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The Future of Banking: The Role of Information Technology

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Abstract – The article examines the impact of information technology (IT) on the banks and on the banking industry as a whole. Over the years, the economic foundation of banking has not changed much. However, as IT-driven banking interactions are extremely cost-effective, the emphasis on transaction banking has been increasing with time. But, the industry should not sacrifice their relationship banking concept. Banks should understand the changing consumer preferences and drive different aspects of IT to make these new demands feasible through relationship banking model. For this, banks may need to re-engineer their relationship banking concepts. Remodeling of banking activities is also required as FinTech companies have been seizing market shares of the traditional banks. Government interference and various regulations are providing some relief to the banking industry for the time being.

Keywords: Banking, Information Technology, Relationship Banking, Regulation

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I. INTRODUCTION

The traditional concept of banking has been embracing information technology (IT) quite rapidly. In a recent survey of the bank's managers in the USA makes it clear that nearly 50% of them talk about information technology during the board meetings and almost three-quarter of them talk about competition from the non-banking organizations. They see formidable competitors in Walmart, Google, PayPal, Facebook, Amazon, and several other similar companies (Bank Director, 2015). Today, the path banks should follow is not very clear. Is the banking industry is ready to defend their market? What competitive advantage do they enjoy?

To predict the road to be followed, at least to some extent, we need to re-examine the economics behind banking. We accept that the need of banking for common people and an economy have not changed yet. Banks act as a source of information where the banking customers get all required information to meet their basic financial needs. Banking regulations are important because they have a specific need for an economy as a whole. However, bank customers changed a lot over the past two decades. A remarkable shift is on the way. The banking customers are demanding ceaseless connectivity, easiness in transactions, and more power.

Developments in IT changing the way banking business are done. IT can show the banking industry various cost-effective ways to conduct their business. However, relationship banking still relevant and we strongly support that system of banking. Human decision-making is still important in certain activities, especially where banks lack relevant data. So, IT should be applied for the improvement of relationship banking.

The banking industry has also been changing as several FinTech and IT companies but the core banking services are still regulated by the authorities which provide a highly competitive advantage to the banks.

This article is organized as follows:

Section 2: Economics of banking including the present banking environment.

Section 3: Discussion of the impacts of IT on the development of the banks.

Section 4: Analysis of the core changes brought by IT in the banking industry.

Section 5: Conclusion of the article.

II. ECONOMICS OF BANKING AND THE CURRENT BANKING ENVIRONMENT

A. Raison D'être of Banks

Understanding the basic economics of banking is essential for understanding the impacts of IT. The contemporary theories on the financial intermediation see banks as the sources of information and financial capital users (Greenbaum, et. al., 2015).

While performing their brokerage function, banks meet the complementary needs of the counterparties. For instance, an investment bank acts as an intermediary for the customers that want to buy IPOs and securities of other companies. Though each customer who wants to invest in IPOs or securities could find new and attractive securities on their own, taking help of an investment bank makes their job easier and faster. It generates the economies of scale. A brokerage function is perfect for the transaction-based banking. This kind of banking facilitates a particular type of transaction become a repeated transaction for thousands of customers (Boot, 2000).

A bank goes some steps more while performing the function of a qualitative asset transformation function. In this function, a bank deals with the counterparties directly that exposes the bank to certain kinds of risks such as liquidity risk and credit risk. The most vivid example of qualitative asset transformation is the most traditional banking activities like accepting public deposits and funding various types of businesses. Deposits are more liquid and less risky whereas loans are riskier.

Banks work on the qualitative asset transformation to meet the customers' requirements. They develop the expertise to manage the risks and improve core problems related to information transfer to the customers. Banks can lower their risks and hazards by focusing on the core problems that generally stem from the traditional concept of relational banking (Boot and Thakor, 2000). In this process of banking, banks create a bond with the customers through constant interaction over a period of time. When the bank interacts with a customer over a long period of time, they could gather different information about the customer that helps to comprehend the reliability of the customers. However, these kinds of comprehensions are tough to quantify. The bankers need to depend on their experience only.

