Banking IN THE NINTH

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NINTH DISTRICT HIGHLIGHTS

Thinking Strategically About Blockchain's Potential

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What do you know about blockchain and if, or how, it might affect you? In today's world, I increasingly hear more and more about fintech, blockchain, Bitcoin, or any variation thereof. Due to what seems to be a fair amount of confusion on this topic, I invited a guest writer from our Payments, Standards, and Outreach group here at the Federal Reserve Bank of Minneapolis to begin answering some questions you may have and to provide you with some resources on this topic. If you have additional questions or are looking for additional information, please reach out to us and let us know.

Christine Gaffney

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Should blockchain be on the minds of business leaders?[1] While it might be tempting to answer a definitive yes or no, the practical response is, it depends. By understanding the landscape of blockchain adoption from a variety of angles, business leaders can make strategic choices about if, when, and how to engage with blockchain and distributed ledger technology (DLT).

In the 10 years since the publication of the 2008 white paper, Bitcoin: A Peer-to-Peer Electronic Cash System, the potential applications of its proposed "chain of blocks" system has expanded far beyond payments.[2] Proponents of the multiparty shared ledger, where the participants themselves contribute to the operation, security, and resilience of the system without reliance on a single "owner," have enumerated hundreds of use cases in various industries from land registry to health care. However, in the past year or so, what was once a multitude of potential use cases have contracted as business leaders ask themselves if blockchain delivers improvement over traditional solutions to their business problems.

Clearly, deciphering what a new technology is and what it does is paramount to the efficient use of time and resources for anyone seeking to capitalize on its potential. Yet one of the key issues affecting the progress of blockchain is its complexity. Put simply, there are many misunderstandings about blockchain. "[A] primary cause of failure (of an enterprise blockchain project)," notes a former vice president of Gartner, Ray Valdes, in a 2017 article, "is a fundamental lack of understanding around the basic concept of blockchain technology, which results in a misalignment of its capabilities with the business problem that the enterprise is seeking to solve." [3]

continued on page 4

SAFETY & SOUNDNESS UPDATE

Data breaches highlight importance of Gramm-Leech-Bliley Act standards for information security and response programs

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Companies announcing breaches of customer information feels like a routine occurrence in today's news cycle. Headlines in 2018 included compromised customer data from Marriott, Facebook, Google, T-Mobile, and many others. The Marriott breach alone involved the data of over a half-billion customers. In addition, significant breaches of private information occurred affecting citizens of India and prominent German politicians. To underscore all of this, over 750 million email addresses and passwords were posted on the dark web during just the first three weeks of 2019.

These regular examples of data breaches serve as a stark reminder for financial institutions to maintain comprehensive and robust customer information security programs, including up-to-date and tested incident response programs. The

continued on page 4

SAFETY & SOUNDNESS UPDATE *continued from page 1*

Gramm-Leech-Bliley Act requires bank directors to create and maintain a written program to protect customer information against unauthorized access. Below is a refresher on some of the customer information security standards set forth in the Gramm-Leech-Bliley Act and additional guidance on responding to breaches of customer information.

A customer information security program starts with a risk assessment at its core and a framework of policies and procedures to implement controls to mitigate identified risks. Of course, the program will just sit on the shelf and be largely ineffective unless employees receive training on their roles and responsibilities.

The best place to start your risk assessment process is with an inventory of what customer information you have and where it is stored. This allows you to ensure that your program has the right controls in place to protect that information. This includes physical controls (e.g., locked file rooms) and logical controls (e.g., strong passwords, data access rules) to prevent unauthorized access and to verify encryption and backup of data. Controls also include monitoring systems to detect unauthorized access and incident response programs to direct actions when a data breach is suspected or detected.

