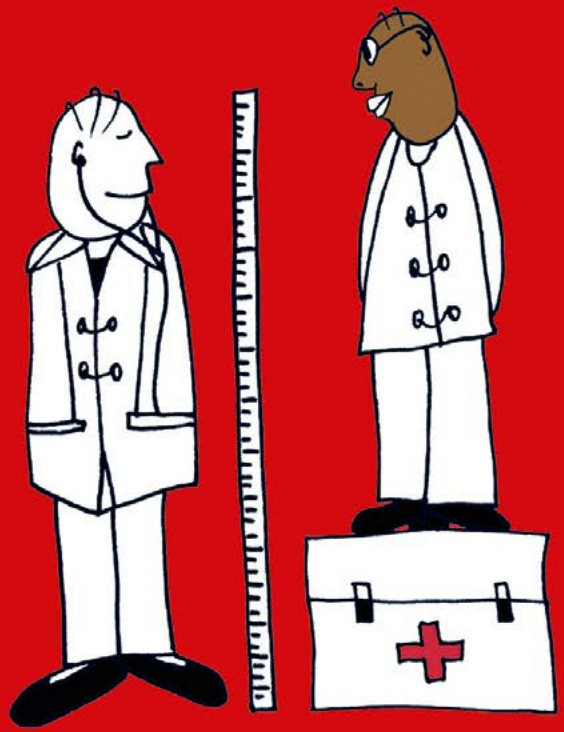


Impact Investing at the Medical Credit Fund

How can the financial and non-financial relevance of impact investment be measured?

Maastricht University
by Sascha Niebel

MEDICAL CREDIT FUND AFRICA

Impact Investing at the Medical Credit Fund

How can the financial and non-financial relevance of impact investment be measured?

Maastricht University – School of Business and Economics

Niebel, Sascha
Supervision: Prof. Dr. Harry Hummels and Dr. Boris Blumberg

This study is part of Maastricht University's PROOF Impact Project, under the supervision of Prof. Dr. Harry Hummels

Table of Contents

1 Introduction 6

2 Impact investing — Investment theses — Literature review 9
2.1 What is Impact Investing – Definition 9
2.2 Financial theories and impact investing 10
2.3 Impact Investing and shared value creation 11
2.4 Impact Investing in the financial market 12
2.5 Opportunities and Challenges in Impact Investing 14

3 A Structural Analysis of the Impact Investment Market 19
3.1 The Impact Investment Market 19

4 Investor Perspective on impact investing 22
4.1 Capital Structures in Impact Investing 25
4.2 Blended capital structures: 25
4.3 Types of capital used in Impact Investing 27

5 Medical Credit Fund 30
5.1 Mission and Investment thesis 31
5.2 Theory of change 32
5.3 Loan qualification and process 37
5.4 Fund structure 38

6 SafeCare 43
6.1 Risk management through SafeCare 44

7 Impact of the MCF 47

8 Research Objective and Hypothesis development 49
8.1 Financial impact 49
8.2 Strategic impact 52

9 Methodology and Data description 55
9.1 Data 55
9.2 Methodology 56

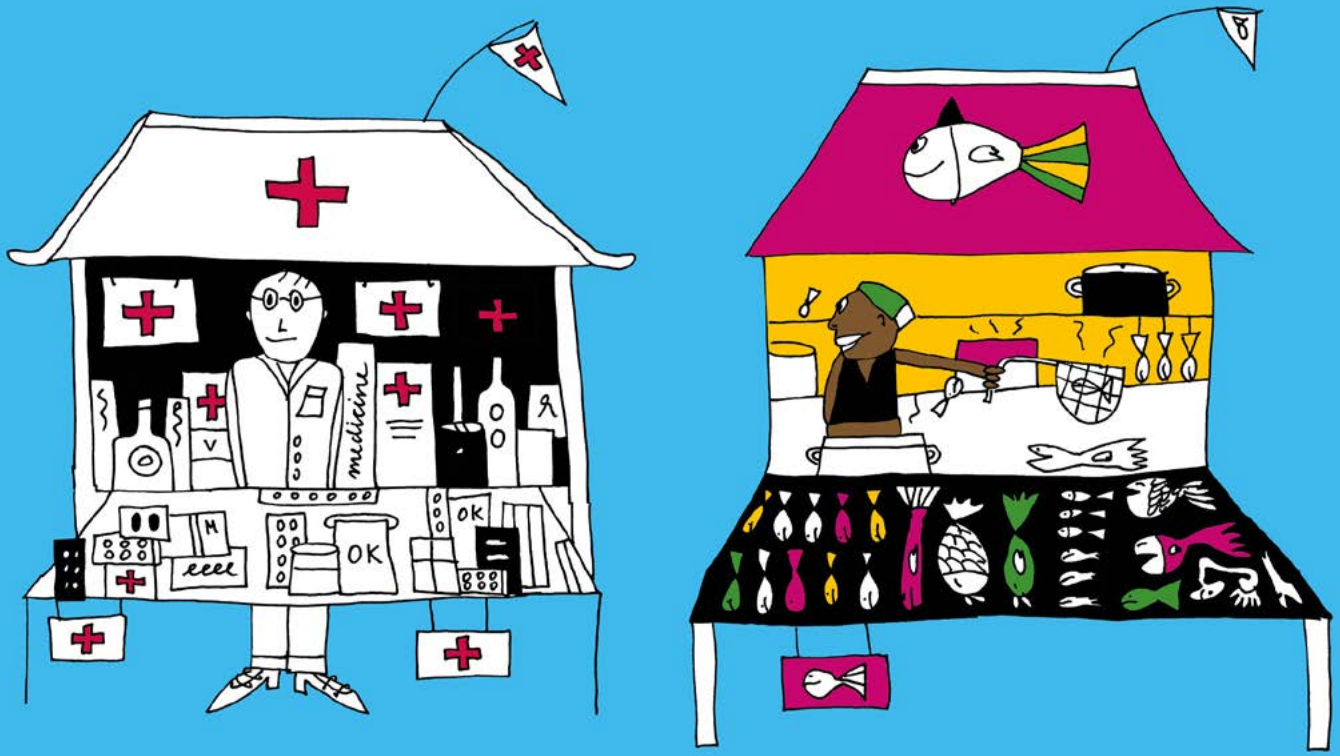
10 Empirical Analysis & Results 62
10.1 Financial Impacts 62
10.2 Strategic Impacts 71

11 Discussion & Conclusion 78

12 Limitations & Future Research 83

References 86

Appendix A Variable Overview 89
Appendix B Descriptive Statistics and estimation outputs 92



Health Care Market

1 | Introduction

Today, many investors look for investment opportunities that go beyond a pure financial purpose, but create sustainable solutions to environmental or social problems. "Impact Investing", which was defined by the Rockefeller Foundation in 2008, is an investment approach to link financial and non-financial objectives in order to create positive returns for communities, society, foundations and investors in the market place. While donations and philanthropy can alleviate urgent social needs and are vital in order to pioneer in developing markets, this type of financial commitment may not necessarily start a virtuous cycle of development. At some point, investments into infrastructure, society and economy are needed in order to create prosperity for a broad range of sectors. Impact investing can bridge this gap and is therefore especially well suited to provide sound investment opportunities while creating shared value for communities.

Studies on impact-investing such as Rangan et al. (2011), Wood et al. (2013) or Hebb (2013) discuss impact investing academically, but providing a respected and accepted methodology to proof impacts that were created and potentially attract institutional investors to the field is still lacking. Successful impacts investment cases are mainly reported through philanthropic literature such as the reports of Ashley, Schramm & Ellis (2009) of the Overseas Development Institute, O'Donohoe et al. (2010) of the Rockefeller Foundation and the GIIN or Freireich & Fulton (2009) of the Monitor Institute. However, developing frameworks that report both financial and non-financial impacts depending on overarching and sector specific measurements are needed and still lacking in the academic literature.

Investments into social or infrastructure projects are desperately needed in order to increase development and prosperity of developing countries. For example, the health care sector in many African states is underdeveloped, with the public sector being unable to make significant investments and little progress can be observed. Exemplarily, Africa carries 25% of the global diseases burden while only making up 1% of global health expenditure (WHO, 2006). Many organizations such as the UN, US Aid or Doctors without Boarders are allocating vast

amounts of resources to tackle the most severe problems, but only the most urgent issues may be addressed and the development of health care systems is not progressing.

Improving health care system as a whole by providing access to capital can provide financially profitable investment opportunities and decrease dependency on grant money and foreign aid programs. Although large foreign aid initiatives provide capital in order to solve urgent problems, the spontaneous availability of capital can destroy private investment initiatives by crowding-out private investments with public donation money (Cutler, 2002). From an economic perspective, donations do not promote the development of a specific economic sector, but can create dependency in the long term and make private investments obsolete due to the free availability of capital (Cutler, 2002).

