

Montana small bank deposit market analysis

by

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ABSTRACT

Over the past few decades, the Federal Deposit Insurance Corporation (FDIC) has reported a steady increase in total deposits and a corresponding decrease in the number of commercial banks. Between 1992 and 2019, the number of banks decreased by approximately 8,000 and total deposits increased from approximately \$2.5 billion to \$13.6 billion. Although total deposits are increasing, it has become increasingly challenging for banks to grow core deposits that leaves them with tight liquidity metrics and forces them to borrow heavily from the Federal Home Loan Bank to fund their money supply. Costly borrowed funds and increased competitive pressure has left banks struggling to maintain sustainable returns. This trend is most relevant in small independent banks; therefore, many have left rural communities with no financial institutions.

The decrease in commercial banks followed by an increase in FinTechs (online banks) resulted in numerous studies in the early 2000s that analyze the impact, if any, that the introduction of FinTechs has on the decline in traditional commercial banks. FinTechs are financial institutions that provide financial services through software or other technology platforms. Additional research has examined how banks can stabilize their funding and expand their deposit base. Researchers found that deposit levels are more stable when customers are incentivized. Those studies also conclude that FinTechs and other online financial institutions have not pushed community banks out of the market, but the upcoming shift in the primary customer base could result in a shift from borrowers who value relationship-based banking to those that do not prioritize relationships, but instead value technology that can complete the task quickly and efficiently.

This thesis focuses on the deposit market in rural Montana. This study estimated the size of the total deposit market in Montana, inclusive of Federal Deposit Insurance deposits, National Credit Union Administration deposits, and online deposits at the county level. Results were used to calculate a bank's market share of deposits on the county level. This thesis relied on discounted cash flow analysis and internal rate of return to evaluate an approach for a small Montana bank to expand its market presence into geographically isolated areas of the state.

This project concluded that Montana's rural economy, primarily those areas with an agricultural focus, creates a unique pool of deposits in towns and areas without any existing depository institution. Implementing a limited service branch in these underserved areas may provide a benefit to the bank through increased deposits and earnings growth potential. The results from this study are helpful to financial institutions that are seeking to expand their market presence in rural areas and suggests that banks looking to increase their core deposits should consider expanding to rural areas that are driven by stable industries and have limited competition from other banks.

TABLE OF CONTENTS

List of Figures.....	vi
List of Tables	vii
Chapter I: INTRODUCTION.....	1
1.1 Research Question and Objectives	4
1.2 Thesis Outline.....	5
Chapter II: LITERATURE REVIEW.....	6
2.1 Decline in Core Deposits	6
2.2 Fintechs.....	6
2.3 Stabilizing Bank Funding.....	6
2.4 Where are Rural Deposits?.....	7
2.5 Bank Funding Strategies	10
Chapter III: Theory.....	11
3.1 Consumer Behavior.....	11
3.2 Cost-Benefit Analysis	12
3.3 Internal Rate of Return.....	12
3.4 Discounted Cash Flow Analysis Terminal Value	13
3.4.1 Perpetuity Method.....	13
3.4.2 Exit Multiple Method.....	14
Chapter IV: DATA.....	15
4.1 Introduction	15
4.2 Deposit Data	15
4.2.1 Federal Deposit Insurance Corporation Deposit Data	15
4.2.2 National Credit Administration Deposit Data	17
4.2.3 Online Financial Institutions and Fin-Tech Deposit Data	21
4.2.4 Montana Bank Deposit Data.....	25
4.3 Overnight Cost of Funds Data	28
4.4 Population	28
4.5 Loan Demand	29
Chapter V: METHODS	31
5.1 Objectives	31

5.2 Data Acquisition	31
5.3 Small Market Model.....	31
5.1.1 Deposits Per Location	34
5.1.2 Direct Expenses.....	34
5.1.3 Cost of Funds Improvement vs. Current Marginal Funding Cost.....	35
5.1.4 Product Income	35
5.1.5 Town Candidate Examples	35
5.1.6 Payroll Assumptions	35
5.1.7 Occupancy Assumption	36
5.1.8 Community Support.....	36
5.1.9 Per Location Project Return.....	36
5.1.10 Cumulative Effect	36
5.1.11 Internal Rate of Return.....	37
Chapter Vi: Results	38
6.1 Objectives	38
6.2 Rural Deposit Market.....	38
6.2 Town A Micro Branch Scenario Summary	42
6.2.1 Break Even Analysis	44
6.3 Micro Branch Options.....	47
Chapter Vli: Conclusion.....	53
7.1 Limitations and Consideration of Research.....	53

LIST OF FIGURES

Figure 1.1: FDIC Deposits Trend, 1989-2019	1
Figure 1.2: FDIC Number of Commercial Banks 1989-2019.....	2
Figure 2.1: FDIC Institutions Total Deposits (\$000's) by Bank Size, 1992-2020	8
Figure 2.2: FDIC Institutions Total Deposits (\$000's) by Bank Size, 1992-2020, Logarithmic Scale	8
Figure 2.3: FDIC Institutions Total Assets (\$000's) by Bank Size, 1992-2020	9
Figure 2.4: FDIC Institutions Total Assets (\$000's) by Bank Size, 1992-2020, Logarithmic Scale	9
Figure 4.1: Total FDIC Deposits per Montana County as of 06/30/2020	17
Figure 4.2: Total NCUA Deposits per Montana County as of 06/30/2020	20
Figure 4.3: Total Online Deposits per Montana County as of 06/30/2020	24
Figure 4.4: Total Bank A Deposits per Montana County as of 06/30/2020	26
Figure 4.5: Montana Population by County, 2019	29
Figure 4.6: Agricultural Loan Demand in Montana (\$000's), 2015-2020	30
Figure 5.1: Small Market Model.....	33
Figure 6.1: Estimated Total Deposits per Montana County as of 06/30/2020.....	40
Figure 6.2: Estimated Average Deposit per Person per Montana County, 06/30/2020	41
Figure 6.2: Initial Montana Small Market Model – Town A Micro Branch, 2019	45
Figure 6.3: Updated Montana Small Market Model – Town A Micro Branch, 2021..	46
Figure 6.4: Bank A's Share of Total Deposits per Montana County as of 06/30/2020	49

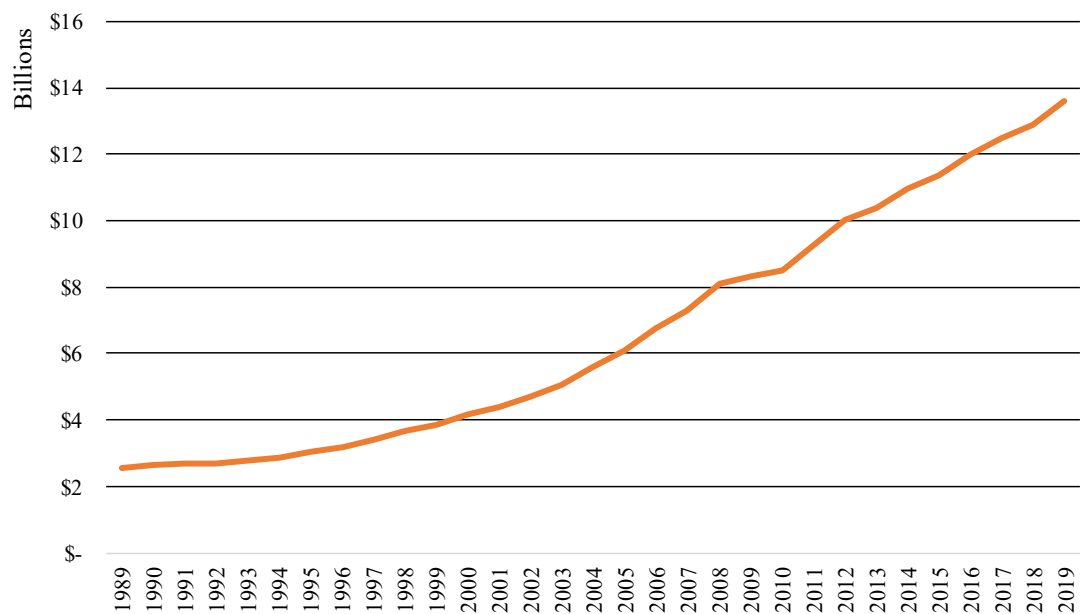
LIST OF TABLES

Table 4.1: Total FDIC Deposits per Montana County (\$000's), 2010-2020	16
Table 4.2: Total NCUA Deposits Per Montana County (\$000's), 2015-2020	19
Table 4.3: FDIC Branch Service Codes Definition.....	21
Table 4.4: Total FDIC Online Deposits Per Montana County (\$000's), 2015-2020	23
Table 4.5: Total Bank A Deposits per Montana County, 2015-2020	27
Table 6.1: Estimated Total Deposits in Montana per County as of 06/30/2020.....	39
Table 6.2: Bank A's Share of Montana Deposits per County as of 06/30/2020	48

CHAPTER I: INTRODUCTION

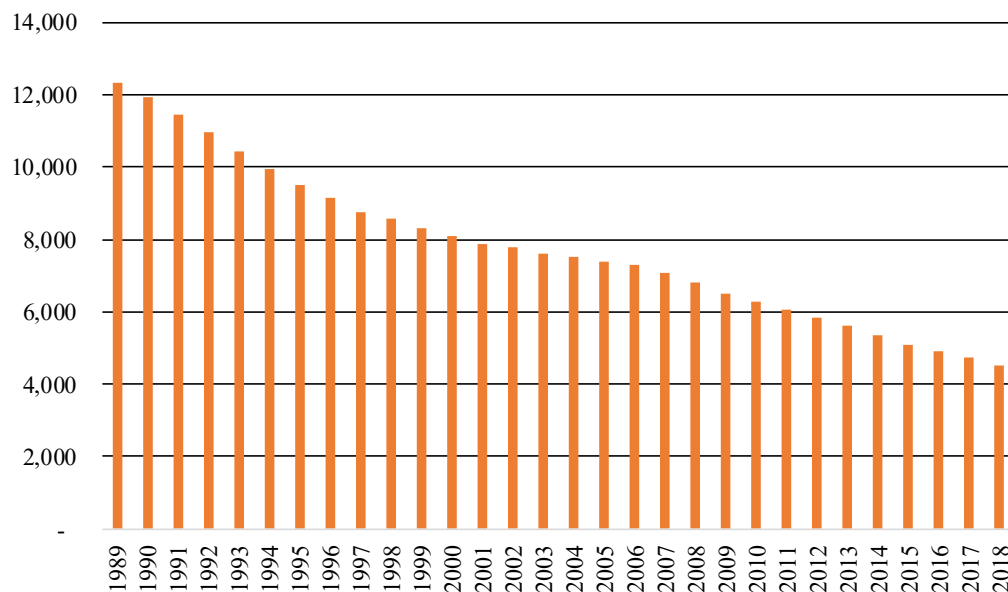
Over the past few decades, the Federal Deposit Insurance Corporation (FDIC) has reported a steady increase in total deposit values (Figure 1.1) and a corresponding decrease in the number of commercial banks (Figure 1.2). In 2019, FDIC reported deposit totals of \$13,614,252,211,000 at 4,519 commercial banks.

Figure 1.1: FDIC Deposits Trend, 1989-2019



Source: BankFind Suite: Find Annual Historical Bank Data 2019

Figure 1.2: FDIC Number of Commercial Banks 1989-2019



Source: BankFind Suite: Find Annual Historical Bank Data 2019

Although the FDIC has reported steady total deposit growth, this trend varies by type of bank. For example, community banks have reported minimal growth in deposit balances while FinTechs and other online banking institutions are experiencing significant deposit growth. FinTechs are financial institutions that provide financial services through software or other technology platforms. The FDIC defines community banks as banks that provide traditional banking services to their local communities, with a significant focus on conducting business locally by relying on their specialized knowledge of the local community (Federal Deposit Insurance Corporation 2020).

Over the past couple decades, several studies have analyzed why customers are moving deposit accounts away from community banks to online financial institutions including FinTechs. Some studies concluded that consumers in areas underserved by traditional financial institutions are more likely to hold their deposits with FinTechs and other online banking platforms (Jagtiani and Lemieux 2018). Studies also found that there

was a generational shift to more millennial business owners and a shift away from community banks as relationship banking was no longer a top priority (Jagtiani and Lemieux 2018). In an effort to bring deposits back to brick and mortar financial institutions, banks and other institutions are installing interactive teller machines (ITM) in different locations. This modernization is a new generation automatic teller machine (ATM) that offers a virtual version of an in-person banking experience through live video chat with an operator that can be based anywhere. Studies on interactive teller machines are limited as banks have been hesitant to adopt the technology. However, in March 2020 the American Banking Association reported that banks are becoming more interested in interactive machines to meet consumer's technological demands and reduce overhead costs (Reider 2020). Reider (2020) also reported that ITMs present financial challenges due to significant implementation costs, hesitant customer adaption, and technological challenges. Reider (2020) references a study by Bancography, who surveyed their clients to analyze the current implementation levels of ITM's. Bancography concluded that only one fourth of responding institutions had implemented the technology, however, 60% of the remaining respondents showed interest in ITMs (Reider 2020).

The declining trend in core deposit levels at community banks has forced banks to supplement their money supply with more expensive funding sources while maintaining profitable operations and managing their reputational risk by meeting their communities' financing demands. Many financial institutions borrow heavily from the Federal Home Loan Bank as well as selling parts of their loan portfolios. These alternative funding methods have proven to be inherently risky to banks (Demirguc-Kunt and Huizinga 2010).

In addition to understanding the risk of alternate funding methods, studies have analyzed what encourages borrowers to save, therefore increasing bank funding. Schlueter, Sievers, and Hartmann-Wendels (2015) found that an increase in rewards such as interest payments and government subsidies increase customers' saving behavior. What these studies lack is a cost-benefit analysis of implementing these methods to capture additional deposits. Developing an understanding of the full implication to a bank's balance sheet and operations when implementing these methods may be a valuable tool for banks looking to increase their deposit share in rural markets.

Bank A, a small Montana bank, wants to identify and capture rural deposits in areas that are not well served by financial institutions. The incentive is to increase core deposit levels therefore decreasing the need to borrow heavily from the Federal Home Loan Bank to fund the Bank's balance sheet.

1.1 Research Question and Objectives

The research question of interest is: what is the cost/benefit to the bank of securing rural deposits?

The overall objective is to estimate the potential size of the market for rural deposits and determine the cost and benefit of getting those deposits. The specific objectives are as follows:

1. Recognize and define the actual available deposit market. What is the potential size of the market for rural deposits?
2. Consider the cost of obtaining rural deposits through the implementation of a micro branch to an area underserved by traditional financial institutions. What would be the cost of getting these deposits?

3. Demonstrate the financial, representational, and overall franchise value of being the bank to get this done.

1.2 Thesis Outline

This opening chapter presents the background to this project. A review of literature on the decline in deposits, the introduction of FinTechs, and bank funding strategies, and the approaches used to analyze limitations and successes of funding strategies are discussed in Chapter 2. Chapter 3 outlines the conceptual framework. Data are presented in Chapter 4 and the methods for this project are outlined in Chapter 5. The results and conclusions are reported in Chapters 6 and 7.

CHAPTER II: LITERATURE REVIEW

2.1 Decline in Core Deposits

Community banks have been experiencing declining core deposits. Core deposits, most bank's primary source of funds, are defined as deposits that are more stable and less interest rate change sensitive. As banks rely on core deposits to fund their balance sheet, the decline has forced banks to supplement funding with more expensive options that negatively impact the bank's profitability metrics. Harvey and Spong (2001) found that to remain profitable and meet the credit needs of rural communities, community banks need to develop strategies to maintain their local depositor base by offering a competitive range of products and to diversify their funding sources for security. Harvey and Spong (2001) conclude that innovative and forward-looking banks maintain successful operations.

2.2 Fintechs

Jagtiani and Lemieux (2018) found evidence that FinTech lenders, specifically LendingClub, had a larger consumer lending market share in areas with less bank branches per capita. Over the last decade, the number of banks and bank branches continue to decline providing the opportunity for alternative deposit and lending sources to penetrate those markets underserved by traditional financial institutions. Jagtiani and Lemieux (2018) also conclude that as millennials are making up a larger portion of small business owners, and they are more comfortable with technology that non-traditional lending sources use, FinTech lenders will continue to increase their market share.

2.3 Stabilizing Bank Funding

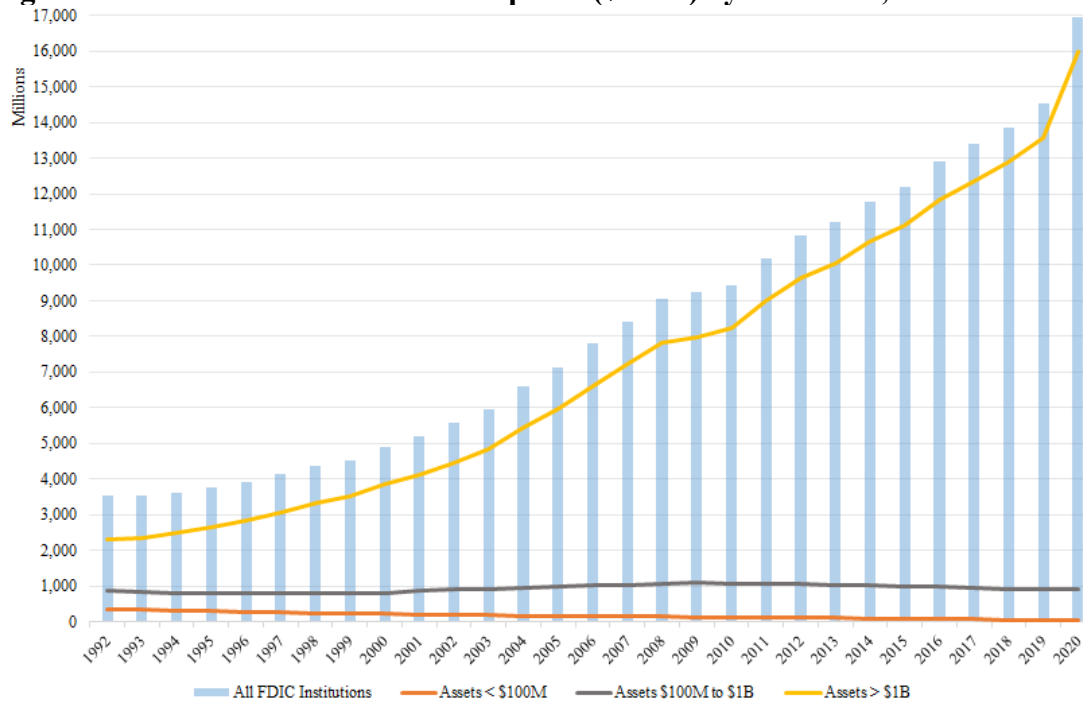
Schlueter, Sievers and Hartmann-Wendels (2015) examined banks' non-maturing deposit account behavior and analyzed to what extent the bank can offer incentives that

influence retail customers' saving habits. Schlueter, Sievers and Hartmann-Wendels (2015) analyzed data from a German bank and found that pricing incentives had the largest influence on a depositor's saving behavior. In this study, rewards or pricing incentives lead to stabilized deposit account levels with a steady increase in new deposits.