The last item, an incident response program, is an important detail of the Gramm-Leech-Bliley Act. As the news reports show, there is always a risk of unauthorized access, so knowing what to do in advance of a breach is a prudent planning tool. While a good incident response program includes steps to contain the incident, another key step is to complete an assessment of whether customer information is involved. If sensitive customer data have been misused (or are likely to be), take appropriate steps to notify affected customers. Your plan should also include notifying your federal regulator and appropriate law enforcement authorities.

Finally, it is useful, and required, to test your incident response plans on a regular basis to ensure that they are both adequate and up to date. Typically, examiners look for at least annual testing of the incident response plan. However, examiners expect more frequent testing for organizations with riskier, more complex environments. Factors increasing complexity may include use of cloud computing, number of branches or operations centers, and use of third parties for accepting, processing, or storing customer information. Tabletop exercises to test the plans need to include management and staff, and management should communicate results to the board of directors. Regular involvement in testing also keeps staff vigilant and ready to respond appropriately when an event occurs.

Gramm-Leech-Bliley Act, Section 501(B) Appendix D-2 – Interagency Guidelines Establishing Standards for Safeguarding Customer Information (Effective July 1, 2001)

SR Letter 05-23 / CA 05-10 - Interagency Guidance on Response Programs for Unauthorized Access to Customer Information and Customer Notice (Issued December 1, 2005)

NINTH DISTRICT HIGHLIGHTS *continued from page 1*

Nevertheless, where organizations have demonstrated some success, they often cite the potential to reduce manual document or information transfer processes among multiple parties. Blockchain could, in these cases, offer business leaders opportunities to gain efficiencies in certain business processes.

For instance, in the financial services industry, one bank launched a platform for private equity transactions on a blockchain. Then in 2018, the bank announced that an accounting firm now has access to its blockchain ecosystem and a "golden copy" of the fund's transaction data. In this situation, both entities claim that blockchain improves efficiency and marks a step toward future innovation.

Additionally, some real-world applications outside of banking and finance have begun to scale. One example is a program launched to track certain foods through the supply chain in an effort to reduce the impact of food-borne illnesses. Notably, where organizations with significant market presence begin to move toward a new technology or process, others may be forced to comply. For example, a major retailer recently announced a requirement for some of its suppliers to begin entering product data onto its blockchain by September 2019.

In light of these developments, the question of whether to investigate or potentially invest in the technology may become top-of-mind. In that case, first understanding the technology and its limitations well enough to develop an appropriate use case is key. Second, business leaders may consider monitoring the following:

- Announcements on earnings calls. When companies begin announcing how investments in blockchain are resulting in cost savings or increased revenue opportunities, this may be an indicator of growing adoption.
- The pace of standards development. International, national, and industry-led efforts are under way and signal the desire for many stakeholders to work together to stabilize and expand adoption of common practices to achieve secure and efficient use of the technology.

Paying attention to the emerging landscape of blockchain through a strategic approach will help business leaders decide next steps for if, when, and how to engage with this new tool.

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[1] The term "blockchain" will be used throughout this article. Generally, blockchain is considered one well-known type of distributed ledger technology.

[2] Nakamoto, Satoshi. "Bitcoin: A Peer-to-Peer Electronic Cash System." https://bitcoin.org/bitcoin.pdf

[3] Pettey, Christy. "7 Strategies to Gain Value from a Doomed Blockchain Project." Gartner, April 5, 2017. https://www.gartner.com/smarterwithgartner/7-strategies-to-gain-value-from-a-doomed-blockchain-project/

Storms on the Horizon – Part 2

Zachary Lundquist, Quant Analyst

Heading into 2019, agricultural producers and their lenders face another challenging year. "Storms on the Horizon – Part 1," in the January 2019 issue of Banking in the Ninth, identified increasing credit risk in the ag industry as farm incomes have continued to decline from their 2012-13 historical highs. Since then, many producers have faced break-even or negative cash flows year over year. Consequently, farm balance sheet strength is under pressure as working capital is depleted to maintain operations, and equity capital is used to restructure debts. [1]

