationship, millennials have a collective inherent distrust of banks, partially due to witnessing the Great Recession, among other pivotal financial moments such as the bursting of the first technology bubble and the Madoff Ponzi scheme. Not only do new modes of managing wealth leverage millennials' aversion to traditional financial institutions, but some also appeal to their affinity for digital socialization. The digital experience offered by technology incumbents is extending to FinTech, and this is predicated on more transparency and customer-centric models. These are characteristics that consumers have come to expect and are necessary to engage the massive opportunity with millennials and to change expectations to retain existing clients.

More than just robo in wealth management

Robo advisors provided an initial catalyst for change, and alternative approaches are now evolving. Robo advisors, online services that use automated algorithms to manage a portfolio, are considered an efficient way to escape high management fees. Widely covered by the mainstream media, these approaches have been growing at a pace well above the industry's historical trend but still represent

Improved digital services will attract high-net-worth investors too

Like millennials, high-net-worth individuals also are not keen on wealth management services, partially because of the lagging adoption of technology by the industry. Findings from a survey focused on high-net-worth individuals included in PwC's publication "Sink or swim" illustrate the point.

1. 69% of the high-net-worth demographic uses online/mobile banking; only 25% of advisors offer digital channels beyond email.
2. Client satisfaction is low, with only 39% of respondents likely to

recommend their wealth advisor. This falls to 23% among clients with more than \$10 million in investable assets.

3. Approximately 47% of high-net-worth individuals younger than age 45 who do not currently utilize robo advisors suggest they would do so in the future.

Given that high-net-worth individuals are highly profitable, advisors who do not up their digital game face significant risk to their existing revenue stream and attrition through the generational asset transfer.

only a fraction of total industry assets and less than 1% of the mutual fund and ETF assets.²⁰

Although robo advising seeks to supplant traditional advisors, social trading and other types of crowdsourced information gathering are also beginning to emerge and provide innovative ways for millennials to participate directly without relying on an institutional analyst's view of the market.

Use of social media for investing is gaining ground as millennials swap tips and learn to invest online in a way that exceeds what was possible in the "chat forums" of early financial websites. These communal discussions are seen as providing a more intimate investing experience, especially to a generation criticized for over-sharing: Portfolios are laid bare for followers to see and can be "liked," commented on, and openly discussed. Divulging one's positions may seem overly revealing, but this is the model employed by successful platforms such as Openfolio, ClosingBell, and Estimize.

It may seem counterintuitive to ignore trained professional investors in favor of amateur investors; however, an inter-business school study by universities in Hong Kong and the U.S., "Wisdom of Crowds: The Value of Stock Opinions Transmitted through Social Media," compared opinion pieces on Seeking Alpha, a crowdsourced site, to the information provided by professional analysts and traditional financial news.²¹ The study found that the crowdsourced forum, in aggregate, outperformed professional advisors, and millennial investors trust information received from social media, or the crowd. When this model produces the intended results, it gives millennials further disincentive to rely on traditional financial outlets, paid media, or a financial advisor.

Investment clubs are reappearing

The investment club is reemerging with a new flair: elements of social networks now regularly appear in this medium. The traditional investment club was founded to help pool investor money, discuss the financial merits of an investment, and invest when the club's investment voting rules were satisfied. These clubs were especially popular when trading was more expensive, which is largely now a nonfactor.

Online investment clubs now help millennials collaborate in group learning, and this communal element is fostering the growth of these clubs to help individuals navigate the challenging wealth management landscape. This is another extension of the crowdsourcing model, but

Elements of social media are a natural attraction for millennials and help attract this demographic to online investment club models.

it contains the added caveat of a socialized investment risk. If a community is created around a similar goal but there is a variance in the skill sets that are brought to the group, then the consolidation of all ideas is thought to yield a much more intelligent investment decision. Furthermore, to encourage participation, many social media enticements have been introduced, gamification chief among them. By introducing competition, such as outperforming friends, investment leaders, or known figures such as Warren Buffett, social media encourages high performance and educates others as to what makes for successful analysis.

Social and automated trading are emerging

Social trading differs from online clubs, as it allows users to automate trades to follow individual traders based on performance, investment style, or relationship. This approach is also different from robo advising in that instead of trying to personalize a portfolio based on a standard questionnaire and then rebalance the portfolio accordingly, users are following an investor's activities, even if the style diverges from their initial intent. This model introduces an element of investment risk as well as trust, but could also outperform a robo advisor if the followed investor is able to foresee market events. Furthermore, it opens up investment in different asset classes: Whereas robo advisors tend to select ETFs and mutual funds, social trading sites like ZuluTrade and FxPro allow investors to follow foreign exchange trading strategies, and eToro, one of the most popular social trading sites, allows investors to auto-invest in commodity strategies, stocks, currencies, and indexes. These sites appeal to many millennial characteristics: They encourage transparency, facilitate community through strategy discussions, offer a lower management fee than an advisor, and grant the user the ability to jump from strategy to strategy seamlessly in an online experience.

This type of trading also engages the millennial work ethic. Many sociological assessments of this demographic indicate that millennials are less likely to "pay their dues" in their climb up the corporate hierarchy. Social trading sites facilitate a platform on which higher-performing investors can be recognized in a shorter period of time. Furthermore, if successful, traders can grow quantifiable assets under management, as counted by the amount held by investors following one's strategy, and build a track record faster than a young trader would in his or her new fund. This type of recognition could enhance one's career, as well as satisfy the narcissistic qualities that are often associated with millennials.

To engage millennials early, speak their “language”

To engage the millennial group as early as possible, we advise incumbents to create a more human and credible marketplace position by using the tools this demographic prefers. This is important because millennials are the largest global demographic, and they are the beneficiaries of tremendous technological innovation. Another reason to follow this advice is to address the negative perception millennials hold of formal banking institutions. The oft-cited Millennial Disruption Index indicates that 53% do not believe their bank has differentiated offerings; 71% would rather go to the dentist than listen to a banker; and one in three is open to changing banks in the next 90 days.²²

Financial institutions have an uphill challenge in designing millennial customer acquisition strategies. They will need to better utilize tools such as podcasts, blogs, and social forums written and hosted by savvy peers. Furthermore, millennials tend to be more socially oriented and want their investments to support causes, an approach not often taken by financial institutions. To grow this customer base, incumbents need to foster a sense of connection and social purpose.

Millennials’ lifestyle priorities challenge traditional advisor models. Another challenge that incumbents face in advising millennials is that the group’s savings objectives are far different from those of other demographics. This generation would rather pursue goals that are less focused on wealth accumulation, such as saving for travel rather than retirement. Looking to spend money on experiences and lifestyle may not be a new trend for any young demographic; however, as major life choices such as marriage, children, and college funds are pushed to later in life, it may be some time before millennials prioritize savings. This delay will be exacerbated, as they are soon to be the recipients of one of the largest wealth transfers in history. If millennials have learned to trust their social networks and other new wealth management channels such as robo advisers, they may not see the need for traditional advisers.