Providing affordable and quality health care is a fundamental challenge for many African states and investments into the private health care market are desperately needed in order to develop an economically viable system. With the private health care sector serving over 50% of the population in many African countries (MCF Annual Report, 2013), increasing the access to capital can initiate investments into infrastructure and quality of services, leading to higher standards of living and prosperity in the society. The PharmAccess Group, a health care organization that has been active in African countries for several decades, initiated the Medical Credit Fund (MCF) in 2009 in order to supply investment capital for small and medium-sized health care facilities in Africa. The MCF aims to create social impacts through their investments in the health care sector of African countries, while at the same time providing a sound investment case for international investors as well as a financial return.

The market environment and investment approach of the MCF is not only interesting from an impact investing point of view, but also provides a unique data set of the African health care market since data on health care quality and various non-financial variables are collected first hand. Taken together, a rich database is created that can yield significant insights into the effectiveness of impact investments, not only in the health care market, but also for similar impact investments in the future.

In the context of impact investing, this study aims to grow the academic literature in the impact investment domain by investigating impacts with regard to the case of the Medical Credit Fund and provide academics and investors with practical guidance on measuring and disclosing

impact for investments. Further, this thesis investigates the effectiveness of investments made by the MCF. By adopting a case study approach, the goal is to empirically proof impact investments in this specific context and provide deeper insights into the practices of the MCF and the effectiveness of impact investments in developing markets to the academic literature. The lessons learned from the MCF case can inspire the wider impact investing community how impact investments can be structured and successfully implemented. As a pioneering company in the impact investment area, the Medical Credit Fund provides a unique case to investigate how impact investments can shape a market, provide financial returns and at the same time significantly influence the social development of communities in Africa.

The remainder of this study is organized as follows. The next section will introduce impact investing and discuss the developments in this field. The third section provides an overview of the current developments in the impact investment market. The fourth section analyzes impact investments from a financial investors perspective. Section five introduces the Medical Credit Fund and their investment approach, followed by an introduction of SafeCare. Next, the impact of the MCF and the research objectives are discussed followed by the development of the research methodology. Finally, the results of the statistical analysis are presented and discussed.

2 | Impact investing — Investment theses — Literature review

2.1 | What is Impact Investing – Definition

The field of impact investing is a rather young and emerging domain in the financial market continuum. In recent years, various terms and definitions have been connected with impact investing, ranging from socially responsible investing (SRI) and ethical investing, to mission-driven investing or triple-bottom line investing, eventually converging to the term impact investing. Impact investing is much more of a subcategory of Socially Responsible Investing (SRI), which itself applies to ESG finance and standards to investments, in the sense that it aims at realizing predetermined social or environmental objectives and is able to measure the outputs, outcomes and – hopefully – impact of the investment. In contrast, SRI generally seeks to minimize negative externalities rather than proactively create social and environmental benefit (O'Donohoe et al. 2010). Impact Investing can be described as an integrative approach to wealth creation, compromising the entire spectrum of investments in order to create shared value, incorporating both investing for social or environmental impact as well as the goal to create financial returns. While there are various definitions of impact investing in the academic literature, this study uses the definition of the Global Impact Investing Network (GIIN), which is a non-for-profit organization dedicated to increase the scale and effectiveness of impact investing. According to GIIN (2015):

"Impact investments are investments made into companies, organizations, and funds with the intention to generate social and environmental impact alongside a financial return."

Creating an impact describes the influence or effect of a decision on a specific subject. McKinsey (2010) define social impact in a similar, but broader sense stating that impact is "a meaningful change in economic, social, cultural, environmental or political conditions due to

specific actions and behavioral changes by individuals and families, communities and organizations and/or society and systems". Impact investing can therefore be seen as the entire spectrum of investments that create shared value and must fulfill several characteristics (Hummels & Roentgen, 2013). First, impact investments generate financial and non-financial value, ranging from increasing access to capital, improving the environment or developing educational and health infrastructures. Second, the allocation of capital leading to a financial return is a defining feature of an investment. Finally, the resulting impact has to be measurable as a result of the investment (Hummel & Roentgen, 2013). Without measuring the impact through a sound methodology and a reporting of the financial and non-financial benefits, an impact investment cannot be regarded as such. The nature of an impact may be different depending on the context. Therefore, Chambers et al. (2009) identified several questions when addressing impact evaluations:

- Is the impact produced by a direct intervention or indirectly?
- Is the impact permanent or can it be reversed?
- Would the impact have happened without any context specific factors or are several related factors needed in order to achieve the impact?

Defining what an impact is and how it can be measured is one of the major challenges that are apparent in the field of impact investing. As many impact evaluations are context specific, a general methodology that can be applied to every investment and research is not suitable. Finding individual metrics and datasets that can be causally linked to financial performance is therefore important in order to broaden the field of impact investing academically. While providing a direct causal link is an aspiring task for any study, the focus of this study is to develop a sound methodology to measure impact in a specific context. The objective is to develop a research design in order to prove the impact of investments made by the MCF, with a unique database provided by the MCF that goes beyond cross-sectional or qualitative approaches and adds to the existing literature in the field.

2.2 | Financial theories and impact investing

Impact investments aim to achieve a financial return either at or below the market rate, where the market rate is defined as the risk-adjusted return that is equal or exceeds a relevant benchmark (O'Donohoe et al. 2010). Traditionally, the development of the Capital Asset Pricing Model (CAPM) by William Sharpe (1964) or the 4-Factor model by Fama & French (1993) shaped the investment behavior and risk attitudes of investors in the

entire financial industry. While these fundamental theories provide solid benchmarks for investments with solely financial purposes, investments with social or environmental intentions may require alternative benchmarks, as financial returns are not the main objective. Investments in social or environmental fields are not necessarily able to achieve a similar return as pure financial market investments and flexibility must be given to benchmarks with regard to the return expectations of the investors. From a financial perspective, a relevant impact benchmark should incorporate both the risk-return profile of the investment and factors such as the relative fiduciary responsibilities towards shareholders (O'Donohoe et al. 2010). From an impact perspective, the benchmark needs to incorporate whether the objective of the investment with respect to social or environmental impact factors have been achieved and whether these investments have a long term effect on its surroundings (IRIS & GIIN, 2011). In contrast to classic financial investing, impact investing is bridging the gap between pure financial oriented investments and capital deliberately given to social and environmental causes without any financial return expectations.

2.3 | Impact Investing and shared value creation

Impact investing differentiates itself from classic Corporate Social Responsibility (CSR), which is a company's sense of responsibility towards the community and environment in which it operates (Business Dictionary, 2015), or environmental, social and governance (ESG) investing, which are used in capital markets by investors to evaluate corporate behavior and determine the future financial performance of companies including non-financial performance indicators (Financial Times Lexicon, 2015). In contrast to ESG, impact investments combines financial returns with social or environmental wealth creation, but takes the business rational as a point of departure. Seeing impact investing as "creating shared value" focuses on the creation and fair distribution of prosperity in a society or economic system. Creating shared value is defined as creating economic value in a way that also creates value for the society by addressing its needs and challenges (Porter and Kramer, 2011), and is a more general approach to tackle social or environmental problems through investments. Factors such as the creation of labor, environmental, cultural, social, religious and other non-financial criteria are relevant for communities in which investments are made and where impact investments focus.

In contrast to previous approaches such as CSR, which only focus on impacts on the company level, impact investing through shared value creation is not just

addressing social responsibility, philanthropy or sustainability but is a new way to achieve integrated success for an entire community (Porter and Kramer, 2011). Porter & Kramer (2011) stress the fact that the next wave of innovation and productivity growth in the global economy emerges from a focus on shared value creation, not just profit per se. While the financial crisis of 2008 and the ongoing volatility of capital markets created serious doubts in the existing financial systems, investors turn toward investments that are not justified on the financial aspect alone but have sustainable impacts in societies or in the environment. Porter & Kramer (2011) further emphasize that shared value creation may justify business actions and investments again, away from the rather financially driven industry goals of the recent years. Impact investment is therefore an important field in order to develop shared value creation. The creation of new opportunities with sound reporting processes will further stress the importance of these developments. With significant and relevant investment frameworks, the focus can be rebalanced from pure financial objectives and underscore the importance of the achieved impact of the projects. This increases the relevance of social and environmental factors in comparison to a pure financial orientation. Among others, politicians, NGOs and the media want to know whether investments are made in the public interest. While donations or public funding lack the efficiency of financial investments but may achieve relevant social objectives and financial investments may forgo social impact for financial return, impact investing is a promising method as it combines both social and environmental objectives with the orientation towards a financial return. Through this combination, impact investments are an interesting model for foundations, corporations, private investors and philanthropy or for long-term investors, where each investor class can include different qualities and capabilities in order to create financial and non-financial returns on their investments.

