

# **The Great Disruption:**

## How Fintech Will Transform Banking

By: Dusty Wunderlich



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# Introduction

A major revolution in the United States' financial system is necessary and already underway. Informed consumers and evolved businesses must take responsibility for this change and demand a better way of banking.

Radical innovation from emerging financial technology or “fintech” companies is taking root. Fintech leverages technology to craft modern systems and solutions to the antiquated banking business model, bringing better products and sustainable services to consumers, investors, and the industry.

Since the late 1990s fintech companies have chipped away at the archaic banking system through innovative technologies in payments, trading, lending, and insurance. Nearly half of consumers, 46 percent, already have an account with a fintech provider and 28 million households want to move to a more innovative bank.<sup>1</sup> Consumer frustration with banks is at a tipping point and adoption of new banking solutions is increasing exponentially. This moment in time is ideal for a new wave of technology and philosophy to repair our broken banking system.

Current industry leaders and policymakers struggle to keep pace with the rapid advancement in financial technology. The very technology that could permanently disrupt the banking system, the blockchain, has lawmakers and regulators scratching their heads. The debate of how to embrace this revolution within the constraints of our banking system marks a shift in leadership from institutional bankers to new innovators.

The blockchain is the DNA of the new banking system and will change how we view banking forever. Popularized first through its application with the cryptocurrency Bitcoin, blockchain technology is a distributed and decentralized ledger that eliminates the need for third-party intermediaries like banks. With the blockchain, each consumer functions as their own bank, transacting peer-to-peer through highly secure cryptography. The blockchain brings an unprecedented level of security and transparency to banking and the financial services.

Despite efforts to reform the banking and financial industry, systemic issues persist. Events such as the 2008 housing crisis and the 2016 Wells Fargo scandal damaged the industry beyond repair. Consumer confidence in banking hovers near a 30-year low.<sup>2</sup> These events continue to surprise younger generations because they assume our nation solved its banking issues after the Great Depression. The implementation of lasting reform requires the adoption of new technology and a shift in philosophy, a path lead by the innovators in fintech.

In recent decades, lawmakers focused on symptoms of a broken system without addressing the underlying cause. After the 2008 housing crisis and the unprecedented multi-trillion-dollar bailout of the too-big-to-fail banks by the Federal Reserve, new legislation was written to mitigate similar risks.

The Dodd-Frank Wall Street Reform and Protection Act of 2010<sup>3</sup> consolidated financial power into the hands of a few. The result was the concentration of power among the top 12 banks that were bailed out. Those banks now control 70 percent of all banking assets.<sup>4</sup> This system seeks to survive and maintain the status quo at all costs, rather than adapt to

*Americas' Confidence in Banks, 1979-2016 Trend*

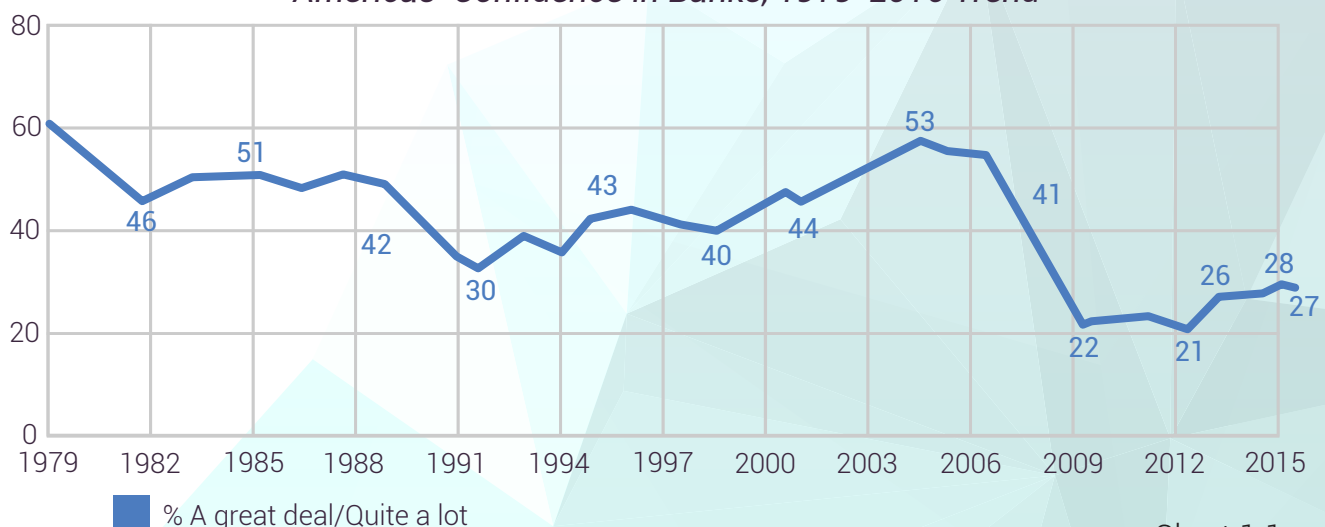


Chart 1.1

(NTT DATA, Inc. 2016)

<sup>2</sup> (Gallup, 2016)

<sup>3</sup> (House, 2008)

<sup>4</sup> (Fisher, 2013)

changing consumer demand by adopting a new approach. Henceforth, systematic issues persist. Instead of too many too-big-to-fail banks, we need a decentralized and distributed system of too-small-to-save banks.

Extreme disruption demanded by the consumer may be the only way to unhinge the system as we know it and rebuild. To disrupt a multi-trillion-dollar industry, we first must understand the underlying issues within the system. Only by understanding the problems can we start to build logical and comprehensive solutions.

This paper addresses the systemic issues within the banking and financial industry and outlines solutions to create long-term sustainable solutions through innovation.

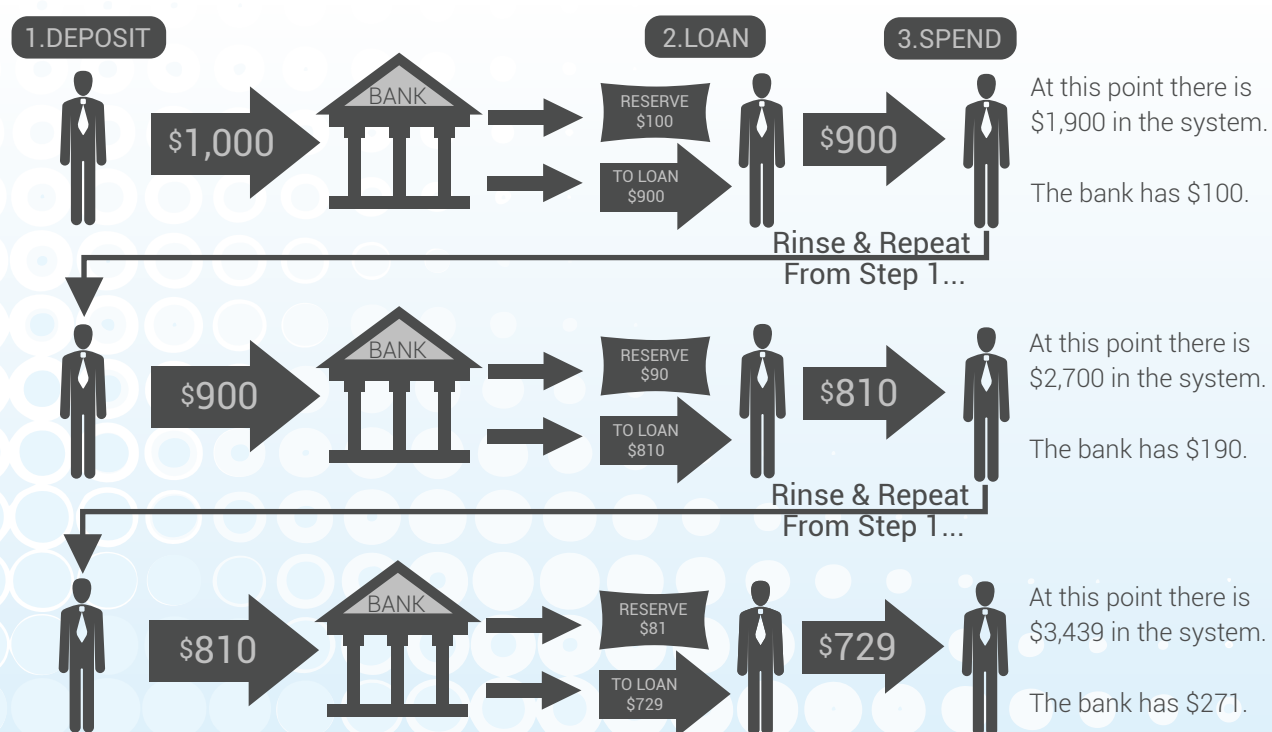
## A Story of Monetary Fallacy: Fractional Reserve Banking and Central Banking

To objectively diagnose our financial system's problems, we must first investigate its anatomy. The fractional reserve banking system is the foundation of our banks and the widely-adopted philosophy of global central banking functions. To better understand our financial system, it is pertinent to understand fractional reserve and central banking.