Traditional financial advisors need to recognize that change is necessary if they are to capture these emerging clients, many of whom have different expectations about the consumer experience. Technology solutions abound, and incumbents need to analyze their prospective client base and place themselves in the right place with the right products and services, including some never before used by traditional firms (*see Exhibit 7, next page*).

Exhibit 7

Challenges financial institutions need to address in attracting millennials

Challenge	Comments
Digital services are the expected minimum, not a premium add-on.	Millennials are the first digitally native generation, a fact that has shaped a far different expectation for digital services.
Millennials have a different perception of the quality and dynamic nature of services.	73% of individuals are more excited about a new financial services offering from Amazon, Apple, Google, PayPal, or Square than from their own bank. ²³
Savings objectives of millennials are different.	Retirement wealth accumulation is often not a top priority.
Early consumer engagement requires a different approach.	Younger consumers have historically been unprofitable for wealth management firms. The economics are changing, due to lower-cost digital delivery, and incumbents must engage consumers earlier.
Comfort with social networks is a new dynamic.	Millennials' trust in social networks is immense, and they may see greater value in robo or social investing than in using traditional advisors.

Source: Strategy& analysis

RegTech update:

U.S. hosts innovation-focused forums

The second quarter proved eventful in the regulatory space, as “Brexit” noise impacted worldwide financial markets, U.S. regulators released draft rules on payday and installment lenders, and innovation-focused forums were held in Washington, D.C., on the future of FinTech in the financial services space. As U.S. regulators begin to take initial steps to oversee FinTech market entrants, Europe faces operational disruption as cross-border regulations may now apply to FinTech startups based in London with operations in other parts of Europe.

The U.K.’s leadership in fostering growth while regulating the industry will become increasingly complicated with the exit from the European Union. As we noted in our 1Q16 report, the U.K. has differentiated itself from its peers by building a financial ecosystem with deliberate actions to balance innovation, competition, and regulation in the banking industry. If FinTech firms in the country are suddenly more limited operationally, the U.K. may find growth finally slowing in the space.

Select relevant activities in the United States

- **U.S. FinTech regs:** During the month of June, both the Federal Trade Commission and the Office of the Comptroller of the Currency held public forums in Washington, D.C., on cultivating innovation in financial services, with a heavy focus on marketplace lending. These forums followed white paper publications by both agencies as the U.S. generally plays catch-up with Europe in regulating FinTech, focusing heavily on small business lending protections, consumer fairness, and privacy concerns. These forums and white papers ultimately are meant to spark a discussion similar to the European Banking Authority’s paper on consumer data and FinTechs, and they help to establish a regulatory framework for the industry.
- **Madden v. Midland:** On June 27, 2016, the U.S. Supreme Court declined to hear the case of Madden v. Midland Funding LLC, letting stand the decision of the U.S. Court of Appeals for the Second Circuit that the National Bank Act does not protect against state usury law

claims if the bank's assignee is not located in the state in which the loan was originated.²⁴ The silver lining is that, for now, the ruling applies only in the Second Circuit: New York, Connecticut, and Vermont. The Solicitor General's Office and the Office of the Comptroller of the Currency have come out against the Second Circuit court's ruling. Thus far, the ruling has impacted credit availability in the affected markets, but national impact is still relatively minimal.

- **Payday and installment loan rules:** The Consumer Financial Protection Bureau (CFPB) released draft rules for payday and installment lending on June 2, 2016.²⁵ The rules largely center on loans with terms under 45 days or with annual percentage rates above 36%.²⁶ The rules are intended to promote increased consumer protections, such as consideration of the ability to repay; to decrease consumers' ability to access these loans repeatedly (less predatory reliance); and to provide more stringent rules for payday and installment lenders looking to collect through direct access to a consumer's bank account. Garnishing consumer bank accounts has been a key point in marketplace lending discussions as well, and the CFPB's proposed limits to withdrawal could provide a framework for potential future rules.

