E-finance, Entrepreneurship & Economic Growth in Developing countries

Achraf Haddad
Master Essay in Economics - 30 hp
Södertörn University — Spring 2018
Supervisor: Johanna Palmberg
Contents

1. Introduction ........................................................................................................................................... 3
   1.1 Presentation of e-finance .................................................................................................................. 5
   1.2 Methodology & Data ......................................................................................................................... 8
2. Literature Review on E-finance and Entrepreneurship in Developing Countries ................................................. 11
3. Implementation and Expansion of E-finance in Developing Countries ................................................................. 14
   3.1 Financial Services and Payment Systems in Developing Countries .................................................. 15
   3.2 Technology and Quality of Infrastructure in Developing Countries ............................................... 20
   3.3 Culture and Institutions in Developing Countries ............................................................................. 21
4. Impact of E-finance on Entrepreneurship and Economic Growth ......................................................................... 23
5. Conclusion .................................................................................................................................................. 26

Annexes ......................................................................................................................................................... 27
References ....................................................................................................................................................... 36

Figure 1: Percentage of adults using digital payments in the world in 2014 .............................................................. 7
Figure 2: Composition of E-finance .................................................................................................................. 11
Figure 3: Comparing M-PESA with alternatives mobile payments in Kenya ............................................................ 17

Table 1: Developing countries of observation .................................................................................................... 8
Table 2: Developing countries with the highest e-readiness value (2016) ............................................................... 14
Table 3: Percentage of adults using a mobile money account and value of e-readiness (2017) ............................ 16
Table 4: Global Entrepreneurship Index for the selected developing countries (2018) ............................................ 25

Annex 1: Information and communication technology data for the world, by geographic regions and by level of development .................................................................................................................. 28
Annex 4: Account penetration around the world, 2014 .................................................................................... 30
Annex 5: Mobile money account penetration in sub-Saharan Africa (2014) ....................................................... 31
Annex 6: Price ranking of internet by country (monthly) .................................................................................. 32
Annex 7: 4G availability (%) .......................................................................................................................... 33
Annex 8: 4G availability comparison (2018) .................................................................................................... 34
1. **Introduction**

“Changes [...] offer opportunities for countries to leapfrog. E-finance can accelerate financial sector development by lowering the costs, increasing the breadth and quality, and widening access to financial services. But achieving this result requires a reassessment of the approach to financial sector development, particularly in developing countries.”

(Claessens, Glaesser, & Klingebiel, 2002, p.2)

Joseph Schumpeter (1934) stated that “carrying out innovation is the only function which is fundamental in history”. E-finance, or electronic finance, is precisely an innovation that reshapes individuals’ knowledge about the financial system and enables developing countries to leapfrog (Claessens et al, 2001). It provides financial services through computer network or electronic media and is a subset of e-commerce where goods and services are sold on the Internet. This financial innovation comprises e-payment, e-money, e-banking, e-trading, e-broking, e-mortgage and e-insurance. E-finance, also called digital finance or cyberfinance, is described as “the most promising area of e-commerce” (Zekos, 2004, p.31) and as “a driving force that is changing the landscape of the finance industry” (Lin, Geng & Whinston, 2001, p.13).

To facilitate the expansion of e-finance, the internet penetration rate and the use of mobile phones and computers are key factors. With the generalization of use of the Internet around the World, numerous opportunities related to financial services and electronic payments appeared. In 2016, developing countries¹ had 39 percent of individuals using the internet, over 34 percent of households had a computer and over 96 per 100 inhabitant had a mobile-cellular telephone subscription (cf. Annex 1). These numbers have tripled the last 10 years. The data varies for young populations where 67 percent of the 15-24 years old used the Internet in developing countries in 2017 (cf. Annex 2).

Additionally, e-finance can be a tool to boost the entrepreneurial framework of a country. According to Schumpeter (1960) entrepreneurs are “individuals who exploit market opportunity through technical and/or organizational innovation”. They develop new solutions and techniques

¹ Developing countries are defined by the IMF as countries with lower per capita income level, with a poor export diversification and with a low degree of integration in the global financial system.
that increase productivity and thus economic development. Innovation and entrepreneurship are key factors for economic growth. However, to innovate, it is fundamental to have access to proper financing system. “Many entrepreneurs lack financial knowledge, strategic vision, resources and in some cases, the willingness to attract sources of finance other than straight debt” (OECD, 2017, p.8). Therefore digital finance can constitute a better access to funding and it is even more important in countries lacking a developed financial system. According to King and Levine (1993), the productivity of a country improves and leads to higher profits with the development of the financial system through a higher quality of entrepreneurial projects. A more-developed financial system enables the diversification of the risk. Thus, financial intermediaries’ services are positively correlated to economic growth and they are essential for technological innovation (Schumpeter, 1911).

Consequently, this paper investigates the effects of e-finance on entrepreneurship in countries with less developed financial markets. What is the impact of this financial innovation on economic growth in developing countries this last decade?

This paper is organized as follows. I will present the previous literature and theoretical framework in section 2. Therefore follows, in section 3, a discussion about the e-finance framework conditions to be able to select accession countries eligible for the development of this innovation. Section 4 presents the impact on the entrepreneurial ecosystem and on economic growth in developing countries. Section 5 concludes this paper.

While the literature and previous studies focus on the effect of finance on economic growth in developing countries, less is known about the effect of e-finance on economic growth and especially its impact on entrepreneurship. Although I present the large spectrum of e-finance (including e-brokerage, e-insurance, e-mortgage etc.), the focus of this paper rests on the impact of this digitalization on entrepreneurship; so it mainly centers on e-payment and e-banking to allow funding for new projects. I will measure the entrepreneurial framework through a study of the innovation and growth of business creation in a country. However, I will not study the different regulations of financial markets in developing countries. The purpose is to demonstrate that e-finance can provide, through established digital
means, stepping stones towards a better entrepreneurial environment, more private initiative, investments and accordingly, economic growth. So I will conduct a qualitative analysis that I will detail later in this paper.