2.4 | Impact Investing in the financial market

Impact investments are a relatively new type of investment in financial markets. Rather than being a completely new financial product, impact investments bridge the gap between philanthropy and sustainable investments. Investors can combine the direct social impacts of philanthropic engagements with a return on or of capital, potentially increasing the amount of capital deployed in the market. Figure 1 was developed by the Social Impact Investment Taskforce (2014) and shows the relationship between impact investing and other forms of social investing. Impact investing lies between investing sustainably and philanthropy but does not solely focus on either.

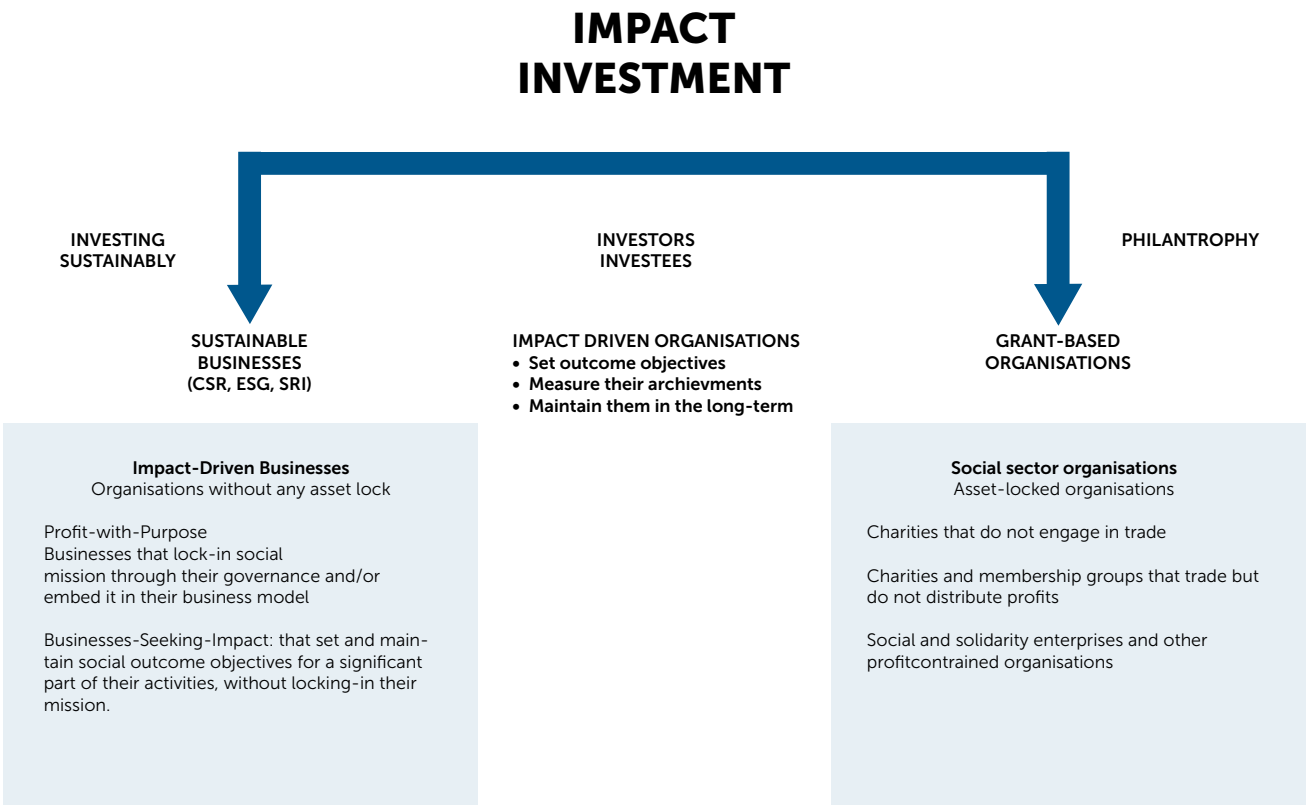


Figure 1: Source: OECD Social Impact Report (2014) and the Social Impact Investment Taskforce (2014)

Investments in the impact category proactively seek a measurable social impact alongside a financial return (OECD, 2014). However, many foundations can also be classified as impact investors. Many corporations that have traditionally been involved in CSR or ESG initiatives also tend to move into the impact investment space, according to the OECD (2014).

On the financial investment continuum, impact investing can be placed between purely philanthropic uses of capital and individual sustainable investment initiatives by businesses and industries. Rangan et al. (2011) state that impact investing is not seen as a panacea or replacement for philanthropy but instead a potential source of net-new capital working in concert with philanthropy and market-based approaches to support social change. O'Donohoe et al. (2010) define impact investments as an single asset class, since a unique set of investment and risk management skills are needed, special organizational structures accommodate this skillset, industry organizations, associations and education are build to address this asset class and most importantly new standardized metrics, benchmarks or ratings are developed. Hedge funds and emerging markets are examples for defining new asset classes as the underlying investments are different from traditional debt and equity products and their unique characteristics of people, process structures and risks involved separate them from mainstream asset classes towards an alternative asset category (O'Donohoe et al., 2010). Recognizing the similar features of impact investing is the foundation in building a marketplace for the future, defining the processes needed for these investments and potentially provides a more efficient way to conduct investments in social or environmental issues. Acknowledging the special characteristics of a certain asset class or type of investment is a key catalyst in driving the institutional growth for these assets in the last 20 years (O'Donohoe et al., 2010).

2.5 | Opportunities and Challenges in Impact Investing

In order to be relevant for a broader range of investors like institutional investors, impact investing needs to meet the standards and regulations of professional investments. Developing sound standards and measurements for impact investing is therefore key in order to advance the field to a broader audience and attract professional investment vehicles. Many studies on impact-investing such as Jackson (2013), Wood, Thornley and Grace (2013) or Hebb (2013) develop an academic foundation for impact investment, but providing a respected and accepted methodology to proof impacts that were created and potentially

attract institutional investors to the field is still lacking. Most proofed impacts are reported through literature of philanthropic background such as the reports of Ashley, Schramm & Ellis (2009) of the Overseas Development Institute, O'Donohoe, Leijonhufvud & Saltuk (2010) of the Rockefeller Foundation and the GIIN or Freireich & Fulton (2009) of the Monitor Institute. Finding standards that report both financial and non-financial impacts depending on overarching and sector specific measurements is therefore needed. However, identifying which standards are shared by all investments and which impacts are project or sector specific demands a collection of evidence across fields and an aggregation of the data.

The GIIN developed the Impact Reporting Investment Standards (IRIS) in 2011 in order to collect and aggregate impact investment data and develop a universal language for social, environmental and financial performance reporting. IRIS reports aggregated data from impact investments in a broad range of sectors and identifies that 63% of the organizations involved in impact investing are profitable. More interesting for the case of this thesis, about 81% of all investments with health improvement objectives and 74% of all investments in the sub-Saharan African region are profitable (IRIS & GIIN, 2011). While the report is an initial collection of the potential of the entire industry, IRIS continues to develop standards and metrics for impact investing. In combination with other institutions such as ANDE (Aspen Network of Development Entrepreneurs), PULSE (an reporting tool for funds to quantify impact of investments), the Global Reporting Initiative or the Impact Employment Metrics, the industry wide recognition of standards and measurement tools is growing and building a common foundation.

Providing evidence on impact is not easy. Many investors see social or environmental impacts as a rather secondary objective of their investment strategy (Saltuk et al., 2011). Also, data issues may arise due to non-obligatory reporting standards, making it difficult to report significant results to investors due to a lack of data or to lower quality of data collection compared to obligatory financial reporting standards (Ashley et al., 2009). Impact investing needs to justify the additional actions besides the financial commitment and be comparable to other investments in the same asset class in order to develop a market for these investments and generate a competitive environment for the providers of such investments (Evans, 2012). The industry therefore needs to manage market expectations via thorough and honest assessment of investor's ability to simultaneously generate strong financial returns and impact (Evans, 2012).