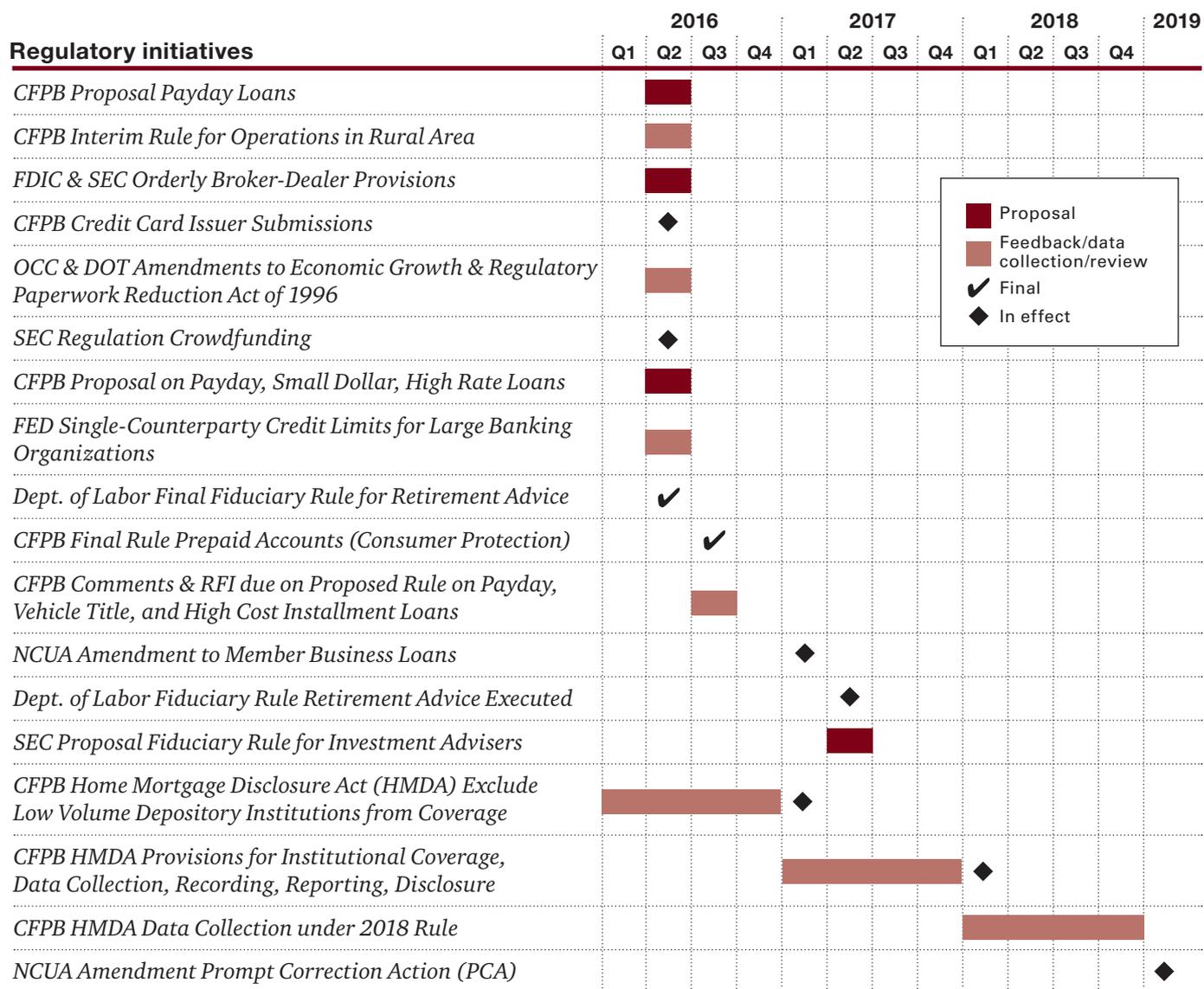
Select relevant activities in Europe

- **Brexit and FinTech:** On June 23, 2016, U.K. voters chose to leave the European Union, adding uncertainty, including around the FinTech sector in the United Kingdom. The U.K. has fostered innovation and disruption in financial services, and how U.K.-based financial services companies continue to operate in Europe will be a critical part of the pending negotiations. The U.K. FinTech sector could be particularly impacted if its ability to perform cross-border payments is not protected through negotiations.²⁷ The recent actions of the Financial Conduct Authority (FCA), including its New Bank Start-up Unit initiative and issuing licenses to mobile-only banks Atom and Tandem, now stand in question in Europe as a whole.
- **Consumer data and privacy:** The European Banking Authority (EBA) published a discussion paper on May 4, 2016, on innovative uses of consumer data by financial institutions, as the agency continues to monitor innovation in the industry.²⁸ The EBA appears to be weighing privacy concerns about increased data sharing from nontraditional FinTechs with the operational benefits for financial institutions and consumers alike.²⁹
- **Testing innovative products:** Interested FinTech firms met the July 8, 2016, deadline to apply to be among the first participants in the

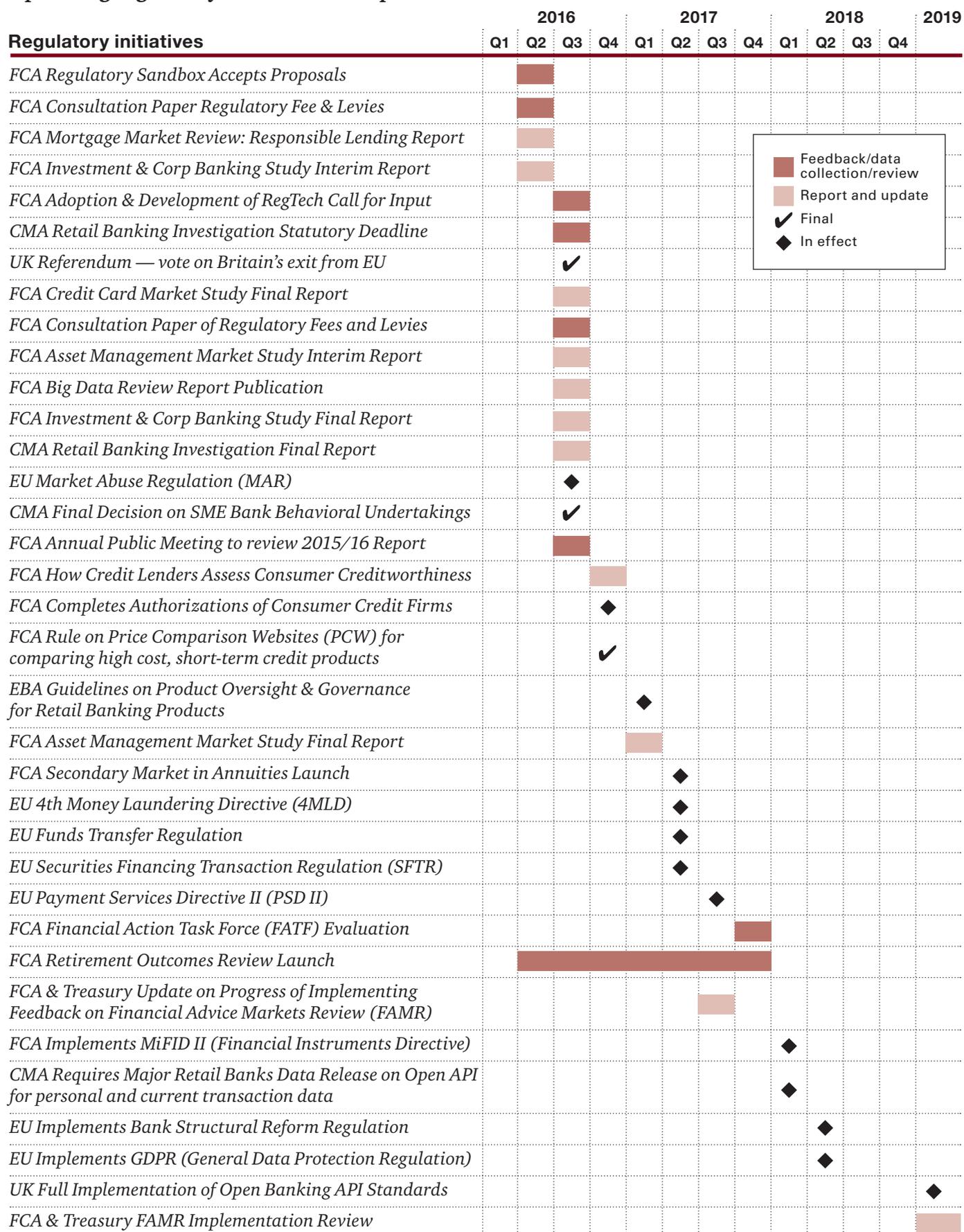
We view distributed ledger as a concept and blockchain as an implementation of this concept under decentralized governance.

FCA’s regulatory sandbox. The sandbox, which is a “safe space” for testing innovative products, is targeted toward unauthorized businesses and could reduce the cost and time associated with getting a startup approved. Further, the sandbox aims to benefit authorized businesses by allowing them to participate in the process for interpreting relevant regulations, by providing waivers or modifications to regulations where the rules are not applicable or are overbearing, and by promising no disciplinary or enforcement action in the event of an unexpected issue in business development.