### Fractional Reserve Banking

The fractional reserve banking system was first adopted by England in the 1800s to expand credit in the marketplace and increase economic activity. Through this system, a central bank requires commercial banks to hold only a portion of its deposits and allows the remainder to be used for loans or other investments of the bank's choosing, within regulation. This is how the banking system creates new money. Chart 1.1<sup>5</sup> illustrates how a deposited dollar works through the fractional reserve banking system

Chart 2.1 The Basic Fractional Reserve Banking Cycle



Since the adoption of the fractional reserve and central banking system, unprecedented expansion of the money supply has contributed to systemic inflation and more severe economic cycles. According to the Consumer Price Index, inflation has increased 2,324.3 percent since the inception of the Federal Reserve in 1913<sup>5</sup>. An item that cost \$100 in 1913<sup>6</sup> now costs \$2,324.30. This system gives central banks the ability to increase or decrease reserve requirements and interest rates to try to control an economy

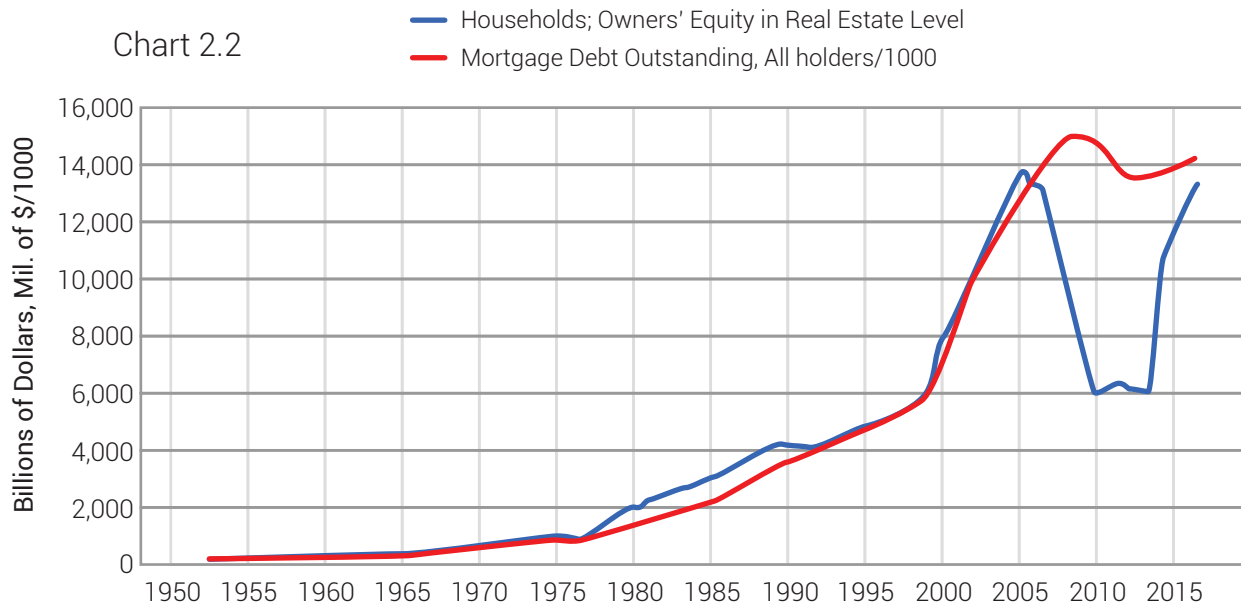
What were once good intentions have set global economies on a merry-go-round of boom-and-bust economic cycles. Very few people are aware that central banks use their deposits in this manner and have this much control over our money and lives. Hence, many do not attribute the 2008 housing market collapse and Great Recession to the failure of a fractional reserve and central banking system. The Federal Reserve's artificially low-interest rates and reserve requirements created an exponential credit expansion and asset bubble in the housing market. Outstanding mortgage debt more than doubled from 2001 to 2017 from \$7 trillion to \$14 trillion.

<sup>5</sup> (ZeroHedge, n.d.)

<sup>6</sup> (Statistic, 2017)

Homeowners equity peaked at \$13 trillion in 2005 and bottomed out in 2009 at \$5.9 trillion. At the peak in 2006, the real estate market was valued at \$25 trillion, and homeowner's equity accounted for 52 percent. At the bottom of the crash, the housing market fell to \$20.6 trillion, and homeowner's equity accounted for 28 percent. Homeowners lost nearly half their equity value in less than three years due to reckless banking practices. Our fractional reserve banking system directly causes this type of loose lending and unchecked credit expansion.<sup>7</sup>

Fractional reserve banking creates new money because more than one party owns the same dollar at one time. Our government effectively ignores this violation of private property rights. This misallocation of private property creates inefficiencies between borrowers and savers. It also tends to favor borrowers over savers by suppressing interest rates to encourage borrowing. This takes the market further away from natural interest rates and ultimately penalizes savers long term. The manipulation of reserve requirements and interest rates within the fractional reserve banking system creates extreme variables in our economy.



Before the Great Recession, reserves were too low to insure the high-risk, unchecked mortgages banks lent to borrowers. Record low-interest rates for home loans created billions of dollars of mispriced risk in the credit markets. Combined, these two factors led to a significant expansion of credit that drove unsustainable housing price inflation. As a result, some of the largest banks in the world failed, and government provided massive bailouts to shore up the balance sheets of these inherently weak institutions.

The Great Recession should have come as no surprise. In the case of fractional reserve banking, history repeated itself. Wild stock market speculation, similar to the real estate speculation of the Great Recession, caused the Great Depression in the 1930s. Money supply expanded through the adoption of the Federal Reserve and dismissal of the gold standard during World War I. This caused a boom in asset prices, specifically in the stock market. Once the stock market bubble burst in 1929, like the housing bubble in 2008, Americans went to withdraw their funds from the banks to find it was not there. This was the first hard lesson America learned about fractional reserve banking. Who would have thought we would repeat this same mistake nearly 100 years later?

## Central Banking

The Great Recession and Great Depression illustrate the severe economic issues that expansion of credit by the fractional reserve banking system can cause. In the case of the Great Recession, too-low interest rates caused credit expansion to outpace real supply. Both economic crises resulted from central banking controlling an economy instead of consumers driving a free market. In a true free market, prices and interest rates adjust based on real market value through risk and time preferences.

The irony in both significant historical economic events is that the free market was blamed rather than the controllers behind the curtain. During both the Great Recession and Great Depression, a central entity and government-manufactured system created the worst economic malfunctions in modern history. Whenever the government is the cause of an economic disaster, it is the first to lay blame and come to the system's rescue.

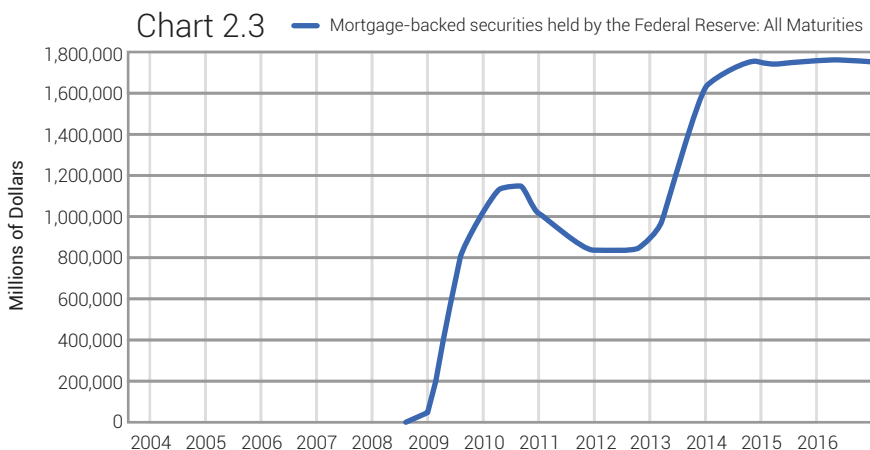
In response to the Great Recession, Dodd-Frank legislation mandated banks increase their reserves. As a result, commercial bank reserves grew from \$600 billion to \$1.2 trillion from 2008-2016. This is, in theory, a logical approach, but it fails

<sup>7</sup> ((FRED), 2016)



to address the underlying issues of the fractional reserve banking system that can lay dormant for decades before viscerously attacking. Yet, we continue to put a bandage on a gaping, festering wound hoping it will heal itself.

Like post-Great Depression era legislation, post-Great Recession legislation has proven to be reactive and miss the mark. To penalize commercial banks, this legislation left the central bank and federal government unchecked and able to further control the market.



After the 2008 housing collapse, the Federal Reserve went on a spending spree, buying nearly \$2 trillion in mortgage-backed securities.<sup>8</sup> However, the more troubling issue is the growth of the federal mortgage agencies such as Fanny Mae and Freddie Mac. As private banks were forced to grow their reserves and tighten mortgage lending standards, the federal agencies overtook the housing market. These government lenders took control of the \$26-trillion U.S. mortgage market in the eight years following the collapse<sup>9</sup> and, unlike the banks before the collapse, these agencies have little to no reserves. Fanny Mae, Freddie Mac, and other federal lenders are taking on even more risks than the banks blamed for the Great Recession did, but with less insurance. In less than three decades,

government-guaranteed mortgage securities increased from less than 10 percent of the total to more than 50 percent in the amount of \$7 trillion.<sup>10</sup>

## Marketplace Symptoms

The extreme variables and issues caused by the fractional reserve banking system and the central bank are not unique to the housing market. The same problems present themselves in the student loan market and within pension structures. The expansion of credit through the fractional reserve banking system and artificially low-interest rates allow lenders to misprice risk and eventually create asset bubbles. Mispriced risk creates a significant mismatch by over stimulating our economy with too much credit. This misallocates resources and creates unintended long-term consequences.

Driving down interest rates to spur economic growth creates unnaturally high demand on the money supply. Companies and individuals want to borrow when rates are low; thus, demand increases and money supply expands through fractional reserve banking to meet that demand. Increasing money supply further prompts the suppression of interest rates. This typically results in growing demand for a static or slow supply of goods, such as houses, and falsely drives up prices, creating an asset bubble. A reduction in interest rates may drive immediate economic activity but comes with dire long-term consequences.

One of the most important long-term effects of artificially-suppressed interest rates is the decline in returns for savers—gains crucial to the health of our pension systems. Short-sighted policy, in turn, led to the gross underfunding of our global pension system. By driving down interest rates, we sacrifice long-term stability for short-term gain.

Legislation continues to address the symptoms rather than the cause of financial woes, which is the fractional reserve banking system. The false ability to create money simply masks underlying problems within the economy. The housing market has yet to deleverage and, less than a decade after its collapse, it is now the largest asset in the world again.

Although large, this is just one example of a failure created by central banks and the fractional reserve banking system. The dilemma that the fintech industry must address is the very foundation of our current system. To create a more stable banking and monetary system, we must rethink and examine the philosophy of a fractional reserve banking system.

## The Philosophy of Consumption

Philosophies drive cultures and cultures impact decisions. The fractional reserve and central banking system are purely a result of culture and philosophy. We created an utterly unsustainable banking system to satisfy our desires and wants. Although big government and special interests played a major role, we as individuals played our part in allowing this to happen.

We played into this partly because, as a society, we began to move toward a philosophy driven by materialism and instant gratification. We lost the art of delayed gratification and the importance of savings. Why? Because we got what we wanted in the moment. But now we are paying for those choices, and we must adjust our philosophy to correct course.