A consensus on metrics and industry standards is important to develop the market for impact investing, but efficient management of impact investing can only be achieved when investment can be tracked on performance with intelligent measurements. As investors are forward looking, they are not interested whether previously taken decisions need to be justified. More importantly, relevant metrics must show an investor whether the investment is generating the desired outcome in order to make sound judgments and decisions to intervene in the process (IRIS, 2011). Investors should be able to make investments and monitor whether an investment is on the right track to realize its financial and non-financial objectives. For the future, relevant metrics must be able to show the process and status of the investment and a stronger evidence base can help encouraging a global market to grow (OECD, 2014).

Freireich & Fulton (2009) identified several opportunities and challenges in the impact investing market. First, a growing set of investors and capital providers seek new approaches to money management that enables them to "make a difference" alongside financial return. Especially in developing and emerging economies, investment and social or environment impact potential provide viable opportunities. Second, there is a greater recognition of the need for effective solutions to social and environmental challenges in societies and investors. Third, different cases of impact investing are showing early successes and stand up to the promise to yield financial return and impact simultaneously. Finally, impact investing is attracting financial talent and academics that explore and develop the field further. Many young professionals are interested in careers and creating businesses that have a social or environmental impact, leading to more investment opportunities and more effective providers of investments over time.

While these opportunities show the increasing interest in impact investing, some substantial barriers exist and constrain the development of the market. As Freireich and Fulton (2009) point out, these challenges relate to the rigidity of the investment industry as well as the weakness of market infrastructures for impact investing. First, Freireich & Fulton (2009) as well as Huppé & Silva (2013) identify a lack of intermediation or mechanisms to connect capital and impact investment opportunities as the investment industry is structured around the historical binary of philanthropy (for impact) and investments (for returns). Although the impact market is making progress in the sense that organizations like the OECD, GIIN or Rockefeller Foundation work towards setting standards in

defining and measuring impact investments, search and transaction cost remain high, with fragmented demand and supply, complex deals and underdeveloped networks (Freireich & Fulton, 2009). The lack of market aggregation makes it difficult for individual investors to find investment opportunities that justify the fixed costs of searching and evaluation. Finally, the impact investing market has not reached the scale to absorb significant amounts of capital. Today, only few companies provide investable business models in the market. As impact investing schemes need new and disruptive business models, many up-thriving companies have not yet proven to deliver the return and impact that they have promised (Huppé & Silva, 2013). Huppé & Silva (2013) also stress the shortage of high-quality investment opportunities with track record. This is however not surprising for the current, emerging state of the impact market, as the developing of the industry needs 10 to 15 years to operate at broad scale (Freireich & Fulton, 2009)


26054.56.9.8.000-8.54.030.00.23
43089.7.50
00.016.836.000
91.210.870
1.300
0.000.438.000
7865.900.
0.150.001.000
234.110.057.86
7.583.000.302.000
Micro Finance

3 | A Structural Analysis of the Impact Investment Market

3.1 | The Impact Investment Market

Since the early 2000s, various developments in the social and environmental investment market like the emergence of CSR, ESG or the development of practical strategies to achieve the Millennium Development Goals by the United Nations (UN Millennium Project, 2005), foundations, businesses and investors have experienced an increasing need to find new solutions to development problems around the globe. In addition, a higher awareness of climate change and the success of many green technology start-ups increased the awareness of profit opportunities in alternative market segments or at the "Bottom of the Pyramid", which represents the poorest socio-economic group in a society (Prahalad & Hart, 2002). While these fields have traditionally been addressed by public or private grant money due to zero or no return on capital, the increasing social and environmental awareness in society and economy gave way to new business models in order to find viable and sustainable solutions for the future (Hart, 2010). The lack of financial investment opportunities after the financial crisis in 2008 and high amounts of idle capital from investors seeking to make a change with their investment opened the market for alternative investments such as impact investments with excellent basic conditions. As the previous section pointed out, several opportunities and challenges are characterizing the development of impact investing. Joy, et al. (2011) stress the fact that building a market is essential by helping impact investments to become more efficient and sustainable. This section therefore investigates the current state of the impact investment market by adopting the analogy of Freireich & Fulton (2009) who analyzed the developments in the impact investing market in comparison with historical developments in markets such as venture capital, community development finance or microfinance.

Freireich & Fulton (2009) correlate the progress of impact

investing with similar markets along different stages of market development. As can be seen in Figure 2, industries can emerge from uncoordinated innovation towards market building and capturing the value of the marketplace to finally reach maturity, which is similar to the classic theory of market life cycles of Levitt (1965).

When comparing the development of venture finance/ private equity or microfinance with the current stage of the impact investment market, several commonalities are observable. With regard to the first stage of market development, improved coordination and standardization through industry organizations are key in order to advance through the first stage of market development. As various organization like the GIIN, the International Institute for Sustainable Development (IISD), the OECD and more are addressing the issue of industry coordination, impact investing passed the point of mere coordinative initiatives. Especially with regard to microfinance, the creation of market infrastructure and widely accepted standards as well as policy changes can help to unlock institutional capital and create more impact investment opportunities (Freireich & Fulton, 2009). Together, these findings support the market building state of impact investing today.

Impact investment has to meet the conditions that prevail in an institutional environment, where regulation and industry standards set the tone for a professional approach of investing. Today, many private and institutional investors take an interest in the non-financial outputs and outcomes of their investments and how these will be measures and communicated. Investors will ask the question to proof that impact investing makes sense – both financially and non-financially. Brown & Will (2011) from the Boston Consulting Group identify several actions in order to unlock the growth in the impact investment market that call for more "investable" business models, the improvement of financial skills in the social sector, improved metrics and independent audits, improved commissioning capabilities and finally address the distortive effects of grant and "soft" finance. Saltuk, et al. (2011) report that the majority of investors still see Impact Investing in its infancies, while a small fraction sees the market about to take off. As discussed, the impact investment market is in the phase of market building, agreeing upon standards and professionalizing the types of investments being made. It is the challenge for the current generation of impact investors to build this market, create market standards and establish impact investing in an institutional environment.

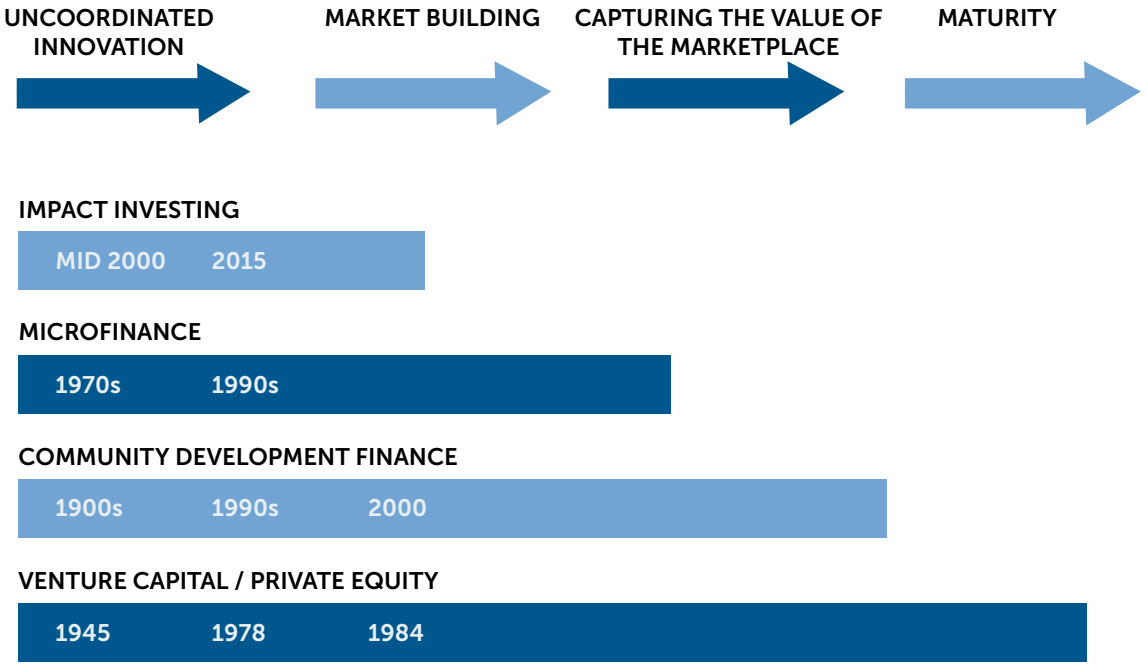


Figure 2: Adapted from Freireich & Fulton (2009)

4 | Investor Perspective on impact investing

The following section discusses why investors choose to invest into impact investments and provides an overview how impact investments attract different investors to the field.

Investors invest into impact investments to intentionally generate targeted social and/or environmental change through their activities. Investments are made into funds or enterprises that generate positive impacts through their operations. For example, investments are aimed to increase the access to capital and health care, such as the case of the Medical Credit Fund, increase the access to affordable housing or quality employment in emerging economies (IRIS & GIIN, 2011).