Upcoming regulatory initiatives: United States



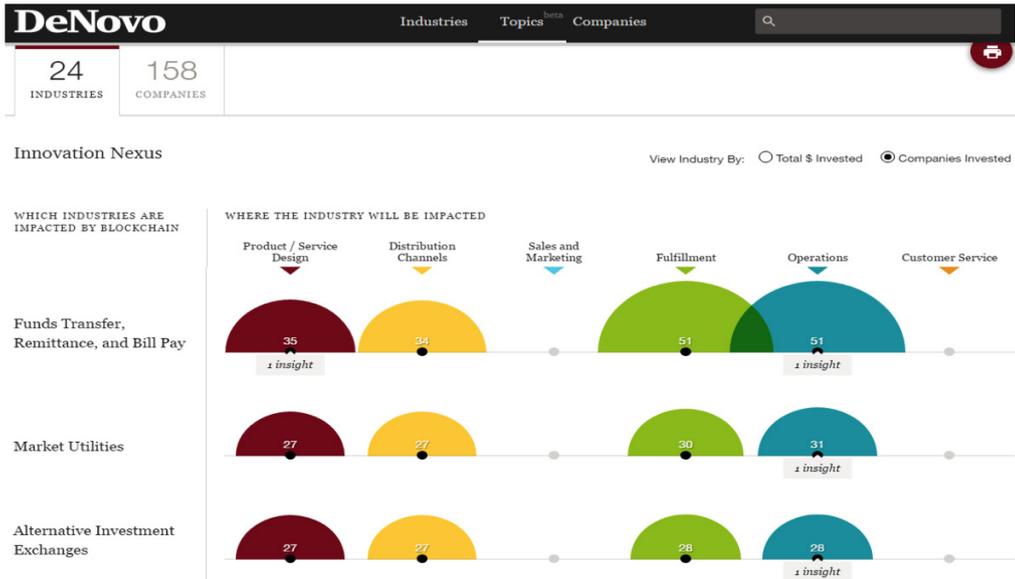
Upcoming regulatory initiatives: Europe



Horizontal look: The emergence of a blockchain ecosystem

The blockchain ecosystem is evolving quickly with several consortiums driving proofs of concepts, several startups focusing on different aspects of the market, and use cases expanding from the core financial origins. In DeNovo, we follow 158 blockchain-specific companies in 24 industry subsectors, illustrating the wide-ranging and flexible nature of the technology. Our definition includes pure-play blockchain companies in the financial services industry and excludes cryptocurrency exchange companies (see Exhibit 8).

Exhibit 8
Blockchain companies are well represented within DeNovo and span 24 industry subsectors



Source: Strategy& analysis

The degree to which, and the time frame by when, distributed ledger technology is successfully adopted within financial services will arguably be influenced by (1) standardization of the communications protocol; (2) maturity of the programming language; (3) demonstration of compelling business cases; and (4) ability to manage risk and compliance within regulatory adherence.

1. Standardization of the communications protocol. The largest risk to the development of blockchain technology, in our view, is the rise of “splinters,” or incompatible variants of the technology. Currently, there are several variants of the technology at the core infrastructure communications layer, including Bitcoin, Ethereum, Hyperledger, and Tendermint. The risk to adoption exists when incompatible variants start to achieve scale. This could divide the third-party developer ecosystem that builds the applications that reside atop this infrastructure layer.

Ethereum and supporters of the Hyperledger Project could start to cooperate more effectively. Additional community development and donation of proprietary code to the open Hyperledger Project could help standardize the communications protocol, which would ultimately foster greater adoption.

2. Maturity of the programming language. Blockchain, for the most part, is still in an experimental stage. The technology needs to move beyond an incompatible and non-interoperable concept to a state where third-party development is seamless. As the programming language matures, larger numbers of developers at financial institutions will have exposure to the technology. Further, the burgeoning role of the cloud from the likes of Amazon, IBM, and Microsoft also presents a case for an open ecosystem and modular design, which involves maturity of the programming language.

3. Demonstration of compelling business cases. The development of business cases to (1) decentralize the governance of data and process or (2) provide cryptographic immutability of data and process under centralized control is likely needed. Demonstration of these cases will help influence larger decision makers at organizations to support distributed ledger approaches as a concept and in specific implementations.

4. Ability to manage risk and compliance within regulatory adherence. From the regulatory standpoint, distributed ledger technology should be no different from that of a database: It is technology and should not be regulated. The application use cases that reside on top of the ledger, however, will and should be

regulated, especially if replacing intermediators in trading, clearing, or settlement roles. Industry standards for the technology at the messaging layer are arguably important for the industry in order to appease and shape the regulatory agenda.

Owing to the number of companies within the ecosystem, the separate agendas of the various consortiums, and the differing views on open standards, it is helpful to consider the evolving landscape by the different layers of the stack (see Exhibit 9). What this visual tells us is that there are select “stacks” forming, and cooperation between Ethereum and Hyperledger may be necessary to begin establishing industry standards.

Cooperation between Ethereum and Hyperledger may be necessary to begin establishing industry standards.

Exhibit 9
Several areas within the blockchain stack

Stack layer	Description
Application	This is a customer-facing application where countless use cases can be developed on top of the blockchain in various industries. An underlying blockchain stack makes most sense when multiple parties that share data need to establish trust with one another, transactions are time-sensitive, or records need to be verified.
Application development and APIs	The application development layer is the middleware for developing the applications. It is essentially a set of established routines that determines how software components work with each other. It is an important layer to making the distributed computing layer compatible with the application layer and graphical user interfaces. This layer is cryptographically secured on a public infrastructure.
Protocol/ business logic	The protocol and business logic layer is optional middleware that helps make the messaging system compatible with various technical needs for business use cases. Sidechains and smart contracts are hosted at this layer.
Distributed messaging	The distributed messaging layer is the core layer where the nodes, miners, and transactions are executed. This underlying infrastructure can be hosted on a cloud of physical servers or on a private backbone. The type of distributed layer determines how the nodes verify the validity of transactions, and the different methods in which nodes obtain consensus have advantages and disadvantages (further discussed below). Hashing power necessary to maintain the messaging layer is determined at this level of the stack.

Source: Strategy& analysis

Blockchain-as-a-Service (BaaS) provides the ultimate sandbox.

Associated with a distributed ledger stack are hosted services that encompass all aspects of the technology in a third-party cloud environment. IBM and Microsoft Azure have introduced BaaS offerings to leverage their existing Web service platforms. Amazon Web Services has taken a different approach in partnering with organizations that are helping enterprises experiment with blockchain. These services help customers develop, test, and deploy distributed ledger solutions in an on-demand environment — blockchain is still technical and requires much experimentation, a situation for which cloud environments are ideal.

The protocol is taking different shape to address shortcomings

A notable aspect of Exhibit 10 (*see next page*) is the advancements made from the initial bitcoin protocol, which was designed for transfer of value. Ethereum, for example, can codify contracts, which expands the use case beyond a transfer-of-value mechanism. The ability to unite the data with the messaging layer enables this functionality and is an architectural difference from the current Internet and database design. As such, these new protocols, supported with smart contracts, can effectively automate the concept of an audit natively within the transaction. This is a significant expansion in capability and enables the development of a wide range of applications beyond cryptocurrency transfer of value.