2.4 Where are Rural Deposits?

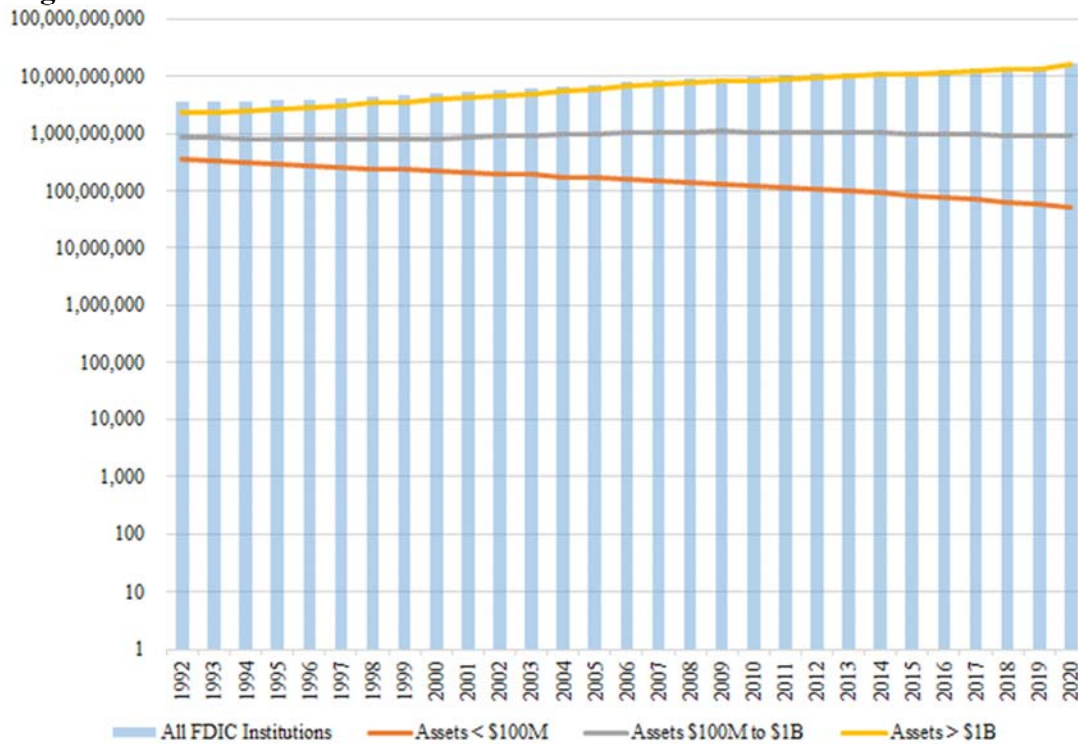
Over the past few decades, the total shares of U.S. banking assets and deposits held by large banks have increased while shares held by community banks decreased. Financial institutions with assets greater than \$1 billion hold a majority of FDIC deposits, while institutions with less than \$100 million in assets report a steady decline in deposits and decreased shares of total FDIC deposits (Figures 2.1-2.2). The same trend is occurring for total banking assets. Small institutions with less than \$100 million in assets are reporting a steady decline in total assets while institutions with assets greater than \$1 billion are increasing their share of total assets (Figures 2.3-2.4). Gilbert and Wheelock (2019) analyzed rural U.S. counties deposit shares by bank size and found that large banks have not pushed community banks out of rural markets. They conclude that the community banks' deposit share has remained stable, which suggests that they hold the competitive advantage against larger banks in rural markets.

Figure 2.1: FDIC Institutions Total Deposits (\$000's) by Bank Size, 1992-2020



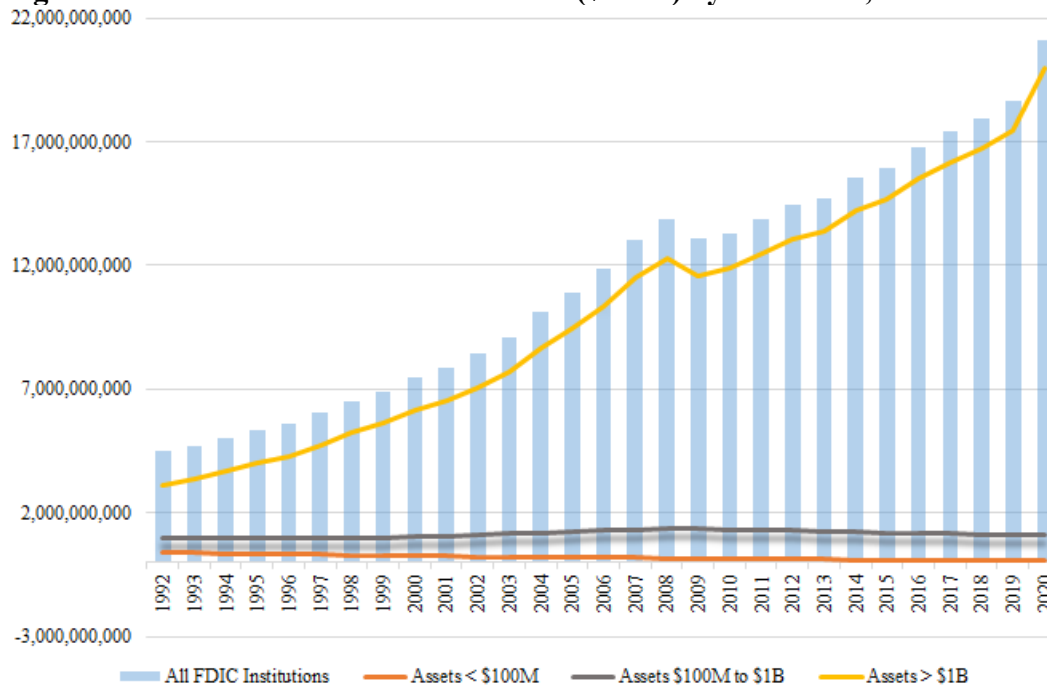
Source: Federal Deposit Insurance Corporation 1992-2020

Figure 2.2: FDIC Institutions Total Deposits (\$000's) by Bank Size, 1992-2020, Logarithmic Scale



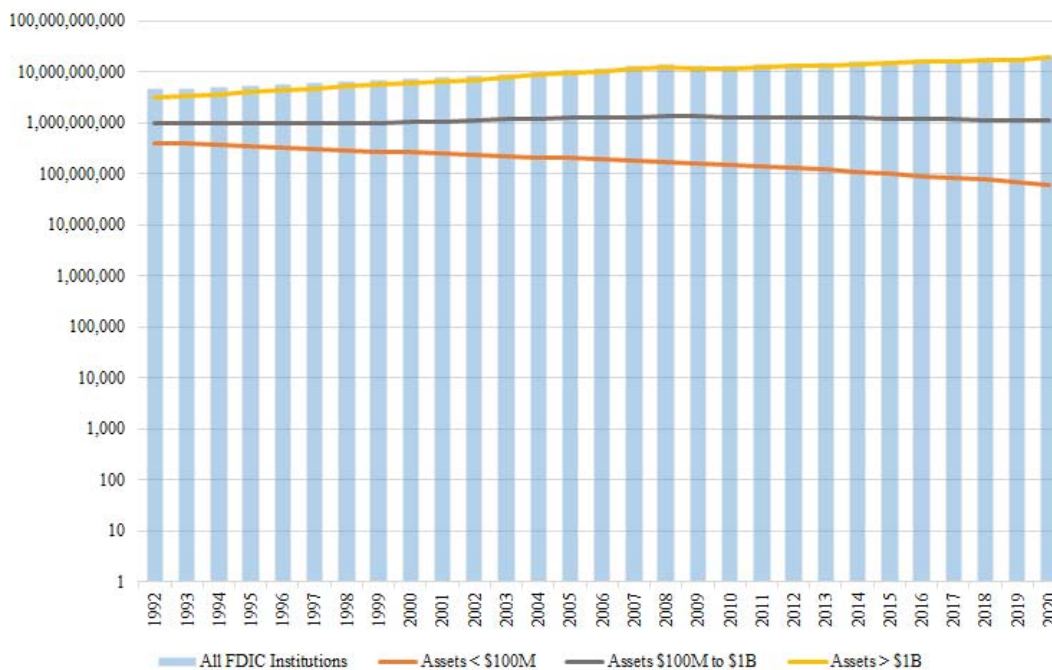
Source: Federal Deposit Insurance Corporation 1992-2020

Figure 2.3: FDIC Institutions Total Assets (\$000's) by Bank Size, 1992-2020



Source: Federal Deposit Insurance Corporation 1992-2020

Figure 2.4: FDIC Institutions Total Assets (\$000's) by Bank Size, 1992-2020, Logarithmic Scale



Source: Federal Deposit Insurance Corporation 1992-2020

2.5 Bank Funding Strategies

Demirguc-Kunt and Huizinga (2010) examined the effect of income and funding strategies on banks' profitability. They found that higher risk was associated with increased non-deposit and non-interest income funding. In conclusion, traditional banking strategies were determined to be safe and more stable.

CHAPTER III: THEORY

The banking industry is a highly competitive industry. As a Montana-based bank with numerous locations in rural markets, Bank A is looking to increase their market share in rural deposits in an attempt to lower their cost of funds for their lending operations. Traditional financial institutions typically underserve rural markets so barriers to entry are minimal. The purpose of this thesis is to estimate the available deposits in rural areas and to provide an analysis of the cost and benefit to the bank to get those deposits.

3.1 Consumer Behavior

Consumer behavior is the study of consumers and the processes they use to purchase, consume, and dispose of goods and services. Additionally, consumer behavior studies what motivates consumers. Understanding consumer behavior is vital for firms to be competitive in the marketplace.

Basic consumer theory assumes that the average consumer acts rationally in the decision-making process to get the most value out of their purchase. This rationale arises from the utility maximizing theory. Utility maximization suggests consumers strive to get the highest satisfaction from their economic decisions. Utility maximization also drives the level of value derived from their experience.

People are altruistic and get utility from helping others in their community. Utility maximization supports the framework that increased community investment based on deposit levels may incentivize new or increased deposit levels. This thesis analyzes the benefit of the Bank rewarding consumers with deposit accounts that meet specific thresholds by making a financial investment in the community on their behalf. It is expected that the consumer's utility will increase as a result of the community investment

that does not require a personal expenditure and therefore increase the Bank's total deposit market share.

Consumer behavior also assumes that convenience drives consumer choice. Due to a lack of technology and capital resources, community banks have struggled to compete in the area of online banking and ultimately may have lost customers to larger competitors. Presently, many rural markets are underserved by traditional financial institutions. Therefore, this study explores the potential benefit of implementing an Interactive Teller Machine. Consumer behavior theory suggests that the convenience of a virtual branch in their market could provide increased deposits for the Bank.

3.2 Cost-Benefit Analysis

The theory of cost-benefit analysis is often used in the decision making process. A cost-benefit analysis evaluates decisions in terms of consequences. When the benefits outweigh the costs, then firms will proceed with the investment. There are numerous approaches to complete a cost-benefit analysis.

3.3 Internal Rate of Return

The internal rate of return (IRR) is a profitability measure used to estimate the expected return of potential investments and is commonly used by firms in the capital planning process. Discounted cash flow analysis (DCF) is a valuation method used to estimate the present value of an investment based on expected future cash flows using a discount rate. In a discounted cash flow analysis, the internal rate of return is the discount rate that makes the net present value equal to zero. More specifically, the internal rate of return is the break-even rate for an investment.

The formula to determine IRR is:

$$NPV = C_0 + \frac{C_1}{1 + IRR} + \frac{C_2}{1 + IRR} + \dots + \frac{C_T}{(1 + IRR)^T} = 0.$$

Source: (Brealey, Myers and Allen 2017)

In theory, a firm would accept an investment project if the internal rate of return is greater than the opportunity cost of capital as the project has a positive net present value.

The calculated IRR is compared to the firm's required rate of return to determine if the proposed project meets company standards and will be profitable.

3.4 Discounted Cash Flow Analysis Terminal Value

Terminal value is an estimate of the business value beyond a defined forecast period. In a discounted cash flow analysis (DCF), future cash flows are typically projected for a period of time where reasonable assumptions can be made, however, forecasting cash flows beyond that period is difficult and requires significant assumptions to be made. There are two approaches to determine the DCF Terminal Value: 1) perpetual growth method and 2) exit multiple method.

3.4.1 Perpetuity Method

The perpetuity method or Gordon's Growth Model assumes that cash flows will grow at a constant rate forever. Terminal value is calculated by dividing the last forecasted cash flow by the difference between the discount rate and growth rate. The formula to calculate the terminal value using the perpetual growth method is:

$$TV_0 = \frac{C_N * (1 + g)}{r - g}.$$

Source: (Brealey, Myers and Allen 2017)

3.4.2 Exit Multiple Method

The exit multiple method estimates the value of a business by multiplying a financial metric by a market multiple. Most commonly, firms use the enterprise value divided by earnings before interest, taxes, depreciation, and amortization (EBITDA) to predict the terminal multiple. The formula to calculate the terminal value using the exit multiple method is:

$$TV_0 = \text{Financial Metric} \times \text{Terminal Multiple}.$$

Source: (Brealey, Myers and Allen 2017)

CHAPTER IV: DATA

4.1 Introduction

The data used to address the objectives of this thesis are discussed in this chapter. A model created by Bank A was expanded using Microsoft EXCEL to evaluate the feasibility of attracting rural deposits. This study was completed with current and historical deposit data, Montana population data, overnight cost of funds data, and deposit cost data.

4.2 Deposit Data

Data to estimate deposits were obtained from the Federal Deposit Insurance Corporation, the National Credit Union Administration, and Bank A's financial reports and deposit database. The Federal Deposit Insurance Corporation releases a Summary of Deposits annually as of June 30th. The National Credit Union Administration releases a quarterly Call Report. For the purpose of this thesis, June 30th or Quarter 2 data were used. Data are reported data at the national, state, county, and city level. To gain perspective on current conditions, historical deposit values and trends were evaluated to estimate the current deposit market.

4.2.1 Federal Deposit Insurance Corporation Deposit Data

For Federal Deposit Insurance Corporation insured bank deposits, ten years of annual data as of June 30th from the Annual Summary of Deposits County Summaries Deposit Market Share Report for Montana were used (Table 4.1). The data represents the total FDIC deposits in Montana sorted by county. The deposits per county are determined based on the bank branch location. Historical deposit trends are important when evaluating the current deposit market. As of June 30, 2020 there were \$28,668,427,000 FDIC deposits in Montana deposited in fifty-two FDIC-insured institutions with three hundred eighty-one offices in the state (Federal Deposit Insurance Corporation 2010-2020). This number

increased by 63% from 2010 deposits of \$17,546,081,000 (Federal Deposit Insurance Corporation 2010-2020). FDIC deposit totals are used to estimate the total deposit market.