B. Regulation of Bank

Banks are very essential for the smooth functioning of the real economy. The worldwide economic crisis provides a key instance of how essential the constancy of banking is and, particularly, how comprehensive the adverse externalities of bank catastrophe are. Bank catastrophes may spread through the financial system contagiously. It may also result in disaster in the systemic banking system with an enormous cost for the actual economy. It is also seen that in absence of banks the small firms are likely to riddle with information irregularities and are also incapable of tapping the financial markets. Apart from that, it may not get funds to perform their projects. Several savers may delay their investments in case the choice of safe deposits is not there on the table. There may be a risk in the payment system as well and it may certainly lead to suffocation of the actual economy.

Adverse externalities of bank catastrophes call for widespread protection in banking that may range from deposit insurance, central bank interference policies, and government provision, or even bailout, to absolute nationalization of unsuccessful banks. Policymakers recognized that the business of some bank (for example, payment system processes, deposit-taking action, and retail loaning) is so essential that it requires to be protected during the crisis period and thus requires to be protected from riskier bank actions (for example, investment banking, trading as well as bank actions on the capital markets).

C. Changing customer preferences

In spite of the extreme composite supervisory framework, banks are alert that their main function is to serve their customers and it is required to adapt to the digital system. The customers of the bank are changing very rapidly. They desire to get reasonable service which is tailor-made to their requirements and available at any place and also at any point of time. They need a faultless multichannel experience. The customers of Bank desire to be authorized for making their personal decisions. Apart from that, it is also seen that the interaction with the customer plays a great role. But it is also true that the excellence of bank products, as well as services, still plays a great role apart from the banking experience. Banks need to be alert that they require to be an attractive place.

The outcome of these arguments is that banks obtain their competitive benefits in justifying their information issues, partly through brokerage but mainly with the help of qualitative asset transformation as well as through relationship banking. Thus there is no doubt that banking will still continue to be a deeply controlled business at its core. But the biggest question is how to familiarize with the innovative preferences of customers and how to hold innovations that mainly stem from the development of IT.

III. TRANSFORMATIONAL EFFECTS OF IT ON A BANK

The developments in IT have caused an extraordinary change in the whole banking industry. Large-scale transmission through Internet permits for the everlasting connectivity. Apart from that, the enormous data that can be found on the Internet makes it possible to low-cost data mining potentially with the help of cloud computing and also on the basis of open-source software. Due to the enhancement of artificial intelligence, it is seen that the fast algorithms are now becoming much smarter.

A. Communication

Online banking has already begun to upset the bank branch networks. The number of branches of credit institutions is found to fall from 182,478 in 2010 to 159,397 in 2014 in the euro area (Banks vs. Alternative Payment Providers, 2015). The present customers of the bank are now proud to avoid going to the bank branch network. 10,000 US "millennials" were researched (i.e., the bank customer who was born in between the year 1981 and 2000), and it was found that 68% of these bank customer said that "*in five years, the way we access our money will be totally different*." 71% would "*rather go to the dentist than listen to what banks are saying*."[3]

Thus it can be concluded that the branch network requires to be reconfigured in the direction of highly information-driven as well as personalized bank products and services.

B. Automation

It is seen that the development in IT have created considerable cost savings, particularly in numerous areas of transaction banking. Bank can certainly manage economies of scale (Beijnen and Bolt, 2009) in terms of payment processing. It can also get the advantage of clearing as well as settlement systems (Berger and Udell, 2006). Nowadays paper-based payments are getting replaced with electronic payments, for example, credit cards, debit cards, e-money purchases, and mobile payments. Online access channels have the full ability to generate more cost savings. In order to develop economies of scale, banks can provide scalable transaction banking instead of concentrating on developing long-term relationships with that of their clients.