Investors can focus their impacts on developed and emerging markets or both, depending on their objectives and the investment instruments that are used (GIIN, 2015). Especially with regard to the choice of market and investment instruments, the range of financial return can vary from generating a return on capital or a return of capital. Depending on the return expectations of investors and the impact objectives of the investment, returns can vary from below market rate to risk-adjusted market rate returns in financial perspectives. A survey by J. P. Morgan and GIIN (2013) showed that 89% of investors report that their impact investments portfolios were meeting or exceeding their financial expectations, showing evidence that both financial and non-financial return can be combined successfully.

Investors may choose to support early-stage high-risk projects or focus on the expansion of proven business models to reach scale in a specific market. Equity contribution can be a classic structural approach in order to participate in impact projects directly (Huppé & Silva, 2009). Investors may want to take an active role in mentoring or leading the growth of the project similar to the

mentoring role of venture capital funds or simply participate in the project by providing capital (Huppé & Silva, 2009). Grants or guarantees enable impact projects to lower the investment risk for more conservative capital providers through their catalytic characteristic of adopting initial losses or setbacks in the investment projects (GIIN, 2013). Here, in contrast to the individual use of grant capital, a "crowding-out" effect is hindered as soft financial capital is used to reduce the investment risk in order to attract additional investment parties, and is not the type of capital used for delivering an impact. However, the type of investment vehicle that is used highly depends on the context of the impact investment project and the return expectation of the investor.

While some investors prefer to achieve a higher financial return, others prefer to focus on maximizing social impact of the investment. Joy et al. (2010) classify impact investors according to their willingness trade-off these two objectives. "Impact-first" investors are willing to sacrifice financial return relative to traditional investors in order to achieve higher social returns. On the other side, "finance-first" investors aim to generate a financial return commensurate with risk while achieving social returns. See Figure 3.

In theory, impact investments are structured in a way to overcome this trade-off and satisfy both ends of the spectrum. However, mediation between both objectives is often needed in practice. In a report by Rockefeller Philanthropy Advisors, Godeke and Bauer (2009) observe that opportunities that have high financial and social or environmental returns are scarcer than those that have one or the other. The empirical findings of Saltuk, et al. (2011) suggest that the market offers great potential for these kind of investments, but only about half of all investors balance impact and financial return and otherwise prioritizing one over the other. While many investment opportunities exist in the market, the search costs to find the right risk-return preference are relatively high. Building the market with respect to the creation of both financial and non-financial viable investments is therefore vital to create momentum for further growth. In order to overcome this problem, many impact investing organizations adopted capital structures that can support different risk and return profiles. As the next section will analyze, it is possible that various investors with different return expectation can participate in the same impact project through the use of tranches or blended capital structures.

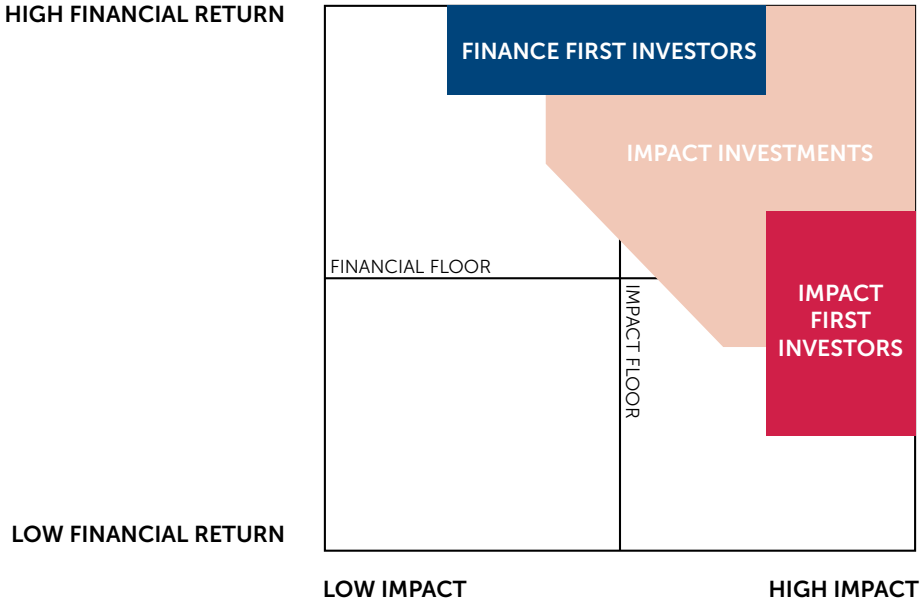


Figure 3: Adapted from Freireich & Fulton (2009)

4.1 | Capital Structures in Impact Investing

Impact investment combines traditionally unrelated fields of financial and social investing into a hybrid structure. Huppé and Silva (2013) point out that impact investment are made in a range of asset classes, financial instruments, market sectors and types of projects with different social, environmental or economic impact purposes. The broad range of investments brings different investors together at one table, ranging from governmental or public institutions and private donors to institutional or private investors. Many impact-investing companies therefore adapt "blended" capital structures in order to satisfy the different return expectations of the participating investors. Blended capital structures incorporate various investor types into one Special Purpose Vehicle in order to raise necessary capital for investments while satisfying the risk-return profiles of individual investors (Huppé and Silva, 2013).

4.2 | Blended capital structures:

Impact investment organizations attract investment capital such as capital from institutional investors, private equity, private and public grant money (Godeke & Bauer, 2009). The demand for impact investment is high across different investor types, yet the diverse investment opportunities cannot satisfy the risk and return expectations of all investors individually. Huppé and Silva (2013) show how different investor types can be grouped into different tranches depending on their risk appetite through blended capital structures. In blended capital structure, capital is divided similar to a debt capital structure. Dividing capital into categories like catalytic first loss capital, junior equity and senior equity, different seniority of equity is given to each capital provider according to the risk and return preference of the investor.

Figure 4 below as well as Huppé and Silva (2013) show an exemplary capital structure of an impact investment fund. By trenching the capital according to different risk and return expectation, a heterogeneous investor base can participate in the same investment, which increases the scalability of impact investment opportunities. This model of securitization has been transferred from the financial industry, and relates to is the practice of pooling various types of contractual debt (Happé & Silva, 2013). This structure is especially attractive for those investors that still want to achieve a market rate of return, while others are satisfied with more idle capital usage and less financial return, but place emphasis on the generated impact.

By adopting blended capital structures, impact investment organization can act as an intermediary to pool different

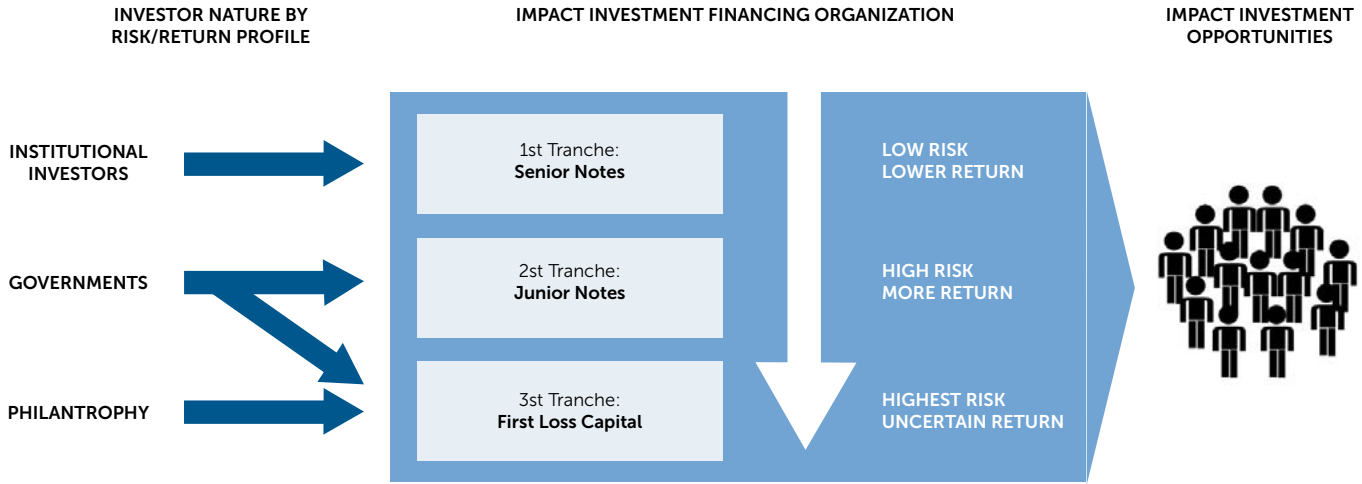


Figure 4: Investors grouping by Impact Investment Organizations, adapted from Huppé and Silva (2013)

types of capital together in order to realize investments into social or environmental projects. Projects and local communities benefit from larger capital infusions and impact investment organizations can amplify the effect of their investments through the use of larger amounts of capital.