Capital represents an entity's resilience to adverse conditions and is therefore considered its loss-absorbing capacity, be it a producer's resilience to deteriorating farm income or a bank's resilience to increased credit losses from nonperforming loans. This article explores changes in the capital of banks with and without concentrations in ag lending (ag banks versus non-ag banks), given the elevated and growing credit risk present in the ag industry. [2]

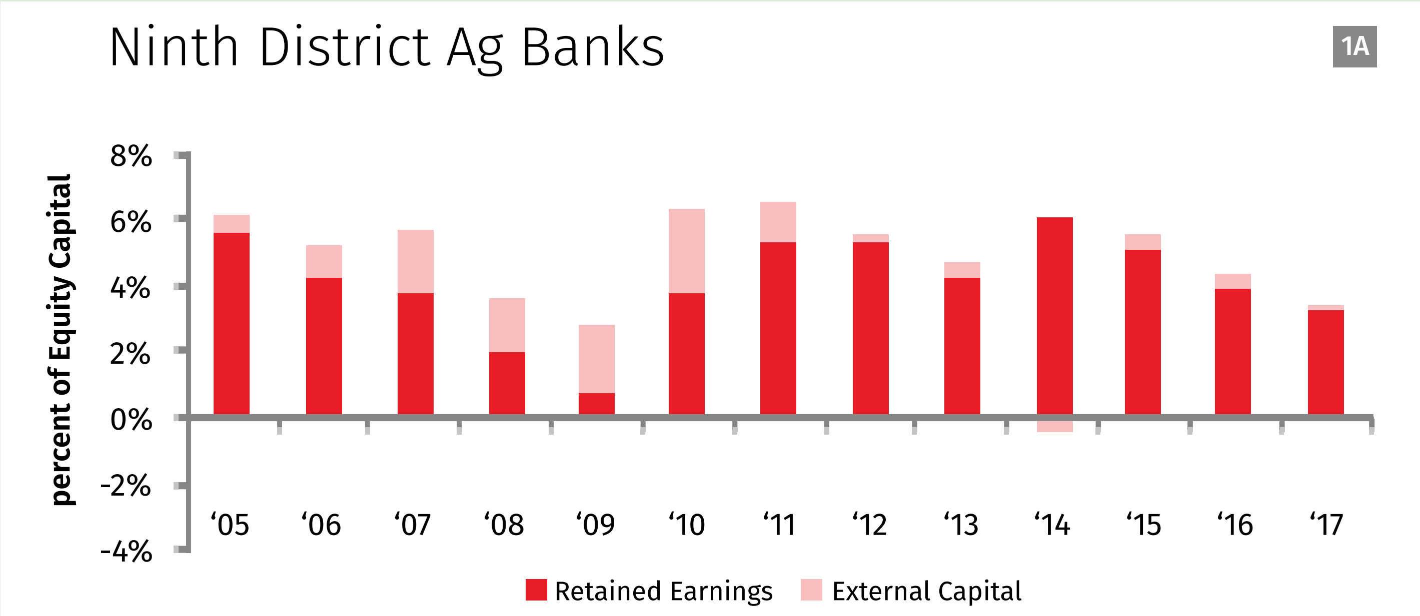
Banks build capital from two primary sources, external capital and retained earnings. External capital sources consist of transactions that involve capital and Treasury stock or other shareholders (e.g., a bank raises capital through the issuance of new bank stock). Retained earnings are the bank's net income remaining after dividends are paid to shareholders. Banks usually report positive net income and therefore are in a position to grow capital and pay dividends. However, when banks lose money (negative net income), capital levels decrease unless external sources are able to offset losses. Figures 1a (ag banks) and 1b (non-ag banks) illustrate on an annual basis how banks have built capital in recent years using these two primary sources of capital formation.