Consumer expenditures as a percentage of GDP have steadily increased since 1967, from 58 percent to 68 percent today. This increase in consumer spending corresponds with a decrease in savings from 12.5 percent in 1967 to 4.7 percent today. During the same period, our economy left the gold standard and sound money. Gold, although not perfect, protected the people's money and checked the central bankers.<sup>11</sup>

<sup>8</sup> ((FRED), 2016)

<sup>9</sup> (Economist 2016)

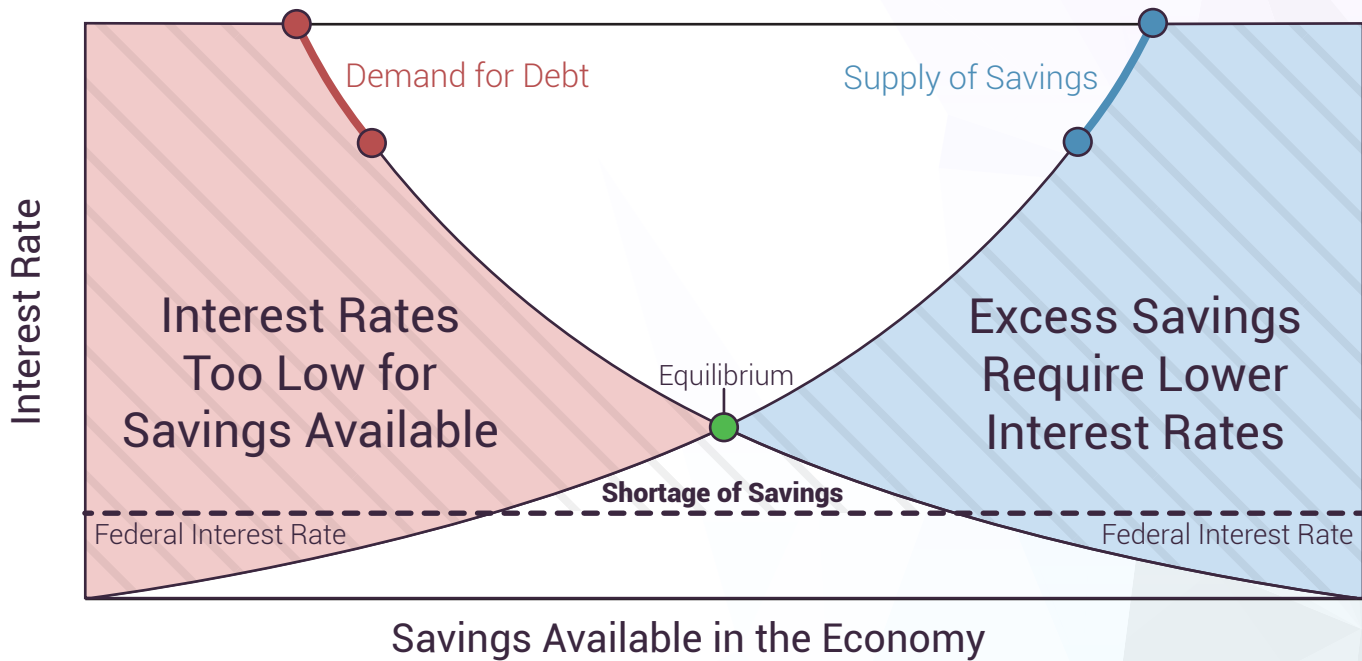
<sup>10</sup> (Reserve 2016)

<sup>11</sup> ((FRED), 2016)

This moment in history began the disequilibrium between borrowers and savers. When there is no guide for money supply and credit expansion, the free market basis for supply of savings and demand for debt breaks and cannot set a natural interest rate. In this environment, interest rates are held below their natural level, resulting in artificially expanded debt and imbalance between borrowers and savers. Unfortunately, the result is savers lose, which inevitably leads to an erosion of savings.

Chart 2.4

## Savings and Production Drive Economic Growth



Without checks and balances, the Federal Reserve increased the money supply by 2,252 percent from \$560 billion in 1967 to \$13.2 trillion in 2016. Since the break from the gold standard, inflation has increased 622 percent, and debt has grown exponentially. In 1967 debt as a percentage of GDP was 39 percent. In 2016 it sits at 104 percent.<sup>12</sup>

We can look to Japan as an indicator of where this philosophy eventually ends. Japan's economy adopted this philosophy a few decades before the United States. As a result, Japan's debt as a percentage of GDP increased from 50 percent in 1980 to 230 percent in 2016. Japan printed new money multiple times through quantitative easing and used negative interest rates to spur its economy. This led to nearly \$7 trillion in negative yield bonds, which is degrading savings and Japan's capital. Yet, the country's economy remains stagnant as its currency and banking system degrades to nearly nothing.<sup>13</sup>

Without controls on money or our banking system, the government can continue to print money and increase debt to cover up mishaps. The economies of the U.S. and Japanese teach that a lack of monetary discipline leads to a disparity among borrowers and savers, resulting in trillions of dollars of mispriced risk in the economy. Mispriced risk inevitably causes more frequent and severe economic cycles. The philosophy of consumption is still an experiment, but the early results are not promising, and the theoretical end seems catastrophic. But, we have an opportunity to study, learn and transition to a more sustainable philosophy.

## Mispriced Risk: How Subsidized Credit Markets Create Inefficiencies

The credit markets drive our economy. Understanding how fractional reserve and central banking impact the market is crucial to changing the banking system. Artificially low-interest rates and reserve requirements set by the Federal Reserve create significant inefficiencies and mispriced risk in the credit markets.

After decades of artificially low-interest rates intended to drive economic growth, it's time to reevaluate our relationship with interest rate management, risk-based pricing, and policy making. An objective and scientific approach must be implemented to adopt a healthy relationship between pricing risk and marketplace policy.

We cannot continue to correlate low-interest rates with good economic policy. Only by reviewing the booms, bailouts, and busts can we understand how risk was mispriced and recalculate those rates had they matched actual market supply and demand. To begin, let's first address how lending occurs in a low-interest rate environment. Below are the current philosophies or approaches within the lending markets created to adjust for the low-interest rate environment and misguided policy.

<sup>12</sup> ((FRED), 2016)

<sup>13</sup> ((FRED), 2016)

### **Asset Bubble Lending**

In this environment, fixed or artificially low-interest rates combine with loose lending standards.

**Example:** The student loan market, pre-2008 housing markets

**Implications:** Broad credit expansion creates asset bubbles and hyperinflation. Interest rates and lending requirements, such as income thresholds, serve as risk indicators to help lenders and borrowers avoid default. When those guideposts are manipulated or disregarded to drive short-term results, such as increased homeownership or higher university enrollment, inflation increases. Low-interest rates create demand for money, increasing the money supply and leading to more dollars chasing the same number of goods. This creates asset-price inflation, artificially-low interest rates and loose lending standards that miscalculate risk, putting both borrower and lender at greater risk. Eventually, this creates an asset bubble.

When credit expansion outpaces actual supply, demand, and income thresholds, a significant correction must occur. In the case of the housing crisis, that market correction was made by repricing risk through a massive taxpayer bailout. Those who adjusted markets for short-term gain ended up paying massive long-term consequences with taxpayer dollars. The Great Recession housing bailout cost an estimated \$7.7 trillion.<sup>9</sup> Policymakers and central bankers should retroactively study pricing risk and assess what interest rates should have been set based on the total cost of the bailout. This would indicate the real interest rates reflective of actual market supply and demand.

### **Discriminatory Lending**

In this environment, fixed or artificially low-interest rates combine with tight lending standards.

**Example:** Small business lending, credit challenged consumers

**Implications:** This combination creates a highly discriminatory environment. When lenders cannot accurately price risk among borrowers, prime borrowers become the only group able to access credit. Those with damaged credit or no credit cannot get credit, creating a negative loop. By nature, this system discriminates against borrowers with arbitrary thresholds. For example, most small businesses with relatively unpredictable margins or those with wider gaps between income and cost of living have no pathway to credit. This compounds income inequality and incapacitates select groups from contributing to the economy. In this environment, there is not a bailout or correction, but severe widening income inequality and decreasing level of entrepreneurship. Lack of innovation ensues due to limited access to credit among consumers and entrepreneurs.

### **Predatory Lending**

In this environment, high, static pricing combines with high market demand.

**Example:** Payday lending, title loans

**Implications:** In the two previous cases, fixed or artificially low-interest rates prohibit lenders from appropriately pricing risk and influence them to ignore many potential borrowers. This creates pent-up demand among non-prime and discriminated groups. A small group of companies interested in profiting from those ignored, often high-risk, high-need consumers

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<sup>14</sup> (Week, 2011)



and businesses meet this demand. The limited competition supports the emergence of these statically-priced, non-transparent products that often do more harm than good for the consumers and businesses they serve. In this environment, consumers and businesses are typically mispriced and face unfairly high fees. Those borrowers in these groups, who may be more responsible, pay the same extraordinarily high fees like every other borrower to offset the costs of the high-default, high-risk segment. They do not receive individualized risk-based pricing similar to what prime groups experience. Many borrowers in this segment cannot afford the cost of financing and enter an endless debt cycle worse than having no access to credit.