Table 4.1: Total FDIC Deposits per Montana County (\$000's), 2010-2020

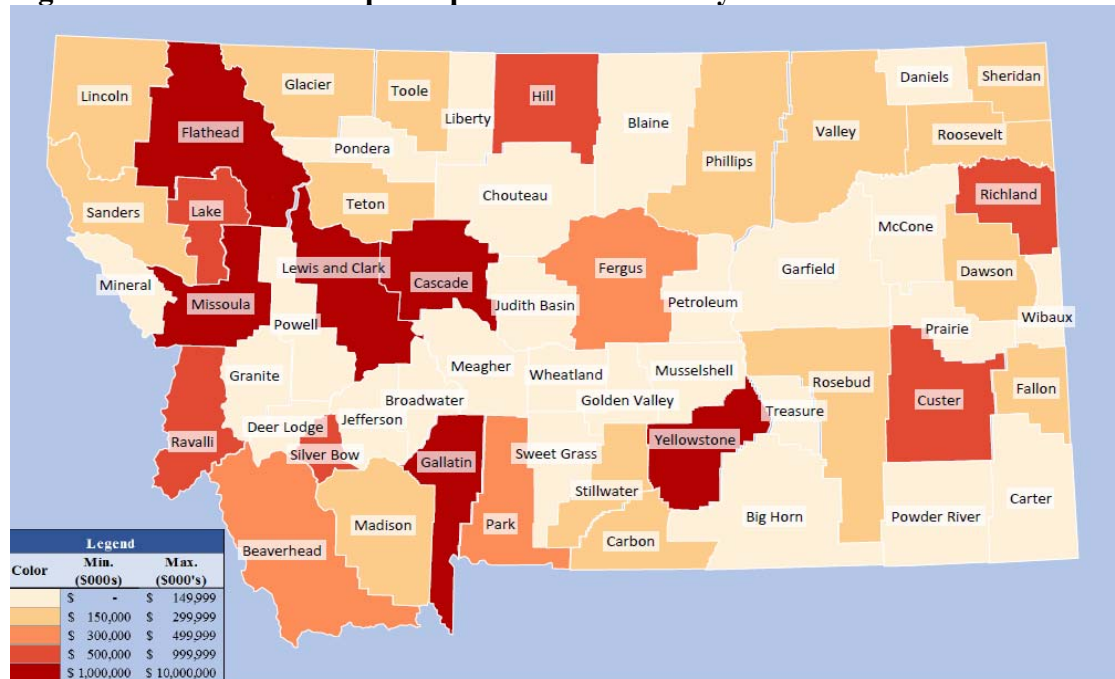
Montana County	6.30.2010	6.30.2011	6.30.2012	6.30.2013	6.30.2014	6.30.2015	6.30.2016	6.30.2017	6.30.2018	6.30.2019	6.30.2020
Beaverhead	\$ 174,437	\$ 186,066	\$ 201,744	\$ 208,126	\$ 207,304	\$ 213,147	\$ 224,340	\$ 250,297	\$ 257,660	\$ 250,645	\$ 303,048
Big Horn	\$ 97,444	\$ 97,694	\$ 103,819	\$ 106,225	\$ 114,086	\$ 128,860	\$ 127,614	\$ 125,651	\$ 121,501	\$ 122,619	\$ 138,082
Blaine	\$ 85,956	\$ 90,722	\$ 99,219	\$ 103,557	\$ 105,164	\$ 107,261	\$ 108,371	\$ 96,197	\$ 70,483	\$ 71,201	\$ 110,679
Broadwater	\$ 50,624	\$ 56,483	\$ 57,102	\$ 59,678	\$ 65,907	\$ 65,786	\$ 68,419	\$ 73,594	\$ 72,928	\$ 72,574	\$ 82,807
Carbon	\$ 162,665	\$ 153,900	\$ 168,899	\$ 172,826	\$ 183,050	\$ 188,565	\$ 198,409	\$ 183,307	\$ 191,023	\$ 202,823	\$ 230,818
Carter	\$ 29,118	\$ 29,296	\$ 25,567	\$ 22,305	\$ 21,800	\$ 25,525	\$ 30,572	\$ 28,106	\$ 29,454	\$ 27,814	\$ 29,897
Cascade	\$ 1,132,104	\$ 1,227,499	\$ 1,276,906	\$ 1,334,722	\$ 1,298,887	\$ 1,308,265	\$ 1,392,366	\$ 1,381,877	\$ 1,361,615	\$ 1,450,083	\$ 1,752,346
Chouteau	\$ 103,685	\$ 104,769	\$ 111,113	\$ 118,400	\$ 126,667	\$ 121,018	\$ 118,069	\$ 119,021	\$ 117,155	\$ 110,604	\$ 114,349
Custer	\$ 322,951	\$ 371,785	\$ 410,957	\$ 461,424	\$ 472,824	\$ 483,142	\$ 491,442	\$ 472,671	\$ 486,108	\$ 493,583	\$ 564,555
Daniels	\$ 53,043	\$ 66,883	\$ 67,519	\$ 69,717	\$ 65,366	\$ 71,848	\$ 90,369	\$ 92,475	\$ 101,769	\$ 112,266	\$ 115,241
Dawson	\$ 172,913	\$ 180,841	\$ 200,805	\$ 218,993	\$ 234,309	\$ 232,133	\$ 227,147	\$ 236,088	\$ 234,903	\$ 235,923	\$ 264,470
Deer Lodge	\$ 102,084	\$ 95,951	\$ 99,046	\$ 106,595	\$ 105,707	\$ 105,256	\$ 101,786	\$ 103,295	\$ 107,770	\$ 105,924	\$ 141,917
Fallon	\$ 122,824	\$ 148,963	\$ 145,228	\$ 154,122	\$ 174,621	\$ 178,776	\$ 163,736	\$ 161,569	\$ 158,910	\$ 123,158	\$ 154,587
Fergus	\$ 240,691	\$ 285,776	\$ 288,171	\$ 255,959	\$ 276,469	\$ 286,119	\$ 289,198	\$ 289,617	\$ 331,671	\$ 324,594	\$ 347,795
Flathead	\$ 1,501,577	\$ 1,407,825	\$ 1,467,439	\$ 1,787,700	\$ 1,716,631	\$ 1,824,963	\$ 1,943,916	\$ 2,036,588	\$ 2,044,601	\$ 2,136,481	\$ 2,385,341
Gallatin	\$ 1,853,268	\$ 1,824,365	\$ 1,916,752	\$ 1,987,697	\$ 2,120,915	\$ 2,328,731	\$ 2,600,530	\$ 2,797,959	\$ 3,059,804	\$ 3,234,077	\$ 3,890,303
Garfield	\$ 34,427	\$ 37,930	\$ 44,481	\$ 43,604	\$ 46,753	\$ 51,873	\$ 56,997	\$ 63,164	\$ 63,318	\$ 65,273	\$ 70,144
Glacier	\$ 96,746	\$ 95,101	\$ 104,744	\$ 97,561	\$ 98,349	\$ 97,783	\$ 100,798	\$ 116,945	\$ 114,912	\$ 106,620	\$ 154,134
Golden Valley	\$ 4,613	\$ 4,827	\$ 4,827	\$ 5,709	\$ 5,387	\$ 5,309	\$ -	\$ -	\$ -	\$ -	\$ -
Granite	\$ 30,536	\$ 29,843	\$ 32,261	\$ 35,203	\$ 33,224	\$ 34,866	\$ 38,734	\$ 38,168	\$ 41,040	\$ 41,659	\$ 47,428
Hill	\$ 330,821	\$ 357,230	\$ 356,347	\$ 351,831	\$ 361,939	\$ 394,766	\$ 410,369	\$ 475,605	\$ 511,589	\$ 564,515	\$ 666,135
Jefferson	\$ 58,988	\$ 59,700	\$ 61,144	\$ 60,839	\$ 64,568	\$ 67,988	\$ 71,795	\$ 75,833	\$ 80,716	\$ 83,995	\$ 96,287
Judith Basin	\$ 51,584	\$ 55,064	\$ 56,745	\$ 57,711	\$ 61,718	\$ 65,874	\$ 59,727	\$ 61,869	\$ 60,747	\$ 60,768	\$ 63,761
Lake	\$ 294,610	\$ 286,136	\$ 307,603	\$ 309,005	\$ 343,346	\$ 349,749	\$ 361,388	\$ 362,182	\$ 386,117	\$ 405,144	\$ 512,113
Lewis And Clark	\$ 1,092,660	\$ 1,101,478	\$ 1,126,228	\$ 1,176,038	\$ 1,238,835	\$ 1,310,090	\$ 1,401,032	\$ 1,369,833	\$ 1,509,586	\$ 1,703,742	\$ 1,827,726
Liberty	\$ 28,590	\$ 32,612	\$ 34,224	\$ 38,432	\$ 40,501	\$ 37,561	\$ 37,192	\$ 37,665	\$ 14,646	\$ 27,024	\$ 33,011
Lincoln	\$ 161,822	\$ 157,935	\$ 165,903	\$ 178,103	\$ 191,286	\$ 196,606	\$ 206,935	\$ 214,816	\$ 247,067	\$ 239,762	\$ 266,986
Madison	\$ 142,765	\$ 146,353	\$ 147,935	\$ 153,607	\$ 164,711	\$ 169,495	\$ 180,581	\$ 186,482	\$ 200,488	\$ 208,202	\$ 232,748
McCone	\$ 11,113	\$ 9,945	\$ 10,326	\$ 13,118	\$ 16,413	\$ 20,118	\$ 20,253	\$ 22,330	\$ 13,077	\$ 14,375	\$ 18,562
Meagher	\$ 29,130	\$ 31,416	\$ 31,272	\$ 29,704	\$ 33,671	\$ 32,919	\$ 34,311	\$ 34,086	\$ 29,165	\$ 28,862	\$ 29,150
Mineral	\$ 40,059	\$ 38,854	\$ 35,071	\$ 38,346	\$ 38,386	\$ 40,011	\$ 42,501	\$ 43,401	\$ 47,916	\$ 43,871	\$ 54,340
Missoula	\$ 1,882,881	\$ 1,913,475	\$ 1,941,905	\$ 1,928,259	\$ 1,943,736	\$ 2,009,780	\$ 2,136,373	\$ 2,349,893	\$ 2,386,956	\$ 2,448,539	\$ 3,003,294
Musselshell	\$ 53,073	\$ 52,219	\$ 55,237	\$ 55,785	\$ 57,257	\$ 59,536	\$ 57,219	\$ 60,276	\$ 68,387	\$ 55,652	\$ 64,934
Park	\$ 306,466	\$ 305,892	\$ 300,844	\$ 305,533	\$ 313,204	\$ 337,094	\$ 347,395	\$ 377,983	\$ 388,080	\$ 403,183	\$ 464,368
Petroleum	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Phillips	\$ 139,366	\$ 147,336	\$ 149,107	\$ 149,960	\$ 157,112	\$ 162,836	\$ 163,638	\$ 160,371	\$ 166,751	\$ 163,408	\$ 187,295
Pondera	\$ 114,440	\$ 121,284	\$ 127,757	\$ 141,754	\$ 149,392	\$ 155,665	\$ 150,105	\$ 155,624	\$ 136,993	\$ 143,851	\$ 97,048
Powder River	\$ 27,173	\$ 28,067	\$ 32,040	\$ 32,764	\$ 35,159	\$ 42,039	\$ 45,093	\$ 41,485	\$ 42,255	\$ 40,193	\$ 46,828
Powell	\$ 87,086	\$ 90,890	\$ 84,423	\$ 84,984	\$ 89,276	\$ 91,593	\$ 95,366	\$ 95,829	\$ 105,790	\$ 102,063	\$ 115,289
Prairie	\$ 36,953	\$ 37,997	\$ 38,357	\$ 41,185	\$ 40,138	\$ 41,196	\$ 39,132	\$ 38,278	\$ 37,703	\$ 38,055	\$ 42,939
Ravalli	\$ 616,201	\$ 567,084	\$ 589,378	\$ 596,631	\$ 611,332	\$ 631,172	\$ 670,114	\$ 704,007	\$ 754,284	\$ 776,539	\$ 940,788
Richland	\$ 271,739	\$ 309,093	\$ 362,487	\$ 413,843	\$ 442,598	\$ 456,073	\$ 523,478	\$ 501,895	\$ 511,359	\$ 540,567	\$ 599,169
Roosevelt	\$ 168,549	\$ 173,620	\$ 195,605	\$ 213,678	\$ 235,100	\$ 242,952	\$ 241,774	\$ 219,230	\$ 254,011	\$ 241,460	\$ 272,538
Rosebud	\$ 123,387	\$ 134,591	\$ 132,138	\$ 141,831	\$ 146,149	\$ 155,666	\$ 164,903	\$ 168,887	\$ 162,610	\$ 162,075	\$ 182,344
Sanders	\$ 147,760	\$ 149,979	\$ 157,406	\$ 152,179	\$ 155,054	\$ 162,353	\$ 166,163	\$ 176,624	\$ 165,608	\$ 162,873	\$ 191,994
Sheridan	\$ 181,328	\$ 198,543	\$ 213,592	\$ 211,534	\$ 222,157	\$ 235,043	\$ 230,588	\$ 217,452	\$ 215,331	\$ 215,349	\$ 243,684
Silver Bow	\$ 544,518	\$ 534,648	\$ 552,969	\$ 588,163	\$ 601,583	\$ 558,625	\$ 550,872	\$ 589,295	\$ 594,608	\$ 612,450	\$ 713,615
Stillwater	\$ 135,201	\$ 134,527	\$ 130,172	\$ 136,104	\$ 141,839	\$ 145,354	\$ 143,871	\$ 147,233	\$ 147,794	\$ 152,598	\$ 181,874
Sweet Grass	\$ 109,278	\$ 106,634	\$ 102,380	\$ 111,185	\$ 114,725	\$ 122,146	\$ 127,014	\$ 126,876	\$ 124,830	\$ 127,850	\$ 143,613
Teton	\$ 146,684	\$ 165,945	\$ 166,839	\$ 175,481	\$ 185,336	\$ 198,895	\$ 192,124	\$ 183,819	\$ 173,646	\$ 168,269	\$ 162,103
Toole	\$ 119,942	\$ 143,290	\$ 161,199	\$ 168,340	\$ 165,745	\$ 172,619	\$ 172,162	\$ 166,824	\$ 186,244	\$ 164,331	\$ 188,700
Treasure	\$ 14,679	\$ 16,501	\$ 17,018	\$ 18,441	\$ 18,936	\$ 17,725	\$ 17,271	\$ 18,137	\$ 17,809	\$ 17,520	\$ 18,057
Valley	\$ 212,150	\$ 218,899	\$ 238,578	\$ 248,816	\$ 271,211	\$ 294,202	\$ 293,027	\$ 292,649	\$ 274,481	\$ 272,409	\$ 284,334
Wheatland	\$ 31,630	\$ 32,006	\$ 30,281	\$ 31,464	\$ 28,616	\$ 28,932	\$ 33,447	\$ 33,055	\$ 32,250	\$ 33,440	\$ 41,763
Wibaux	\$ 19,172	\$ 21,625	\$ 24,526	\$ 26,221	\$ 27,258	\$ 28,562	\$ 27,915	\$ 24,490	\$ 25,794	\$ 27,691	\$ 27,175
Yellowstone	\$ 3,442,577	\$ 3,631,831	\$ 3,932,112	\$ 4,152,657	\$ 4,429,456	\$ 4,451,736	\$ 4,521,239	\$ 4,599,696	\$ 4,716,103	\$ 4,720,600	\$ 5,755,921
Total Montana Deposits	\$ 17,546,081	\$ 18,009,218	\$ 18,895,747	\$ 19,883,649	\$ 20,611,163	\$ 21,346,197	\$ 22,309,180	\$ 23,000,599	\$ 23,757,416	\$ 24,459,146	\$ 28,668,427

Source: Federal Deposit Insurance Corporation 2010-2020

Someka EXCEL solutions was used to generate a heat map of Montana counties color coordinated by deposit threshold (Figure 4.1). Off-white represents counties with less than \$150,000,000 total deposits. Tan represents counties with greater than \$150,000,000

deposits and less than \$300,000,000 deposits. Orange represents counties with greater than \$300,000,000 deposits and less than \$500,000,000 deposits. Light red represents counties with greater than \$500,000,000 deposits and less than \$1,000,000,000 deposits. Dark red represents counties with greater than \$1,000,000,000 deposits.

Figure 4.1: Total FDIC Deposits per Montana County as of 06/30/2020



Source: Federal Deposit Insurance Corporation 2010-2020

The dark red counties have large metropolitan areas within the county. These areas report higher deposits due to larger populations within those areas. Light red and orange counties each have larger towns that offer majority of necessary services. The tan and off-white counties are more rural, however are located close to the more populated counties. It appears that FDIC institutions are primarily located in or near the larger towns.

4.2.2 National Credit Administration Deposit Data

For credit union deposits, five years of annual data were sourced from the National Credit Administration's custom query database. These data are compiled during the annual

5300 Call Report cycle. The National Credit Administration reports deposit totals per credit union. For this thesis, a list of credit unions in Montana was collected from the National Credit Administration. A Google search was conducted to determine the number of branches and the geographic location of those branches. To estimate the total deposits per credit union per county, the total deposits as of June 30th for each of the five years was divided by the total number of branches. From there, an EXCEL spreadsheet was used to calculate the total credit union deposits per county (Table 4.2).

Credit union deposit totals have grown approximately 33% from 2015 to 2020 reporting total deposits of \$4,594,067,573 in 2020 held at forty-five NCUA credit unions with one hundred seventeen branches in Montana (National Credit Union Administration 2015-2020). For this thesis, historical credit union deposits help estimate the total deposit market.

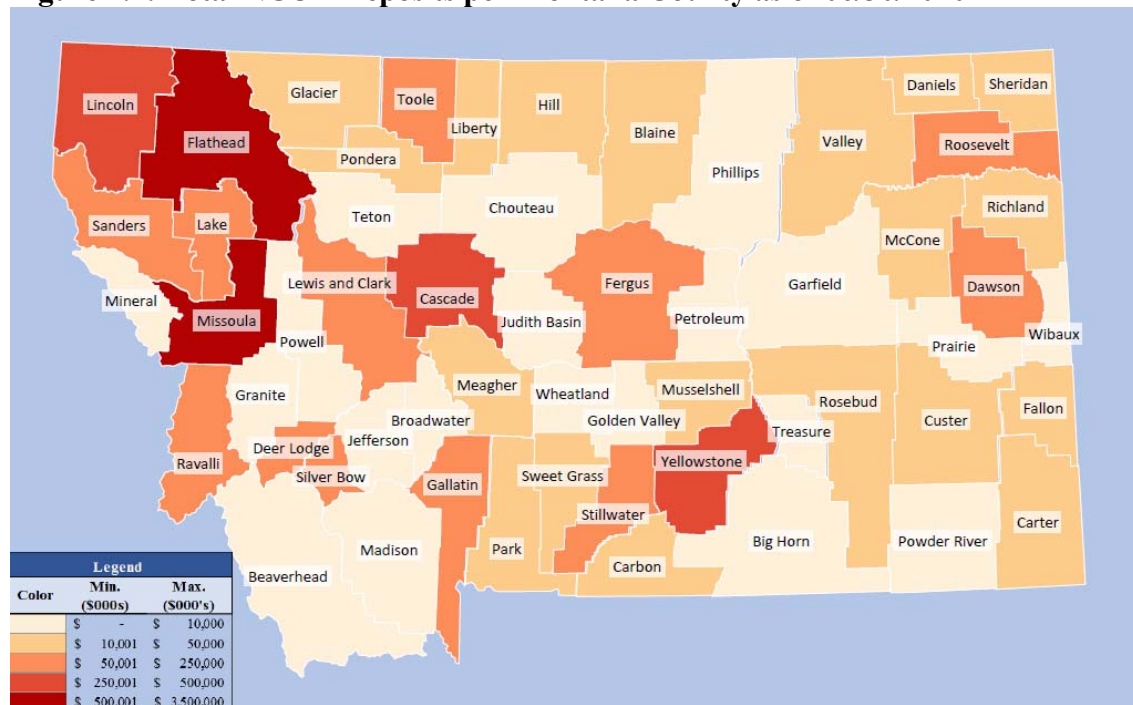
Table 4.2: Total NCUA Deposits Per Montana County (\$000's), 2015-2020