The figures illustrate that the 2008 financial crisis had a larger impact on non-ag banks, which show three consecutive years of negative retained earnings, whereas retained earnings for ag banks remained positive during the same period. Despite adverse pressure on earnings, the contribution to capital from external sources expands under stress for non-ag and ag banks alike and offsets the reductions in capital caused by the extreme losses for non-ag banks. [3] Both types of banks demonstrated an ability to raise capital from external sources during a period of stress.

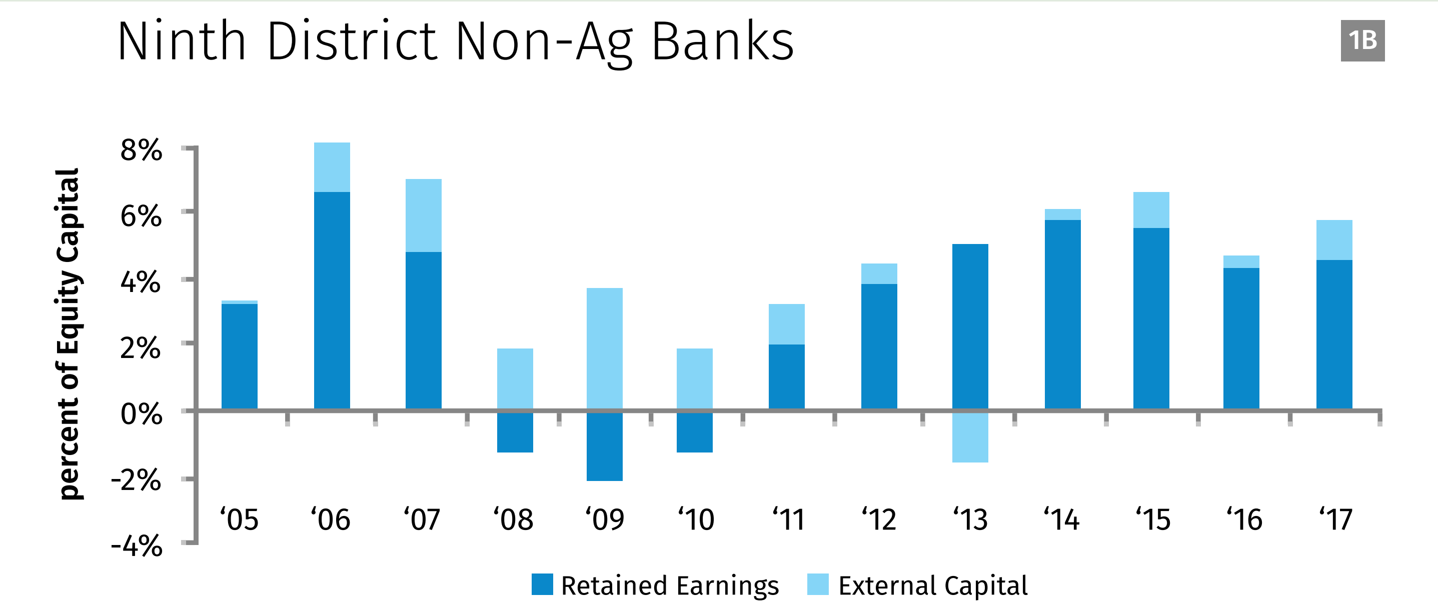
Coming out of the crisis and moving into record-high farm income seasons (2012-13), ag banks reported strong annual contributions to capital (6 percent, 6 percent, 5 percent, and 4 percent, respectively) relative to non-ag banks (1 percent, 3 percent, 4 percent, and 3 percent, respectively). It is clear that ag banks were able to contribute more earnings to capital during the ag boom, but contributions have steadily declined since 2014.

Figures 1a and 1b illustrate contributions to capital but do not show the resulting capital ratios, which are used by bank regulators to determine whether capital levels are sufficient given a bank's risk profile. Capital is commonly measured as a ratio relative to risk-weighted assets (RWA), the riskiness of a bank's assets. This ratio is referred to as the risk-based capital (RBC) ratio. Table 1 shows changes in average RBC ratios of ag and non-ag banks before the crisis (2005-08) and after the record farm income years of 2012 and 2013 (2014-17).