E-finance has several advantages and its continuous growth merits close scrutiny. This innovation is a cheaper solution to integrate economic agents into the financial sector. It enables to reduce transaction costs, encourages funding initiatives through easier availability of loans and forges a closer relationship between customers and the financing institutions. With the development of e-finance, the delivery of financial services becomes quicker, easier and with less collateral required. This last advantage is important in developing countries. Last but not least, this innovation can help boost entrepreneurship and contribute to the GDP by widening the financial market and making it a safer place.

1.1 Presentation of E-finance


The main advantage of this innovation is “to reach the unbanked masses in a safe, simple, reliable, convenient, and cost-effective manner, enabling them to manage small transactions” (Riley & Kulathunga, 2017, p.201). This unbanked target-population is common in developing countries and it affects severely the financial stability.

- E-payment & E-money:

Electronic payment and e-money both challenge cash-based societies. They are tools to purchase goods and services through the Internet. They are innovative systems that increase the efficiency of transactions and reduce fraud thanks to their traceability. This money exchange between a buyer and a seller include the use of credit/debit cards online, electronic cheques and electronic cash. E-money or digital money can also be cited as an electronic purse where the value of cash is stored on an electronic devise (phone, computer) or a card.
In the report written by the Better than Cash Alliance, the Bill & Melinda Gates Foundations and the World Bank Group in 2014, digital payment is described as an innovation that enables to:

- increase efficiency through higher financial inclusion
- reduce costs and increase incentive to save,
- increase accessibility of financial services through mobile phones,
- increase control over money sent by migrants
- increase security through traceability,
- improve speed through less traveling time to get cash
- and increase financial inclusion

Moreover, according to the authors, this innovation empowers women through confidentiality and higher economic participation, “opening an account can be an important first step for introduction to the formal economy for an entrepreneur and can lead to formalization of her small business” (p.ii).

The authors also showed that the digitalization of payment of Social Security Pension in India reduced bribery by 47 percent. The cost of social transfer in Niger decreased by 20 percent thanks to mobile transfer and the travel time to take cash has decreased by 40 minutes. Consequently, e-payment enables to have more productivity time but e-finance remains far from developed in this country. Finally, in Mexico, digital payments used by the government enable to save nearly $1.4 billion annually.

As per the figure 1 below, the countries with the highest percentage of adults making or receiving digital payments in the developing World are Iran, Kenya and South Africa (more than 60 percent in 2014).
E-finance, Entrepreneurship & Economic Growth in Developing countries

**Figure 1: Percentage of Adults Using Digital Payments in the World in 2014**

- **E-banking & E-mortgage:**

  E-banking include all the banking services online. It facilitates the access to bank accounts through electronic devices and enables a self-directed service 24/7. It includes traditional banking services such as bank accounts checking, money transfer, inquiry, customer service etc. Some banks allow further autonomy with wider range of financial services such as loan demands and facilitated trading opportunities. This leads us to electronic mortgage where classic mortgage loans are executed online.

  According to the data analytics company Nielson (2016), “mobile-only banking is most popular in developing countries with large unbanked populations; usage rates are highest in India (46%), Indonesia (37%), Mexico (34%) and Turkey (34%)”.

- **E-insurance:**

  E-insurance include all the insurance services online. It also enables an easy access 24/7 to the insurance documents online, similarly to e-payment and e-banking. Moreover, electronic insurance reduces paperwork and increases risk management. Since a lot of banks offer insurance services today, e-insurance goes hand in hand with e-banking.

---

- **E-trading & E-brokerage:**

Trading electronically refers to buying and selling securities, foreign exchange and derivatives online. This paperless method affects equity markets and leads to a significant reduction of costs and a faster way to execute orders.

Finally, e-brokerage is an innovative system allowing buyers and sellers to trade stocks electronically. It reduces brokerage bias. However, the facility of use of e-trading and e-brokerage can encourage online investors to take more risks. In 2014, 28 percent of brokerage services in India were provided online and according to the World Band and the United Nations Conference on Trade and Development in 2002, in Mexico, e-brokerage was “rather well developed” and the country was leading “Internet banking in Latin America.”

Below is a recapitulative table of the countries to discuss in this paper because they were affected by the expansion of e-finance the last decade.

<table>
<thead>
<tr>
<th>E-finance</th>
<th>Developing countries of observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-payment – E-money</td>
<td>Iran, Kenya, India, Mexico, Niger, South Africa</td>
</tr>
<tr>
<td>E-banking – E-mortgage – E-insurance</td>
<td>India, Indonesia, Mexico, Turkey</td>
</tr>
<tr>
<td>E-trading – E-brokerage</td>
<td>India , Mexico</td>
</tr>
</tbody>
</table>

*Table 1: Developing countries of observation*

### 1.2 Methodology & Data

The use of e-money and e-payment has already been studied in developing countries and particularly in Africa and Asia. Indeed, these innovations can potentially solve the problem of very low bankability and reduce urban and rural disparities.

The objective of this paper is to:

- study the development of e-finance through the development of e-payment and e-banking improving the entrepreneurial framework,
- understand the trend of this innovation in developing countries,
- illustrate the challenges for the integration of this innovation in the developing world and,
- to find out how e-finance impacts entrepreneurship to, in fine, increase economic growth.

In order to answer my problematic and to study the effect of e-finance on entrepreneurship and economic growth in developing countries, I collected the data from previous academic studies. Allen, McAndrews and Strahan wrote in 2001 a paper introducing e-finance and its effects on financial services and financial markets, highlighting disintermediation, deregulation, consolidation and access to credit. In 2002, Claessens, Glaessner and Klingebiel wrote two reports about electronic finance, one focusing on the positive impact of this innovation on the financial sector and one stressing the effect of the expansion of e-finance around the world.