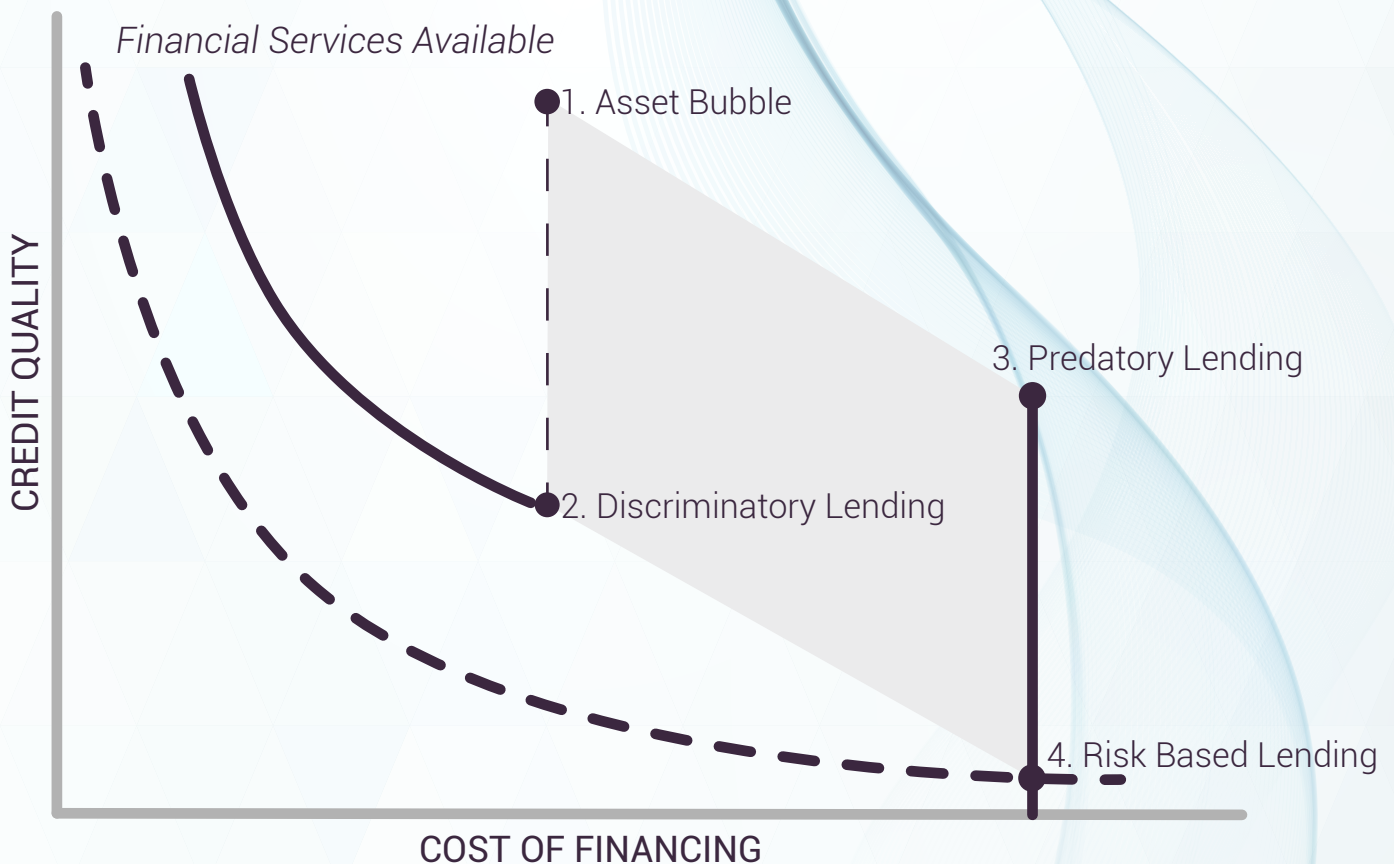
## Risk-Based Pricing

Each of the above approaches fails to accurately price risk, regardless of whether the interest rates are priced too low or too high. In these environments, a bank that offers artificially low-interest rates to homebuyers through credit expansion has no ethical high ground over the payday lender overcharging a struggling consumer. Both parties are mispricing risk and harming the consumer or small business owner. The ethics violation is to misprice risk, regardless if that is on the low or high end.

“None of this might matter were it not for the fact that extremely low interest rates have fueled increased risk-taking by borrowers and yield-hungry lenders. The result has been a massive mispricing of financial assets. And that has created a growing risk of serious adverse effects on the real economy when monetary policy normalizes and asset prices correct.” — Martin Feldstein, Harvard Professor of Economics.

Accurate risk-based pricing is not a function of the rate but a function of the correct risk estimation and valuation. To evolve our economy, we must learn how to appropriately price risk and create a framework to support a more democratized and equitable lending environment.

Chart 3.1



To address this problem, as a society we must accept that interest rates and lending requirements should be based on the reliable indicators of capital resource allocation and time preferences. To accept this truth, we must be willing to accept that higher interest rates are not inherently wrong, but a fair indication of time preference, risk, and resource allocation. We must also remember that higher rates drive better returns for savers and a more stable pension system. There must be an equilibrium set by the supply of savings in relation to the demand for debt to obtain the natural interest rate.

A core contributor to mispriced risk is the government's "put" to the banking and financial industry. As chairman of the Federal Reserve, Alan Greenspan set a dangerous precedent when he bailed out long-term capital management in the late '90s. He sent a signal to the banking industry that the federal government felt some entities were too big to fail, which led to more risk taking and greater misallocation of resources. Combining a back stop with the ability to create money is a recipe for disaster, which we later realized with the 2008 housing crisis.

Dallas Federal Reserve President and CEO Richard Fisher, a critic of Dodd-Frank legislation and the banking bailouts, said it best in his famous speech "Ending 'Too Big To Fail': A Proposal for Reform Before It's Too Late."

"We recommend that the largest financial holding companies be restructured so that every one of their corporate entities is subject to a speedy bankruptcy process, and in the case of the banking entities themselves, that they become an appropriate size, complexity and geographic footprint that is "too small to save." Addressing institutional size is vital to maintaining a credible threat of failure, thereby providing a convincing case that policy has truly changed. This step gets both bank incentives and structure right, neither of which is accomplished by Dodd-Frank." – Richard Fisher

The mainstream adoption of different economic indicators is a massive transition only possible by a complete overhaul of U.S. monetary policy and the banking system. Seemingly unachievable, a shift is already underway with the emergence of fintech through quick adoption by hungry consumers and a public will to end Too Big To Fail.

Now that we've addressed the core systematic issues, let's look at three case studies in the marketplace resulting from the aforementioned systemic problems in banking.

## Education Arbitrage: The Effects of Mispriced Risk on the Cost of Higher Education

There is no better place to look for an example of faulty monetary policy and mispriced risk than the U.S. higher education system. This is the perfect storm of political metrics and the desire for higher college enrollment combined with credit expansion. The combination causes extreme inflation. Higher education is breaking the laws of economics, specifically the elasticity of demand, the value of a college degree is decreasing while costs are increasing. As a result, Americans are more educated than they have ever been but many find themselves worse off than their less-educated peers. The law of diminishing returns means many individuals with a college education are actually worse off.

Although much smaller than the \$14 trillion housing mortgage market,<sup>15</sup> the \$1.3 trillion student loan<sup>16</sup> market is too large to ignore and creates significant, long-term impacts on the economy. It clearly illustrates the issues policies have on the broader economy when risk is mispriced.

In recent decades, policymakers have had an economically unhealthy obsession with indicators like college enrollment and homeownership rates. Policy written to improve these indicators include the Higher Education Act of 1965, Omnibus Budget Reconciliation Act of 1993, and the Healthcare and Education Reconciliation Act of 2010. The latter focused on moving private enterprise away from originating government-guaranteed loans to originate loans from the government instead directly. These policy reforms and the nationalization of the student loan market created an excessive expansion of student loans, flooding the market with available funds and leading to inflation in higher education. These very policies inadvertently drove the cost of education up by expanding the money supply and mispricing risk through direct government lending

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<sup>15</sup> ((FRED), 2016)

<sup>16</sup> ((FRED), 2016)

According to a study conducted by economists Grey Gordon and Aaron Hedlund on the excessive inflation of higher education, reforms to the Federal Student Loan Program and changes in the college earnings premium caused tuition to increase. All these changes combined to generate a 106 percent rise (in constant 2010 dollars) in net tuition between 1987 and 2010. Changes in the FSLP account for 102 percent of that tuition increase.<sup>17</sup>

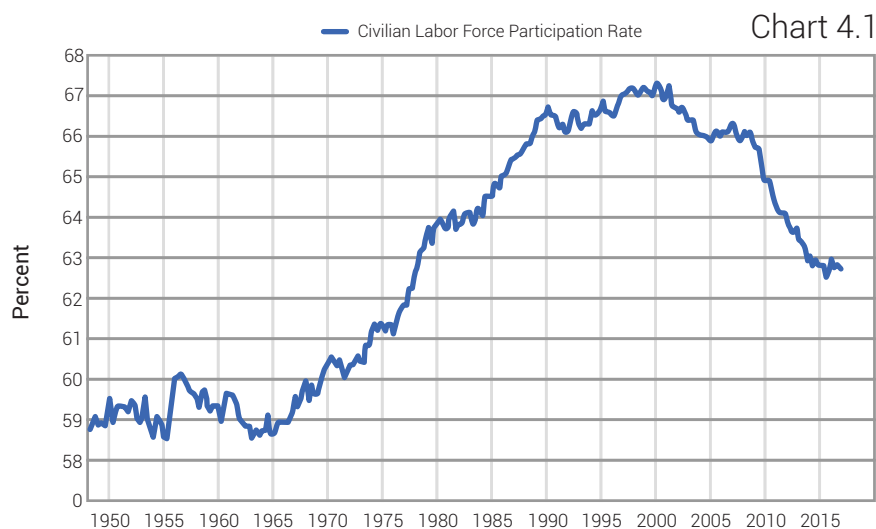
## Economics 101

Since 1978, college tuition has increased 1,120 percent <sup>18</sup>—four times the pace of inflation. Government - guaranteed fixed-rate student loans offer diminishing returns when labor market demand is not properly matched to supply of educated employees. As a result, about 50 percent of college graduates today have jobs that do not require a college degree.<sup>19</sup> The situation is increasingly dire. The United States Department of Labor predicts that between 2010-2020 there will be 17 million new college graduates, yet only 10 million jobs will be created that require a college degree.<sup>20</sup>

Broad access to loose credit in a misgauged market leads to significant underemployment among those with high degrees. High school graduates are now more likely to be employed, own a home, and own a car than their college degree-holding peers.<sup>21</sup> In terms of investment, higher education has diminishing returns.

A generation now carries \$1.3 trillion in student loan debt without corresponding gains in income or employment to pay it down. Barely half of 30-year-olds make more money than their parents, despite being more educated.<sup>22</sup> Their lifetime in debt is due in large part to misguided decision making and mispriced risk.

Riddled with debt, Millennials now postpone major purchases such as homes and cars. Some drop out of the workforce altogether. This has contributed to the lowest labor force participation rates since the 1970s when women began to enter the workforce.<sup>23</sup>



Return on investment varies drastically and is based on the degree and the institution that issues the degree. Federally- guaranteed loans do not vary by degree or school, creating an oversupply of degrees in the labor markets. Put simply, a student with a degree from UC Berkeley will earn about \$1.1 million more than a high school graduate during a 20-year period. However, a student with an art degree from Murray State will earn \$247,000 less than a high school graduate during a 20-year period.<sup>24</sup> The government will price these loans identically, regardless of different risk profiles and future cash flow expectations. This defines mispricing risk and why it leads to inefficiencies in the

marketplace. If we continue to ignore supply and demand in the labor markets while pricing student loans, more subsequent generations will fail our economy.

## The True Value of a Degree

A recently released Department of Labor study indicates that 65 percent of children entering primary school today will ultimately end up working in jobs that don't yet exist.<sup>25</sup> Institutions of higher education must adapt to train a new workforce properly. Moreover, these institutions must justify the increase in tuition given the corresponding job

<sup>17</sup> (Gordon, 2015)

<sup>18</sup> (Economist, 2012)

<sup>19</sup> (Adams, 2013)

<sup>20</sup> (ProCon.org, n.d.)

<sup>21</sup> (ProCon.org, n.d.)