From left to right, Table 1 can be interpreted as average RBC ratios on the low end and high end (25th to 75th percentile) for ag and non-ag banks. It is clear that ag and non-ag banks have consistently built capital through external sources and retained earnings since the financial crisis, contributing to a moderate increase in their RBC ratios. In addition, average RBC ratios at both types of banks are well above the minimum threshold to qualify as well-capitalized (8 percent) during both time periods.



Note: Figures 1a and 1b show the sum of retained earnings and external capital divided by the sum of equity capital at the beginning of the year for the banks in the sample.



	Ag Banks			Non-Ag Banks		
	Avg. P_{25}	Avg. P_{50}	Avg. P_{75}	Avg. P_{25}	Avg. P_{50}	Avg. P_{75}
2005-2008	11.0%	13.4%	17.4%	10.3%	12.2%	15.2%
2014-2017	12.0%	14.2%	17.6%	12.3%	14.5%	18.1%
Difference	1.0%	0.8%	0.2%	2.0%	2.3%	2.9%

Table 1:
Risk-based capital ratios [4] at different points in the distribution (25th, 50th, and 75th percentiles) for ag and non-ag Banks before the financial crisis and in recent years.

Table 1 shows that non-ag banks consistently held lower capital levels than ag banks prior to the crisis and have since responded by building capital to levels similar to ag banks. The difference shown in Table 1 tapers off at the higher end for ag banks but is consistent across all ranges of non-ag banks. It is important to note that nearly all of the growth in RBC ratios occurred between 2008 and 2014, with relatively little to no growth in ratios since then for ag and non-ag banks. From 2014 to 2017, the RBC ratio at the median ag bank (P50) increased from 14.12 percent to 14.37 percent and decreased from 15.07 percent to 14.20 percent at the median non-ag bank.

In summary, relative contributions to capital from ag banks have declined, and ag bank RBC ratios are relatively unchanged as ag credit conditions have deteriorated (since 2014). Ag banks and non-ag banks maintain similar capital levels, although the ag banks face more uncertain prospects in ag credit risk. However, it may be that ag banks are maintaining appropriate capital levels, and the similarity in RBC ratios to non-ag banks could be because non-ag banks were holding too little capital prior to the financial crisis, given their risk profiles.

[1] Working capital (current assets less current liabilities) is a portion of equity capital that is used for short-term needs, such as daily operations.

[2] In this report, banks with ag loans greater than or equal to 25 percent of total loans are classified as ag banks, and banks with ag loans less than 25 percent of total loans are classified as non-ag banks. This article uses publicly available Call Report data. Year-end 2018 data are not yet available. Since changes in capital are best captured on an annual basis, data end at year-end 2017. The population of banks is limited to those with $1 billion or less in total assets (95 percent of all banks and 99 percent of all ag banks).

[3] Figures 1a and 1b are stacked bar graphs, where the contributions to capital are shown on a combined basis. For example, -2 percent retained earnings and 4 percent external capital in the same year represent a total contribution to capital of 2 percent.

[4] RBC ratio here is calculated by dividing the average of tier 1 capital by the risk weighted assets.

Housing options are a key element to dynamic community development, economic growth, and stable families

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If your bank operates in or near Indian Country, you probably know that the need for housing on reservations is acute, and the demand for homeownership is strong. You may already have recognized the potential for lending in Indian Country as well as the related challenges. Unlocking this potential and addressing these challenges are the main objectives of the Tribal Leaders Handbook on Homeownership. A financial institution could find the Handbook useful for various parts of its business, including but not limited to its Community Reinvestment Act (CRA) program, as discussed below.