Development of various distributed ledger protocols has made enhanced use of smart contracts and sidechains that significantly expand the potential use of the underlying technology:

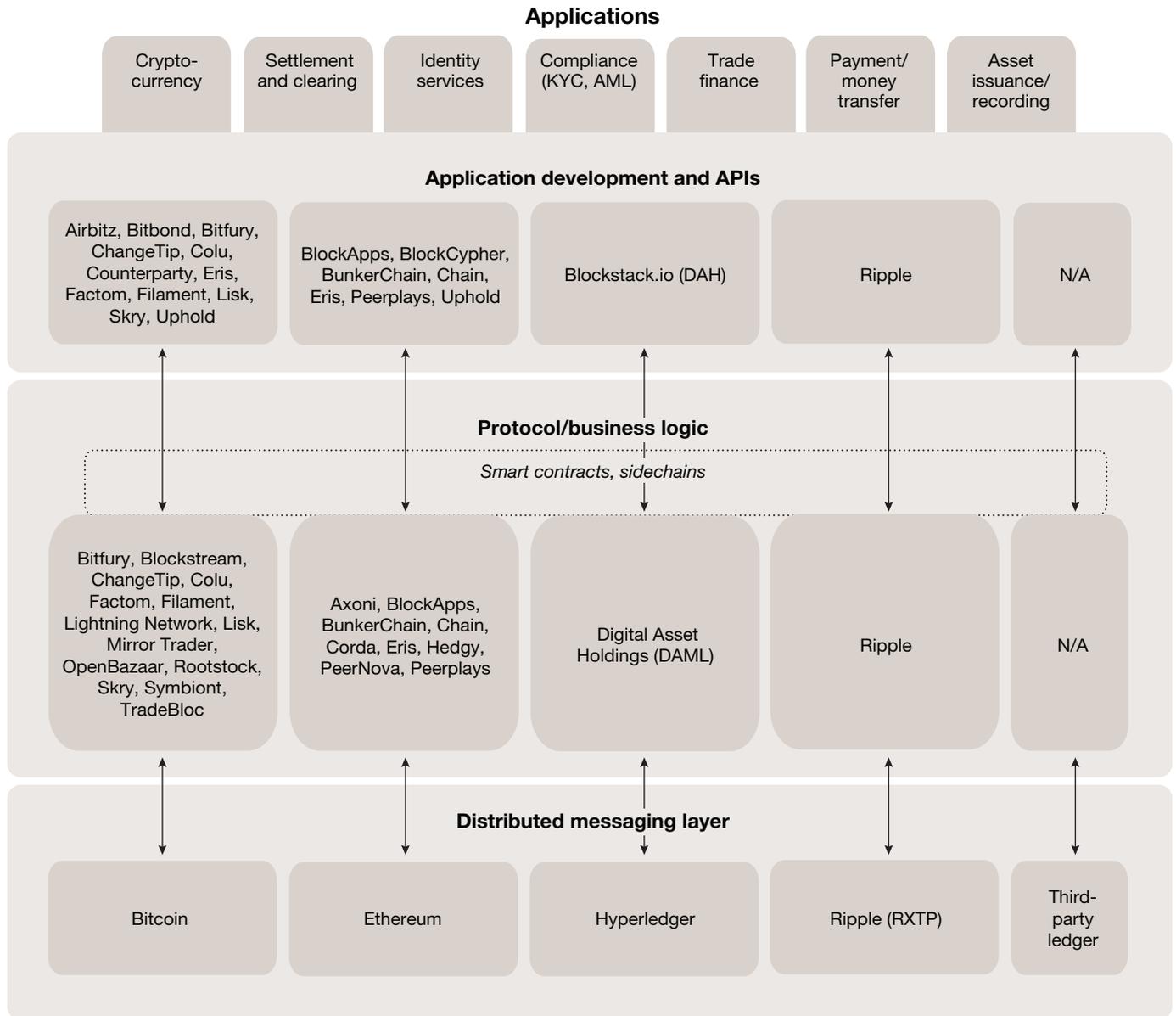
- **Smart contracts:** This technology predates bitcoin and is essentially an automated program that executes the terms of a contract directly within the distributed ledger. As business partners establish the set terms and conditions of a transaction, the smart contract can execute on these terms with an automated validation and audit.
- **Sidechains:** Sidechain technology runs alongside the messaging layer to alleviate some shortcomings of the messaging protocol. For example, sidechains can be used to enable immediate transactions and add a layer of privacy on the blockchain.

Another aspect of the different protocols is the Turing complete concept of the program. The objective of bitcoin is a cryptocurrency transfer-of-value medium, and the technology is limited when used for transactions beyond this. Select solutions that are Turing complete (such as Ethereum with its Solidity language and Hyperledger's chain code programmed with Go) can execute a wider variety of industry use cases. The inclusion

Advancement of the protocol to include codified contracts has expanded the breadth of possible applications on a blockchain infrastructure.

Exhibit 10

PwC's view of the companies in the blockchain ecosystem



Source: Strategy& analysis

of Turing complete essentially adds the logic to enable the protocol and related smart contracts to be used beyond a cryptocurrency payment mechanism.

The role of permissions and consortiums

The arrival of consortiums such as R3 and the Hyperledger Project has made headlines partially because of the number and prestige of member firms — R3 and Hyperledger each boast more than 50 leading technology companies and financial institutions such as Ing Bank and U.S. Bancorp, and BNY Mellon and Wells Fargo, respectively.

The approach to establishing consortiums is primarily threefold: (1) to learn from the financial institutions themselves about the use of blockchain and develop technology accordingly (the opposite of the agenda for many aspects of software); (2) to develop a significant list of early adopters as the use of a distributed network is highly correlated to the number of participants; and (3) to establish a permissioned ecosystem.

Permissioned trust models are likely a prerequisite in financial services. A second aspect of regulating the use case of blockchain-based applications is the role of miners, which confirm and post the transaction on the ledger. In a P2P cryptocurrency blockchain model, miners complete the process of verification. These miners can be unaffiliated with the economics of the transaction itself; they perform the function of updating the chain and are compensated for this work, which is then validated by other miners. Through this process all ledgers that support the cryptocurrency are reconciled and match.

Two primary issues arise when adapting these mechanics to financial services. First, unaffiliated miners are unlikely to be viewed as an accepted participant by regulators or banks, and second, scalability problems can arise simply because of the current limitations of the technology. Bitcoin handles about three transactions per second — and is technologically limited to seven transactions per second (which has divided the community) — while Ethereum can handle roughly 25.³⁰ To put this into context, Visa averages more than 3,000³¹ transactions per second with peak capacity of 30,000.³²

Technology currently limits transactions

Transactions per second

Bitcoin	3
Ethereum	25
Visa	3,200

There are middleware components that facilitate blockchain's messaging layer to allow for higher transaction volume. However, not all use cases will require high transaction per second.