<sup>22</sup> (Davis, 2016)

<sup>23</sup> ((FRED), 2016)

<sup>24</sup> (Economist, 2014)

<sup>25</sup> (Forum, n.d.)



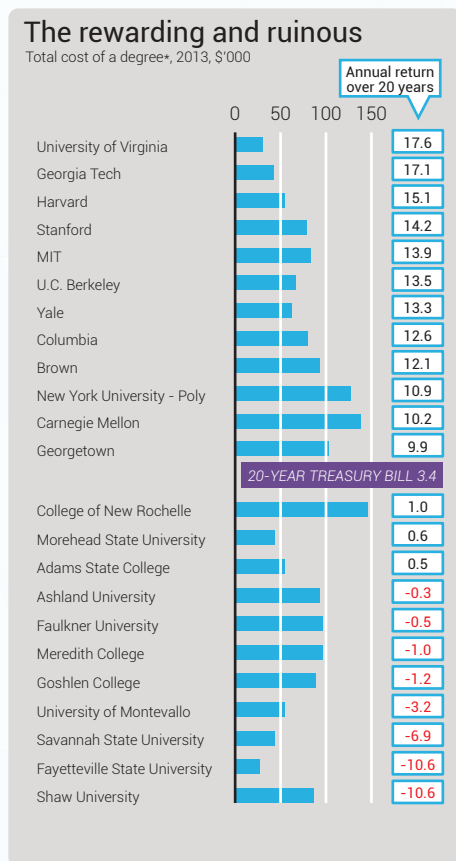


Chart 4.2

placement and market-readiness results. We must turn away from university enrollment rates as an indicator of economic success and revisit the supply and demand of higher education altogether. The system must allow for the interest rate to float so student loans can be priced appropriately to mitigate risk.

Just as public companies frantically boost profits each quarter, U.S. lawmakers have come to gauge success by rates of homeownership and higher education, and as a result, long-term strategy is compromised for short-term gains.

## The Low Rate, Low Return Conundrum: Low-Interest Rates Impact Pension Returns

The cycle of miscalculated inflation coupled with the political pressure to drive economic growth, home ownership, and higher education enrollment has led to a perpetually low interest-rate environment. As illustrated, this has created credit expansion and asset inflation leading to continuous boom-and-bust cycles. However, a much greater liability lurks in the shadows.

Low-interest rates should spur growth by encouraging borrowers, but they often discourage savings, a vital component of our financial health. The unintended consequences of low-interest rates impact savers. Japan and parts of Europe are experimenting with negative interest rates. Central banks are so desperate to spur growth, which will diminish long-term savings to accomplish this goal. Unfortunately, the war on savers by central banks is creating a significantly larger liability than even the 2008 housing crisis. The global pension system is a ticking time bomb.

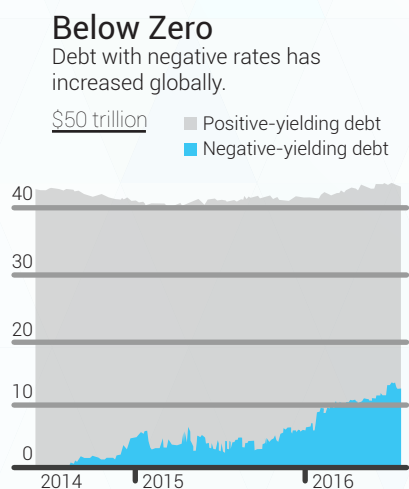


Chart 5.1

Unfunded pension liabilities are probably the most troubling and often overlooked, unintended consequence of current monetary policies. When interest rates are artificially decreased to drive economic growth, we choose to address an immediate problem that may otherwise correct itself over time. This reactive decision making forces lawmakers to act at the whim of the volatilities of a reactive economy.

Because of years of artificially low-interest rates, the pension systems of 20 developed countries are underfunded by \$78 trillion.<sup>26</sup> Global central banking policies have contributed to a global average government pension fund contingent liability growing to 190 percent of GDP, nearly three times traditional GDP to debt ratios for a country. These unfunded liabilities often go off balance sheet and are unreported. Countries are turning a blind eye to this ticking time bomb in our economy. This is an undeniable side effect of the unhealthy relationship between manipulated interest rates and mispriced-risk in our economy.

<sup>26</sup> (Citi GPS, 2016)

Unfortunately, the negative and low-interest rate experiment by the global central banks is having the opposite effect of its intention. In theory, negative and low rates should incentivize companies to borrow and savers to move their money into riskier investments like stocks. However, consumers are saving more and businesses are holding onto cash in countries with low or negative interest rates. This contrary consumer and corporate behavior is eroding the theory central banks use to justify this corrosive monetary policy. Negative interest rate bonds continue to grow globally, illustrating the flaw in the rational choice theory on which the central banks built their monetary policy.<sup>27</sup>

Mispricing risk through low-interest rates creates asset bubbles and boom-and-bust cycles in our economy. Even worse is the erosion of savings and the viability of a thriving aging population. The effects of poor monetary policy leave countries potentially crippled with unfunded pension liabilities and no growth to show for the efforts. Global central banks continue to double down on these harmful policies by lowering rates and expanding the money supply at the expense of our global pension system.

## Negative Innovation: How Monetary Policies Affect Business Innovation

Global central banks employ low and negative interest rates to spur growth and encourage borrowing for investment. Theoretically, this should also incentivize savers to move their capital to more risky assets such as the equity markets. This means companies can borrow and invest more money at lower rates, which should theoretically drive greater productivity, job creation, and innovation.

Instead, companies are leveraging low rates to borrow—but not for growth. This cheap borrowing does not encourage business investments; rather, it encourages share buybacks. In the last three years, U.S. publicly-traded companies have bought back \$1.2 trillion in shares.<sup>28</sup> The weakest recovery and business investment in a recent expansion resulted in this counterproductive use of funds.

### Risk Aversion

Index of spending by businesses  
(2009=100)

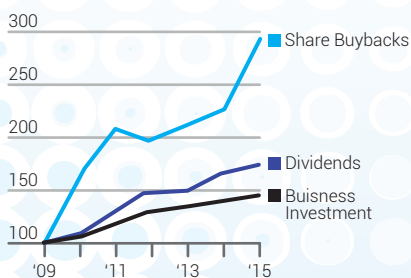
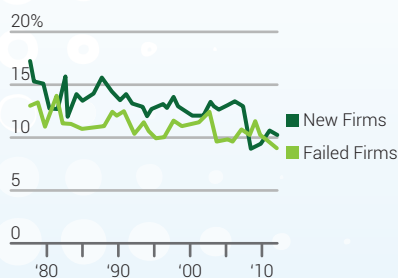


Chart 6.1

Business startups and closures  
as a share of all firms



U.S. corporate spending has increasingly gone to investor-friendly measures like share buybacks over investment in the business, while the American entrepreneurial spirit seems to be fading.

### Plummeting Productivity in the United States Today

The lack of business investment is troubling as investment typically drives productivity. Defined as a measure of output per unit of input, productivity is a key economic measurement necessary for wage increases, higher employment rates, and overall economic health. For decades, wages in the U.S. have stagnated. In periods of great innovation and high competition, rates of productivity rise. Higher output per labor hour increases, raising profitability and, ultimately, wages.

Between 2007-2015, productivity decreased by half to 1.3 percent compared to the prior seven years.<sup>29</sup> Stagnant productivity is crucial to understand and correct to solve for the ensuing symptoms impacting Americans today. High inflation, flat wages, and decreased purchasing power will continue to be problematic if productivity remains stagnant. In this post-recession economy, there is less incentive for companies to increase productivity when money supply expands and prices rise.

Economists with diverse philosophies and perspectives continue to discuss the best way to increase productivity. But, one certain factor is the importance of innovation driven by new business and competition in a marketplace. Periods of business investment and business creation lead to greater recoveries and economic growth. In short, entrepreneurs must drive our economy, rather than a low-rate borrowing environment.

<sup>27</sup> (GEORGI KANTCHEV, 2016)

<sup>28</sup> (Lahart, 2016)

<sup>29</sup> (Luebsdorf, 2016)



## The Extinction of Entrepreneurs

As illustrated, productivity gains after the Great Recession are much lower than comparable expansionary periods. Two specific symptoms are the decline in entrepreneurship and companies closure rates. Since the 1970s, the rate of entrepreneurship decreased to nearly half of what it once was. Now, more companies are closing rather than opening.<sup>31</sup>

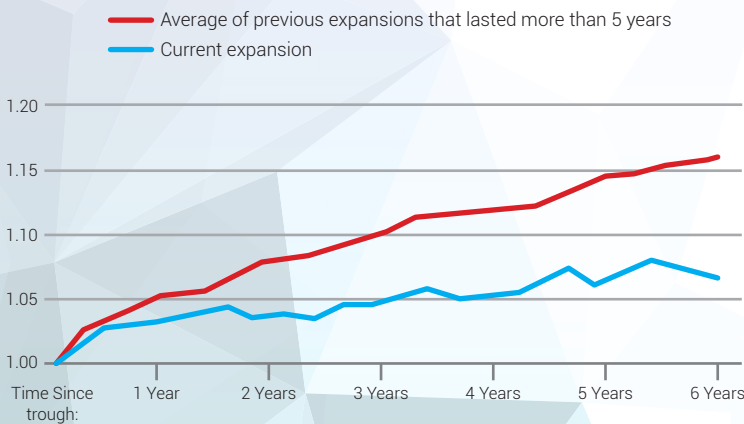
The cause of this decline is multifaceted and hotly debated. During the drastic decrease of new businesses, increased business sector regulations combined with a significant drop in credit extension to small businesses. As a result, we now have some of the highest consolidation of business in modern history. Big business consolidates and gains power every year entrepreneurship decreases.

Declining productivity and entrepreneurship is just another example of when economic theory implemented by central banks fails in the marketplace. Rather than low-interest rates driving business investment as central banks intended, low rates drive share buybacks and consolidation. Large companies use this cheap form of capital to increase earnings per share and dividends rather than investing in innovation.

### Productivity's Plodding Pace

Chart 6.2

Nofarm productivity, Index: 1.00 = trough of business cycle



This cheap capital also funds mergers to drive consolidation. Since 2008, U.S. companies have gone through one of the largest rounds of consolidation via \$10 trillion in mergers and acquisitions. This merger spree increased the concentration of power in two-thirds of industries between 1997-2013. In industries where the top four firms control one to two-thirds of the market, revenues increased 9 percent. However, less than a tenth of economic activity comes from industries where the top four firms control two-thirds of the sales.<sup>33</sup> This illustrates yet another way consolidation and lack of competition drives a decline in innovation and higher prices for consumers.