Montana County	6.30.2015	6.30.2016	6.30.2017	6.30.2018	6.30.2019	6.30.2020
Beaverhead	\$ 5,932	\$ 6,842	\$ 6,805	\$ 7,259	\$ 7,202	\$ 8,713
Big Horn	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Blaine	\$ 18,975	\$ 20,419	\$ 21,268	\$ 21,122	\$ 20,306	\$ 22,118
Broadwater	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Carbon	\$ 28,205	\$ 28,904	\$ 30,768	\$ 32,248	\$ 33,813	\$ 41,265
Carter	\$ 12,580	\$ 12,971	\$ 12,930	\$ 12,620	\$ 12,697	\$ 14,765
Cascade	\$ 247,113	\$ 251,999	\$ 268,600	\$ 270,066	\$ 219,534	\$ 304,367
Chouteau	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Custer	\$ 15,031	\$ 15,721	\$ 15,662	\$ 15,757	\$ 15,731	\$ 17,869
Daniels	\$ 23,468	\$ 22,760	\$ 22,232	\$ 21,656	\$ 20,228	\$ 22,257
Dawson	\$ 55,263	\$ 53,230	\$ 51,682	\$ 50,232	\$ 49,075	\$ 57,079
Deer Lodge	\$ 48,308	\$ 50,464	\$ 51,457	\$ 52,940	\$ 53,821	\$ 59,003
Fallon	\$ 37,726	\$ 39,228	\$ 49,502	\$ 40,035	\$ 33,390	\$ 39,159
Fergus	\$ 53,379	\$ 54,987	\$ 57,478	\$ 56,832	\$ 61,792	\$ 66,781
Flathead	\$ 747,785	\$ 786,847	\$ 814,139	\$ 849,637	\$ 866,500	\$ 976,019
Gallatin	\$ 102,898	\$ 109,924	\$ 117,522	\$ 127,826	\$ 136,337	\$ 159,625
Garfield	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Glacier	\$ 18,360	\$ 17,704	\$ 19,360	\$ 19,447	\$ 18,841	\$ 21,509
Golden Valley	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Granite	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Hill	\$ 19,493	\$ 20,998	\$ 21,930	\$ 21,775	\$ 21,118	\$ 23,020
Jefferson	\$ 5,932	\$ 6,842	\$ 6,805	\$ 7,259	\$ 7,202	\$ 8,713
Judith Basin	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Lake	\$ 159,634	\$ 167,685	\$ 172,992	\$ 179,885	\$ 182,888	\$ 203,937
Lewis And Clark	\$ 130,996	\$ 133,393	\$ 140,896	\$ 147,767	\$ 152,260	\$ 171,837
Liberty	\$ 18,975	\$ 20,419	\$ 21,268	\$ 21,122	\$ 20,306	\$ 22,118
Lincoln	\$ 250,169	\$ 261,012	\$ 269,786	\$ 278,068	\$ 275,173	\$ 310,197
Madison	\$ 5,932	\$ 6,842	\$ 6,805	\$ 7,259	\$ 7,202	\$ 8,713
McCone	\$ 28,305	\$ 29,502	\$ 38,562	\$ 31,157	\$ 33,390	\$ 39,159
Meagher	\$ 10,561	\$ 11,447	\$ 12,504	\$ 14,492	\$ 14,704	\$ 17,461
Mineral	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Missoula	\$ 386,218	\$ 411,232	\$ 454,502	\$ 482,186	\$ 181,079	\$ 617,750
Musselshell	\$ 20,824	\$ 21,424	\$ 23,044	\$ 24,710	\$ 27,106	\$ 32,448
Park	\$ 15,587	\$ 15,950	\$ 17,227	\$ 19,564	\$ 21,126	\$ 25,239
Petroleum	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Phillips	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Pondera	\$ 18,360	\$ 17,704	\$ 19,360	\$ 19,447	\$ 18,841	\$ 21,509
Powder River	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Powell	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Prairie	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Ravalli	\$ 101,259	\$ 110,245	\$ 123,273	\$ 127,846	\$ 130,410	\$ 160,603
Richland	\$ 38,434	\$ 36,474	\$ 36,453	\$ 36,294	\$ 37,783	\$ 39,800
Roosevelt	\$ 49,145	\$ 47,579	\$ 47,412	\$ 47,755	\$ 50,581	\$ 53,720
Rosebud	\$ 13,943	\$ 14,135	\$ 14,480	\$ 13,850	\$ 13,831	\$ 15,142
Sanders	\$ 159,634	\$ 167,685	\$ 172,992	\$ 179,885	\$ 182,888	\$ 203,937
Sheridan	\$ 23,468	\$ 22,760	\$ 22,232	\$ 21,656	\$ 20,228	\$ 22,257
Silver Bow	\$ 114,049	\$ 118,171	\$ 102,322	\$ 104,501	\$ 108,682	\$ 120,184
Stillwater	\$ 49,029	\$ 50,328	\$ 53,812	\$ 56,958	\$ 60,919	\$ 73,713
Sweet Grass	\$ 15,587	\$ 15,950	\$ 17,227	\$ 19,564	\$ 21,126	\$ 25,239
Teton	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Toole	\$ 61,569	\$ 63,086	\$ 66,294	\$ 65,949	\$ 63,243	\$ 65,744
Treasure	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Valley	\$ 9,058	\$ 9,123	\$ 9,933	\$ 11,840	\$ 11,442	\$ 12,432
Wheatland	\$ 1,057	\$ 1,062	\$ 1,215	\$ 1,123	\$ 1,306	\$ 1,366
Wibaux	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Yellowstone	\$ 339,662	\$ 352,544	\$ 373,845	\$ 400,997	\$ 415,825	\$ 487,303
Total Montana Deposits	\$3,461,904	\$3,605,590	\$3,786,575	\$3,920,583	\$3,629,930	\$4,594,068

Source: National Credit Union Administration 2015-2020

Someka EXCEL solutions was used to generate a heat map of Montana counties color coordinated by deposit threshold (Figure 4.2). Off-white represents counties with less than \$10,000,000 total deposits. Tan represents counties with greater than \$10,000,000 deposits and less than \$50,000,000 deposits. Orange represents counties with greater than \$50,000,000 deposits and less than \$250,000,000 deposits. Light red represents counties with greater than \$250,000,000 deposits and less than \$500,000,000 deposits. Dark red represents counties with greater than \$500,000,000 deposits.

Figure 4.2: Total NCUA Deposits per Montana County as of 06/30/2020



Source: National Credit Union Administration 2015-2020

Total NCUA deposits are evenly distributed throughout the state. It is apparent that credit unions have a larger presence in northwestern Montana counties. Similar to FDIC deposits, the orange, light red, and dark red counties are located around larger towns and off-white and tan counties are located in more rural areas.

4.2.3 Online Financial Institutions and Fin-Tech Deposit Data

There is a significant lack of publicly available data for online financial institutions and FinTech deposits. To identify online financial institutions and FinTechs, a list of all Federal Deposit Insurance Corporation insured banks as of June 30, 2020, sorted by branch service type code was used. Service type codes identify the type of service that the FDIC-insured institution's branch office provides (Table 4.3).

Table 4.3: FDIC Branch Service Codes Definition

Code	Service Type	Office Type	Activities
11	Full	Brick and Mortar	Accept deposits, make loans, open/close accounts, loan officer on site, normal hours, full-time staff; may have safe deposit facilities on site. The site may be owned by the institution or leased by the institution.
12	Full	Retail	Accept deposits, make loans, open/close accounts, loan officer on site, normal hours, full-time staff, located in a retail facility such as a supermarket or department store; may have safe deposit facilities on site.
13	Full	Home Banking	A website through which your customers can open accounts, apply for loans, make fund make fund transfers into accounts and other types of electronic transactions. Uses the internet address as your physical address and the city, state, county and zip of your operations center than performs your back room operations associated with web activity.
14	Full	Mobile	Branches that operate on wheels, travel to many locations and provide services such as opening accounts, accepting deposits and making loans. Since these offices do not have a fixed location, they are normally recorded with the address of the main office.
15	Full	Home/Phone Banking	Phone and/or PC banking capabilities through which your customers can open accounts, apply for loans, arrange for withdrawals and fund transfers and other types of electronic transactions. Uses the address of your operations center that fulfills these requests as the address of the location.
16	Full	Seasonal	Opened for a limited period, accepts deposits and make loans - for example, an office opened at a county fair
21	Limited	Administrative	Reflects a management office. Accepts no deposits nor makes loans.
22	Limited	Military Facility	Reflects an office which is operated on a military base for the sole purpose of cashing military and government payroll checks.
23	Limited	Drive Thru/Detached Facility	Accept deposits and payments; however, may not offer other services. May be a bank's own facility, located within a retail establishment or drive-through branch.
24	Limited	Loan Production	Processes loans and does not accept deposits.
25	Limited	Consumer Credit	Processes consumer credit loans.
26	Limited	Contractual	Affiliated institutions contract with one another to utilize the brick and mortar branches of another entity.
27	Limited	Messenger	These locations are used by courier services to make deposit drops. There is no retail customer intervention.
28	Limited	Retail	These types of facilities are located in retail establishments, or free standing kiosks that have limited customer service assistance (unmanned), and provide most services through an ATM.
29	Limited	Mobile	This office may already be on your list but will require a service level change. Accept deposits, accept payments and make withdrawals and may be located in a nursing home, etc. Other services are not available.
30	Limited	Trust	Conduct trust activities only. May have monies that are insured by the institution but have not been deposited into an account of an insured depository institution

Source: Federal Deposit Insurance Corporation 2010-2020

For the purpose of this thesis, a list of FDIC-insured institutions with the service code “13”, which indicates the branch is a cyber-office, was compiled. FDIC’s Annual Summary of Deposits was used to collect annual deposit data as of June 30th 2015-2020 for each cyber office. Over the past five years, cyber branch deposits have increased by 107% from \$401,685,796 in 2015 to \$830,598,393 in 2020 (Federal Deposit Insurance Corporation 2010-2020).

To estimate Montana’s share of online deposits, total FDIC deposits in Montana as of June 30th of each of the five years was divided by total FDIC domestic deposits in the United States. On average, Montana’s share of total domestic FDIC deposits is 0.19% (Federal Deposit Insurance Corporation 1992-2020).

To estimate online deposits at the county level, total deposits for each Montana county was divided by total deposits in Montana for each year to calculate each county’s share of the state’s deposits. An EXCEL spreadsheet was created to estimate online deposits in each Montana county for each year from 2015 to 2020 (Table 4.4) by taking the estimated online deposits in Montana multiplied by each county’s average share of the state’s total deposits.

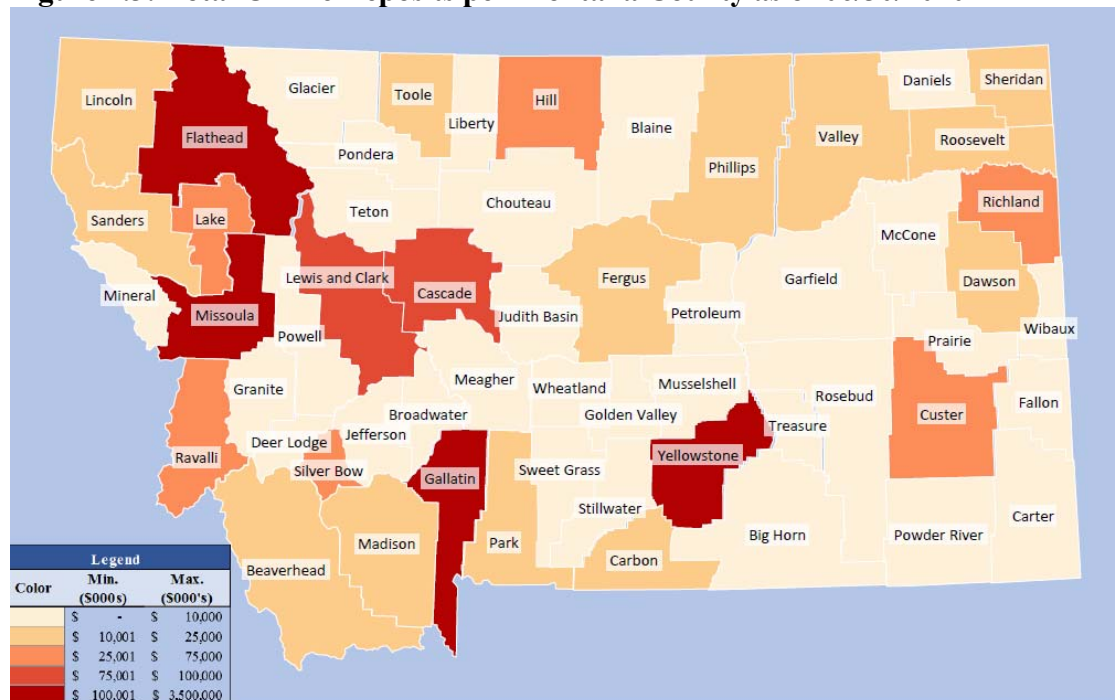
Table 4.4: Total FDIC Online Deposits Per Montana County (\$000's), 2015-2020

Montana County	6.30.2015	6.30.2016	6.30.2017	6.30.2018	6.30.2019	6.30.2020
Beaverhead	\$ 8,085.04	\$ 9,355.45	\$ 11,343.57	\$ 13,082.52	\$ 13,282.97	\$ 16,220.37
Big Horn	\$ 4,887.89	\$ 5,321.77	\$ 5,694.56	\$ 6,169.13	\$ 6,498.21	\$ 7,390.71
Blaine	\$ 4,068.60	\$ 4,519.30	\$ 4,359.69	\$ 3,578.73	\$ 3,773.31	\$ 5,923.99
Broadwater	\$ 2,495.38	\$ 2,853.22	\$ 3,335.31	\$ 3,702.87	\$ 3,846.07	\$ 4,432.17
Carbon	\$ 7,152.60	\$ 8,274.08	\$ 8,307.55	\$ 9,699.07	\$ 10,748.64	\$ 12,354.33
Carter	\$ 968.21	\$ 1,274.92	\$ 1,273.78	\$ 1,495.51	\$ 1,474.01	\$ 1,600.21
Cascade	\$ 49,624.78	\$ 58,064.61	\$ 62,627.26	\$ 69,135.12	\$ 76,847.39	\$ 93,792.74
Chouteau	\$ 4,590.42	\$ 4,923.73	\$ 5,394.08	\$ 5,948.47	\$ 5,861.48	\$ 6,120.43
Custer	\$ 18,326.42	\$ 20,494.17	\$ 21,421.65	\$ 24,681.82	\$ 26,157.51	\$ 30,217.30
Daniels	\$ 2,725.32	\$ 3,768.58	\$ 4,191.01	\$ 5,167.25	\$ 5,949.56	\$ 6,168.17
Dawson	\$ 8,805.21	\$ 9,472.51	\$ 10,699.61	\$ 11,927.05	\$ 12,502.78	\$ 14,155.52
Deer Lodge	\$ 3,992.54	\$ 4,244.69	\$ 4,681.37	\$ 5,471.95	\$ 5,613.46	\$ 7,595.98
Fallon	\$ 6,781.29	\$ 6,828.14	\$ 7,322.38	\$ 8,068.55	\$ 8,526.78	\$ 8,274.13
Fergus	\$ 10,852.99	\$ 12,060.17	\$ 13,125.57	\$ 16,840.38	\$ 17,201.91	\$ 18,615.41
Flathead	\$ 69,224.04	\$ 81,065.41	\$ 92,299.05	\$ 103,813.29	\$ 113,223.16	\$ 127,673.23
Gallatin	\$ 88,332.84	\$ 108,447.61	\$ 126,804.71	\$ 155,359.56	\$ 171,390.44	\$ 208,224.96
Garfield	\$ 1,967.63	\$ 2,376.90	\$ 2,862.62	\$ 3,214.93	\$ 3,459.15	\$ 3,754.39
Glacier	\$ 3,709.08	\$ 4,203.49	\$ 5,300.00	\$ 5,834.58	\$ 5,650.34	\$ 8,249.88
Golden Valley	\$ 201.38	\$ -	\$ -	\$ -	\$ -	\$ -
Granite	\$ 1,322.53	\$ 1,615.29	\$ 1,729.79	\$ 2,083.78	\$ 2,207.73	\$ 2,538.54
Hill	\$ 14,974.17	\$ 17,113.26	\$ 21,554.62	\$ 25,975.60	\$ 29,916.57	\$ 35,654.27
Jefferson	\$ 2,578.90	\$ 2,994.00	\$ 3,436.78	\$ 4,098.30	\$ 4,451.33	\$ 5,153.67
Judith Basin	\$ 2,498.72	\$ 2,490.74	\$ 2,803.93	\$ 3,084.39	\$ 3,220.41	\$ 3,412.75
Lake	\$ 13,266.59	\$ 15,070.65	\$ 16,414.24	\$ 19,604.84	\$ 21,470.67	\$ 27,410.39
Lewis And Clark	\$ 49,694.01	\$ 58,426.00	\$ 62,081.42	\$ 76,648.25	\$ 90,290.09	\$ 97,827.39
Liberty	\$ 1,424.75	\$ 1,550.99	\$ 1,706.99	\$ 743.64	\$ 1,432.14	\$ 1,766.88
Lincoln	\$ 7,457.61	\$ 8,629.63	\$ 9,735.55	\$ 12,544.67	\$ 12,706.23	\$ 14,290.18
Madison	\$ 6,429.24	\$ 7,530.61	\$ 8,451.44	\$ 10,179.65	\$ 11,033.70	\$ 12,457.63
McCone	\$ 763.11	\$ 844.59	\$ 1,012.01	\$ 663.98	\$ 761.81	\$ 993.51
Meagher	\$ 1,248.68	\$ 1,430.84	\$ 1,544.79	\$ 1,480.83	\$ 1,529.55	\$ 1,560.23
Mineral	\$ 1,517.69	\$ 1,772.38	\$ 1,966.95	\$ 2,432.90	\$ 2,324.95	\$ 2,908.50
Missoula	\$ 76,234.47	\$ 89,091.28	\$ 106,498.17	\$ 121,196.14	\$ 129,760.73	\$ 160,748.60
Musselshell	\$ 2,258.30	\$ 2,386.15	\$ 2,731.73	\$ 3,472.31	\$ 2,949.29	\$ 3,475.53
Park	\$ 12,786.57	\$ 14,487.11	\$ 17,130.35	\$ 19,704.51	\$ 21,366.75	\$ 24,854.88
Petroleum	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Phillips	\$ 6,176.65	\$ 6,824.05	\$ 7,268.08	\$ 8,466.67	\$ 8,659.83	\$ 10,024.80
Pondera	\$ 5,904.65	\$ 6,259.70	\$ 7,052.95	\$ 6,955.73	\$ 7,623.41	\$ 5,194.41
Powder River	\$ 1,594.61	\$ 1,880.47	\$ 1,880.12	\$ 2,145.47	\$ 2,130.03	\$ 2,506.43
Powell	\$ 3,474.28	\$ 3,976.96	\$ 4,343.01	\$ 5,371.42	\$ 5,408.85	\$ 6,170.74
Prairie	\$ 1,562.64	\$ 1,631.89	\$ 1,734.78	\$ 1,914.35	\$ 2,016.73	\$ 2,298.27
Ravalli	\$ 23,941.46	\$ 27,945.17	\$ 31,905.90	\$ 38,298.28	\$ 41,152.81	\$ 50,354.83
Richland	\$ 17,299.65	\$ 21,830.14	\$ 22,746.10	\$ 25,963.92	\$ 28,647.44	\$ 32,069.98
Roosevelt	\$ 9,215.59	\$ 10,082.49	\$ 9,935.60	\$ 12,897.24	\$ 12,796.21	\$ 14,587.35
Rosebud	\$ 5,904.68	\$ 6,876.80	\$ 7,654.03	\$ 8,256.42	\$ 8,589.19	\$ 9,759.80
Sanders	\$ 6,158.33	\$ 6,929.35	\$ 8,004.68	\$ 8,408.64	\$ 8,631.48	\$ 10,276.31
Sheridan	\$ 8,915.59	\$ 9,616.01	\$ 9,855.02	\$ 10,933.29	\$ 11,412.46	\$ 13,042.97
Silver Bow	\$ 21,189.62	\$ 22,972.53	\$ 26,707.10	\$ 30,190.84	\$ 32,456.89	\$ 38,195.60
Stillwater	\$ 5,513.53	\$ 5,999.73	\$ 6,672.66	\$ 7,504.14	\$ 8,086.96	\$ 9,734.64
Sweet Grass	\$ 4,633.21	\$ 5,296.75	\$ 5,750.08	\$ 6,338.16	\$ 6,775.43	\$ 7,686.76
Teton	\$ 7,544.44	\$ 8,011.98	\$ 8,330.76	\$ 8,816.76	\$ 8,917.44	\$ 8,676.42
Toole	\$ 6,547.74	\$ 7,179.52	\$ 7,560.54	\$ 9,456.42	\$ 8,708.75	\$ 10,100.00
Treasure	\$ 672.34	\$ 720.24	\$ 821.98	\$ 904.24	\$ 928.48	\$ 966.48
Valley	\$ 11,159.60	\$ 12,219.85	\$ 13,262.98	\$ 13,936.59	\$ 14,436.36	\$ 15,218.72
Wheatland	\$ 1,097.44	\$ 1,394.81	\$ 1,498.07	\$ 1,637.47	\$ 1,772.16	\$ 2,235.33
Wibaux	\$ 1,083.41	\$ 1,164.11	\$ 1,109.90	\$ 1,309.67	\$ 1,467.49	\$ 1,454.52
Yellowstone	\$ 168,862.14	\$ 188,545.24	\$ 208,460.21	\$ 239,457.07	\$ 250,168.98	\$ 308,080.48
Total Montana Deposits	\$ 809,698.63	\$ 930,340.06	\$ 1,042,397.10	\$ 1,206,267.38	\$ 1,296,216.48	\$ 1,534,451.69

Source: Federal Deposit Insurance Corporation 2010-2020

A heat map was generated using Someka EXCEL Solution to show deposits in Montana counties color coordinated by deposit threshold (Figure 4.3). Off-white represents counties with less than \$10,000,000 total deposits. Tan represents counties with greater than \$10,000,000 deposits and less than \$25,000,000 deposits. Orange represents counties with greater than \$25,000,000 deposits and less than \$75,000,000 deposits. Light red represents counties with greater than \$75,000,000 deposits and less than \$100,000,000 deposits. Dark red represents counties with greater than \$100,000,000 deposits.