Use of distributed ledger technology in financial services will almost certainly be limited to permissioned models within consortiums. Permissioned models eliminate the role of an “open miner” and restrict the validation role to the established member entities. This almost certainly is a better model from a regulatory standpoint. The challenges with scalability can be mitigated simply because of the likelihood of accurate transaction volume forecasting.

Permissionless, or public, ledgers have a future, but it will be dictated by the application use case. Details of the transaction can be revealed to the public, and open miners perform the validation role (although the compensation model outside of bitcoin is unclear). Therefore, applications such as digital identity and loyalty programs are more ideal for permissionless trust models.

DeNovo FinTech funding recap

Funding of DeNovo FinTech companies continued to trend lower in 2Q16, with funding down 26% sequentially from 1Q16. The general macroeconomic risk aversion in 2016, relative to 2015, is impacting the volume of larger transactions, which is the primary reason for the lower funding levels on both a sequential and annual basis. In 2Q16, the sector saw only seven transactions with funding of \$40 million or greater, down from 15 transactions of \$40 million or greater in both 1Q16 and 2Q15.

Fewer large deals in 2Q16

	1Q16	2Q16	2Q15
\$40mn-plus	15	7	15
\$20mn-plus	25	26	33

Looking into 3Q16, the initial public offering market has started to pick up, but this optimistic data point could be offset by fallout from Brexit. In any case, 3Q16 faces the most difficult year-over-year comparisons due to several large transactions in 3Q15 (e.g., Social Finance, Avant). As such, funding will most likely be lower on a year-over-year comparable basis in 3Q16.

Other key takeaways from second-quarter funding activity

- The quarter saw \$1.32 billion in total funding, compared with \$1.77 billion in 1Q16. On a year-over-year basis, dollar funding in 2Q16 was lower by 51% from the \$2.71 billion closed in the year-ago period (see Exhibit 11, page 41). As previously stated, 2015 was a particularly

Notes: We include only non-publicly traded, pure-play FinTech and technology companies focused on the financial services industry. We believe this definition of FinTech investment is the most accurate depiction of the industry. We exclude industry-agnostic horizontal technology companies that would incorrectly influence our analysis. As such, the data is calculated using only companies included in the DeNovo platform.

We have excluded China-based transactions from our data due to a concentration of large funding in select transactions. Our data set provides a more informative global view of FinTech funding activity.

strong year for FinTech funding, driven by both volume and large deal flow, which will make year-over-year comparisons difficult for the remainder of 2016.

- The average transaction funding amount in the second quarter was \$15.0 million, down from the recent average funding amount of \$16.9 million in both 1Q16 and 2Q15. Average transaction funding is above historical levels (average of \$11.9 million since 2010), which indicates some maturing of the sector.
- The largest transaction in the quarter was a \$150 million transaction for Janalakshmi Financial Services, India's largest microlender.* The company is a large issuer of prepaid cards and micropensions in India and will use the proceeds for additional customer acquisition and product expansion plans.
- InsurTech has seen average sequential growth of 12% in funding for each of the last two quarters and has been an outlier in the midst of an aggregate FinTech industry downtick (see Exhibit 12, next page). The InsurTech space is now attracting greater interest as an area of potential disruption specifically addressing new methods of distribution among small-to-medium businesses and 1099 contract workers.
- The trend of marketplace lending continues to show signs of maturity as it remains outside the top 10 most active trends — not a surprise given recent events that have heightened investor confidence. The data shows that new companies entering the consumer lending subsector utilizing nontraditional data sources may have peaked in 1Q15, and the entrance rate of companies with at least three rounds of funding (a proxy for more “mature” areas) is decelerating, also indicative of a peak and suggesting maturity of the trend (see Exhibit 15, page 45).

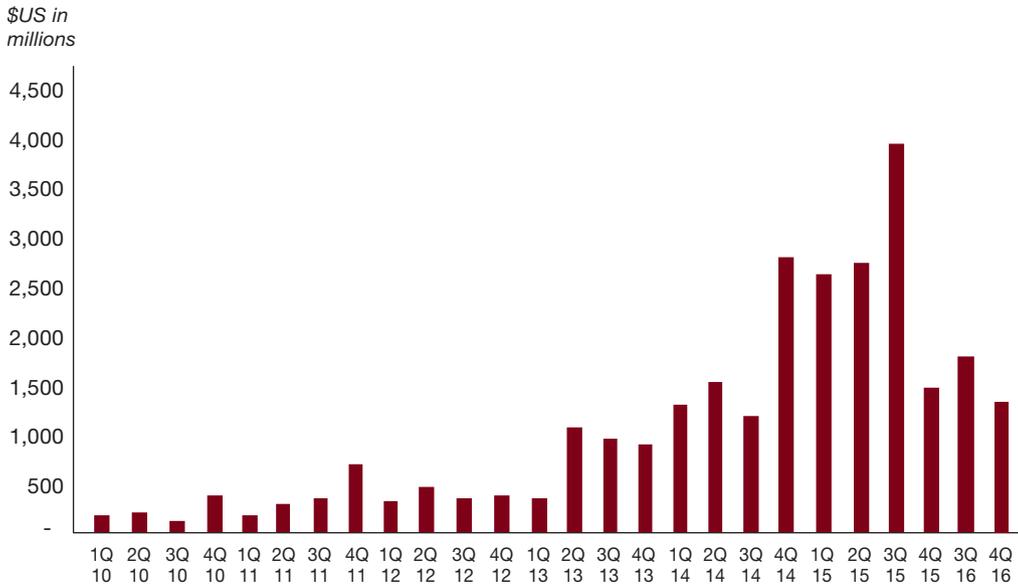
Quarterly funding by subsector

Banking services continues to see the largest percentage of total funding, representing 41% (\$527 million) in the second quarter. However, the subsector continues to represent a smaller percentage of total funding relative to the other subsectors, with second-quarter 2016 activity representing the third consecutive quarter that banking has declined as a percentage of the total (41% of the total in the second quarter compared with a trailing fourth-quarter average of 57%).

*The funding round consisted of \$150 million in primary equity financing, with an additional \$60 million secondary to provide partial exits for existing investors.