Artificially low rates and credit expansion by the central banks created an environment of negative innovation and resulted in one of the worst economic recoveries in modern history. In periods of consolidation, large companies welcome insurmountable regulation because it deters small businesses and start-ups that cannot afford to navigate such regulation.

The combination of penalizing competitive players through thick regulation, nonsensical taxation, and the unintended consolidation of corporations limits innovation and deters competition, which both drives the productivity necessary to increase wages and eliminate income inequality.

Since 2009, federal agencies have issued 20,642 new regulations, 566 of which are major new rules with nearly no reductions. This increase in regulations since 2009 costs taxpayers an additional \$100 billion a year.<sup>35</sup> This creates pressure on wages and taxes, further reducing purchasing power for families and entrepreneurs. Over-burdensome regulation creates a snowball effect, perpetuating the problems facing our already struggling economy.

Compounding the problem, states wage war on small business and entrepreneurship through tax incentives and subsidies offered by centralized state economic development authorities. In the name of economic development, individual states compete for business. But in this process, only the large companies win at the expense of small business and entrepreneurs.

According to a study by Good Jobs First, nearly 75 percent of local and state subsidy dollars go to large corporations. An example is Berkshire Hathway, which received \$1.08 billion. Boeing now surpasses \$13 billion in subsidies.<sup>37</sup> These dollars could have encouraged new companies and small businesses.

State and local government use economic development to justify subsidies, but this zero-sum game tries to treat a symptom by making the virus stronger. The further we subsidize big business through artificially low borrowing rates and subsidies, the further we drive entrepreneurship into extinction and hinder innovation.

<sup>31</sup> (Harrison, 2016)

<sup>33</sup> (Economist, 2016)

<sup>35</sup> (Gattuso & Katz, 2016)

<sup>37</sup> (Mattera, 2016)

## Encouraging Innovation

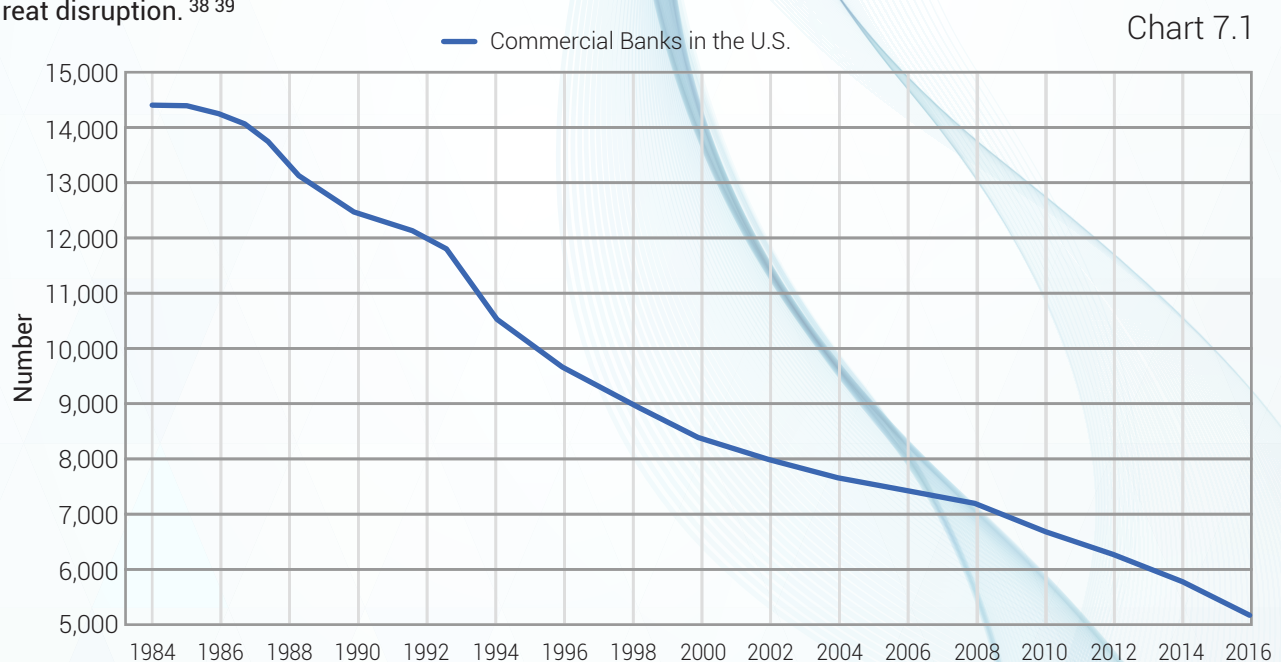
The question becomes how to support business creation and innovation. A highly productive and widely accepted brand example for a quick study is UBER. By introducing highly innovative technology to a relatively uncompetitive marketplace, the company created higher output per operating hour by introducing a more efficient model into a decades-old industry. The product's lower prices drive wages to drivers interested in a new form of supplemental income from a traditionally depreciating asset.

Despite positive results and record levels of private investment, taxi industries, lobbyists and policy makers resist this innovative technology. In some cases, local governments tax ride-sharing with the sole purpose of supporting the taxi industry's attempts to compete. This is literally a tax on innovation and productivity—an unprecedented event in our economy.

Policy and attitudes must change to allow entrepreneurs to create the next generation of innovation and address stagnant wages and productivity. For the next Apple or Google to emerge, a drastic change in monetary policy is required

## The Great Disruption: Taking Back Our Money and Banking System

The case studies and overview to this point paint a dark history of boom-and-bust cycles driven by a centralized banking system manipulating the economy at the expense of hard-working families. Consumer confidence in banking is at a 30-year low—and rightfully so. In the early 1980s, consumers could choose from about 15,000 banks. By 2016, that number dwindled to 5,000. Twelve banks control 70 percent of the banking assets. The banking system is prime for a great disruption.<sup>38 39</sup>



"If the American people ever allow private banks to control the issue of their currency, first by inflation, then by deflation, the banks and corporations that will grow up around them will deprive the people of all property until their children wake up homeless on the continent their Fathers conquered. I believe that banking institutions are more dangerous to our liberties than standing armies. The issuing power should be taken from the banks and restored to the people, to whom it properly belongs." — Thomas Jefferson

Thomas Jefferson warned of the dangers of private citizens relinquishing control of banking and currency. Jefferson could have never imagined a central bank in America that controlled the issue of money and interest rates. The very centralized power our founding fathers fought to protect us from has come to fruition. Much like the frog in boiling water, Americans have slowly allowed the banking cartel to take control of our money and, through that, our lives

<sup>38</sup> ((FRED), 2016)

<sup>39</sup> (Fisher, 2013)

For centuries, no force could fully wrest control from the banking cartel, government and large institutions that monopolize our money and banking system. The idea that money and banking could exist outside of government has never been possible—until recently. A small group of brilliant activists and entrepreneurs have started a revolution against the banking cartel through the development of innovative technology. No one owns this technology, which gives the people the blueprint to take our money and financial system back. This technology disrupts centralized power and banking through open-source systems that will decentralize and distribute our financial system.

A group of rogue entrepreneurs and coders fight against the same tyranny of centralized power as our founding fathers. This movement is not centered on greed or power, but rather aims to take back what rightfully belongs to the individual. This movement and philosophy take form in a new technology called the blockchain. The DNA of the fintech movement, blockchain is the Trojan horse that will disrupt the corruption of the central banking system.

## Blockchain: The DNA of Fintech

In November 2008, an individual named Satoshi Nakamoto sent out a white paper, "Bitcoin: A Peer-to-Peer Electronic Cash System," which gave birth to the DNA of fintech. No one knows who Satoshi Nakamoto is or whether it is a woman, man, or group of people. The first version of Bitcoin software shortly followed white paper's release. Nakamoto continued to work with an open source group to develop the software until abruptly leaving the project in 2011. This unknown entity gave society a gift that could change banking and finance forever.

What better way to start a new financial revolution than through an anonymous pseudonym? In all reality, this is how it had to be. Core Bitcoin developer Jeff Garzick put it best:

"Satoshi published an open-source system for the purpose that you didn't have to know who he was, and trust who he was, or care about his knowledge. Open-source code makes it impossible to hide secrets. The source code spoke for itself. Moreover, it was smart to use a pseudonym, because it forced people to focus on the technology itself rather than on the personality behind it. At the end of the day, Bitcoin is now far bigger than Satoshi Nakamoto." — Jeff Garzick

Bitcoin is the most popular and widely adopted cryptocurrency, a digital currency in which encryption techniques regulate the generation of units of currency and verify transfer of funds, operating independently of a central bank.<sup>41</sup> For the first time in modern history, technology allows for a decentralized medium of exchange independent of central banking. It allows a peer-to-peer medium of exchange based on a public and transparent general ledger protected by cryptography. Cryptocurrency is created by the collective peer-to-peer system and produced at a rate that is agreed upon and public at its creation.

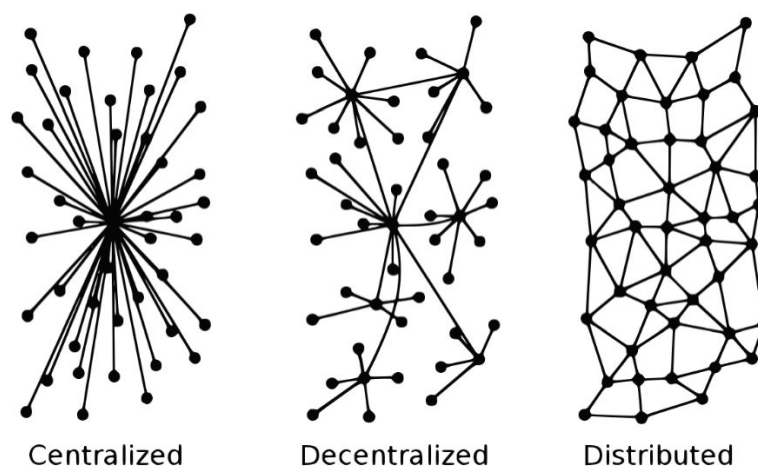


Chart 7.2

Most cryptocurrency systems are built like a precious metal-backed currency. Over time there is a reduction of units issued and, ultimately, a cap on the total amount of currency. Unlike the current central banking system, this does not allow any central power to adjust the integrity of the currency for political or economic reasoning. Therefore, the blockchain offers the purest medium of exchange in the marketplace.