Boot and Thakor (2001) has shown a certain problem that exists in the traditional strategy. The competition that is there in transaction banking is more forcefully corroding the bank rents. That is the reason why turning to relationship banking can be still the best road for the banks.

C. Decision-making

The development in IT has made it possible to avail automated decision-making in bank lending. There are numerous transaction lending techniques that permit the banking industry for collecting, combining as well as using huge array of quantitative information about their clients, for example, financial statement of lending history of the client, credit scoring of some small business, asset-based lending history of client, factoring as well as fixed-asset lending history of client (Berger and Udell, 2006). Some people may concern about the fact that artificially intelligent computer programs can exceed humans in terms of the credit history of the customers of the bank. It is certainly a big question that whether the automatized decision-making can make the transaction lending in the same way human decision-making does and whether it can the relationship banking out-dated?

Long before, computers programs had exceeded humans during a chess competition and from the developments in IT have become huge. But in 2011, the IBM program Watson constantly outperformed the best human contestants in the US open-question quiz show. Thus Computers appear to be stimulating their existence in the financial markets. Computer programs presently perform on most of the professions on the US Treasury market.

The former chairman of the Federal Reserve, Ben Bernanke, argued that bankers still have superiority. "*The largest banks typically rely heavily on statistical models to assess borrowers' capital, collateral, and capacity to repay, and those approaches can add value, but banks whose headquarters and key decision-makers are hundreds or thousands of miles away inevitably lack the in-depth local knowledge that community banks use to assess character and conditions when making credit decisions. . . . The IBM computer program Watson may play a mean game of Jeopardy, but I would not trust it to judge the creditworthiness of a fledgling local business or to build longstanding personal relationships with customers and borrowers.*"

Although Citigroup somewhat disproved what Bernanke had said by hiring Watson to reshape their products in their retail operations. The current local banks that are built on the relationship banking can still continue to have an advantage. They need to concentrate on those segments where information difficulties are the most noticeable. Parkes and Wellman (2015) debated that artificially intelligent computer programs have the chance to grasp the idea of *Homo economicus* — a legendary, fully rational, and self-engrossed agent. However, it can be quite different from how humans act (Parkes and Wellman, 2015). As for example, a poker game that does not have complete information can be very difficult for

computers for mastering into it as compared to that of chess which has complete rules and information. That means there is a chance that computer matches a perfect opponent without providing him any incomes in the long run. However, it is seen that computers follow the same approach irrespective of the opponent. That is, the computer does not have the ability to enhance their approach when competing with an error-prone human performer.

Artificial intelligence still has a chance of dealing with incentives, information difficulties, and absurd human behavior. Apart from that, the massive data on the Internet are mostly made on a cross-sectional basis. Getting a time dimension can be more problematic. Relationship banking which is actually built on long-term, as well as informational intense collaboration with the customers of the bank, continues to be very essential.

D. Empowering the customers of the bank

It is seen that the customers of the bank want more and more tailor-made facilities which can suit their requirements. Bank customers are now no more want to follow the norms of the bank rather they want to make decisions themselves. Apart from that, it is the entertainment that actually matters. Nowadays it is seen that the banking platforms are largely getting high interactive day by day, presenting advice with the help of different media channels. Mobile banking is not providing the balance check or account history, but it also provides the facility of photo bill paying, voice assistance as well as discounts with merchants.

IV. CHALLENGES FACED IN THE BANKING INDUSTRY

Developments in IT have not only extended the markets but it also enhanced the level of in the banking industry as well which also resulted in the formation of numerous new competitors. With the increase in competition, the startups FinTech are started to develop. Not only is that, the IT companies that were already-established also found to enter into the business of traditional banking.