To have an extensive analysis of e-finance, I started by collecting the data of e-commerce for a larger vision of e-finance in the developing countries then a thoroughgoing study of electronic payment, mobile payment and online banking. Therefore, I used the report of Lawrence and Tar about the barriers to e-commerce, and the report of Mas, Radcliffe and Bill and Melinda Gates Foundations about mobile payment with a special focus on Kenya.

Finally, to be able to connect e-finance, entrepreneurship and economic growth, I collected the data from the McKinsey Global Institute, the publication of King and Levine in 1993 in the Journal of Monetary Economics and also the report of Ratten written in 2012 about entrepreneurship, e-finance and mobile banking. The focus of the authors was on improving the financial system to stimulate productivity and economic progress.

Additionally, I used several survey and indexes to collect the data needed for developing countries in terms of e-finance, entrepreneurship and economic growth. Therefore, I selected the Global Entrepreneurship Index 2018, the Global Innovation index 2017, the Information and Communication Technologies (ICTs) facts and figures report of 2017, the report of OECD in 2017 “Financing SMEs and Entrepreneurs”, the Global Findex Survey Data, reports published by the International Monetary Fund and by the World Bank’s Global Financial Development Database.

The main challenge was the lack of information available about the use of e-finance in developing countries. Consequently, I studied different aspects revolving around e-finance such as e-
commerce, e-readiness, innovation, financial inclusion, rates of mobile payments and rates of e-banking.

After gathering the information needed and based on the barriers of e-commerce described by Lawrence and Tar in 2010, I prepared a non-exhaustive list of what needs to be settled to enable the implementation and expansion of e-finance in a country:

- Infrastructure
- Technology (mobile phone and access to computers)
- Telecommunication (Internet penetration, affordability of the subscriptions)
- Socio-cultural and institutional factors (entrepreneurship environment, trust, acceptance of innovation, language, education, IT education, financial education)
- Socio-economic factors (investments and respect of private property)

From this list and the data available for developing countries, I identified a group of countries (Table 1), with more or less settled factors and it made them eligible for the implementation and growth of e-finance. In this group, there are also countries that demonstrated an already knowledgeable expansion of e-finance, in general, and mostly a well-developed mobile payment system. The examined countries in this paper stand out from other developing countries because of the measures taken inside their territory to increase the rate of financial inclusion for their poor, unbanked and underprivileged populations.

In order to position the countries, I chose to compare their data with data from other developing countries instead of developed economies because financial markets are more comparable in Africa, Asia and Latin America. Nonetheless, the group of developing countries is far from being homogenous and they are not on an equal footing with technology and innovation.

Moreover, in this paper I will study the case of Kenya and particularly M-PESA, one of the most developed mobile payment system in Africa, and Wizzit, a South African mobile banking system targeting the unbanked/underbanked populations in the country. These examined cases, enable me to present examples of the impact of e-finance on a country’s economy.
2. **Literature Review on E-finance and Entrepreneurship in Developing Countries**

In this part, I will start by a general presentation of the studies conducted on the matter of e-finance to then focus, in a second phase on the work wrote precisely on developing countries.

Sato, Hawkins and Berentsen wrote a paper in 2001 where they represented the structure of e-finance in six-layers.

![Figure 2: Composition of E-finance](source: Sato, Hawkins, Berentsen (2001))

The first layer involves services exchanged online.

The second one clusters the intermediaries delivering financial services.

The third layer is about “the market coordination environment” (p.70) where buyers and sellers negotiate prices.

The forth layer represents the system used to execute orders.

The fifth layer groups a set of rights and obligations to do financial transactions and also the regulatory framework of e-finance.

Finally, the sixth layer is about the communication platform that sends price, quantity and product description signals.

The authors added that the future of e-finance depends on three aspects that improves competition, through higher entry, and leads to disintermediation:

- “low [...] set-up costs [...]"
- low marginal operating costs […];
- [and] irrelevance of physical location” (p.74)

They also mentioned the problem of regulation on the Internet, the higher impact of e-finance on smaller financial markets, privacy issues, the risk of monopoly at first and the risk of fraud. Finally, they stated that there are systemic threats since financial institutions have similar software programs so one choc can affect a large number of institutions.

In 2011, Litan, Masson and Pomerleano considered that developing countries face the problem of being “left behind by the coming wave of e-finance that some say will revolutionize financial sectors” (p.1). Similarly to Sato, Hawkins and Berentsen (2001), the authors also presented the challenges of “international regulatory cooperation, since the Internet respects no national boundaries” (p.11). They added that policymakers “have to learn how to monitor operational risks of institutions that use the Internet” (p.11). Additionally, they raised the question of the intensification of financial sector risk with the entry of foreign investors.

In the same book, Pomerleano and Vojta (2001) reflected that “despite the lack of infrastructure and the presence of legal and regulatory obstacles in developing countries, there is a little doubt that the low penetration of financial services and rapidly growing Internet usage combine to make e-finance a very attractive future opportunity for both foreign and domestic banks” (p.82).

Sauvé and Steinfatt (2011) added that the divergent growth of e-finance depends essentially on the rate of Internet penetration. Regarding the expansion of this innovation, Tuner (2011) has his doubts and considers that e-finance is not a top priority for many developing countries because “policymakers have more pressing issues to consider” (p.389).

Furthermore, Modhavan (2000) considers that e-finance affects transparency. The “Democratization of Information” brought by the Internet leads to:

“(1) More information, generally of better quality, at lower or no cost, from old and new sources, is now available in real time, and
(2) Millions of people see and act on this information in real time” (p.7)

He stated that “automated markets are typically highly transparent because they provide relevant information” (p.6). But there is a risk of information overload with e-finance.
In their paper written in 2010, Lawrence and Tar presented the barriers in developing countries, notably political and governmental barriers with the lack of government initiatives. According to them, “most developing countries do not have ICT policies to guide the provision of Internet services” (p.32).

In the research conducted by McKinsey Global Institute in 2016, we find out that the majority in developing countries “rely on informal financial solutions that are often less flexible and more expensive than formal alternatives—and frequently fail to deliver when needed the most.” (p.2). Also small business suffer from the requirement of very high collateral and interest rates once they succeed to have access to credit.