4.3 | Types of capital used in Impact Investing

Investors can use different kinds of capital in order to create blended capital structures. Generally, the different types are categorized among their claim or return structure, similar to debt claims in classic financial capital structures. Due to the different investment style and focus on impact, several distinctions can be made in comparison to traditional capital structures. Also, in the social and environmental investment fields, new financial structures are needed in order to combine both fields in order to create clear governance structures.

4.3.1 First loss capital

The most striking difference to financial capital structures is the increasing use of "catalytic first loss capital" (CFLC), which is capital that will be used first to absorb potential losses of the investment and serves a guarantee (GIIN, 2013). The term catalytic is used for investment opportunities that have strong potential for social or environmental impact but a high perceived investment risk, but the use of first loss capital makes the investment opportunity attractive to parties that were reluctant to invest beforehand, as potential losses are covered through an initial capital layer. CFLC is a credit enhancement tool that encourages the flow of capital into investment opportunities by improving their risk-return profiles and attracting additional parties to invest (GIIN, 2013). However, the use of first loss capital always raises the concern of moral hazard behavior, since the return of capital is somewhat guaranteed (GIIN, 2013). CFLC is used in impact investing in order to invest into project that have no financial track record or are perceived as having high financial risk. In case of default, CFLC is therefore absorbing the financial losses up to a certain threshold. Impact investors include CFLC in innovative ways to reduce risk, advance social and environmental objectives with commercial capital at scale and stimulate investment activities in new markets (GIIN, 2013).

4.3.2 Senior and junior capital

Besides first loss capital, investments in blended capital structures are differentiated among seniority. Senior loans or senior equity are investments that are served firsts and get priority for repayment in a case of default, but may receive less return on their capital for the lower risk (Huppé & Silva, 2013). Junior or subordinated equity

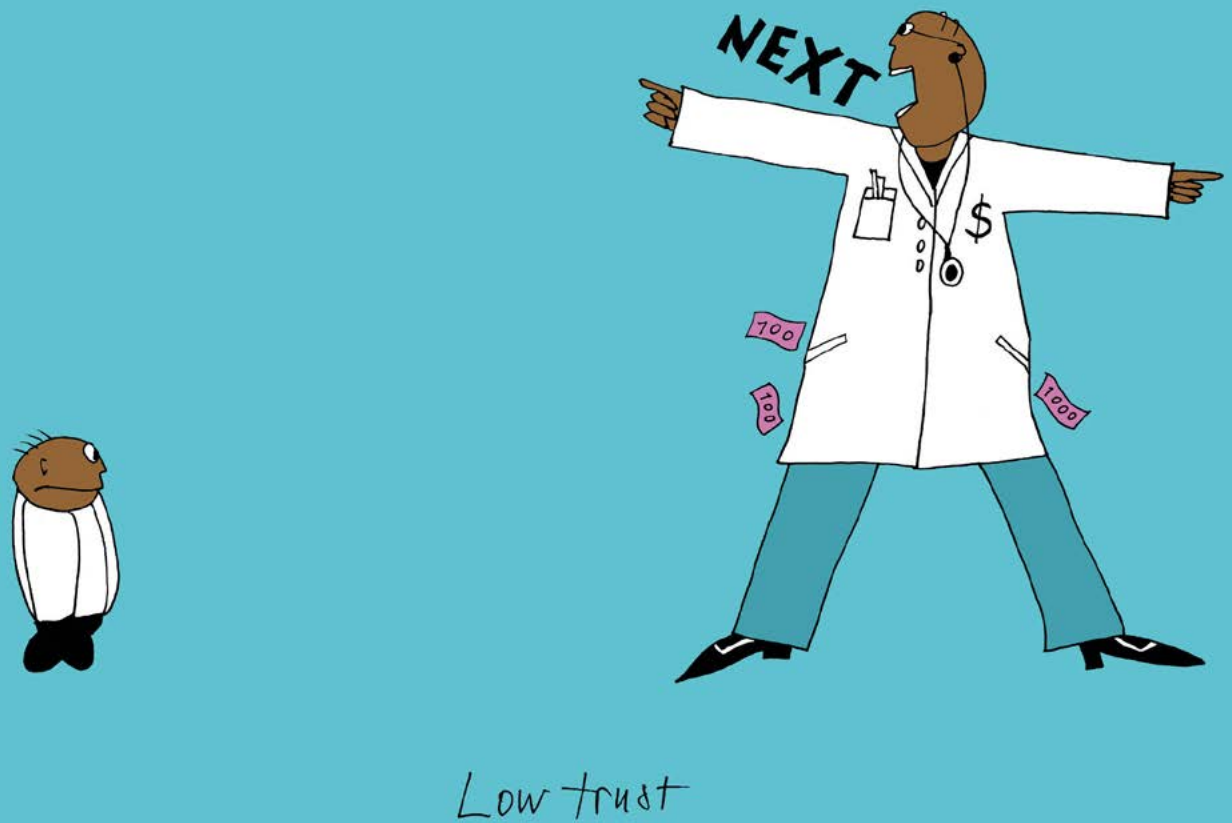
or loans are at the lower layers of the capital structure, accepting more risk while potentially receiving a higher return on their investment. Investors can choose between different seniorities of equity, participating at impact investment according to their risk and return preference. Private or financially oriented investor may therefore choose for a higher return option and invest into junior equity, while public or institutional investors may prefer a more conservative investment and choose senior capital investments instead.

4.3.3 Capital structures in practice

Blended capital structures therefore serve as special purpose vehicles for impact investment organization in order to make investment attractive for different investor classes. As Figure 4 shows, different types of capital seek different kinds of financial return, depending on their risk appetite. Grouping different types of capital into one organization therefore requires a categorization depending on the risk-return profile of the underlying capital and the use of capital for different purposes. For example, grant money can serve as first-loss capital whereas pension funds or private investment may serve as senior or subordinated equity. Impact investment organizations can use this tranching strategy in order to reach out to a broader investor base and attract more capital for their investments, although the investment opportunity may not satisfy for the requirement of investors individually.

This combination legitimized both aspects of impact investing, the focus on non-financial objectives with respect to improvements in the social and environmental context as well as the focus on financial returns. Whether the invested project focuses on social or environmental aspects, a respective mix of capital according to the objectives of the investment and the context has the ability to connect various return expectations, decrease the risk of the investment by pooling investor groups together and interlinking financial and non-financial investment objectives.

The next section will introduce the Medical Credit Fund, its investment approach, how it works and why it is exemplary as an impact investment organization. The theories discussed in the previous sections will be applied and a research model will be developed in order to show and understand the impacts created by the MCF empirically.


NEXT
$
700
100
1000
Low trust

5 | Medical Credit Fund

The Medical Credit Fund (MCF) was established in 2009 as a social, non-profit investment fund that provides access to capital to the private health care sector in African countries and bridges the financing gap of small and medium health care enterprises. The fund's main objectives are to enhance the provision of quality health-care services for low-income groups and improve business practices by private small and medium health care facilities through facilitating access to capital and the provision of business and quality assistance. As part of the PharmAccess Group, the MCF fulfills the role of financing and investing into health care facilities and works closely together with other subsidiaries of PharmAccess, such as SafeCare or the Health Insurance Fund (HIF).

Health care providers in the sub-Saharan Africa need investment capital in order to grow their businesses and improve the quality of their services. The demand for these services is growing as the population is expanding in both urban and rural areas. At the same time, public health care providers cannot deliver quality services, as resources are limited, resulting that the majority of the population is turning to private health care facilities (Schellekens et al. 2007). Unfortunately, the private sector is fragmented and quality standards are inconsistent, which is why private health care providers find it difficult to find investment capital to improve and expand their services. Medical professionals in these regions, especially those that serve low-income groups, have limited or no access to credit facilities, as the costs of finance are too high and they cannot provide financial information on their business. Local banks are therefore reluctant to finance the lower-tier health care sector as the prevailing financial and operational risks are unknown or considered to be too high.