Figure 4.3: Total Online Deposits per Montana County as of 06/30/2020



Source: Federal Deposit Insurance Corporation 2010-2020

Online deposits in Montana have grown from an estimated \$809,699 in 2015 to an estimated \$1,534,452 in 2020 (Federal Deposit Insurance Corporation 2010-2020). The four dark red counties are located around four of the largest cities in Montana that include Bozeman, Missoula, Billings, and Kalispell. Light red, orange, and tan counties are located

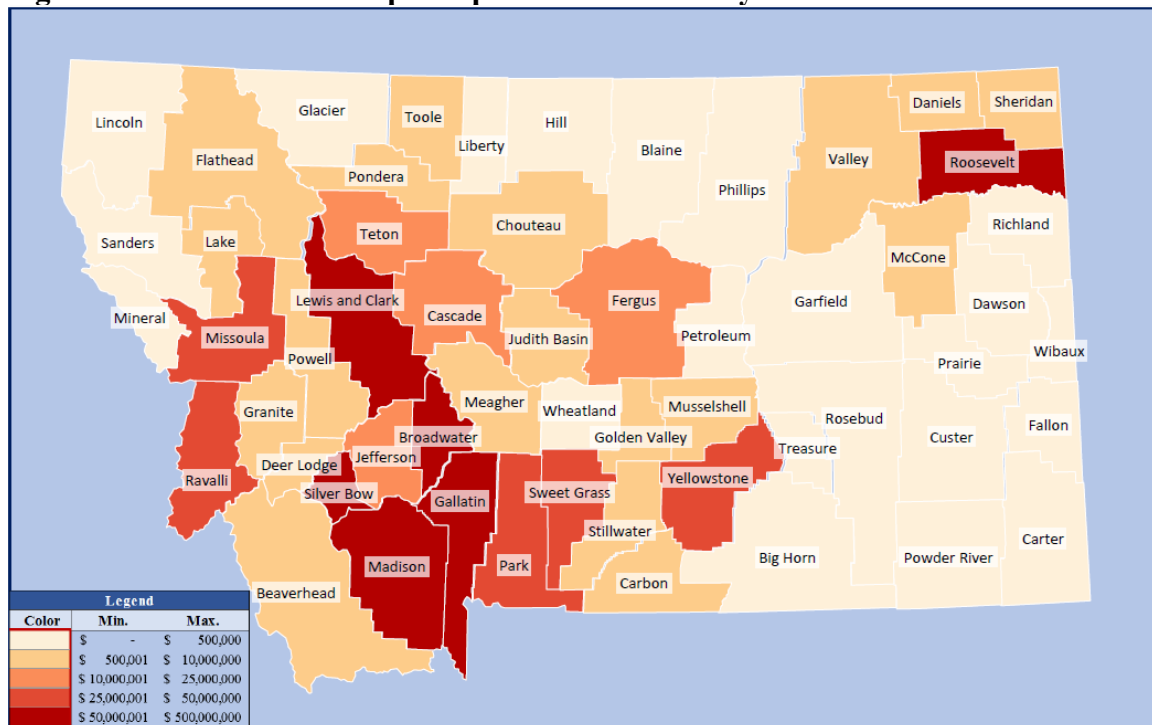
next to the dark red counties or near the more populated areas. The off-white counties are located around rural areas.

4.2.4 Montana Bank Deposit Data

Historical Bank A deposit totals were sourced from internal bank data. This raw data includes total deposits for all bank customers sorted by county based on the depositor's address on file from 2017 through 2020 (Table 4.5). Over the last four years, Bank A deposits have grown 92%. The substantial growth is primarily attributed to three bank acquisitions. The bank reported \$958,343,000 total bank deposits on June 30, 2020 (Federal Deposit Insurance Corporation 2010-2020). Bank-specific data showed \$921,852,635 of Montana-based deposits on June 30, 2020 (Bank A, Internal Data 2017-2020). The discrepancy in reported deposit values are because the FDIC-reported data includes out-of-state and foreign depositor's accounts whereas the raw data only included accounts with Montana addresses on file.

Someka EXCEL solutions was used to generate a heat map of Montana counties color coordinated by deposit threshold (Figure 4.4). Off-white represents counties with less than \$500,000 total deposits. Tan represents counties with greater than \$500,000 deposits and less than \$10,000,000 deposits. Orange represents counties with greater than \$10,000,000 deposits and less than \$25,000,000 deposits. Light red represents counties with greater than \$25,000,000 deposits and less than \$50,000,000 deposits. Dark red represents counties with greater than \$50,000,000 deposits.

Figure 4.4: Total Bank A Deposits per Montana County as of 06/30/2020



Source: Bank A, Internal Data 2017-2020

The bank has deposits in every county in Montana. The counties with higher Bank A deposits, the dark red, light red and orange counties, are counties in which there are larger towns, the bank has branches, or both. The tan counties, which border counties with existing branches, indicates that the bank's market share is greater in counties where they have physical locations. The off-white counties are located long distances from any of the bank's branches.

Table 4.5: Total Bank A Deposits per Montana County, 2015-2020

Montana County	6.30.2017	6.30.2018	6.30.2019	6.30.2020
Beaverhead	\$ 1,382,617	\$ 5,418,029	\$ 6,211,331	\$ 6,016,952
Big Horn	\$ 8,754	\$ 7,040	\$ 11,666	\$ 7,354
Blaine	\$ 1,872	\$ 4,576	\$ 2,525	\$ 241,090
Broadwater	\$ 21,876,274	\$ 23,305,414	\$ 67,136,033	\$ 76,169,461
Carbon	\$ 1,036,697	\$ 399,403	\$ 544,947	\$ 570,097
Carter	\$ -	\$ -	\$ 1,181	\$ 220,257
Cascade	\$ 2,222,894	\$ 4,145,463	\$ 10,496,498	\$ 18,995,294
Chouteau	\$ 95,753	\$ 96,699	\$ 768,212	\$ 942,961
Custer	\$ 558,820	\$ 88,440	\$ 316,145	\$ 300,761
Daniels	\$ 2,887	\$ 2,904	\$ -	\$ 755,124
Dawson	\$ 19,983	\$ 30,607	\$ 27,894	\$ 97,047
Deer Lodge	\$ 732,028	\$ 1,247,963	\$ 2,045,843	\$ 9,050,630
Fallon	\$ -	\$ -	\$ 9,419	\$ 4,321
Fergus	\$ 1,274,979	\$ 1,915,504	\$ 14,571,791	\$ 16,448,278
Flathead	\$ 1,828,149	\$ 2,276,988	\$ 1,849,138	\$ 2,591,614
Gallatin	\$ 94,309,290	\$ 102,556,369	\$ 107,225,500	\$ 129,124,640
Garfield	\$ 9,163	\$ 8,867	\$ 34,739	\$ 55,134
Glacier	\$ 208,541	\$ 70,899	\$ 152,805	\$ 68,429
Golden Valley	\$ 498,245	\$ 526,301	\$ 536,889	\$ 553,940
Granite	\$ 345,630	\$ 324,252	\$ 222,854	\$ 570,608
Hill	\$ 136,874	\$ 137,006	\$ 476,050	\$ 215,311
Jefferson	\$ 14,071,073	\$ 17,926,729	\$ 19,440,657	\$ 24,991,257
Judith Basin	\$ 33,134	\$ 60,904	\$ 785,619	\$ 816,868
Lake	\$ 965,493	\$ 1,123,122	\$ 1,191,813	\$ 1,764,658
Lewis And Clark	\$ 135,144,207	\$ 133,734,162	\$ 151,162,881	\$ 179,766,741
Liberty	\$ -	\$ -	\$ 82,462	\$ 299
Lincoln	\$ 76,198	\$ 110,977	\$ 107,966	\$ 196,702
Madison	\$ 1,662,868	\$ 70,872,178	\$ 67,617,553	\$ 78,216,575
McCone	\$ 186	\$ 1,251	\$ 1,452	\$ 3,936,204
Meagher	\$ 519,143	\$ 335,402	\$ 2,505,652	\$ 2,105,033
Mineral	\$ 494,521	\$ 409,134	\$ 464,339	\$ 414,079
Missoula	\$ 35,098,937	\$ 35,225,542	\$ 36,430,121	\$ 45,750,678
Musselshell	\$ 1,131	\$ 5,787	\$ 50,468	\$ 1,144,994
Park	\$ 33,018,071	\$ 38,882,154	\$ 36,323,217	\$ 38,743,535
Petroleum	\$ -	\$ 5,474	\$ 48,042	\$ 23,429
Phillips	\$ 6,363	\$ 7,670	\$ 8,076	\$ 53,910
Pondera	\$ 15,628	\$ 24,421	\$ 1,021,190	\$ 857,353
Powder River	\$ 19,026	\$ 152,517	\$ 76,237	\$ 38,053
Powell	\$ 2,175,988	\$ 2,539,543	\$ 2,402,920	\$ 3,034,362
Prairie	\$ -	\$ 69	\$ 10,087	\$ 22,439
Ravalli	\$ 22,165,318	\$ 25,175,612	\$ 26,890,346	\$ 28,986,684
Richland	\$ 58,565	\$ 121,318	\$ 113,978	\$ 274,870
Roosevelt	\$ 64,205	\$ 11,357	\$ 20,786	\$ 74,812,903
Rosebud	\$ 322,926	\$ 351,826	\$ 358,636	\$ 119,398
Sanders	\$ 163,209	\$ 166,106	\$ 146,012	\$ 245,669
Sheridan	\$ -	\$ -	\$ 1,726	\$ 763,029
Silver Bow	\$ 57,432,586	\$ 61,218,215	\$ 61,835,326	\$ 68,321,039
Stillwater	\$ 1,124,293	\$ 950,404	\$ 908,606	\$ 1,464,741
Sweet Grass	\$ 26,174,079	\$ 28,764,501	\$ 26,858,566	\$ 35,605,052
Teton	\$ 3,289	\$ 106,513	\$ 16,033,899	\$ 19,228,770
Toole	\$ 2,666,778	\$ 609,231	\$ 1,341,157	\$ 1,569,853
Treasure	\$ -	\$ -	\$ -	\$ -
Valley	\$ 77,332	\$ 88,297	\$ 114,734	\$ 4,160,665
Wheatland	\$ 163,746	\$ 68,453	\$ 63,825	\$ 174,877
Wibaux	\$ -	\$ -	\$ 11,196	\$ 11,280
Yellowstone	\$ 19,570,572	\$ 21,279,367	\$ 26,530,394	\$ 41,237,333
Total Montana Deposits	\$ 479,838,315	\$ 582,890,961	\$ 693,601,399	\$ 921,852,635

Source: Bank A, Internal Data 2017-2020

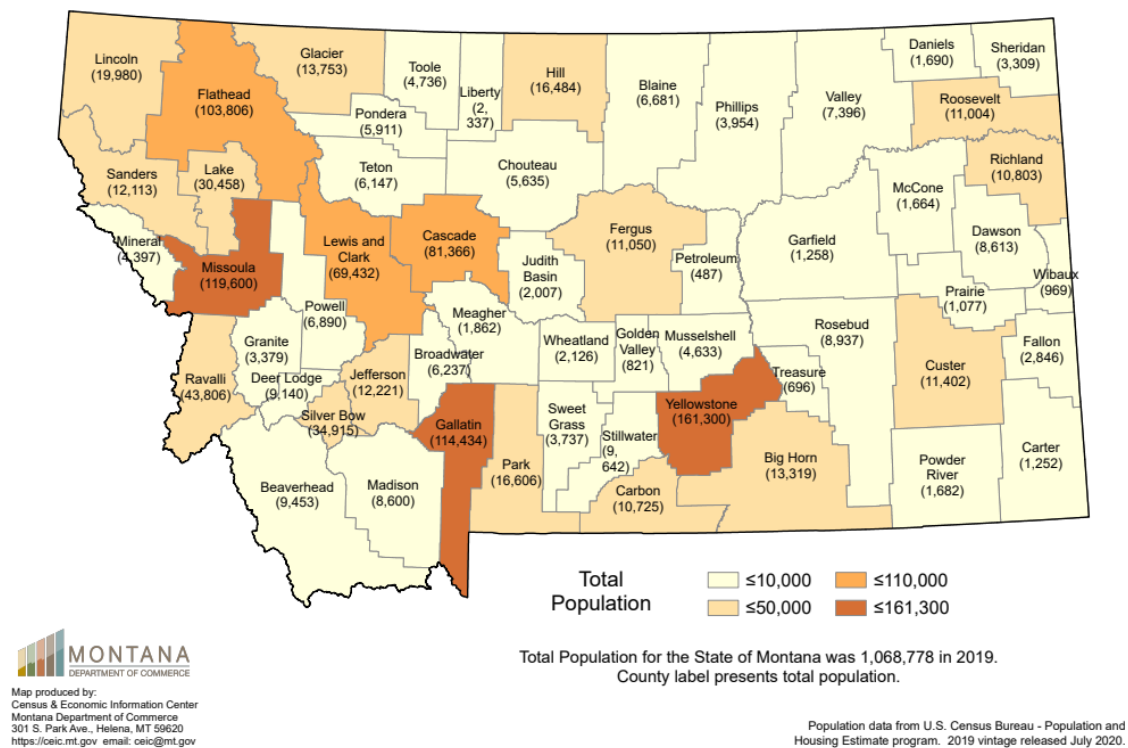
4.3 Overnight Cost of Funds Data

The overnight bank funding rate (OBFR) is a measure of wholesale, unsecured overnight bank funding costs (Federal Reserve Bank of New York n.d.). The OBFR is a volume-weighted median calculated using federal funds transactions and Eurodollar transactions reported in the FR 2420 Report of Selected Money Market Rates. Unsecured borrowings between depository institutions and other entities such as government-sponsored entities make up federal funds market. The Eurodollar market is the unsecured U.S. dollar deposits at banks or bank branches outside of the United States (Federal Reserve Bank of New York n.d.). For the purpose of this thesis, the daily OBFR from March 1, 2016 through November 23, 2020 was sourced from the Federal Reserve Bank of New York. The average overnight cost of funds for depository institutions during that timeframe was 1.19% (Federal Reserve Bank of New York n.d.).

4.4 Population

Montana population by county was sourced from Arc GIS Maps as of July 1, 2019. Figure 4.5 is a map of Montana counties color coordinated by population threshold. Off-white represents counties with less than 10,000 residents. Tan represents counties with greater than 10,000 residents and less than 50,000 residents. Orange represents counties with greater than 50,000 residents and less than 110,000 residents. Dark orange represents counties with greater than 110,000 residents and less than 161,300 residents.

Figure 4.5: Montana Population by County, 2019



Source: Montana Department of Commerce Census & Economic Information Center 2019

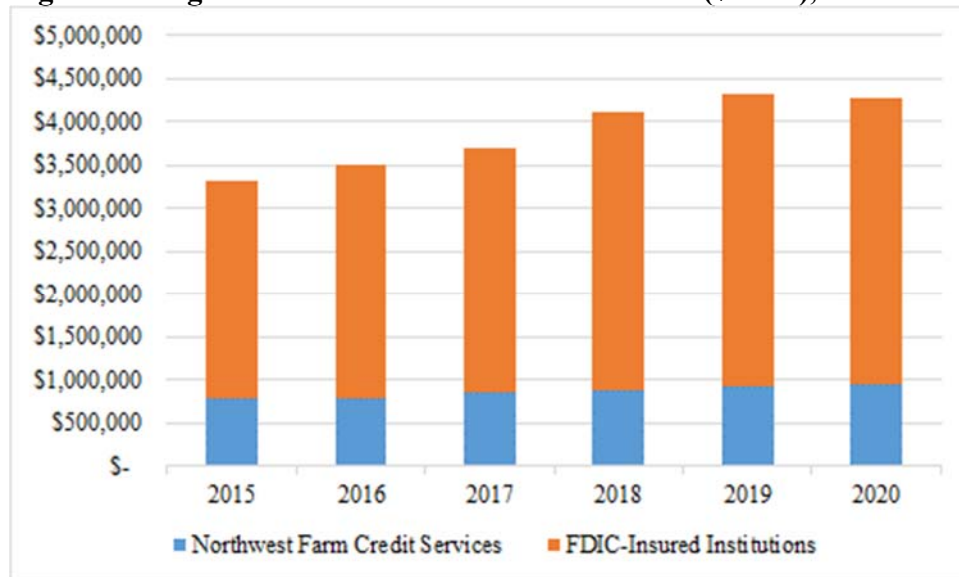
For the purpose of this thesis, the top ten most populous counties in Montana were excluded when estimating available rural deposits. The ten most populated Montana counties are Yellowstone, Missoula, Gallatin, Flathead, Cascade, Lewis & Clark, Ravalli, Silver Bow, Lake, and Lincoln (Montana Department of Commerce Census & Economic Information Center 2019). Although there are rural areas in the geography of the top ten most populous counties, specific data for those areas were unable to be collected.

4.5 Loan Demand

Agricultural loan volume data for Montana from 2015 through 2020 were sourced from FDIC's Statistics on Depository Institutions and Northwest Farm Credit Service's Annual report as commercial banks and Farm Credit are the largest agricultural lenders in the state. Agricultural loan volume in Montana has grown 28% from year end 2015 to year

end 2020 (Figure 4.6). Due to lack of available data, a breakdown of agricultural loans on a county basis is not possible.

Figure 4.6: Agricultural Loan Demand in Montana (\$000's), 2015-2020



Source: Federal Deposit Insurance Corporation 1992-2020, Northwest Farm Credit Services, 2015-2020

Although total agricultural loan volume has grown over the last five years, volume has remained stable with little total growth reported for the past three years. Over the past five years, Northwest Farm Credit Services' share of total loan volume has remained steady with minimal growth. The majority of loan volume growth appears to be at commercial banks.