To conclude this part related to e-finance in general, Ratten (2012) underlines the importance of knowledge. “The rate at which people adopt mobile banking will be influences by how quickly they learn about it” (p.3). Moreover, “technological innovations in e-finance require people to be proactive to understand mobile banking services” (p.6). And “the higher people’s level of entrepreneurial inclination is towards mobile banking, the more likely they will adopt mobile banking as an e-finance service” (p.6).

In order to connect e-finance to entrepreneurship and economic growth, I relied on the theories of Schumpeter and Kirzner. The entrepreneur undertake actions and take decisions to create profit opportunities. Therefore this economic agent’s activities benefit a country’s economy and constitute an engine of development through innovation. Without innovation, the economy is stationary, with no economic growth and no endogenous change. Schumpeter describes this pre-capitalism economy as an analogy with the blood circulation. Schumpeter (1942) is well-known for his concept of creative destruction, meaning the introduction of new products leading to the restructuration of the economy by destroying the old ones. For the latter, an entrepreneur is a disruptive force in the economy. Thus, e-finance is the introduction of new products and technical processes leading to a dynamic of change in the economy. On the other hand, Kirzner’s entrepreneur is the master of discovery until the emergence of competition eliminating his/her profit opportunities. For the economist, entrepreneurship is an arbitrage between two identical goods with different prices. Unlike Schumpeter, Kirzner’s entrepreneur constitutes an equilibrating force in the economy participating to a better allocation of resources. For Knight (1921), the profit of the entrepreneur-innovator is introduced by two concepts: risk compensation
and compensation for innovation. Following the Austrian view of knowledge, the relevant knowledge is waiting to be discovered through entrepreneurs’ actions.

Finally, according to King and Levine (1993), financial intermediaries are essential to evaluate new projects of investments in order to select the most profitable ones and to reduce risks. “Better financial services expand the scope and improve the efficiency of innovative activity; they thereby accelerate economic growth” (King and Levine, 1993, p.517).

3. **Implementation and Expansion of E-finance in Developing Countries**

In order to enable the expansion and growth of e-finance in a country, several necessary financial, technological, infrastructural and cultural aspects must be implemented and developed.

One of the challenges that faces e-finance in developing countries is the lack of e-readiness, meaning the lack of determination to benefit from ICTs.

The table 2 gathers the developing countries per region with the highest e-readiness value.

<table>
<thead>
<tr>
<th>Developing Countries</th>
<th>Value of E-readiness (/6)</th>
<th>World ranking (/150)</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Arab Emirates</td>
<td>5.3</td>
<td>26</td>
</tr>
<tr>
<td>Qatar</td>
<td>5.2</td>
<td>27</td>
</tr>
<tr>
<td>Bahrain</td>
<td>5.1</td>
<td>28</td>
</tr>
<tr>
<td>Malaysia</td>
<td>4.9</td>
<td>31</td>
</tr>
<tr>
<td>Chile</td>
<td>4.6</td>
<td>38</td>
</tr>
<tr>
<td>Uruguay</td>
<td>4.5</td>
<td>43</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>4.5</td>
<td>44</td>
</tr>
<tr>
<td>Mauritius</td>
<td>4.4</td>
<td>49</td>
</tr>
<tr>
<td>South Africa</td>
<td>4.2</td>
<td>65</td>
</tr>
<tr>
<td>Seychelles</td>
<td>4</td>
<td>74</td>
</tr>
</tbody>
</table>

* Middle-East
** Eastern Asia
*** Latin America

*Source: The Networked Readiness Index 2016*
The common thread with all the countries of the table above, with relatively high e-readiness value, is that none of them has a low income level. All these developing countries have either a high-income economy or an upper-middle economy. Thus, electronic readiness is positively correlated to the countries’ economies.

In this section, I discuss the institutional foundations that need to be solidly established to enable the expansion of e-finance in a country. Firstly, I will focus on the position of financial services and payments systems in developing countries. Secondly, the technology and the quality of infrastructure, essential to e-finance, will be analyzed in the developing countries. Finally, I will study the socio-cultural and institutional factors, also indispensable for the expansion of the financial innovation.

### 3.1 Financial Services and Payment Systems in Developing Countries

Financial institutions play a predominant and obvious role in the implementation of e-finance, but not solely, because electronic payment also solves the problem of lack of access to the financial sector.

Stable financial institutions reflect risks minimization and inspire confidence for investors. It attracts investors, encourages economic agents to seek funding but also to adapt to novelties put in place by banks, insurances, brokerage firms etc. E-finance would be able to develop better in a financially stable environment since there would be a greater number of depositors seeking access to their accounts and funds.

In 2013-15, the Middle East and North Africa had the highest bank Z-score\(^3\) in the developing World measuring the stability of financial institutions (Annex 3). However, the stability in this sector did not lead to better access to financial institutions. The Middle East was the region with the lowest account penetration in 2014 with only 14 percent of adults owning an account (Annex 4). As mentioned in the section 1, Iran is the only country in the Middle East with a high percentage

\(^3\) Z-score = \(\frac{\text{ROA} \times \text{Equity}}{\text{Assets}}\); ROA: Return On Assets
of access to financial institutions, where 86 percent of individuals above 15 years old had an account at a formal financial institution and all the banks of the country invested in IT systems. However, electronic purse, and more precisely cryptocurrency, is illegal in Iran since earlier this year because of the fear of terrorism and money laundering.

The developing countries in East Asia and Pacific reached 69 percent of adults with an account in 2014, almost 5 times the percentage in the Middle East.

In Sub-Saharan Africa, one of the most financially instable region, 34 percent of adults had an bank account according to the Global Findex database of the World Bank in 2014 and 1/3 of them had a mobile money account, especially in East Africa. In Ivory Coast, Somalia, Tanzania, Uganda and Zimbabwe there is a higher percentage of adults using a mobile money account than an account at a financial institution (Annex 5).