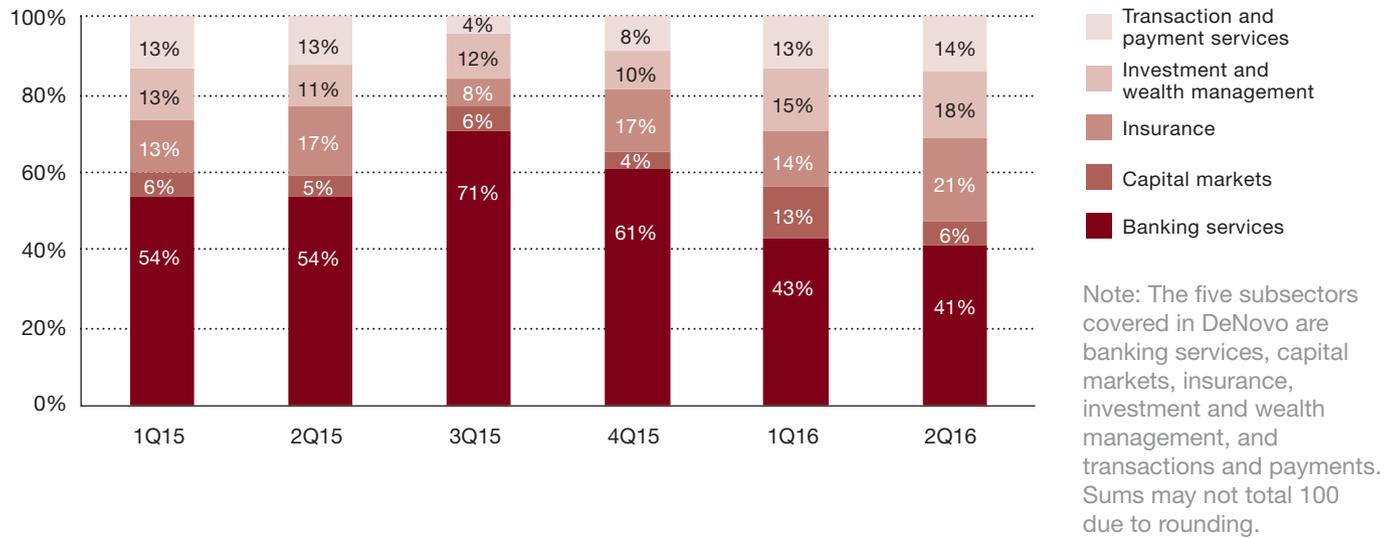
The decline in marketplace lending has negatively impacted overall banking funding.

Exhibit 11
FinTech funding by quarter



Source: Strategy& analysis

Exhibit 12
FinTech funding by industry subsector



Source: Strategy& analysis

Industry subsectors on the upswing include insurance and payments. InsurTech has seen very stable funding (in the midst of the aggregate FinTech industry downtick), with modest uptick in absolute dollar funding for two consecutive quarters (12% average sequential growth over the last two quarters). Insurance has arguably been a FinTech laggard (relative to subsectors such as banking and payments) and is now attracting greater interest as an area of potential disruption.

InsurTech bucks the trend in larger deal flow. Peer-to-peer insurance models have been covered by the mainstream media, but this area is not truly moving the needle in terms of funding. The strength in InsurTech has seen funding steered primarily toward new methods of distribution, many of which are focusing on small-to-medium businesses and servicing 1099 contract workers. The growing interest in the sector is also seen in funding transaction sizes. In 2Q16, three of the seven large (\$40 million or greater) transactions occurred in the InsurTech space, and average transaction size was \$18.3 million, or 20% greater than the average FinTech deal size in 2Q16.

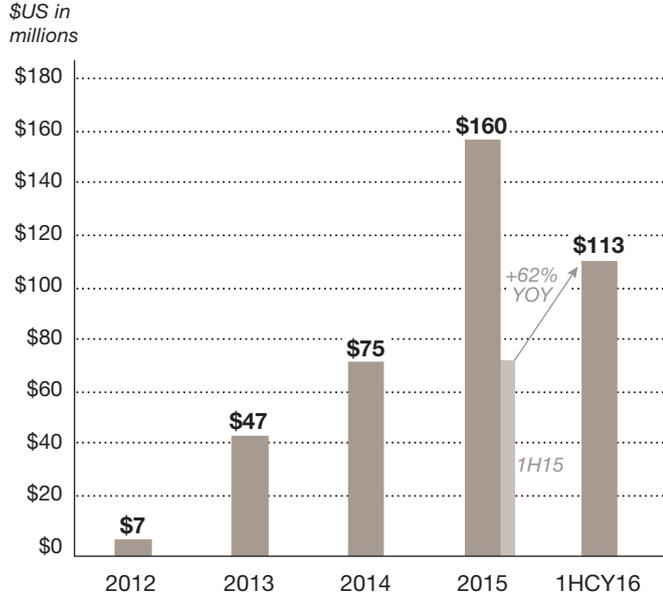
A specific area within insurance that has seen healthy funding trends is the commercial insurance subsector. With DeNovo, we look at not only industry subsectors, but also the funding trends of specific technology topics within the subsector. At this level, we can better understand whether disintermediation may or may not be occurring, and the innovation in specific technology areas.

In an otherwise “soft” first half (1H16) for FinTech, investments in unmanned aerial vehicles (UAVs) used by the commercial insurance sector have increased 62% year-over-year from 1H15 (*see Exhibit 13, next page*). The average investment per company has also seen a steady upward pace with an average transaction size of \$38 million in 2016 (up from \$32 million in 2015) and well above the \$15.6 million average investment for FinTech in 1H16.

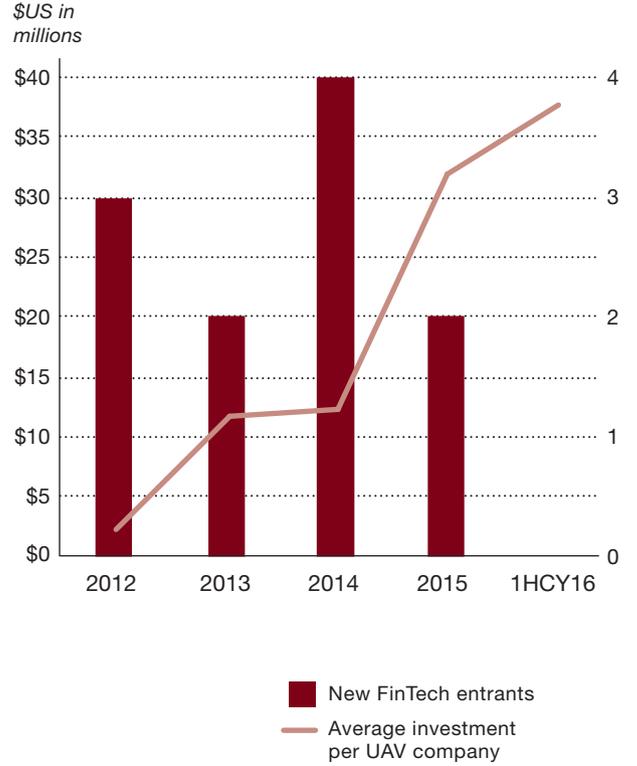
Exhibit 13

Investment in UAV within commercial insurance

Unmanned aerial vehicle investment within commercial insurance has been an outlier of strength



Average funding per UAV company within commercial insurance is more than twice that of all FinTech in 1H16



Source: Strategy& analysis

Funding by DeNovo trend

Emergence of services and solutions for un(der)served customers continued to be the most funded trend in 2Q16. This trend has been consistently high in funding — it was the second or third largest funded trend in each quarter in 2015 — and in both the first and second quarters of 2016 it has been the top-funded trend. This coincides with our views of the large addressable opportunity (see Exhibit 14).