CHAPTER V: METHODS

5.1 Objectives

The objective of this thesis is to develop an analysis for a Montana bank to evaluate the cost and benefits of increasing rural deposits. First, the available rural deposit market is calculated. Next, the costs and returns of capturing those defined deposits is estimated.

Bank A has identified an approach to secure additional rural deposits by implementing a micro branch with an Interactive Teller Machine in a rural Montana town that is underserved by financial institutions. The small market model discussed below was developed to analyze the potential benefit of installing a micro branch in Town A, Montana. The findings were considered in this project.

5.2 Data Acquisition

To estimate the rural deposit market, deposit data was gathered as of June 30th for each year using FDIC's annual Deposit Market Share Reports, FDIC's annual Summary of Deposits, and NCUA's custom query reports for bank-specific and credit union-specific information. The information from these sources is filtered by state, county, and zip code based on bank branch location. To approximate total credit union deposits on the county level, total deposits for each Credit Union were divided by the number of locations in each county. For online banks and FinTech's, total deposits were pro-rated by Montana's share of FDIC domestic deposits in the United States. Additional data were sourced from the Federal Reserve Bank of New York and internal data from Bank A.

5.3 Small Market Model

The Small Market Model (Figure 5.1) is a financial tool created by Bank A to estimate the internal rate of return on potential investment projects. The model has been

customized to evaluate the potential return of establishing a limited service branch in rural Montana. The micro branch is a brick and mortar location that has an Interactive Teller Machine and part-time employees in the branch to service customers. The model is organized into sections summarizing expected deposits, income, expenses, the capital investment, and the internal rate of return. The overall profitability of the small market model is a measure of the funding cost improvement plus additional product income less direct expenses of the location. The goal is to update the model with actual investment information to estimate future returns on an investment and potential future investments.

Figure 5.1: Small Market Model

Montana Small Market Model				
Deposits per Location	Cost	Low	Expected	High
DDA	0.00%	1,500,000	2,000,000	2,750,000
Savings	0.15%	1,000,000	1,350,000	1,900,000
MMDA	0.15%	750,000	1,250,000	2,500,000
CD	1.50%	1,000,000	2,250,000	4,000,000
Total Deposits		4,250,000	6,750,000	10,750,000

Direct Expenses	Low	Expected	High
Savings Int. Paid	1,500	1,875	2,250
MMDA Int. Paid	1,125	1,875	3,750
CD Int. Paid	15,000	33,750	60,000
Base Payroll	18,600	18,600	18,600
Deposit Incentive	10,625	16,875	26,875
Occupancy	7,600	7,600	7,600
Community Support	8,000	16,000	25,000
Misc	4,000	6,000	8,000
Total	66,450	102,575	152,075
Effective Funding Cost	1.56%	1.52%	1.41%
Marginal Funding Cost (FHLB Overnight)	2.03%	86,275	137,025
Net FHLB Dividend			218,225

Cost of Funds Improvement vs. Current Marginal Funding Cost	Low	Expected	High
Before Additional Product Income	19,825	34,450	66,150
	0.47%	0.51%	0.62%

Product Income	Low	Expected	High
HLD Closings		4	6
Average \$	150,000	150,000	150,000
Total Findings	600,000	900,000	1,200,000
Income Per Closing	2%	3,000	3,000
HLD Net Income	12,000	18,000	24,000
Comm/Cons Loans			
Total Portfolio (New Local Loans)	500,000	750,000	1,000,000
Annual NIM	20,000	30,000	40,000
Other Fees	3,000	6,000	10,000
Total Product Income	35,000	54,000	74,000

Town Candidate Examples	Town A	Town B	Town C
Town			
Population	208	364	233
Miles to Closest Bank	39	27	30
Existing Examples			
Population	316	247	
Miles to Closest Bank	24	30	
Bank Deposits (\$21/19)	21,570,031	15,236,752	

Payroll Assumption	Low	Expected	High
Days Open	5	3	3
Hours Per Day	9	9	9
Wage/Hr	20	20	20
Weekly Total	300	300	300
Annual Wage	15,600	15,600	15,600
Benefit Tax/Misc	3,000	3,000	3,000
Annual Total	18,600	18,600	18,600

Occupancy Assumption	Low	Expected	High
Rent	3,000	3,000	3,000
Utilities	1,200	1,200	1,200
Phone/Data	2,400	2,400	2,400
Misc	1,000	1,000	1,000
Annual Total	7,600	7,600	7,600

Community Support - Paid Annually	Low	Expected	High
Average Deposits:			
1 Million or less	5,000	5,000	5,000
2 Million	6,000	6,000	6,000
3 Million	7,000	7,000	7,000
4 Million	8,000	8,000	8,000
5 Million	15,000	15,000	15,000
6 Million	17,000	17,000	17,000
7 Million	18,000	18,000	18,000
8 Million	19,000	19,000	19,000
9 Million	20,000	20,000	20,000
10 Million	25,000	25,000	25,000

Per Location Project Return (Before Corporate Overhead)	Low	Expected	High
Capital Investment			
ATM	75,000	75,000	75,000
FF&E/Misc	10,000	10,000	10,000
Marketing/Legal	15,000	15,000	15,000
Total Investment	100,000	100,000	100,000
Annual Marginal Return	19,825	34,450	66,150
Funding Cost Improvement	35,000	54,000	74,000
Product Income	35,000	54,000	74,000
Tax	(21,910)	(35,380)	(56,060)
Annual Return	54,825	88,450	140,150
Capitalized at 15%	365,500	589,667	934,333

Cumulative Effect over Multiple Locations	Low	Expected	High
Number of Locations	4	4	4
Total Investment	400,000	400,000	400,000
Annual Marginal Return	219,300	353,800	560,600
Total New Core Deposits	17,000,000	27,000,000	43,000,000
Annual Community Support	32,000	64,000	100,000

5.1.1 Deposits Per Location

This segment of the model projects the expected deposit balances for the new limited service branch location (Figure 5.1). The deposit accounts are broken into four categories: demand deposit accounts, savings accounts, money market deposit accounts, and certificate of deposit accounts. From there, the low, expected, and high deposit balances are projected using the calculated average deposit per person for the county multiplied by the population of the candidate town multiplied by a multiple factor. The multiple factor is evaluated on a case-by-case basis by examining the bank's current market share in that county. Analyzing three levels provides a conservative estimate of the deposits to be achieved. The five-year average share of total deposits for each account type was calculated using data from the annual 10-K filing to prorate total projected deposits by account type. The cost column is the Bank's average interest rate paid for each account type over the past five years. For this project, these values are determined from the estimated available deposits discussed in Chapter 4.

5.1.2 Direct Expenses

This section of the model is the direct expenses associated with deposits. Expense categories include interest paid, payroll, deposit incentive, occupancy, community support and miscellaneous (Figure 5.1). Interest paid is the projected deposit balance multiplied by the average interest rate paid on deposit accounts by Bank A over the last five years. Payroll, occupancy, and community support expenses are flow-through from payroll assumption, occupancy assumption, and community support categories, respectively. The deposit incentive percentage is set by Bank leadership annually. The effective funding cost is calculated by dividing total expenses into total projected deposits.

5.1.3 Cost of Funds Improvement vs. Current Marginal Funding Cost

To evaluate the potential benefit of securing additional deposits, potential savings were determined by comparing the associated cost of the average Federal Home Loan Bank overnight cost of funds and the average cost of deposits. The marginal funding cost is determined by taking projected total deposits multiplied by the Federal Home Loan Bank's five-year average overnight cost of funds. Total direct expenses are subtracted from the calculated marginal funding cost to determine the savings or increase in cost of funds.

5.1.4 Product Income

This segment conservatively projects new home loan and commercial/consumer loans to be originated at the micro branch. Income is calculated for each product by taking the total new loans multiplied by income per closing for home loans and the annual net interest margin for commercial/consumer loans. For the purpose of this thesis, these values are not modified from the bank projected information to test if the model relies on product income to justify the investment.

5.1.5 Town Candidate Examples

Three similar towns that are potential locations for the small market model are identified. Using Montana Census data and Google Maps, the population and miles to the closest bank are determined. From there, the two closest existing bank branches are identified. Bank A internal data is used to input deposits for each branch as of a specific date.

5.1.6 Payroll Assumptions

This segment of the model captures the expected annual payroll for the micro branch. Inputs include the hours worked per day and the wage rate per hour. Inputs were sourced from the bank.

5.1.7 Occupancy Assumption

This section assumes rent, utility, phone/data, and other miscellaneous office expenses. Expenses are based on area averages, however, are updated in the model when geographic-specific information is available.

5.1.8 Community Support

Community support is paid annually to qualified local causes based on average deposit levels. The goal is to incentivize depositors by supporting local. The support dollars per deposit level is determined by the Bank's leadership annually. Therefore, for the purpose of this project, these values are not adjusted.

5.1.9 Per Location Project Return

The expected project return is calculated and capitalized in this section. Capital investment values were sourced from internal bank data. Capital investment categories include purchasing the automated teller machine, furniture and equipment purchases, and marketing and legal expenses. The annual return is determined by taking the expected cost of funds improvement plus projected product income less tax expenses capitalized at fifteen percent. Tax expenses are estimated at 40%. Funding cost improvement and product income are flow through values from their respective sections.

5.1.10 Cumulative Effect

This segment summarizes the cumulative effect over multiple locations. This concept yields a form of "synthetic acquisition". For example, if the bank were to acquire deposits from other institutions, then the deposits would be multiplying as if multiple micro branches were implemented. The project return value estimates the effect as if the investment was repeated multiple times.

5.1.11 Internal Rate of Return

This section analyzes the expected internal rate of return from investing in one, two, and four micro branches, respectively. The total capital investment, expected core deposits, and calculated annual cash return flow through from their respective categories from the expected column. The internal rate of return is calculated using the expected cash flow over four years with terminal value estimated as of year five calculated for one, two, and four locations respectively. Cash flows are calculated by taking the expected annual return multiplied by the number of locations. Lifetime earnings as of year five are estimated by taking the implied terminal value multiple from a previous investment project multiplied by the annual projected cash flow.

Next, the model analyzes the internal rate of return and percent of investment earned in five years when stock issuance is also considered in the total investment expense. For the purpose of this thesis, the stock issuance equals the cash investment. The internal rate of return is determined for one and four locations at the expected level and four locations at the low level. The projected internal rate of return and percent of investment earned back in five years is compared to the actual internal rate of return and projected percent of investment earned back in five years from the Bank's most recent actual investment, which was to purchase Investment A, a one-branch bank acquisition.

CHAPTER VI: RESULTS

6.1 Objectives

The overall objective of the thesis is to estimate the potential size of the market for rural deposits and determine the cost and benefit of getting those deposits. In this chapter, the results of the estimated deposit market are discussed and the use of the Small Market Model is demonstrated. This section is organized into three parts. The first discusses the estimated rural deposit market in Montana. The second presents the results of the Small Market Model for the planned micro branch in Town A. Potential county locations for the bank to install additional micro branches were identified in the third section.

6.2 Rural Deposit Market

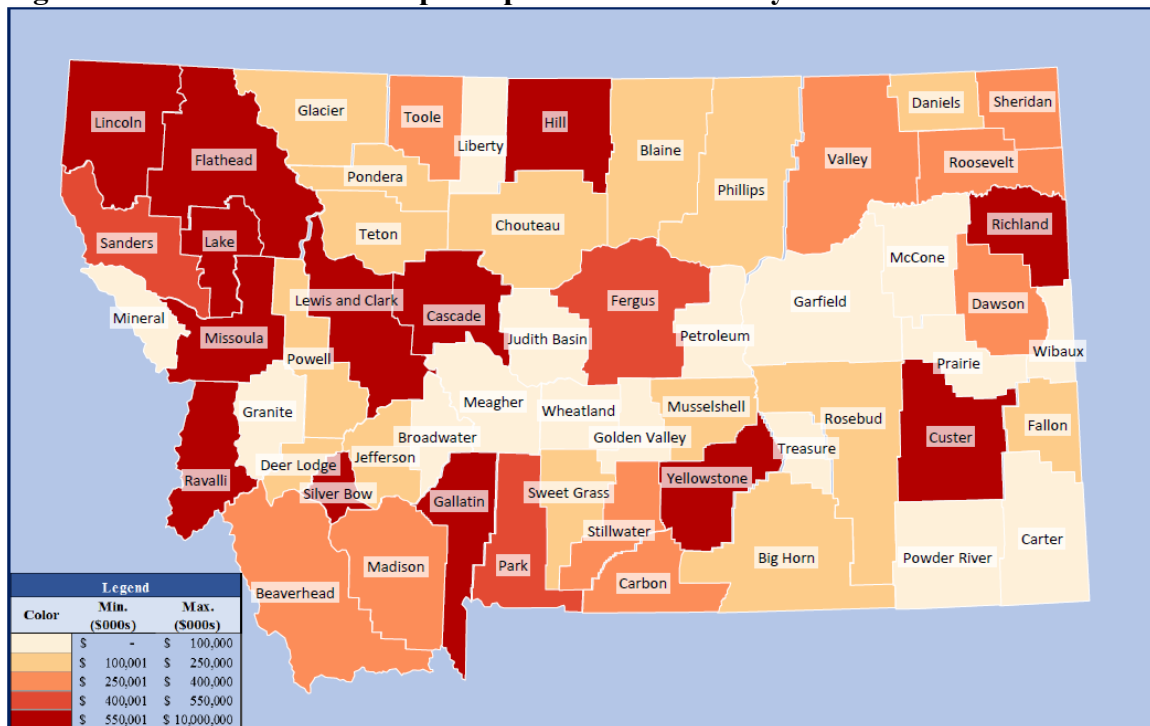
The data collected in Chapter 4 estimated total deposits in Montana at \$34.8 billion as of June 30, 2020 (Table 6.1). A majority or 82% of Montana deposits are held in FDIC financial institutions, while 13% of deposits are at credit unions, and approximately 4% are online deposits. The top ten most populous counties include Cascade, Flathead, Gallatin, Lake, Lewis and Clark, Lincoln, Missoula, Ravalli, Silver Bow and Yellowstone and account for \$25.6 billion or 72% of the state's total deposits. The remaining 28% of deposits are distributed relatively evenly throughout the remaining 46 counties. The purpose of this project is to estimate the rural deposit market therefore deposits for the top ten most populous counties (highlighted in orange in Table 6.1) were excluded from the analysis. The estimated rural deposits as of June 30, 2020 were projected at \$9.1 billion and the estimated rural population is 289,681 people, which would calculate the average deposit per person in the rural counties at roughly \$31,000.

Table 6.1: Estimated Total Deposits in Montana per County as of 06/30/2020

Montana County	2019 Population	Total FDIC Deposits (\$000's)	Total CU Deposits (\$000's)	Total Online Deposits (\$000's)	Total Deposits (\$000's)	Average Deposit (\$/Person)
Beaverhead	9,453	\$ 303,048	\$ 8,713	\$ 16,220	\$ 327,981	\$ 34,696
Big Horn	13,319	\$ 138,082	\$ -	\$ 7,391	\$ 145,473	\$ 10,922
Blaine	6,681	\$ 110,679	\$ 22,118	\$ 5,924	\$ 138,721	\$ 20,763
Broadwater	6,237	\$ 82,807	\$ -	\$ 4,432	\$ 87,239	\$ 13,987
Carbon	10,725	\$ 230,818	\$ 41,265	\$ 12,354	\$ 284,437	\$ 26,521
Carter	1,252	\$ 29,897	\$ 14,765	\$ 1,600	\$ 46,262	\$ 36,951
Cascade	81,366	\$ 1,752,346	\$ 304,367	\$ 93,793	\$ 2,150,506	\$ 26,430
Chouteau	5,635	\$ 114,349	\$ -	\$ 6,120	\$ 120,469	\$ 21,379
Custer	11,402	\$ 564,555	\$ 17,869	\$ 30,217	\$ 612,641	\$ 53,731
Daniels	1,690	\$ 115,241	\$ 22,257	\$ 6,168	\$ 143,666	\$ 85,009
Dawson	8,613	\$ 264,470	\$ 57,079	\$ 14,156	\$ 335,705	\$ 38,977
Deer Lodge	9,140	\$ 141,917	\$ 59,003	\$ 7,596	\$ 208,516	\$ 22,814
Fallon	2,846	\$ 154,587	\$ 39,159	\$ 8,274	\$ 202,020	\$ 70,984
Fergus	11,050	\$ 347,795	\$ 66,781	\$ 18,615	\$ 433,192	\$ 39,203
Flathead	103,806	\$ 2,385,341	\$ 976,019	\$ 127,673	\$ 3,489,033	\$ 33,611
Gallatin	114,434	\$ 3,890,303	\$ 159,625	\$ 208,225	\$ 4,258,153	\$ 37,211
Garfield	1,258	\$ 70,144	\$ -	\$ 3,754	\$ 73,898	\$ 58,743
Glacier	13,753	\$ 154,134	\$ 21,509	\$ 8,250	\$ 183,893	\$ 13,371
Golden Valley	821	\$ -	\$ -	\$ -	\$ -	\$ -
Granite	3,379	\$ 47,428	\$ -	\$ 2,539	\$ 49,967	\$ 14,787
Hill	16,484	\$ 666,135	\$ 23,020	\$ 35,654	\$ 724,809	\$ 43,970
Jefferson	12,221	\$ 96,287	\$ 8,713	\$ 5,154	\$ 110,154	\$ 9,013
Judith Basin	2,007	\$ 63,761	\$ -	\$ 3,413	\$ 67,174	\$ 33,470
Lake	30,458	\$ 512,113	\$ 203,937	\$ 27,410	\$ 743,460	\$ 24,409
Lewis And Clark	69,432	\$ 1,827,726	\$ 171,837	\$ 97,827	\$ 2,097,391	\$ 30,208
Liberty	2,337	\$ 33,011	\$ 22,118	\$ 1,767	\$ 56,896	\$ 24,346
Lincoln	19,980	\$ 266,986	\$ 310,197	\$ 14,290	\$ 591,474	\$ 29,603
Madison	8,600	\$ 232,748	\$ 8,713	\$ 12,458	\$ 253,919	\$ 29,525
McCone	1,664	\$ 18,562	\$ 39,159	\$ 994	\$ 58,715	\$ 35,285
Meagher	1,862	\$ 29,150	\$ 17,461	\$ 1,560	\$ 48,171	\$ 25,871
Mineral	4,397	\$ 54,340	\$ -	\$ 2,908	\$ 57,248	\$ 13,020
Missoula	119,600	\$ 3,003,294	\$ 617,750	\$ 160,749	\$ 3,781,792	\$ 31,620
Musselshell	4,633	\$ 64,934	\$ 32,448	\$ 3,476	\$ 100,858	\$ 21,769
Park	16,606	\$ 464,368	\$ 25,239	\$ 24,855	\$ 514,462	\$ 30,981
Petroleum	487	\$ -	\$ -	\$ -	\$ -	\$ -
Phillips	3,954	\$ 187,295	\$ -	\$ 10,025	\$ 197,320	\$ 49,904
Pondera	5,911	\$ 97,048	\$ 21,509	\$ 5,194	\$ 123,751	\$ 20,936
Powder River	1,682	\$ 46,828	\$ -	\$ 2,506	\$ 49,334	\$ 29,331
Powell	6,890	\$ 115,289	\$ -	\$ 6,171	\$ 121,460	\$ 17,628
Prairie	1,077	\$ 42,939	\$ -	\$ 2,298	\$ 45,237	\$ 42,003
Ravalli	43,806	\$ 940,788	\$ 160,603	\$ 50,355	\$ 1,151,745	\$ 26,292
Richland	10,803	\$ 599,169	\$ 39,800	\$ 32,070	\$ 671,039	\$ 62,116
Roosevelt	11,004	\$ 272,538	\$ 53,720	\$ 14,587	\$ 340,845	\$ 30,975
Rosebud	8,937	\$ 182,344	\$ 15,142	\$ 9,760	\$ 207,246	\$ 23,190
Sanders	12,113	\$ 191,994	\$ 203,937	\$ 10,276	\$ 406,207	\$ 33,535
Sheridan	3,309	\$ 243,684	\$ 22,257	\$ 13,043	\$ 278,984	\$ 84,311
Silver Bow	34,915	\$ 713,615	\$ 120,184	\$ 38,196	\$ 871,994	\$ 24,975
Stillwater	9,642	\$ 181,874	\$ 73,713	\$ 9,735	\$ 265,322	\$ 27,517
Sweet Grass	3,737	\$ 143,613	\$ 25,239	\$ 7,687	\$ 176,539	\$ 47,241
Teton	6,147	\$ 162,103	\$ -	\$ 8,676	\$ 170,779	\$ 27,783
Toole	4,736	\$ 188,700	\$ 65,744	\$ 10,100	\$ 264,544	\$ 55,858
Treasure	696	\$ 18,057	\$ -	\$ 966	\$ 19,023	\$ 27,333
Valley	7,396	\$ 284,334	\$ 12,432	\$ 15,219	\$ 311,985	\$ 42,183
Wheatland	2,126	\$ 41,763	\$ 1,366	\$ 2,235	\$ 45,365	\$ 21,338
Wibaux	969	\$ 27,175	\$ -	\$ 1,455	\$ 28,630	\$ 29,545
Yellowstone	161,300	\$ 5,755,921	\$ 487,303	\$ 308,080	\$ 6,551,304	\$ 40,616
TOTALS	1,068,778	\$ 28,668,427	\$ 4,594,068	\$ 1,534,452	\$ 34,796,946	