In the table 3, we can see that Kenya, Uganda, Tanzania and Zimbabwe have low scores of e-readiness despite the growth of money accounts in their economies.

<table>
<thead>
<tr>
<th>Developing Countries</th>
<th>Mobile money account (%)</th>
<th>E-readiness (/6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenya</td>
<td>58</td>
<td>3.8</td>
</tr>
<tr>
<td>Uganda</td>
<td>35</td>
<td>3.1</td>
</tr>
<tr>
<td>Tanzania</td>
<td>35</td>
<td>2.9</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>32</td>
<td>3</td>
</tr>
</tbody>
</table>

We can conclude that e-readiness and the stability of financial institutions is not sufficient to increase access to accounts in formal financial institutions.

Besides, low levels of stability of financial institutions, low-income and low e-readiness do not prevent the development of mobile payment, thus e-finance. Quite the contrary, e-finance constitutes a solution for low financial inclusion and enables developing countries to leapfrog. "In Africa electronic cash and other smart cards offer savings and payment services to low-income customers including in remote areas who often do not even have formal bank accounts" (Claessens, Glaessner & Klingebiel, p.2).

a. Study Case: M-PESA Kenya
The example of the exceptional growth of M-PESA, a mobile payment service in Kenya, is an interesting case to study because it affects the mentality of the population and leads the way to a higher financial inclusion and a more cashless society. Furthermore, a wider accessibility to the banking sector allows better funding for new projects, vital for entrepreneurs and thus economic growth.

M-PESA is one of the most developed mobile payment in Africa and in Kenya. It was introduced by Safaricom, a mobile phone operator affiliated to Vodafone in Kenya in 2007. Since then, it has seen a big success and an exceptional growth. Once registered, it enables electronic payments via mobile phones and customers can transfer funds to anyone with a mobile phone – to both users and non-users of M-PESA. "Once a customer is connected to an e-payment system, she can use this capability to store money in a savings account, send and receive money from friends and family, pay bills and monthly insurance premiums, receive pension or social welfare payments, or receive loan disbursements and repay them electronically” (Ignacio, Radcliffe, Bill & Melinda Gates Foundation, 2010, p.7). The success of this tool was due to its accessibility to unbanked people penalized by their very low revenues. Now, they only need a mobile phone and a SIM card to use this financial service. Accordingly, Mobile payment is the solution to lower the cost of poor people to access financial services.

![Figure 3: Comparing M-PESA with alternatives mobile payments in Kenya](image)
However, the first customers of this solution were banked ones. So M-PESA only started as a complement to formal financial institutions. Its competitive advantages, shown above, and the growing number of mobile phone users allowed its expansion. “This is one reason why Africa, with its high population of unbanked, is seen as such a promising market for mobile money deployments” (Ignacio, Radcliffe, Bill & Melinda Gates Foundation, 2010, p.10). According to the Global Findex Database, in 2017, Sub-Saharan African was the “global leader in the use of mobile money: 21 percent of adults in the region have a mobile money account” (p.20). The issue is that, for a good mobile payment experience in developing countries, there is a need of a cash-out process because digital money is not accepted everywhere.

b. **Study Case: WIZZIT South Africa**

The other interesting business to study is WIZZIT in South Africa. Launched in 2004, it enables customers to do bank transactions via mobile phone or via debit cards. Unlike M-PESA, the latter is not a payment service. It provides a mobile banking service so banks do possess customers’ deposits. It is interesting to study this case because WIZZIT, with its slogan “My bank in my pocket”, the e-banking tool targets low-income South African by promoting a convenient, secure and cheap mobile banking provider. According to a study, their financial service is one third cheaper than having a formal bank account in the country (CGAP, UN Foundation, Vodafone Group Foundation, 2006). However WIZZIT remains mostly used by individuals with high levels of education and not the poorest fraction of the South African population. Finally the report shows that even though, WIZZIT succeeded to change the mentality and made users ready to use technology, South-Africans still favor human interaction.
Since everything functions online in e-banking - consulting bank statements or general services such as paying bills, applying for a loan or even trading securities - there are less paper and mail costs. Thanks to the Internet, clients can edit their profiles for more personalized pricing of financial services. According to Lee and Lee (2001), "for consumers, Internet banking provides convenience, lower service charges, more accessible information about bank accounts, and an attractive option for busy people since it saves time to go to the bank branches and gives 24 hours access" (p.65). Thus, e-finance is a disruptive innovation that can impact the financial system and the development of the economy. Nevertheless, this revolution in developing countries can be very risky in a legal and regulatory way and these disadvantages constitute a challenge for the growth of e-finance.

Furthermore, to overcome the challenges of e-finance in developing countries, their economies have to become more cashless. The rate of financial inclusion is also low because of an insufficient ATM network, especially in rural areas so e-finance can help reduce the cost of cash. In New Delhi, for example, the 11 million inhabitants spend, collectively, around 72 million hours per year chasing cash (The Institute for Business in the Global Context, 2014). A 2010 study by McKinsey estimates that India could gain Rs 1,000 billion more (1.6 percent of GDP) by becoming cashless. However, in a big majority of developing countries, the cash is king. A cashless society conducts transactions through digital means. Its main advantage is to significantly reduce black money from tax evasion and crime which lessen the government budget. By ensuring a maximum traceability, the State can levy taxes and improve public services. Turkey used e-finance as a solution to fight shadow economy through the development of e-taxation and e-declaration. However, the first and foremost disadvantage of cashless societies is the lack of privacy. Also, the risk of exclusion of individuals in rural areas becomes amplified. The gap between the well-versed stakeholders and the less educated becomes wider. Finally, the Internet has its flaws and hackings can occur, causing the loss of savings. Kenneth Rogoff, professor at Harvard University, conducted a research in his book “The Curse of Cash” written in 2016 about the implementation of a “less-cash” society instead of a cashless one through the abolishment of high-value currency. The implementation of a cashless society is up to governments and the political instability and dictatorships in developing countries prevent the transition. This matter will be discussed later in the paper.
3.2 Technology and Quality of Infrastructure in Developing Countries