<sup>41</sup> Oxford Dictionary



Bitcoin technology is built on a decentralized and distributed public ledger technology called the blockchain. This challenges the very essence of the central banking system and the need for an institutional intermediary.

The blockchain public ledger is a series of transactions verified by the peer-to-peer system and stored chronologically in blocks that are chained together over time. The system maintains its integrity and security through cryptography and multiple peers that verify every transaction. This takes power from one central institution such as a central bank and spreads verification across thousands of peers through a public ledger.

Unlike the blockchain, the current fractional reserve and central banking system work more like a cartel. This centralized system only survives because of a small group of institutions controlling the market and coordinating through this central authority. At its essence, this could not survive if each individual was fairly represented. The fractional reserve banking system maintains a status quo. The cartels agree not to compete, not to challenge one another's deposits, to grow at a similar pace, and to charge similar fees. As a result, 12 banks hold 70 percent of the banking assets.<sup>42</sup> To survive the Great Recession, this system required more bailouts from The Federal Reserve and the too big to fail legacy continued on. However, this system cannot survive if each individual is fairly represented.

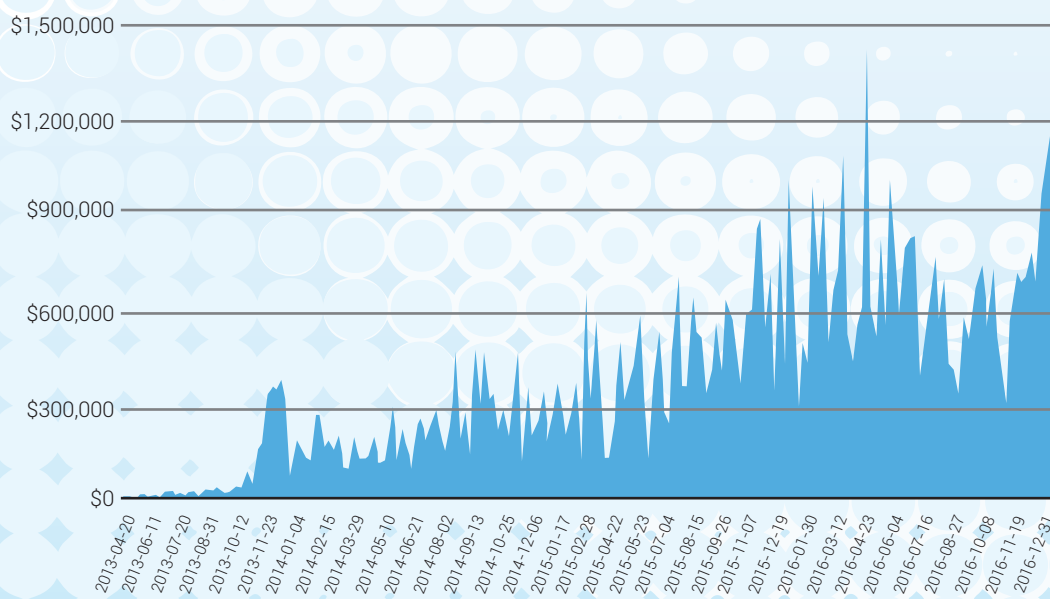
The blockchain presents a clear alternative because it acts like banking in its purest form. Individuals represent themselves, bringing discipline and transparency to the financial system.

We can look to other central banks around the world for potential insights. If we are wise, we can use the failures of central banking in other countries as a motivator to adopt technologies and systems that will bring stability to our banking and monetary system. Demand for cryptocurrency is outrageously high in regions like Latin America and parts of Asia, where decisions of central banks often cause hyper-inflation or prohibit access to hard cash.

Just recently, a small group of central bankers and politicians in India decided to eliminate high denomination currency abruptly. India's government's good intentions to clean up the black market sent its economy into a tailspin. Major shortages of currency ensued, shutting production down in parts of the economy and slowing one of the fastest-growing economies in the world. Chinese citizens make significant Bitcoin purchases because of the quickly depreciating Yuan and strict currency controls. The Chinese government's manipulation of currency to drive exports hurts its citizens by devaluing their currency and depleting their purchasing power.

There is no greater example of central banking failure than in Argentina, a country incapable of controlling inflation since World War II and has since experienced hyper-inflation as high as 20,000 percent in the late '80s.<sup>43</sup> Argentina has become the showcase for cryptocurrency to prove its worth as decentralized medium of exchange replacement for currencies gone bad.<sup>44</sup> Examples such as this match Austrian Economist Friedrich Hayek's prediction of future demand for alternative private currencies in his book, *Denationalization of Money*.

Weekly Local Bitcoin Volume (Argentine Peso) Chart 7.3



<sup>42</sup> (Garofalo, 2013)

<sup>43</sup> (Engelmann, 2016)

<sup>44</sup> (CoinDance.com, 2017)

Can society have more trust in thousands of peers holding one another accountable publicly or a small group of institutions controlling the process privately? The question compares a collective peer group to an institutional cartel. The answer is a philosophical decision that our society must make via its adoption of this new technology and the bank of the future. For the first time in modern history, consumers finally have a choice in the matter. We can now own the issuance of our currency as Thomas Jefferson hoped we would. Fintech disruptors have delivered the technology we need, and society must adopt this system in defiance to a broken central banking authority that squandered our currency.

## The Bank of the Future: The Full-Reserve Fintech Bank

The future of banking and fintech depends on rapid technology adoption, a shift in economic philosophy, and in freedom from traditional financial institutions. Better consumer choice will come through disruption by leveraging more efficient technologies. Only through competition can we put pressure on the 500-year monopoly in the banking system.

Imagine nothing changes and the banking system as we know it maintains status quo. Imagine this boom-and-bust cycle with manipulated interest rates and expansion of money supply continues to protect short-term comforts. By 2030, we will face the greatest global financial crisis in modern history. Much of the developed world will function in negative interest rates and will barely survive several rounds of quantitative easing and other failed attempts to fix the economy. Typical monetary tools will no longer be effective. Unemployment will reach record highs as entrepreneurship continues to decline. Productivity will fall to the lowest rates in history. Foreclosure rates will skyrocket as federal mortgage and student loan agencies lobby Congress for yet another bailout. Banks will freeze deposits. Consumer confidence in the banking and political system will hit an all-time low. Mobs will demand real, lasting change. This future is exactly where we are headed if we continue down this path.

Consider a better alternative. The deleveraging of the global economy will be a historical event and will forever change society and monetary behavior. For the first time, U.S. consumers will rethink the financial system. Society will question government's ability to set rates and print money responsibly. Consumers will demand choice, which technology will provide, and will lead monetary policy to transition to a sound, decentralized financial structure. They will adopt higher interest rates that are priced accurately to match risk. A new financial system will emerge, backed by sound math and technology that cannot be manipulated by a central authority. Many of today's latest financial technologies will create the bank of the future, as well as consumer appetite and readiness to change behavior. They will demand a redesign in the interaction between the government and banking, and the relationship between banking and financial products.

## Full Reserve Banking

A complete financial system redesign will take a multi-faceted approach across financial markets.

The first step in this process is ensuring the return to the integrity of personal property rights by replacing the fractional reserve banking system with a full reserve banking system. The bank of the future will keep deposits fully reserved. Banks will not be able to expand credit and money supply with consumer deposits. Bank depositors will have full access to their deposits at any time, a step to rebuild trust.

Although this will be highly unpopular with the banking cartel, it is the purest form of banking and is now possible due to technological advancements. With banking becoming more digital, the days of an infrastructure-heavy banking system are behind us. The mobile phone is quickly replacing the neighborhood bank, and this drastically reduces infrastructure costs. The reduction of infrastructure costs and the adoption of technology will allow banks to be less reliant on credit expansion. Fintech companies are already proving that they can stand alone without the use of the fractional reserve banking system to survive.

Through the full reserve banking system, consumers may choose to leverage deposits depending on their comfortable level of risk and investment preferences. In other words, consumers will have the autonomy to decide which currency or commodity to hold their deposits. Consumers can choose from various forms of exchange including, but not limited to, cryptocurrency, gold, silver, and fiat currency. The full reserve banking system will properly protect consumer and business deposits, and not decrease their purchasing power through misinformed credit expansion.



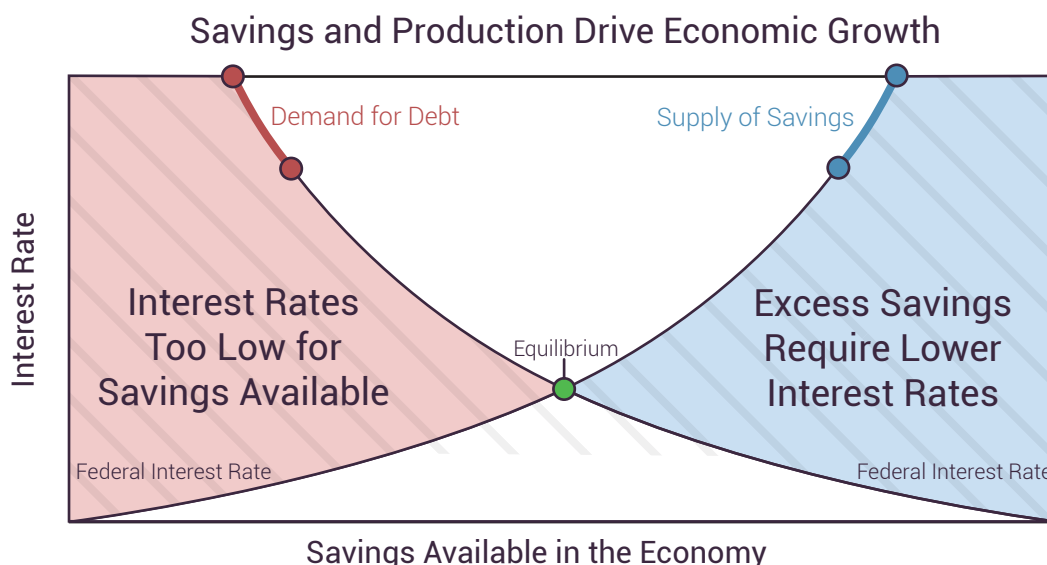
This will introduce the necessary discipline to avoid the severe boom-and-bust cycles created by fractional reserve banking. Full reserve banking will create borrower and saver equilibrium by correctly setting the natural interest rate. The economy will have sound money without risk of hyperinflation or deflation. It will fundamentally change banking, our economy, and our lives for the better. It is a step our society must make to leave behind the dysfunctional, destructive depressions and recessions created by the fractional reserve banking system.