Someka EXCEL solutions was utilized to generate a heat map of Montana counties color coordinated by deposit threshold (Figure 6.1). Off-white represents counties with less than \$100,000,000 total deposits. Tan represents counties with greater than \$100,000,000 deposits and less than \$250,000,000 deposits. Orange represents counties with greater than \$250,000,000 deposits and less than \$400,000,000 deposits. Light red represents counties with greater than \$400,000,000 deposits and less than \$550,000,000 deposits. Dark red represents counties with greater than \$550,000,000 deposits.

Figure 6.1: Estimated Total Deposits per Montana County as of 06/30/2020

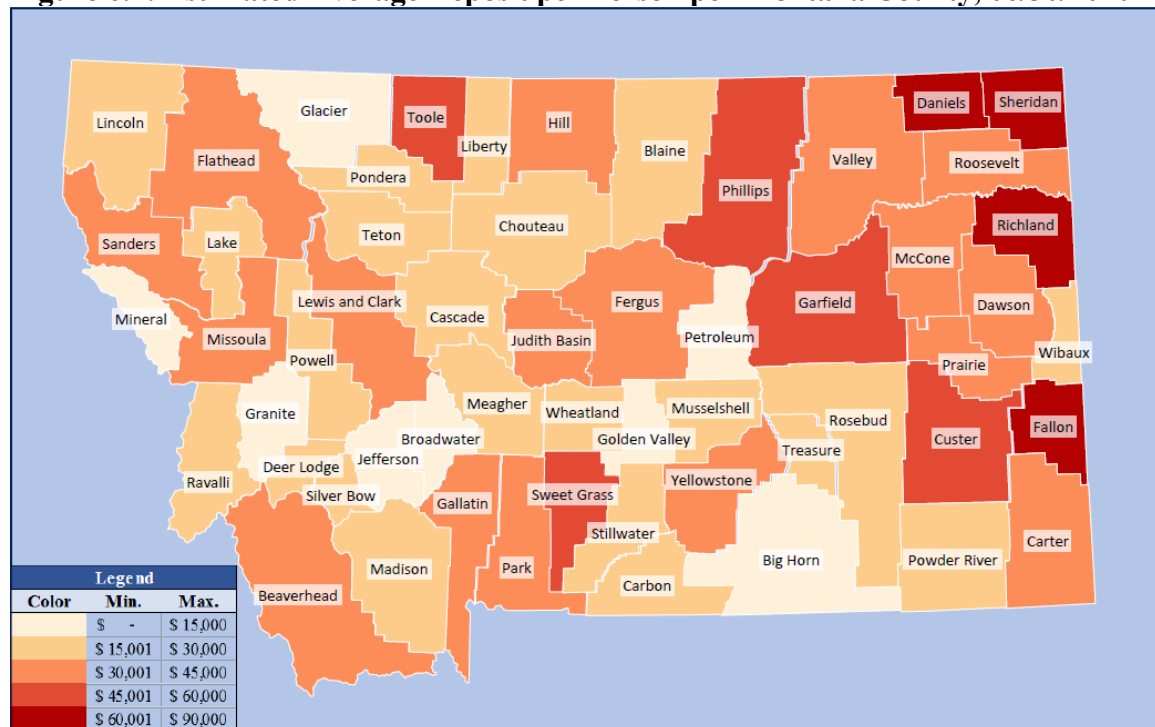


Source: Bank A, Internal Data 2017-2020; National Credit Union Administration 2015-2020; Federal Deposit Insurance Corporation 2010-2020

The results indicate that there is a strong deposit market in Montana and that significant amounts of the deposits are located in rural areas, which are typically underserved by financial institutions. Deposits are higher in counties with larger towns.

A heat map was also generated for Montana counties color coordinated by average deposit per person threshold (Figure 6.2). Off-white represents counties with less than \$15,000 average deposit per person. Tan represents counties with greater than \$15,000 average deposit per person and less than \$30,000 average deposit per person. Orange represents counties with greater than \$30,000 average deposit per person and less than \$45,000 average deposit per person. Light red represents counties with greater than \$45,000 average deposit per person and less than \$60,000 average deposit per person. Dark red represents counties with greater than \$60,000 average deposit per person.

Figure 6.2: Estimated Average Deposit per Person per Montana County, 06/30/2020



Source: Bank A, Internal Data 2017-2020; National Credit Union Administration 2015-2020; Federal Deposit Insurance Corporation 2010-2020

The average deposit per person per county varies from approximately \$9,000 per person to \$85,000 per person. The results show that while deposit levels are higher in more populous areas, the average deposit per person is higher in rural counties. For example,

Yellowstone County, the largest county in the state reported 161,300 residents in 2019, which estimates the average deposit per person at \$40,616; however, Garfield County with only 1,258 residents estimates the average deposit per person at \$58,743. The additional \$18,127 in deposits per person holds a higher appeal for banks looking to expand in rural Montana. Additionally, competition levels are limited in rural Montana, as many of the communities do not have immediate access to a financial institution, as, in many cases, the closest financial institution to these communities could be thirty plus miles away.

6.2 Town A Micro Branch Scenario Summary

Bank A's present strategy is to focus on extending their presence in rural Montana through a limited service bank model. The first Bank A micro branch is set to open in Q2 2021 in Town A, Montana. Town A, reported a population of 195 people in 2019 (Montana Department of Commerce Census & Economic Information Center 2019). The town is geographically isolated with the nearest bank being 30 miles or a 45-minute drive away. Although branch implementation is in progress, an updated Small Market Model was completed and compared to the initial model for this project (Figure 6.2, Figure 6.3).

Expected deposit balances were determined by taking the average deposit per person for the county multiplied by the population of Town A (195) multiplied by 50%, 85%, and 100% for low, expected, and high deposits, respectively. The multiple factors will vary for each location tested by the model. In this scenario, the closest bank to Town A is more than thirty miles away, however, the residents are currently banking somewhere and many people are commonly hesitant to switch banks, therefore getting 100% of Town A's deposits are considered high. In some scenarios, it may be appropriate to use a multiple greater than 100%, especially when considering the population in the areas immediately

surrounding the subject town. Fifty percent was selected as the low multiple for the same reason. As the area is underserved by financial institutions, it is expected that at least 50% of the population are willing to bank with Bank A due to their new “main street presence” in the town. As of June 30, 2020 Bank A holds \$1,335,477 of deposit accounts with Town A addresses. Based on this analysis, the bank already has approximately 17% of the Town A deposit market (Bank A, Internal Data 2017-2020). It is expected that the bank can increase their share of the town’s deposits by 68% for a total of 85% of Town A’s deposits. Payroll and occupancy assumptions were updated to reflect the most recent actual data for the pending limited service branch. No other updates were made to the model.

The most notable dollar variances between the initial model and the updated model are the estimated deposit levels and payroll costs. The updated model has an updated projection of expected deposits as those values were determined using actual deposit data collected and discussed in Chapter 4. Deposit level values in the updated model are similar, although slightly lower than the initial projection. The largest deviation between models is the payroll assumption. The initial plan was to staff the limited service branch with one part-time employee. Throughout the interview process, it was discovered that a team approach would be more appropriate. Now, there will be a team lead and two part-time employees, which significantly increased the projected annual payroll costs from \$18,600 to \$54,961. Based on this adjustment, it actually appears cheaper for the bank to borrow the projected funds from the Federal Home Loan Bank. However, based on the IRR analysis, the expected return of one micro branch location in Town A is 42% and 32% of the investment should be recovered in 5 years. To achieve a positive return, the micro branch will need to meet the expected level of deposits or have significantly higher product income

than projected. The updated model results in a lower IRR than the initial model, although the return in on investment is still adequate and significantly higher than the projected IRR on their most recent bank acquisition.

6.2.1 Break Even Analysis

A break-even analysis was completed using EXCEL's Goal Seek feature. Setting the minimum internal rate of return at a break-even rate of 10% causes the expected deposit volume to decrease to \$4,440,917 from \$6,497,874. The break-even deposit level is 16.19% more than the projected low deposit volume and 31.66% less than the expected deposits.

Figure 6.2: Initial Montana Small Market Model – Town A Micro Branch, 2019

Montana Small Market Model				
Deposits per Location		Projected Balance		
	Cost	Low	Expected	High
DDA	0.09%	1,500,000	2,000,000	2,750,000
Savings	0.15%	1,000,000	1,250,000	1,500,000
NOIDA	0.15%	750,000	1,250,000	2,500,000
CD	1.50%	1,000,000	2,250,000	4,000,000
Total Deposits		4,250,000	6,750,000	10,750,000
Direct Expenses		Low	Expected	High
Savings Int. Paid		1,000	1,875	2,250
NOIDA Int. Paid		1,125	1,875	3,750
CD Int. Paid		15,000	33,750	60,000
Base Payroll		18,000	18,600	18,600
Deposit Incentive	0.25%	10,625	16,875	26,875
Occupancy		7,600	7,600	7,600
Community Support		8,000	16,000	25,000
Misc		4,000	6,000	8,000
Total		66,450	102,575	152,075
Effective Funding Cost		1.56%	1.52%	1.41%
Marginal Funding	2.03%	86,275	137,025	218,225
Cost (FHLB Overnight)				
Net FHLB Dividend				
Cost of Funds Improvement vs. Current Marginal Funding Cost		19,825	34,450	66,150
Before Additional Product Income		0.47%	0.51%	0.62%
Product Income		Low	Expected	High
HLD Churnings		4	6	8
Average \$		150,000	150,000	150,000
Total Findings		600,000	900,000	1,200,000
Income Per Churning	2%	3,000	3,000	3,000
HLD Net Income		12,000	18,000	24,000
Comm/Cons Loans		500,000	750,000	1,000,000
Total Portfolio (New Local Loans)		20,000	30,000	40,000
Annual NIM	4%	3,000	6,000	10,000
Other Fees		3,000	6,000	10,000
Total Product Income		35,000	54,000	74,000
Town Candidate Examples				
Town	Town A	Town B	Town C	
Population	208	364	233	
Miles to Closest Bank	39	27	30	
Existing Examples	Branch A	Branch B		
Population	316	247		
Miles to Closest Bank	24	30		
Bank Deposits (\$21/19)	21,570,031	15,236,752		

Payroll Assumption		5	3	20	300	15,600	3,000	18,600
Days Open		5	3	20	300	15,600	3,000	18,600
Hours Per Day		9:00 to 12:00 or 1:00 to 4:00						
Wage Hr		20						
Weekly Total		300						
Annual Wage		15,600						
Benefit Tax/Misc		3,000						
Annual Total		18,600						

Occupancy Assumption		3,000	2,400	1,000	7,600
Rent		3,000	2,400	1,000	7,600
Utilities		1,200	2,400	1,000	7,600
Phone/Data		2,400	2,400	1,000	7,600
Misc		1,000	2,400	1,000	7,600
Annual Total		7,600			

Community Support - Paid Annually		Annual Support	5,000	6,000	7,000	8,000	15,000	16,000	17,000	18,000	19,000	25,000
Average Deposits:		Annual Support	5,000	6,000	7,000	8,000	15,000	16,000	17,000	18,000	19,000	25,000
1 Million or less												
2 Million												
3 Million												
4 Million												
5 Million												
6 Million												
7 Million												
8 Million												
9 Million												
10 Million												

Per Location Project Return (Before Corporate Overhead)		Low	Expected	High
Capital Investment		75,000	100,000	150,000
ATM		10,000	10,000	10,000
FF&E/Misc		15,000	15,000	15,000
Marketing/Legal		15,000	15,000	15,000
Total Investment		100,000		
Annual Marginal Return		19,825	34,450	66,150
Funding Cost Improvement		35,000	54,000	74,000
Product Income		35,000	54,000	74,000
Tax		(21,930)	(35,380)	(56,060)
Annual Return		54,825	88,450	140,150
Capitalized at 15%		365,500	589,667	934,333

Cumulative Effect over Multiple Locations		4	400,000	Low	Expected	High
Number of Locations		4	400,000	Low	Expected	High
Total Investment						
Annual Marginal Return		219,300	353,800	560,600		
Total New Core Deposits		17,000,000	27,000,000	43,000,000		
Annual Community Support		32,000	64,000	100,000		

IRR Analysis Investment A		One Location - Low	Two Locations - Low	Four Locations - Low	One Location - High	Two Locations - High	Four Locations - High
Investment		(100,000)	(200,000)	(400,000)	(100,000)	(200,000)	(400,000)
Core Deposits		6,750,000	13,500,000	27,000,000	6,750,000	13,500,000	27,000,000
Annual Cash Return		88,450	176,900	353,800	88,450	176,900	353,800
IRR		162%	162%	162%	162%	162%	162%

Small Market Model		One Location (Exp)	4 Locations (Low)	4 Locations (Exp)
Cash Investment		100,000	400,000	400,000
Stock Insurance		100,000	400,000	400,000
Total Investment		200,000	800,000	800,000
Core Deposits		6,750,000	17,000,000	27,000,000
Annual Cash Return		88,450	219,300	353,800
IRR		162%	121%	162%
% of Inv. Earned Back in Five Years (no time value)		221%	137%	221%

Source: Bank A, Internal Data 2017-2020

Figure 6.3: Updated Montana Small Market Model – Town A Micro Branch, 2021

Montana Small Market Model				
Deposits per Location	Projected Balance			
	Cost	Low	Expected	High
DDA	0.00%	1,416,269	2,407,657	2,832,537
Savings	0.06%	617,878	1,050,393	1,235,757
MMDA	0.19%	671,652	1,141,809	1,343,305
CD	0.97%	1,116,479	1,888,014	2,233,958
Total Deposits		3,822,279	6,487,874	7,644,557
				17%
Direct Expenses	Occupancy Assumption			
	Low	Expected	High	
Savings Int. Paid	340	578	680	
MMDA Int. Paid	1,263	2,147	2,525	
CD Int. Paid	10,819	18,392	21,637	
Base Payroll	54,961	54,961	54,961	
Deposit Incentive	7,645	12,996	15,289	
Occupancy	7,600	7,600	7,600	
Community Support	7,600	16,000	17,000	
Misc	4,000	6,000	8,000	
Total	93,627	118,673	127,693	
Effective Funding Cost	2.45%	1.83%	1.67%	
Marginal Funding	1.19%	45,485	77,325	90,970
Cost (FHLB Overnight)				
Net FHLB Dividend				
Cost of Funds Improvement vs. Current Marginal Funding Cost				
Before Additional Product Income	(48,142)	(41,348)	(36,722)	
Product Income	-1.26%	-0.64%	-0.48%	
Product Income	Low Expected High			
	Low	Expected	High	
HLD Closings	4	6	8	
Average \$	150,000	150,000	150,000	
Total Findings	600,000	900,000	1,200,000	
Income Per Closing	2%	3,000	3,000	
HLD Net Income	12,000	18,000	24,000	
Comm/Cons Loans	500,000	750,000	1,000,000	
Total Portfolio (New Local Loans)	4%	20,000	30,000	40,000
Annual NIM				
Other Fees	3,000	6,000	10,000	
Total Product Income	35,000	54,000	74,000	
Town Candidate Examples				
		Town A	Town B	Town C
Town				
Population (2019)		195	318	234
Miles to Closest Bank		39	26	39
Existing Examples				
Population		Branch A	Branch B	
		319	233	
Miles to Closest Bank		26	30	
Bank Deposits (6/30/2020)		24,336,000	18,528,000	

Payroll Assumption				
Days Open	Occupancy Assumption			
	Low	Expected	High	
Days Open	5	7	8	
Hours Per Week	40	40	40	
Wage Hr	770	770	770	
Weekly Total	40,040	40,040	40,040	
Annual Wage	14,921	14,921	14,921	
Benefit/Tax/Misc	54,961	54,961	54,961	
Annual Total	54,961	54,961	54,961	

Occupancy Assumption				
Days Open	Occupancy Assumption			
	Low	Expected	High	
Days Open	5	7	8	
Hours Per Week	40	40	40	
Wage Hr	770	770	770	
Weekly Total	40,040	40,040	40,040	
Annual Wage	14,921	14,921	14,921	
Benefit/Tax/Misc	54,961	54,961	54,961	
Annual Total	54,961	54,961	54,961	

Community Support - Paid Annually				
Average Deposits:	Annual Support			
	Low	Expected	High	
1 Million or less	5,000	5,000	5,000	
2 Million	6,000	6,000	6,000	
3 Million	7,000	7,000	7,000	
4 Million	8,000	8,000	8,000	
5 Million	9,000	9,000	9,000	
6 Million	10,000	10,000	10,000	
7 Million	11,000	11,000	11,000	
8 Million	12,000	12,000	12,000	
9 Million	13,000	13,000	13,000	
10 Million	14,000	14,000	14,000	

Per Location Project Return (Before Corporate Overhead)				
Capital Investment	Annual Marginal Return			
	Low	Expected	High	
ATM	75,000	75,000	75,000	
FF&E/Misc	10,000	10,000	10,000	
Marketing/Legal	15,000	15,000	15,000	
Total Investment	100,000	100,000	100,000	
Annual Marginal Return	(48,142)	(41,348)	(36,722)	
Funding Cost Improvement	35,000	54,000	74,000	
Product Income	5,257	5,061	5,061	
Tax	(13,142)	12,652	37,278	
Annual Return	(87,611)	84,346	248,518	
Capitalized at 15%				

Cumulative Effect over Multiple Locations				
Number of Locations	Total Investment			
	Low	Expected	High	
4	400,000	400,000	400,000	
Annual Marginal Return	(52,567)	50,607	149,111	
Total New Core Deposits	15,289,115	25,991,485	30,578,229	
Annual Community Support	28,000	64,000	68,000	

IRR Analysis				
Investment A: Annuals	Small Market Model - Expected Deposit Levels			
	One Location	Two Locations	Four Locations	Investment A
Investment	100,000	200,000	400,000	
Core Deposits	6,497,874	12,995,747.48	25,991,494.96	
Annual Cash Return	12,652	25,304	50,607.50	
IRR	42%	42%	42%	23%

Small Market Model w/ Stock Issuance				
Investment A	Small Market Model w/ Stock Issuance			
	One Location	Two Locations	Four Locations	Investment A
Cash Investment	100,000	400,000	400,000	
Stock Issuance	100,000	400,000	400,000	
Total Investment	200,000	800,000	800,000	
Core Deposits	6,497,874	15,289,114.68	25,991,494.96	
Annual Cash Return	12,652	(52,566.65)	50,607.50	
IRR	42%	#N/A	42%	23%
% of Inv. Earned Back in Five Years (no time value)	32%	-13%	32%	43%

6.3 Micro Branch Options

Bank A's share of deposits were calculated on a per county basis for 2017-2020 to identify a list of potential future micro branch locations (Table 6.2). The bank shows \$921,853,000 in deposits as of June 30, 2020 that accounts for 2.65% of the estimated deposit market in Montana. Of those deposits, \$405,117,000 are located in rural counties. Significant increases in market share from 2017 to 2020 is the result of bank acquisitions of branches in those respective counties.