The development of e-finance is highly dependent on the technology and the infrastructure of the country. A low financial inclusion is linked to a low rate of credit/debit cards followed by very few ATMs caused by the lack of demand. This constitutes a barrier to e-finance and e-commerce in general. Countries with poor telecommunications infrastructures and low Internet penetration due to high costs stay marginalized from this financial innovation. “In the case of telecommunications […] where the infrastructure is not at the same level of development in all regions of the world, access to the Internet in most developing countries is very slow and expensive” (Lawrence & Tar, 2010, p.27). In some countries, the monthly cost of the Internet subscription surpasses the monthly income of the majority of the population and it is the same for computer equipment. Most of the developing countries with very low numbers of Internet users are in Africa. In 2016, Eritrea, Brunei, Burundi, Somalia and Guinea had more than 98% of the population Internetless.

“The development of broadband markets, efficient and innovative supply arrangements, and effective use of broadband services require policies that promote effective competition and continued to stress liberalization in infrastructure, network services and applications across different technological platforms” (OECD, 2004, p.27).

However, as mentioned with the example of M-PESA, mobile payment can function without Internet and simply with a mobile phone and a SIM card. E-finance is considered as an opportunity to access financial services because, according to the Global Findex Database, in 2017, 2/3 of unbanked adults had a mobile phone. In terms of mobile cellular subscriptions, in 2016, Eritrea still has the lowest score with 7 per 100 people subscribers and Brunei is one of the most expensive country to purchase technology. China, Maldives, Bahrain and United Arab Emirates have the highest score where over 200 per 100 people have a mobile cellular subscription even though the Unites Arab Emirates have the most expensive Internet cost in the World (over $100 per month) (Annex 6). Moreover, China has one of the largest e-commerce company Alibaba and “55% of
China’s internet users have made a mobile payment, versus only 19% of U.S. internet users” according to Long and Cheong during the CKGSB-KPMG Seminar in 2014. They added that “the internet and technology companies […] will lead the mobile payments market share over the next two to four years, not banks”. But this statement has to be balanced because, for example, the Internet penetration is very high in Indonesia (over 90 percent) but the use of e-finance remains very low in the country mainly because of a lack of familiarity in digital financial services from the unbanked population of the country.

### 3.3 Culture and Institutions in Developing Countries

Some cultural and institutional factors enable the expansion of digital finance. First and foremost, the population of developing countries needs to be nonresistant to innovation in order to reduce socio-cultural barriers. For Lavoie and Chamlee-Wright (2000), the culture must be supportive to commerce and entrepreneurship for economic progress. They wrote that culture gives shape to the interpretive process that is entrepreneurship.

Once again United Arab Emirates and China were among the highest ranked developing countries with high scores in the Global Innovation Index (GII) 2017 (43.24 and 52.54/100 respectively). Surprisingly, Kenya, with its large population using M-PESA, had a low score of 30.95/100. Countries like Ivory Coast, Somalia, Tanzania, Uganda and Zimbabwe -where their percentage of adults using a mobile money account is higher than the one using an account at a financial institution- have the lowest scores in the GII.

The acceptance of innovation is correlated to the level of trust among the population and between sellers and buyers of financial services. The lack of face-to-face interaction that helps build strong relationships and that is present in e-finance might seem risky for both parties.

“In the developing world, trust is established and reinforced through family association, repeated personal contact and interaction. The transactional trust and related issues are barriers for conducting online transactions but, are also amplified as a result of cultural characteristics and prevailing legal system” (Lawrence & Tar, 2010, p.29).
For Pelligra (2005), “trust is perceived as playing a crucial role in inter- and intra-organizational relationships, contract theory, labor economics [and] in the area of socio-economic development (p.106).

The growth of cyberfinance permits more transparency in financial transactions and thus less anonymity. Distrust in governments makes people reluctant to having formal bank accounts and being part of the innovation in the financial sector. “Globally, 16 percent of adults without an account at a financial institution cited this barrier” (The World Bank, 2018, p.40) and previous episodes of hyperinflation and bank crisis make the population reluctant to the use of e-finance.

Finally, developing countries suffer from a high percentage of uneducated people and thus incomprehension in front of the Web presented in a different language. This very same education is needed to manipulate computers and mobile phones. High investments in the educational system is, therefore, essential. But this socio-economic barrier is related to political and economic issues in developing countries. Educated people can constitute a threat to dictatorships in developing countries and low revenues and corruption harm public investments in schools for example.

To conclude this first part, the block of developing countries is far from homogeneous and it is difficult to find the essential foundations of e-finance in a single country. Some of them are put forward thanks to their technological progress and innovation, such as countries in the Middle-East and south-Eastern Asia and others by their quick adaptability to mobile payments in response to low financial inclusion, such as Eastern African countries.
4. IMPACT OF E-FINANCE ON ENTREPRENEURSHIP AND ECONOMIC GROWTH

Digital finance is affecting “all aspects of the business of banking and financial intermediation” (Allen, McAndrews & Strahan, 2001, p.5). The financial sector is essential for the allocation of resources for investment purposes. A developed financial market permits to better direct the capital to productive business, to create new projects and thus lead to economic growth. According to Schmith (2008), “a doubling of the size of private credit in a developing country is associated with a 2 percent annual increase in economic growth” (P.3). Therefore, productivity and economic growth depend on the level of development of the financial system. In 1993, King and Levine stated that “better financial services expand the scope and improve the efficiency of innovative activity” (p.517). For the authors a developed financial system leads to a better selection of projects and entrepreneurs by diversifying the risk and by bringing to the fore innovative and profitable businesses. An unstable financial system decreases the services provided to entrepreneurs and savers and consequently harms economic growth.

Today, startups play a key role in the modern entrepreneurial framework along with the ICT revolution. According to Boulding (1978), entrepreneurship is as important as the three factors of production - land, labor, capital. It requires knowledge and know-how since education generates wealth.