The Handbook, published in 2018 by the Center for Indian Country Development at the Federal Reserve Bank of Minneapolis, provides a comprehensive overview of the mortgage lending process, examines challenges to homeownership on trust lands, and presents best-practice case studies showing how tribes have addressed challenges through innovation and perseverance to foster homeownership in Indian Country.

The Handbook shares strategies for tribes or tribal organizations and their partners, including lenders, to build a framework to support success in unlocking home lending potential in Indian Country. Components of this homeownership framework include community needs assessments, home buyer counseling, land planning, financing, and construction. This article discusses examples of how lenders can serve as partners within the framework, with the objective of supporting financial capabilities of people in Indian Country.

Home buyer education and homeownership counseling

According to the Handbook, many Native Americans who are prospective homeowners have little experience with home buying and mortgage lending processes. Lenders can support financial education efforts through activities such as:

- Providing access to relevant gap or assistance programs, such as for down payment or closing costs.
- Coaching and classes to help potential borrowers improve credit scores or achieve financial goals.
- Explaining the mortgage leasehold process.

Financing

As discussed in the Handbook, lending is at the heart of homeownership. The Handbook explains two primary considerations unique to lending in Indian Country: land status (e.g., trust land) and the laws applicable to lending and recourse within tribal jurisdictions. Ways that lenders can support the flow of public and private capital to homeownership in tribal communities include:

- Sharing financial experiences and expertise with members of tribal communities.
- Channeling available capital, such as from federal agencies and secondary market investors.
- Matching borrowers with loans that best fit their needs.
- Engaging in early intervention, when needed, while servicing mortgage loans.

In addition, lenders can use the Handbook to identify strategies relating to opportunities for or obstacles to lending in Indian Country and ways to partner with tribes and tribal housing organizations or programs. The Handbook also is a good training tool to enhance bank staff's knowledge about the capital needs and lending processes in Indian Country. For example, the Handbook devotes entire chapters to land status information and manufactured housing. Finally, the Handbook serves as a resource for identifying loan programs and lenders working in Indian Country.

Importantly, commercial banks can also find the Handbook a useful resource for their CRA programs. Under the CRA, a commercial bank has an obligation to serve the credit needs of its communities, including those parts of its communities that are low and moderate income. The Handbook could help a bank identify ways to engage in community development activities (loans as well as investments or services) in Indian Country. CRA defines community development as the following:

- Affordable housing for low- and moderate-income people.
- Community services targeted to low- and moderate-income people.
- Economic development activities.
- Revitalization and stabilization efforts in low- and moderate-income areas as well as some rural, middle-income areas and disaster areas.

Overall, the Handbook can serve as a catalyst for a commercial bank interested in new or better ways to serve low- or moderate-income borrowers or census tracts in the parts of Indian Country that are within its CRA assessment area(s).

Housing is an integral component of economic development and community well being. We hope you will review the Handbook, available at https://www.minneapolisfed.org/indiancountry/resources/tribal-leaders-handbook-on-homeownership, as a gateway to opportunities that are appropriate for your lending institution or commercial bank and support housing efforts in Indian Country.

Additional Indian Country resources are available on the Minneapolis Fed's website:

Reservation Profiles. Key demographic and economic indicators for American Indian reservations with at least 2,500 residents.

https://www.minneapolisfed.org/indiancountry/resources/reservation-profiles

Native American Financial Institutions. An interactive map of Native-owned banks and credit unions as well as community development financial institutions serving Indian Country, with their asset data. https://www.minneapolisfed.org/indiancountry/resources/mapping-native-banks

Indian Country Resources and Organizations. A list of nations, organizations, and agencies engaged in Native American communities and economic development. https://www.minneapolisfed.org/indiancountry/resources/other-indian-country-resources-and-organizations

Homeownership in Indian Country. Resource page. https://www.minneapolisfed.org/indiancountry/native-homeownership

Information relating to the Community Reinvestment Act is available on the Federal Financial Institutions Examination Council's website at https://www.ffiec.gov/cra/default.htm.

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