Those who are Peer-to-peer lenders started to employ the IT platforms for lending in the same manner what Uber used to do for their cars and Airbnb does for providing lodging. There are many Peer-to-peer lenders for example Lending Club, Prosper, and SoFi which usually match debtors and creditors together. It is true that this sector is small as compared to that of the banking industry, but it is growing rapidly and is found to be double its size after every nine months (Beijnen and Bolt, 2009). It is seen that the Peer-to-peer lenders gathers the arrangement fees and examine the credit-scoring on the basis of the customer data that are from the credit agencies. Examples of credit agencies are FICO or Experian. It is also found that they also collect customer data from the Internet as well. There are a few peer-to-peer lenders who used to apply some new methods for finding out the credit score of the customers, for example, analyzing the online behavior of prospective debtors. The predetermined features actually vary across all peer-to-peer creditors. Some of them permit the creditors to choose the debtors while others check the protection funds for offering some compensation for that of the defaulted loans.

There are some crowdfunding start-ups for example Kickstarter which used to bundle fund along with the selling goods which are otherwise tough to trade (Agrawal, et. al., 2014). Crowdfunding uses the insight of crowds for enhancing the funds. It is very essential to know the demand for a product for forecasting the forthcoming success of the business. Apart from that, the behavioral biases of humans, for example, herding is also analyzed by the Crowdfunding platforms. There are some examples where it is seen that the depositors are very keen to invest in that type of the project which already has a huge accumulated capital.

Payments have conventionally been a profitable business for the whole banking industry. Currently, the payment landscape is redesigned drastically, that putt a challenge on the traditional players such as banks as well as the credit-card providers which actually provides Visa card and Master Card. The peer-to-peer money transfer is found to be flourishing in the US. Venmo is a part of the PayPal Company that permits easy transfer of minor amounts of cash. Along with this, it is seen that some major IT companies have joined the battle. Facebook also entered into the market and started the money-transfer business. Some major company such as Apple Pay, Android Pay, and Google Wallet are also found to be enhancing mobile payments.

FinTech startups are found to be growing in mobile payments. Banks now have to contest with the established IT companies, for example, PayPal as well as with new providers, for example, Stripe or Square. Square is the company that offers mobile payment processing for in-person payment whereas Stripe now has partnered with Visa and start concentrating on the Internet payments (Gilje, et. al., 2013).

New solutions have now decentralized the trust. Traditionally, we have always seen that trust is made by centralization that is either by the government funds or central banks that are supported by the controlling, supervisory and the legal system. Blockchain technology has now appeared and permits decentralization. It uses the concept of cryptology and peer-to-peer confirmation for allowing issuance of crypto-currencies for example, Bitcoins. Though Bitcoins

is seen to suffer in the recent times as a result of considerable instability in their value as well as weaknesses on the subtle points of the infrastructure (such as Bitcoin exchanges), the trust that can again be recognized in a decentralized method is really astonishing.

V. THE ROAD AHEAD FOR BANKS

The developments in IT are found to reshape drastically the whole notion of the bank. Automation, as well as algorithmic decision-making that are made on the basis of artificial intelligence, has enhanced the level of competition in the banking industry.

However, traditional banks can retain a reasonable advantage in relationship banking. Relationship banking mainly deals with human inducements. In this case, banks can retain a benefit over the automatic IT-driven decision-making. But it is true that Banks needs to increase their IT systems to boost the customer experience.

Apart from this, there is another area in which the bank has the superiority and that is the banking business with that of the large systemic component. There are some bank activities, for example, deposit taking as it is not possible to leave this activity to market contestants without regulation and supervision. In this case, banks can certainly retain their competitive benefit (Xue, et. al., 2011). It is true that Banks have superior knowledge and understanding of the insuperable controlling framework.

It is seen that people still trust Banks with than that of the IT or FinTech companies as far as money and sensitive proprietary business information is concerned.

But it does not mean that banks should evade the IT developments. It only means that Banks should leverage their relationship banking business and at the same time, they should hold on the IT developments. The road that is ahead for the banking industry is certainly not easy but it is very interesting as well.

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