In addition, innovation requires funding, hence the major role of financial services in financing the projects of the entrepreneur/innovator but also to take part in the risk associated to the investment. Therefore, to innovation, the financial inclusion that increases with e-finance enables the entrepreneur to benefit from credits and resources. Financial innovations help low-income households in Asia and Latin America to increase savings and to better manage risks. E-finance participates in empowering entrepreneurs by reducing barriers to entry and opening up opportunities. Thereby, employment rates increase and so does productivity and the quality of services.

Moreover, e-finance increases competition in financial services by attracting individuals outside the banking system and increasing competition between providers, that leads to lower fees and cheaper financial services. Indeed, electronic finance reduces the cost of providing services by 80
to 90 percent (McKinsey Global Institute (2016)). The development of this digitalization leads to the restructuration of the financial market and the banking sector by emphasizing the disintermediation. This disintermediation reduces asymmetric information thanks to lower costs of communication, computation and data processing. It leads to a more equal access to information and to more consolidation in the banking sector by raising scale economies (Allen, McAndrews & Strahan, 2001). E-finance enables entrepreneurs to connect affordably with markets and banks and increases their profitability by making the financial transaction less costly and much safer. Besides, by transitioning to digital payments, entrepreneurs can have higher chances to have access to credit through credit history in financial institutions. As a result, shifting to e-finance enable to increase savings as well as the substitution of informal saving (The World Bank, 2018). However, to do so, governments, and also business owners, have to digitalize their payments to increase financial inclusion.

E-finance in general and digital payments in particular can help entrepreneurs track better their sales and improve easier their profit margins. This financial innovation can also boos female entrepreneurship by ensuring them secure and private earnings.

In Africa electronic cash and other smart and even chip cards are being offered as savings and payment services for low-income customers who do not have access to formal bank accounts. Producers in Africa can meet demand in Europe through the use of online platforms and e-payments. In fact, the economic gains from widespread use of digital finance in developing economies would be significant. According to the McKinsey Global Institute (2016), the increased productivity and investment that the widespread use of digital finance generates could boost the annual GDP of all developing economies by 6 percent by 2025 versus a business-as-usual scenario (The World Bank, 2018).

Furthermore, the study of Petersen and Rajan (2001) shows that the distance between banks and business increased and this distance can constitute a barrier for many and prevent them from financial inclusion. Indeed “22 percent of adults without an account said that financial institutions are too far away” (The World Bank, 2018, p.40). Accordingly, e-finance participate in increasing developing countries’ GDP by enabling individuals to save time and that leaves them more labor
time. It also participates to economic growth by increasing productivity through a gain in time and cost for businesses and less outflow of government expenditure and tax collection. And finally e-finance play a role in economic growth by increasing investments with higher proportion of credit to small businesses.

However, the positive impact of e-finance on entrepreneurship needs further refinement. The countries observed in the paper with implemented e-payment and e-banking systems do not necessarily have high scores on the Global Entrepreneurship Index.

### Table 4: Global Entrepreneurship Index for the selected developing countries (2018)

<table>
<thead>
<tr>
<th>Developing Countries</th>
<th>GEI</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Africa</td>
<td>32.9</td>
</tr>
<tr>
<td>India</td>
<td>28.5</td>
</tr>
<tr>
<td>Mexico</td>
<td>26.4</td>
</tr>
<tr>
<td>Kenya</td>
<td>18.4</td>
</tr>
</tbody>
</table>

We can conclude that the development of e-finance, and especially e-payment following the example of Kenya, is not sufficient to boost economic growth through entrepreneurship. Other factors play a disturbing role, such as the political and institutional barriers mentioned in section 3.
5. Conclusion

This paper articulates the connection between electronic finance and entrepreneurship and their impact on economic growth in developing countries. The digitalization of financial services this last decade permits to increase financial inclusion through greater approachability, especially in rural areas, and therefore enables higher access to funding. This financial inclusion enables risk diversification and more resources for innovative projects and investments. The accessibility of e-finance fosters productivity by revealing more profitable businesses conducted by entrepreneurs.

E-finance is a revolutionary tool to improve access to financial services in developing countries for underbanked and unbanked people. This inclusion participates to the growth of business opportunities by reducing the weight of collaterals for credit.

Setting up e-finance in a developing country requires investments in infrastructure, technology and telecommunication systems. These investments have to be combined with educational opportunities to enable better implementation. Today, financial services remain limited in the developing countries. The biggest challenge for e-finance in developing countries remains the ubiquity of cash and political instabilities affecting the economy and preventing from fostering private initiatives such as private investments and innovations. Public and private investments in infrastructure, technology and telecommunication are essential for the progress of e-finance in developing countries. Governments have to set an example by digitalizing their financial services through electronic paychecks and e-taxes for example. But, in order to accelerate the development of the financial sector, regulations and supervisions have to be implemented. Hence, it could be interesting to study how government initiatives can change societies and mentalities. Besides, following the concept of creative destructive of Schumpeter, will e-finance evict one day traditional financial services in developing countries and make today’s payment means by cash obsolete?
## Annexes

### Key ICT indicators for developed and developing countries (as of 2018) and the world (as of 2017)

#### Global Mobile-cellular subscriptions

<table>
<thead>
<tr>
<th>Year</th>
<th>Developed (%)</th>
<th>Developing (%)</th>
<th>Least (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>75.3</td>
<td>41.4</td>
<td>0.1</td>
<td>27.2</td>
</tr>
<tr>
<td>2017</td>
<td>74.9</td>
<td>41.1</td>
<td>0.1</td>
<td>27.0</td>
</tr>
</tbody>
</table>

#### Fixed-telephone subscriptions

<table>
<thead>
<tr>
<th>Year</th>
<th>Developed (%)</th>
<th>Developing (%)</th>
<th>Least (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>15.4</td>
<td>10.4</td>
<td>0.1</td>
<td>16.0</td>
</tr>
<tr>
<td>2017</td>
<td>15.2</td>
<td>10.3</td>
<td>0.1</td>
<td>15.6</td>
</tr>
</tbody>
</table>