The MCF focuses on private SMEs in the health care sector since investment requirements are high but local facilities

remain underfunded. Nevertheless, their social and medical impact is immense, as the private health care sector serves about 50% of the population in African countries (MCF Annual Report, 2013). The private health care sector is broad and covers different health care facilities from smaller hospitals, to diagnostic centers, dispensaries, maternity homes, health shops and nurse-driven clinics (MCF Annual Report, 2013). Further, the sector is characterized by high uncertainty and investment risk due to lack of information on medical performance, medical standards, financial performance and track records (Schellekens et al. 2007). Although the investment need is high, these factors are a major drawback when traditional investors such as local banks consider investing or lending to the private health care market.

The MCF aims to finance quality improvements of health care services by reducing the investment risk for small and medium health care facilities. The MCF fulfills an intermediary role between local facilitates and investors and helps healthcare providers become financeable. Through their investments, facilities can improve their quality and expand their services and receive technical training programs that are delivered by partners of the MCF.

5.1 | Mission and Investment thesis

The investment thesis sets out the expectations and considerations of the investors towards the focal company or investment. The vision of the MCF is to enhance the provision of affordable quality healthcare services in sub-Saharan Africa to low income populations. MCF's investment thesis is to increase the access to capital for small and medium healthcare providers in order to facilitate sustainable clinical quality improvements (MCF Annual Report, 2014).

In order to achieve their mission and overcome the issues of low quality services and lack of capital access in the health care sector, the MCF works together with the PharmAccess Group, but especially close with SafeCare, an internationally recognized quality standards program for healthcare, technical assistance partners and local bank partners. The MCF focuses on first creating an impact at local health care facilities by improving their quality and thereby creating a return on the deployed capital, not the other way around. Investments are targeted in order to strengthen businesses and grow the health care sector. The impact created at the facility level should reduce the investment risk and increase the loan performance of health care facilities, therefore generating sound financial returns.

Ultimately, the goal of the MCF is to structurally enable lending to lower tier health care providers and invest into quality improvements and expansion of health services, eventually to reach more patients in those population with the highest need for health care services (MCF Annual Report, 2014).

The MCF assist health care clinics in procuring loans from local banks, combined with a comprehensive technical advisory service program for quality improvement and business planning. Specifically, the MCF thrives to strengthen the business cases of private primary health-care providers by investing in the quality of their clinical and medical services and by providing business advice and quality technical advisory services (MCF Annual Report, 2013).

In order to define capital needs of health care providers, MCF business advisors work closely together with the health care facilities to identify investment needs, reconstruct management accounts, and produce a financial assessment that can be submitted to a local bank as part of a loan participation (MCF Annual Report, 2013). This process helps to build a credit history and show local banking partners the investment possibilities in the health care market. In general, facilities receive an entry loan for small key investments first, which helps them to build the equivalent of a credit track record to further apply for potentially larger loans and investments. In addition, quality advisors assist the facilities in preparing for later SafeCare certification and accreditation by assessing clinical procedures and protocols. Through this process clinics define upgrading requirements in order to improve medical performance and be able to make further investments in the future.

5.2 | Theory of change

The health care sector is fundamentally different from other industries and businesses as the products and services provided must be of high quality, affordable for its clients and at the same time generate enough revenue for a clinic in order to prosper and be profitable. Investments into the health care sector must therefore focus on many additional aspects compared to investments into classic profit oriented industries. Providing capital to the health care sector can solve many problems, but without an overarching structure the impact of those investments may not live up to its fullest potential. As can be seen with investments to the public health care sector in African countries, 88 percent of every dollar of public expenditure on medication is lost to inefficiencies, where only 12 percent benefit the consumer (Shaw & Elmendorf,

1994). Defining an investment framework that overcomes these inefficiencies is therefore key to generate relevant impacts, develop a functioning health care system and avoid the waste of capital. The PharmAccess Group has been providing health care services in African countries and recognized barriers to effectively set up health care systems. The PharmAccess Group developed a "Theory of Change" in order to overcome these barriers and provide a framework in order to effectively implement change towards functioning health care systems in Africa.

The MCF operates inside this theory of change framework for the health care market as part of the PharmAccess Group. Schellekens et al. (2007) define the theory of change for health care by incorporating all elements of the health care market into one effective model. In order to observe a sustainable change in health care systems, financing, administrative systems, hospitals, medication and laboratories need to be present and functioning, with health insurance as an overarching mechanism (Schellekens et al., 2007).

In most African countries, the demand for health services is high, while 60% of the payments are out-of-pocket payments from the consumer (Schellekens et al., 2007). Most health care services cannot be paid by the local population or puts them into severe financial problems. Therefore, health insurance systems are needed to avoid unexpected financial shocks and maintain a liquid financial flow in the health care system. Finally, health services must be supplied adequately and credible third party providers must enforce quality standards when the regulatory capacities of governments are weak (Schellekens et al., 2007).

At the same time many African countries are in a state of limited access order (LAO), which describes the status of the government being able to maintain government contracts, land rights and restricted markets, but failing to actively and openly invest into further development (North et al., 2011). While these states can maintain rudimental and elementary functions like safety, control of violence and a political system, LAO countries are in a developing state and lack many of the functioning governmental bodies of a developed country. In contrast to many developed countries, health care systems did not structurally develop over centuries but are required to reach a functioning state in a much shorter period of time (North et al., 2011). As a consequence, governments alone cannot realize a proactive development of health care system.

Many African countries face substantial challenges in developing health care systems and are stuck in a vicious

cycle of health, where the demand for quality health care services is high but the supply is low (Schellekens et al., 2007). The entire health care system lacks funding, which is characterized by high risk for investments on the supply and financial side, and low trust into the system by consumers on the demand side. Translating these prerequisites into the context of health care in Africa, a vicious cycle of health care can be observed. See Figure 5.

This negative feedback cycle needs to be challenged through a holistic approach and a Theory of Change. Increasing investments and resources in health infrastructure by setting up funds like the MCF are a starting point to transform the vicious cycle into a virtuous one. Increased quality standards maintained by SafeCare and new health insurance systems on the demand side help to increase trust in the system, decrease risk for investment and contribute to a positive feedback cycle by growing the amount of trust in the system. When addressing different stages of the health care sector directly and not only investing capital at a single point, the entire system can grow, providing not only benefits for consumers but also generating financial returns of investments. Through the activities of the PharmAccess Group and the investments of the MCF, the overarching vision is to transform the vicious cycle of health into a virtuous, self-enforcing one. See Figure 6.

Through this transformation the effectiveness of investments into the health care sector can be increased dramatically. Acting on the basis of the Theory of Change framework, the activities by the PharmAccess group and the investments made by the MCF contribute in building up a functioning system of health care services and aims to reduce risk and risk perception of the market. Together with SafeCare, the MCF finances quality improvements of health care facilities, improves their business cases and reduces the medical and business risk factors. Building a financial track record for health care facilities is key in order to increase the transparency of the investment risk and to show that by improving the medical quality, the business risk is also reduced. Ultimately, the MCF aims to transfer the healthcare specific investment knowledge to local financial institutions, making them comfortable and commercially interested in the sector to accelerate the structural change and development of health care systems.