## Improved Risk-Based Pricing Mechanisms

A fundamental shift in the banking model from fractional reserve to full reserve will change how risk is priced and will ultimately reset the natural interest rate. Without the false credit expansion of fractional reserve banking, banks will properly set rates based on time preference and risk.

Today's approach to governing credit markets accepts that controlling interest rates is the best method to influence outcomes. To democratize lending, we must allow the supply of savings to the demand of debt in the free market to set prices and interest rates. Economics 101 reminds us to set prices and inventory by market demand. Applying the same method to interest rates can work today thanks to technological advancements in data science and machine learning. Instead of manufacturing interest rates in response to political desires or economic engineering, we must instead turn to intelligent, risk-based pricing.

Chart 7.4



New financial technology companies combine increasingly available behavioral data sets with machine learning to more accurately assess the level of individual and market risk. This new ability to make highly-informed, dynamic, risk-based pricing decisions provides more fairly-priced lending for every consumer based on their unique and proven ability to pay, which is calculated by much more than the traditional indicators of a credit score.

This approach benefits consumers most of all. Adoption of a risk-based pricing model will require a shift in thinking. Our culture is accustomed to artificially low rates, so accepting higher rates will be a difficult adjustment on a grand scale. In the interim, consumers are quickly adopting this approach through new, alternative lending sources in the fintech space such as peer-to-peer and alternative lending. The shift is underway. Consumers, whether they're aware, are demanding a better option and improved access. The innovation in fintech is built upon this demand.

Currently, 138 million Americans are not served by existing financial products. This shift in philosophy will open credit to a broader group of consumers and businesses rather than just the bankable elite. New technologies allow this transition to be smoother given the refinement of pricing. Highly intuitive and constantly improving algorithms create these enhanced pricing models. Savers or investors may be the first to champion the new system for improved returns and expanded investment opportunity, indicating a system of strong integrity

## Sharing Economy Lending

Without the fractional reserve banking system, lending models must adapt to sharing economy methods or use traditional certificates of deposit. Under the sharing economy model, savers and lenders share in the risk and possible reward by lending money to one another. This is a similar model to UBER or Airbnb, where one individual leverages an asset that another person wants, supporting an efficient exchange between two private parties.

Banks currently assume lending risk and account for it through fees and penalties applied to consumer deposits. Bank fees actively charge consumers for this privilege. The bank of the future will use a peer-to-peer lending model. Interested consumers can actively accept the risk and return of an investment to share in that reward with the lender. This will bring forth a lending model aligned with property ownership laws, as cash will be kept with the same diligence as commodities face today. For example, if you choose to rent an apartment you own, you set the rental agreement terms and select the renters. That same logic will be applied to savings and deposits. This model allows for individuals to share in the return on investment. Like property investments, this might also help with retirement and supplemental income.

## Enhanced Personal Finance Management Platforms

American families are budget-crunched, and many are in a negative cash flow cycle. An estimated 69 percent of U.S. families have less than \$1,000 in savings.<sup>45</sup> To balance average household income with expenses, we must take a two-part approach. First, we must price risk properly. Then, we must help borrowers change behavior and become savers. Both steps must happen in unison to generate returns high enough to reward savers and change behaviors of current borrowers properly. This is a fundamental shift in behavior that will occur once interest rates are properly set to their natural levels.

In shifting the banking model from fractional reserve to full reserve, a significant change in behavior must occur. Credit must be an extension of savings and not an expansion of money supply. This is a fundamental shift in philosophy, and financial institutions should bear some responsibility to help turn perpetual spenders into savers. Programs must be created to support savings. The goal of such a program is to eventually eliminate a consumer's need to borrow, to help them build long-term savings, and build an individual's reputation so they can better pay back debt at lower rates in the future.

Adequate savings and risk-based pricing of credit will bring back stability to the credit markets and help to democratize lending. Over-supplied, mispriced credit will be eliminated and greatly reduce asset inflation and income inequality.

Emerging personal finance tools and fintech platforms have the power to help consumers navigate thousands of transactions, multiple budgets, daily behaviors, and investments with ease. The data collected through those platforms, including online banking today, allows for more accurate representations of true consumer habits and needs in the market. This data also provides more reliable indicators to set pricing for finance and a modern solution to calculations like the Consumer Price Index. More informed consumers can make better financial decisions. The public will be able to implement its own system of checks and balances to monitor government and banking institution decision making on inflation and prices.

## Peer-to- Peer Payments and Mobile Banking

The banking system monopolizes transactions between parties. Until recently, individuals could not make a payment without a third-party intermediary, creating inefficiencies in transactions and a cartel-like business controlling every transaction. With the consolidation of banking, few options existed for consumers to hold money. As a result, consumers paid \$6 billion to the top three banks for ATM and overdraft fees in 2015.<sup>46</sup> Credit card fees topped \$90 billion in 2014.<sup>47</sup> Consumers and businesses pay to transact and hold money, driving up costs and creating inefficiencies.

Banks and payments companies have every right to earn a fee, but for far too long there has been strong, cartel-like monopolies in the payment and banking space driving up fees over time. Fintech is pushing back, leveraging better technology to bring cheaper fees and less friction to business and consumers. Companies like PayPal and Venmo allow for efficient and affordable currency exchange. Peer-to- peer payment technologies and systems allow for greater flow of currency with fewer fees contributing to banking institution intermediaries. Mobile banking companies like Chime and Aspiration do not charge overage fees or for ATM fees. These state-of- the-art mobile banking platforms encourage savings and investment.

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<sup>45</sup> (GoBankingRates, 2016)

<sup>46</sup> (Long, 2016)

<sup>47</sup> (Andriotis, 2015)



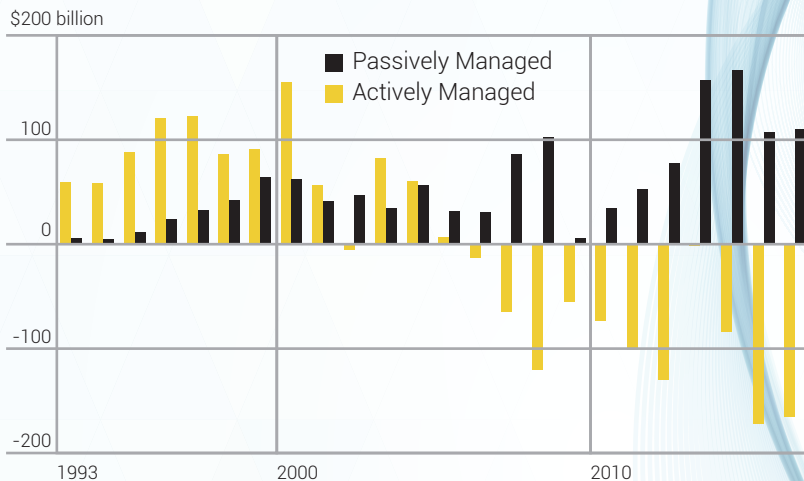
We are witnessing the first competitors to the market disrupting the very service upon which banking is built. Driving down transaction costs and friction while promoting savings and investment will quickly drive deposits and transactions away from traditional fractional reserve banks. The mobile banking platform is the perfect jumping off point for the full reserve banking system.

## Robo and Passive Investment Advisors

With perpetually low rates and an ever-widening pension gap, the importance of smart, cost-effective investments is essential to Americans. Machine-learning algorithms and passive index funds change the landscape for investments by mitigating risk. By removing the human element, everyday borrowers can now access a good portfolio and gain returns in the stock market. Investing becomes much more approachable to the masses.

### Actively Departing

Net flows of U.S. stock mutual and exchange-traded funds



Over time, as machine-learning capabilities and algorithms improve predictive capabilities, retirement savings will improve. Access to public equity and debt markets will broaden to a wider market of individuals who cannot make such investments today.

Currently, just more than 50 percent of individuals participate in these markets, but improved national savings and improved access to public capital markets will ensure that a greater percentage of the population benefits.<sup>48</sup> This will fuel business investment, support marketplace innovation, and improve investment returns for retirement.

During the last three years, a historic transition from active investment to passive investment took place. Investors liquidated nearly \$250 billion from actively managed funds and added \$1.3 trillion to

passive funds.<sup>49</sup> The broker or investment manager that we all like to play golf with is just not as good as the algorithm or index, and a lot more expensive. The new robo-advisors and index funds are opening investment to a much broader audience. This is crucial in ensuring the savings and investments required to maintain properly funded retirement for a society transitioning to a full reserve banking system

## Paying Forward

The bank of the future leverages technology, economic philosophy, and consumer behavior to drive a more sustainable and a mutually-beneficial banking system. The core of the new bank will be built upon blockchain technology and will decentralize and bring transparency to a broken banking system. Leveraging machine-learning technologies and available data will reduce the cost of business and eliminate biased human decision making. Ultimately, this model presents better pricing, returns, and lower costs overall. It will usher in a new generation of financial products that benefit Main Street, not Wall Street.

New economic philosophy driven by technological advancements will broaden consumer choice in markets traditionally controlled by government and institutional monopolies. Although initial costs may be hard to bear, more sustainable, long-term market corrections, independent of manipulation by political, short-sighted governance, will follow.

The shift has already begun. Consumers are adopting new technologies and philosophies, demanding more sustainable personal finances and investment opportunities. Consumers want a return to stability, an economy and banking system built more on savings and investments, and a shift away from unsustainable debt burdens and ever expanding money supply to support boom-and-bust cycles.

<sup>48</sup> (Gallup, 2015)

<sup>49</sup> (Tergesen & Zweig, 2016)

The bank of the future will be so disruptive it will face seemingly insurmountable opposition. It will challenge the very essence of banking, the fractional reserve system, and centralized authority. However, it is imminent. It ushers in a new generation of banking and monetary policy that puts the power into the hands of the consumer. The bank of the future can help democratize our economy and drive a more healthy and stable global marketplace.

The bank of the future will establish safe money and accurate interest rates, deleverage financial markets, encourage savings to drive more equitable lending, and create more opportunities for entrepreneurship and innovation, which will promote fair and free trade. It will be designed to enhance fair competition and drive increased productivity, resulting in increased wages and better income equality.

This is all possible with the fintech revolution and the adoption of sound banking and monetary philosophy. It gives Americans the chance to follow what Thomas Jefferson said more than 200 years ago and take back the issuance of our currency and banking system. It will return individual liberty. The people will be the new banking system. A bank built on Main Street, not Wall Street. A bank for the people and by the people—a return to integrity in our banking system.

# The Great Disruption:

## How Fintech Will Transform Banking

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