#### Active mobile-broadband subscriptions

<table>
<thead>
<tr>
<th>Year</th>
<th>Developed (%)</th>
<th>Developing (%)</th>
<th>Least (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>6.0</td>
<td>2.0</td>
<td>0.1</td>
<td>4.2</td>
</tr>
<tr>
<td>2017</td>
<td>5.8</td>
<td>1.9</td>
<td>0.1</td>
<td>3.8</td>
</tr>
</tbody>
</table>

#### Broadband subscriptions

<table>
<thead>
<tr>
<th>Year</th>
<th>Developed (%)</th>
<th>Developing (%)</th>
<th>Least (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>0.1</td>
<td>0.0</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>2017</td>
<td>0.1</td>
<td>0.0</td>
<td>0.1</td>
<td>0.0</td>
</tr>
</tbody>
</table>

#### Households with a computer

<table>
<thead>
<tr>
<th>Year</th>
<th>Developed (%)</th>
<th>Developing (%)</th>
<th>Least (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>65.0</td>
<td>6.3</td>
<td>0.1</td>
<td>13.4</td>
</tr>
<tr>
<td>2017</td>
<td>64.8</td>
<td>6.2</td>
<td>0.1</td>
<td>13.2</td>
</tr>
</tbody>
</table>

#### Households with internet access at home

<table>
<thead>
<tr>
<th>Year</th>
<th>Developed (%)</th>
<th>Developing (%)</th>
<th>Least (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>44.7</td>
<td>3.2</td>
<td>0.1</td>
<td>11.5</td>
</tr>
<tr>
<td>2017</td>
<td>44.4</td>
<td>3.1</td>
<td>0.1</td>
<td>11.3</td>
</tr>
</tbody>
</table>

#### Individuals using the Internet

<table>
<thead>
<tr>
<th>Year</th>
<th>Developed (%)</th>
<th>Developing (%)</th>
<th>Least (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>1.3</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>2017</td>
<td>1.2</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
</tbody>
</table>
Annex 1: Information and Communication Technology Data for the World, by Geographic regions and by Level of Development


### Table A.1.4: Stability—Financial Institutions

<table>
<thead>
<tr>
<th>Bank Z-score</th>
<th>Number of countries</th>
<th>Average</th>
<th>Median</th>
<th>Standard deviation</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Weighted average</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>192</td>
<td>12.9</td>
<td>10.9</td>
<td>7.7</td>
<td>2.1</td>
<td>39.9</td>
<td>13.7</td>
</tr>
<tr>
<td><strong>By developed/developing economies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developed economies</td>
<td>63</td>
<td>14.4</td>
<td>13.7</td>
<td>7.6</td>
<td>2.1</td>
<td>34.8</td>
<td>14</td>
</tr>
<tr>
<td>Developing economies</td>
<td>129</td>
<td>12.1</td>
<td>10.5</td>
<td>7.6</td>
<td>2.1</td>
<td>39.9</td>
<td>13.4</td>
</tr>
<tr>
<td><strong>By income level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High income</td>
<td>63</td>
<td>14.4</td>
<td>13.7</td>
<td>7.6</td>
<td>2.1</td>
<td>34.8</td>
<td>14</td>
</tr>
<tr>
<td>Upper-middle income</td>
<td>52</td>
<td>12.6</td>
<td>10.9</td>
<td>7.6</td>
<td>2.1</td>
<td>33.2</td>
<td>13.4</td>
</tr>
<tr>
<td>Lower-middle income</td>
<td>49</td>
<td>13.5</td>
<td>10.8</td>
<td>8.4</td>
<td>2.5</td>
<td>39.9</td>
<td>14.8</td>
</tr>
<tr>
<td>Low income</td>
<td>28</td>
<td>8.7</td>
<td>7.5</td>
<td>4.8</td>
<td>3.1</td>
<td>25.4</td>
<td>9.2</td>
</tr>
<tr>
<td><strong>By region</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High income: OECD</td>
<td>33</td>
<td>13</td>
<td>11.9</td>
<td>7.6</td>
<td>2.1</td>
<td>34.8</td>
<td>13.3</td>
</tr>
<tr>
<td>High income: non-OECD</td>
<td>30</td>
<td>16</td>
<td>15.1</td>
<td>7.5</td>
<td>4.7</td>
<td>32.2</td>
<td>15.3</td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td>17</td>
<td>11.9</td>
<td>10.7</td>
<td>7.6</td>
<td>2.5</td>
<td>25.3</td>
<td>12.7</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>21</td>
<td>7.6</td>
<td>6.7</td>
<td>4.1</td>
<td>2.1</td>
<td>18.6</td>
<td>7.7</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>26</td>
<td>14.6</td>
<td>13.3</td>
<td>7.1</td>
<td>4.8</td>
<td>31.8</td>
<td>14.2</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>12</td>
<td>23.2</td>
<td>21</td>
<td>8.1</td>
<td>10.7</td>
<td>39.9</td>
<td>24.5</td>
</tr>
<tr>
<td>South Asia</td>
<td>8</td>
<td>14.7</td>
<td>10.8</td>
<td>9.2</td>
<td>7.8</td>
<td>32.7</td>
<td>15.4</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>45</td>
<td>9.5</td>
<td>8.3</td>
<td>5.1</td>
<td>2.9</td>
<td>23.8</td>
<td>10.4</td>
</tr>
</tbody>
</table>

Annex 4: Account penetration around the World, 2014
Annex 5: Mobile Money Account Penetration in Sub-Saharan Africa (2014)
Annex 6: Price Ranking of Internet by Country (monthly)
Annex 7: 4G Availability (%)
Annex 8: 4G Availability comparison (2018)


Services Research. Retrieved from https://repository.upenn.edu/cgi/viewcontent.cgi?article=1204&context=mgmt_papers


OpenSignal. (February 2018). The State of LTE.