Marketplace lenders again out of the top 10. Marketplace lending was the top trend for the first three quarters in 2015, dropped to the second-largest trend in 4Q15, and in 1Q16 did not make the top 10, which was arguably a leading indicator of the demise in the marketplace lending space. A look at the details of marketplace lending funding in 2Q16 shows that the overall funding amount held steady with levels seen in 1Q16, but the maturation of this trend is clear as it fell slightly

Exhibit 14
FinTech funding by DeNovo trend

Rank	Trend	% of total
1	Emergence of services and solutions for un(der)served customers	10%
2	Increased sophistication in methods to reach, engage, and serve customers in a highly targeted manner	6%
3	Increased digital solutions that firms can integrate to improve operations	5%
4	Revitalization of prepaid cards and funded accounts	5%
5	Advanced methods, tools, and technologies to detect, analyze, and predict fraud	5%
6	The move toward virtual channels	4%
7	Enhanced credit underwriting and decisioning	4%
8	Spread of specific value propositions for customer microsegments	3%
9	Proliferation of international and cross-border transfer platforms	3%
10	Emergence of advanced remote data capturing and analysis solutions for risk and loss assessments	3%

Source: Strategy& analysis

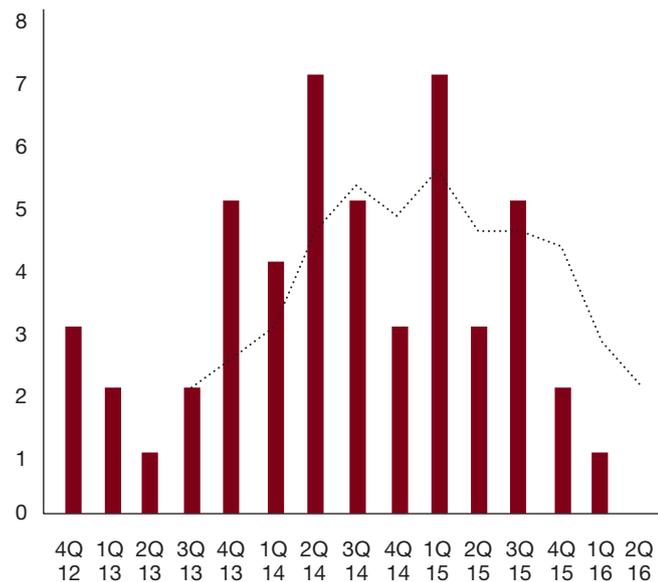
in relative importance. Also interesting to note is that of the \$32 million in marketplace lending funding, \$22 million, or 67%, was aimed at companies outside the United States.

Questionable investor confidence, at least in the U.S., clearly exists for these business models. But in assessing whether this might be a temporary phenomenon or a true sign of maturity, we find other indicative aspects of the market interesting.

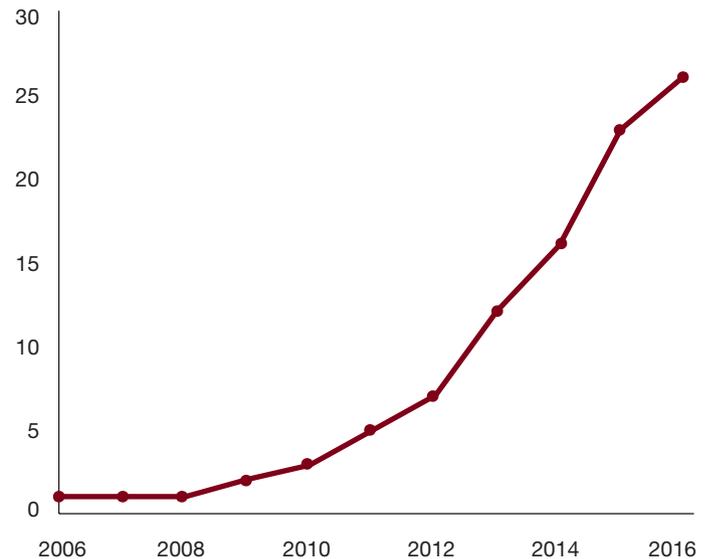
In looking at the companies that operate within the consumer lending subsector and utilize “nontraditional data sources,” a proxy for marketplace lending, we notice a peak in early 2015 of new companies entering the market (see Exhibit 15). We then look at the same “consumer lending” and “nontraditional data sources” combination for companies that have closed at least three funding rounds, which is a proxy for a maturing subsector. Both figures suggest the high growth in funding for this area may have peaked.

Exhibit 15
Marketplace lending technology within consumer banking

New companies entering market



Companies with at least three funding rounds



Source: Strategy& analysis

The top 10 trends in aggregate accounted for 48% of total funding for this quarter, compared with 70% of the average trailing four quarters, showing somewhat more diversity in FinTech funding in 2Q16. Strategic investors participated in 30% of total transactions by count, which is a slight increase from the 28% in 1Q16. Google Ventures was the most active strategic investor in the 2Q16 period (see Exhibit 16).

Exhibit 16
Most active investors

Transactions	Investor
4	Sequoia Capital, Sequoia Capital India (venture)
3	Google Ventures (strategic)
2	26 investors, two transactions

Source: Strategy& analysis

Endnotes

- ¹ ufa.worldbank.org
- ² www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2015/10/19/090224b08315413c/2_0/Rendered/PDF/The0Global0Fin0ion0around0the0world.pdf#page=3
- ³ datatopics.worldbank.org/financialinclusion/home
- ⁴ www.alt-m.org/2016/06/28/finance-for-all-kenyas-m-pesa/
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- ⁶ ufa.worldbank.org
- ⁷ www.pewtrusts.org/~media/legacy/uploadedfiles/wwwpewtrustsorg/reports/safe_banking_opportunities_project/pew20unbanked20reportfinalpdf.pdf
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- ¹² www.cgap.org/sites/default/files/publications/multimedia/cgap/index.html
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- ²² www.millennialdisruptionindex.com
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- ²⁴ www.supremecourt.gov/search.aspx?filename=/docketfiles/15-610.htm
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- ²⁷ techcrunch.com/2016/07/04/opinion-brexit-is-a-tragedy-but-it-could-be-the-making-of-uk-fintech/
- ²⁸ <https://www.eba.europa.eu/-/eba-seeks-views-on-the-use-of-consumer-data-by-financial-institutions>
- ²⁹ www.eba.europa.eu/regulation-and-policy/consumer-protection-and-financial-innovation
- ³⁰ 99bitcoins.com/bitcoin-vs-ethereum-cryptocurrency-comparison/
- ³¹ usa.visa.com/dam/VCOM/download/corporate/media/visa-fact-sheet-Jun2015.pdf
- ³² usa.visa.com/dam/VCOM/download/corporate/media/visanet-technology/visa-net-fact-sheet.pdf
- ^A www.census.gov/newsroom/press-releases/2015/cb15-113.html

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