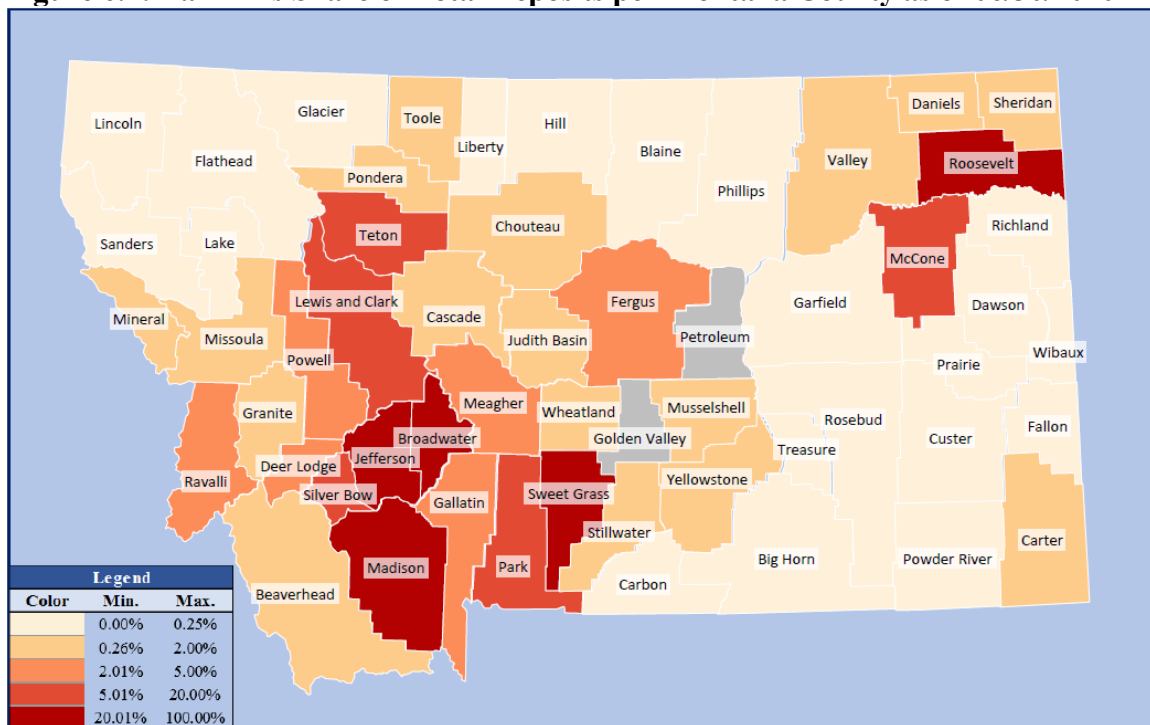
Considerations for future locations include the bank's current market share of county deposits, county population, and estimated average deposit per person. Additional considerations include the number of potential locations within the county, the proximity of those identified locations to the nearest existing Bank A branch, an evaluation of other financial institutions currently servicing that area, and the primary industry supporting the area. Ultimate determination will also rely on a cost-benefit analysis, or completed Small Market Model, on identified locations.

Table 6.2: Bank A's Share of Montana Deposits per County as of 06/30/2020

	6/30/2017		6/30/2018		6/30/2019		6/30/2020	
MT County	Bank A Deposits (\$000's)	Bank A's Share of County Deposits	Bank A Deposits (\$000's)	Bank A's Share of County Deposits	Bank A Deposits (\$000's)	Bank A's Share of County Deposits	Bank A Deposits (\$000's)	Bank A's Share of County Deposits
Beaverhead	\$ 1,383	0.52%	\$ 5,418	1.95%	\$ 6,211	2.29%	\$ 6,017	1.83%
Big Horn	\$ 9	0.01%	\$ 7	0.01%	\$ 12	0.01%	\$ 7	0.01%
Blaine	\$ 2	0.00%	\$ 5	0.00%	\$ 3	0.00%	\$ 241	0.17%
Broadwater	\$ 21,876	28.44%	\$ 23,305	30.41%	\$ 67,136	87.85%	\$ 76,169	87.31%
Carbon	\$ 1,037	0.47%	\$ 399	0.17%	\$ 545	0.22%	\$ 570	0.20%
Carter	\$ -	0.00%	\$ -	0.00%	\$ 1	0.00%	\$ 220	0.48%
Cascade	\$ 2,223	0.13%	\$ 4,145	0.24%	\$ 10,496	0.60%	\$ 18,995	0.88%
Chouteau	\$ 96	0.08%	\$ 97	0.08%	\$ 768	0.66%	\$ 943	0.78%
Custer	\$ 559	0.11%	\$ 88	0.02%	\$ 316	0.06%	\$ 301	0.05%
Daniels	\$ 3	0.00%	\$ 3	0.00%	\$ -	0.00%	\$ 755	0.53%
Dawson	\$ 20	0.01%	\$ 31	0.01%	\$ 28	0.01%	\$ 97	0.03%
Deer Lodge	\$ 732	0.46%	\$ 1,248	0.75%	\$ 2,046	1.24%	\$ 9,051	4.34%
Fallon	\$ -	0.00%	\$ -	0.00%	\$ 9	0.01%	\$ 4	0.00%
Fergus	\$ 1,275	0.35%	\$ 1,916	0.47%	\$ 14,572	3.61%	\$ 16,448	3.80%
Flathead	\$ 1,828	0.06%	\$ 2,277	0.08%	\$ 1,849	0.06%	\$ 2,592	0.07%
Gallatin	\$ 94,309	3.10%	\$ 102,556	3.07%	\$ 107,225	3.03%	\$ 129,125	3.03%
Garfield	\$ 9	0.01%	\$ 9	0.01%	\$ 35	0.05%	\$ 55	0.07%
Glacier	\$ 209	0.15%	\$ 71	0.05%	\$ 153	0.12%	\$ 68	0.04%
Golden Valley	\$ 498		\$ 526		\$ 537		\$ 554	
Granite	\$ 346	0.87%	\$ 324	0.75%	\$ 223	0.51%	\$ 571	1.14%
Hill	\$ 137	0.03%	\$ 137	0.02%	\$ 476	0.08%	\$ 215	0.03%
Jefferson	\$ 14,071	16.35%	\$ 17,927	19.47%	\$ 19,441	20.33%	\$ 24,991	22.69%
Judith Basin	\$ 33	0.05%	\$ 61	0.10%	\$ 786	1.23%	\$ 817	1.22%
Lake	\$ 965	0.18%	\$ 1,123	0.19%	\$ 1,192	0.20%	\$ 1,765	0.24%
Lewis And Clark	\$ 135,144	8.59%	\$ 133,734	7.71%	\$ 151,163	7.77%	\$ 179,767	8.57%
Liberty	\$ -	0.00%	\$ -	0.00%	\$ 82	0.17%	\$ 0	0.00%
Lincoln	\$ 76	0.02%	\$ 111	0.02%	\$ 108	0.02%	\$ 197	0.03%
Madison	\$ 1,663	0.82%	\$ 70,872	32.52%	\$ 67,618	29.86%	\$ 78,217	30.80%
McCone	\$ 0	0.00%	\$ 1	0.00%	\$ 1	0.00%	\$ 3,936	6.70%
Meagher	\$ 519	1.08%	\$ 335	0.74%	\$ 2,506	5.56%	\$ 2,105	4.37%
Mineral	\$ 495	1.09%	\$ 409	0.81%	\$ 464	1.01%	\$ 414	0.72%
Missoula	\$ 35,099	1.21%	\$ 35,226	1.18%	\$ 36,430	1.32%	\$ 45,751	1.21%
Musselshell	\$ 1	0.00%	\$ 6	0.01%	\$ 50	0.06%	\$ 1,145	1.14%
Park	\$ 33,018	8.01%	\$ 38,882	9.10%	\$ 36,323	8.15%	\$ 38,744	7.53%
Petroleum	\$ -		\$ 5		\$ 48		\$ 23	
Phillips	\$ 6	0.00%	\$ 8	0.00%	\$ 8	0.00%	\$ 54	0.03%
Pondera	\$ 16	0.00%	\$ 24	0.01%	\$ 1,021	0.60%	\$ 857	0.69%
Powder River	\$ 19	0.04%	\$ 153	0.34%	\$ 76	0.18%	\$ 38	0.08%
Powell	\$ 2,176	0.02%	\$ 2,540	2.28%	\$ 2,403	2.24%	\$ 3,034	2.50%
Prairie	\$ -	5.44%	\$ 0	0.00%	\$ 10	0.03%	\$ 22	0.05%
Ravalli	\$ 22,165	0.00%	\$ 25,176	2.74%	\$ 26,890	2.84%	\$ 28,987	2.52%
Richland	\$ 59	3.95%	\$ 121	0.02%	\$ 114	0.02%	\$ 275	0.04%
Roosevelt	\$ 64	0.02%	\$ 11	0.00%	\$ 21	0.01%	\$ 74,813	21.95%
Rosebud	\$ 323	0.03%	\$ 352	0.19%	\$ 359	0.19%	\$ 119	0.06%
Sanders	\$ 163	0.09%	\$ 166	0.05%	\$ 146	0.04%	\$ 246	0.06%
Sheridan	\$ -	0.07%	\$ -	0.00%	\$ 2	0.00%	\$ 763	0.27%
Silver Bow	\$ 57,433	0.00%	\$ 61,218	8.39%	\$ 61,835	8.21%	\$ 68,321	7.84%
Stillwater	\$ 1,124	27.65%	\$ 950	0.45%	\$ 909	0.41%	\$ 1,465	0.55%
Sweet Grass	\$ 26,174	0.75%	\$ 28,765	19.08%	\$ 26,859	17.24%	\$ 35,605	20.17%
Teton	\$ 3	13.62%	\$ 107	0.06%	\$ 16,034	9.05%	\$ 19,229	11.26%
Toole	\$ 2,667	0.00%	\$ 609	0.23%	\$ 1,341	0.57%	\$ 1,570	0.59%
Treasure	\$ -	14.07%	\$ -	0.00%	\$ -	0.00%	\$ -	0.00%
Valley	\$ 77	0.00%	\$ 88	0.03%	\$ 115	0.04%	\$ 4,161	1.33%
Wheatland	\$ 164	0.22%	\$ 68	0.20%	\$ 64	0.17%	\$ 175	0.39%
Wibaux	\$ -	0.64%	\$ -	0.00%	\$ 11	0.04%	\$ 11	0.04%
Yellowstone	\$ 19,571	0.00%	\$ 21,279	0.40%	\$ 26,530	0.49%	\$ 41,237	0.63%
TOTALS	\$ 479,838		\$ 582,891		\$ 693,601		\$ 921,853	

Someka EXCEL solutions was used to generate a heat map of Montana counties color coordinated by market share thresholds (Figure 6.4). Off-white represents counties where OBMT has less than 0.25% of the deposit market share. Tan represents counties where OBMT's market share is greater than 0.26% but less than 2.0%. Orange represents counties where OBMT's market share is greater than 2.0% but less than 5.0%. Light red represents counties where OBMT's market share is greater than 5.0% but less than 20%. Dark red represents counties where OBMT holds greater than 20% of the deposit market share.

Figure 6.4: Bank A's Share of Total Deposits per Montana County as of 06/30/2020



Source: Bank A, Internal Data 2017-2020

The results showed that the bank has more than 20% market share of Montana deposits in five counties: Broadwater, Madison, Jefferson, Roosevelt, and Sweet Grass, which indicates that these counties are likely not ideal candidates for a micro branch. The

bank holds 87.31% of the deposits in Broadwater County and has an existing branch in Townsend, the hub of the county, therefore, Broadwater County is not a good location for a micro branch as the costs likely outweigh the benefits. The bank has 30.80% of the deposits in Madison County, split between two branches located within the county. There is one town in the eastern part of the county that is not serviced by the bank; however, a micro branch would likely not be successful as there are two full service banks located there already so elevated competition would make it challenging to gain additional deposits at a level that would justify the costs of implementing a micro branch.

The situation in Jefferson County is similar as the bank has 22.69% of the county's deposits, although they do not have a physical branch located within the county. There are existing full service banks located in each of the towns in the county and the estimated average deposit per person is \$9,013; therefore, a micro branch may be beneficial, although the costs would likely outweigh the benefit due to the competitive situation in the county.

The bank has a strong presence in Roosevelt County through the full service branch that holds 21.95% of the county's deposits. It may be beneficial to expand the bank's presence into the eastern part of the county with a micro branch; however, additional analysis would need to be completed.

The bank has 20.17% of Sweet Grass County's deposits through a full-service branch located in the county seat. The bank branch is located in the primary town in the county offering majority of the necessary services to live; therefore, Sweet Grass County is not a good county to invest a micro branch in.

On the contrary, there are multiple counties where the bank currently holds less than 1% of the deposit market (Figure 6.4). Many of these counties have a very small

population and minimal deposits, such as Wibaux County. These counties are likely not good candidates for future micro branches. Counties that appear to be good potential locations based on proximity to an existing Bank A branch, county population, and average estimated deposit per person include Judith Basin or Wheatland, Meagher, Choteau, Fergus, Teton, Valley, Blaine Phillips, Roosevelt, Granite, and possibly Beaverhead and Park. These are strong candidates as they are geographically isolated with an existing Bank A branch in each of the counties or in the neighboring county that allows for easy access to a full service branch if the need arises. The counties also have strong agricultural industries, which the bank is currently focusing. A strong agricultural presence indicates that potential depositors will likely value relationship-based banking and are more likely to do business with the bank that has a location near them. Agricultural driven economies are also known to provide strong core deposits and excellent lending relationships. Estimated deposits per person are greater than \$20,000 and the 2019 population for each of these counties exceeds 1,800 people. Additional analysis would need to be completed to evaluate the competition in those areas and if the benefit of the investment exceeds the costs in each location.

Two other strong candidate counties are Golden Valley and Petroleum. There is not a financial institution within either of the counties, so the estimated deposits are at \$0; however, the bank presently reports \$554,000 for deposits in Golden Valley County and \$23,000 in Petroleum County, which indicates that there are likely other deposits located in that county as well.

The results of the analysis show that potential locations for future micro branches are located in counties with small rural towns underserved by traditional financial institutions and that have a full service Bank A branch close, meaning within the subject

county or the neighboring county. This analysis can be useful to banks who seek to expand their deposit holdings in rural Montana. The information in this study can be used to analyze their current market share and identify potential locations for expansion projects.

CHAPTER VII: CONCLUSION

The overall objective of this thesis was to estimate the potential size of the market for rural deposits and determine what the cost and benefit of getting those deposits.

Montana's rural economy, primarily those areas with an agricultural focus, creates a unique pool of deposits in towns and areas without any existing depository institutions. Using discounted cash flow analysis and internal rate of return principles through an internally created "Small Market Model", the concept of investing a limited service branch in rural Montana is analyzed. Additionally, Bank A's current share of the deposit market on the county level was estimated, which identified which Montana counties may be strong or weak candidates for future micro branches.

The results of this study indicated that this approach has the potential to capture the value identified in the geographically isolated areas and has the potential opportunity for earnings growth. These findings are useful for financial institutions experiencing tight liquidity and looking for innovative approaches to expand their customer reach in rural Montana.

7.1 Limitations and Consideration of Research

A fundamental limitation of this analysis is a lack of some data that made it necessary to make assumptions. As discussed in Chapter 4, FDIC deposits are reported on the county level based on the bank branch location rather than the county in which the depositor resides. NCUA deposits are reported on the bank level and does not provide a breakdown of deposits per branch. As discussed in Chapter 6, there is very limited publically available information for online banks and FinTech institutions. Many individuals, for reasons of their own, often store cash outside of financial institutions. There

is no way to estimate the level of that money; however, those levels could considerably impact the estimated available deposit market. This analysis is effective despite the reliance on assumptions.

There is value in extending this research in the future with actual performance data from the pilot micro branch to conduct additional analysis. This analysis would provide data to help improve how the expected deposit levels are projected when considering additional locations. There is additional value in extending this research to other states that are primarily rural. Expanding this concept in multiple states would provide a larger data set for rural deposit market studies. That information could be very useful for regulatory agencies as well as rural-focused banks looking to expand their market presence or explore alternative methods to fund their balance sheet.

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