Vicious Cycle of Health

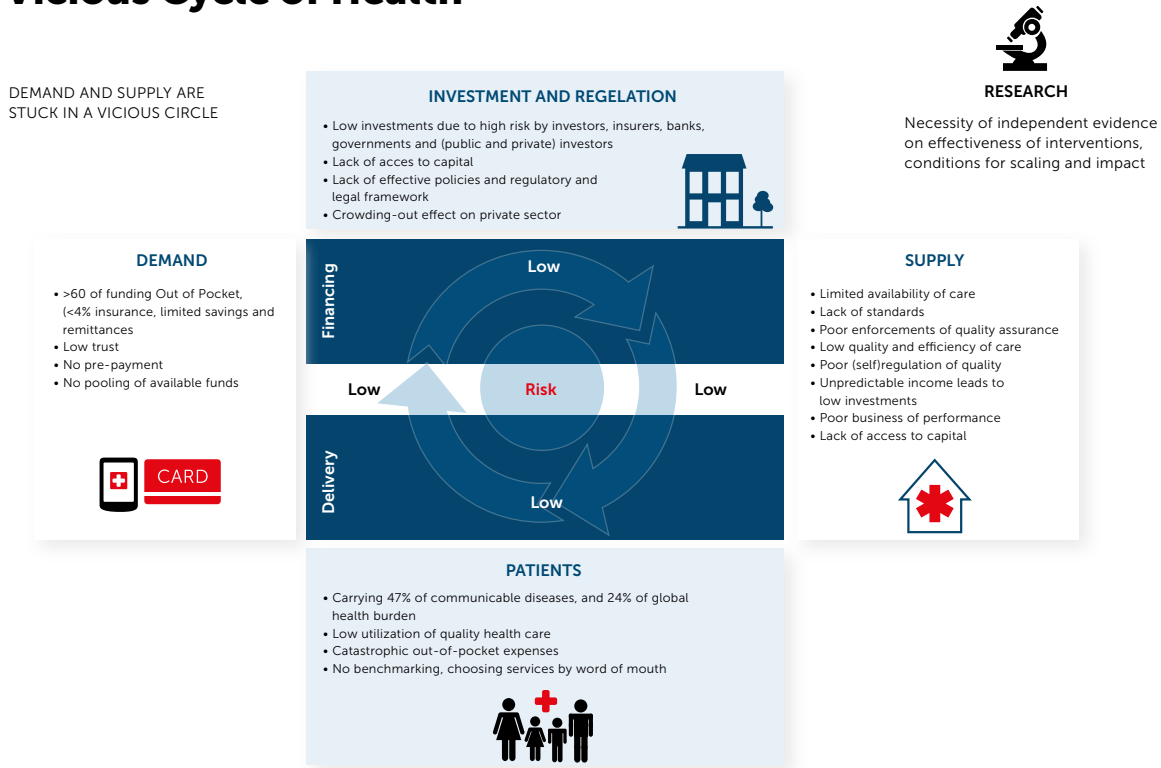


Figure 5: Source: HIF Annual Report, 2015

Virtuous Cycle of Health

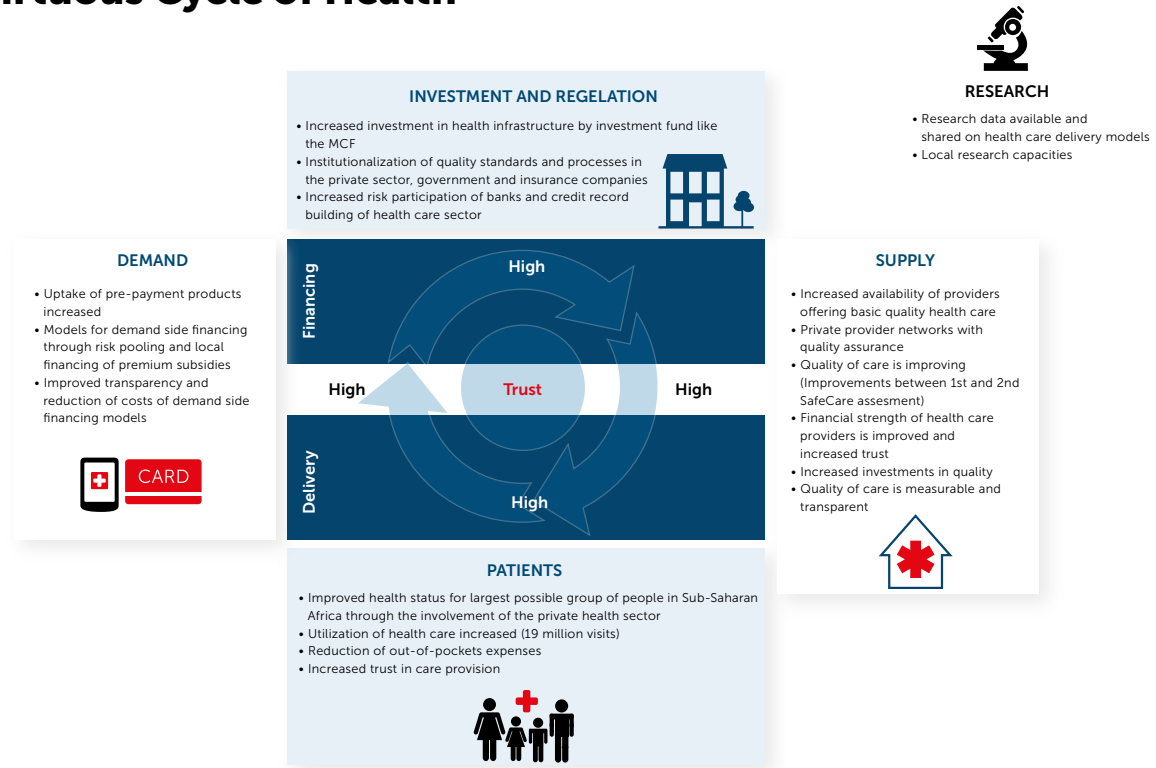


Figure 6: Source: HIF Annual Report, 2015

5.3 | Loan qualification and process

The following paragraphs will outline the process for loan qualification and how the MCF works together with local partners in order to build capacities in the health care sector and make clinics bankable.

The investment approach of the MCF is based on a close cooperation with clinics, technical assistance (TA) partners and banks. Initially, TA partners recruit health SMEs for the loan program and produce expert opinions, which outline staff and patient numbers, revenues and general information about the facility. In addition, advisors assess how the clinic intends to use the loan and a long-term investment plan is created. Based on this first assessment, TA partners monitor the business and quality improvements throughout the tenure of the loan. Additionally, the highest priorities for quality improvement are identified and form the basis of a due diligence for clinics. TA partner assess the clinics general performance, identify its most urgent needs and formalize the relationship between the clinic and a local bank that works together with the MCF. Finally, it is assessed whether the clinic will be able to repay the loan within a given time frame. Through this initial screening, the TA partners help to significantly reduce the investment risks and to build trust on the side of the borrower.

The MCF works together with local banking partner and has risk-sharing agreements for the loan program with local banks in the countries of operation. The majority of the clinics in the program are first-time borrowers and begin with small entry loans, which are loans up to USD 15,000 and are provided in the local currency (MCF Annual Report, 2013). By starting with small loan categories, clinics are protected from over-stretching their repayment capacity and helped to establish a positive track record of borrowing and repaying of the loans.

Besides giving entry loans to SME health facilities, clinics can apply for medium or mature loans. These loans range between USD 50,000 to 350,000 and have a tenure of 24-48 months (MCF Annual Report, 2014). Medium and mature loans are co-financed by a local bank and thus reduce the risk exposure of MCF capital, where local partner banks participate in the funding between 25% and 50%. These types of loans have additional requirements such as a SafeCare entry assessment, follow-up quality assessments, a two-day business and one-day quality training, the development of an upgrade plan as well as a business plan.

The purpose of the MCF is to help health facilities borrow in local markets, not to develop a parallel market.

The loan products are priced following interest rates in the local markets. The loan process is based on building trust among banks and supports clinics to qualify for future, large bank loans independently. With the additional training and technical services, health care facilities can grow the quality of their health services and increase their business potential. A major objective for the MCF is to incentivize local banks to offer loan products to the health care market. By assuming higher risk sharing for entry loans and in countries with limited investments into the health care markets, the MCF acts as an intermediary in order to increase the willingness to invest. Through this policy of incremental lending and technical advisory service, the loan portfolio has a repayment rate of 97,5% in 2013 (MCF Annual Report, 2014). As a result of the process, the risk-participation by local banks increases over time (MCF Annual Report, 2014) and shows the effectiveness of this approach.

5.4 | Fund structure

The previous sections have outlined the actions and theoretical background of the MCF and the PharmAccess foundation. The Medical Credit Fund can be seen as a financial vehicle to shape and grow a health care market in conjuncture with additional actions of the PharmAccess foundation. This section will focus on the structure of the Medical Credit Fund, how investment capital is used to diversify risk and enable impact investments for different investors classes. In addition, this section will give an overview on how much capital is invested and what investments are made in different countries in Africa.

5.4.1 Capital structure of MCF

This section will resume the discussion on blended capital structures and analyze the capital structure of the MCF.

The MCF was able to raise USD 10.6 million in loans from its first round of investment in 2012 and the total amount of capital of the MCF by the end of 2013 is USD 29 million (MCF Annual Report, 2013). The MCF is financed through grant, equity and debt capital from both public and private sources, giving it a blended or layered capital structure. Grant capital is used for the technical advisory services and first loss capital while debt capital is deployed for the loan program. First-loss capital is used when clinics are unable to repay their loan to the fund, where the first-loss layer absorbs the delayed payments or defaults of loan and thereby reduces risk for the debt investors of MCF. Through a blended capital structure the MCF is able to leverage larger amounts of private capital with public funds and increase the amount of investments that can be made. This type of capital structure is a unique feature of

impact investments and can be used to attract a broader investor audience by pooling the financial risk among various investor classes.

In 2014, the amount of the first loss capital buffer amounts to EUR 3.957.557. Strikingly, in the time period of 2012-2014, only EUR 234.457 were realized as losses through defaults in loans, which can also be undermined with the high repayment rate of 97,5%. In total, the first loss position is very comfortable with a first loss cushion covering 151% of the total credit exposure on loans. Thus, from a capital buffer perspective, the MCF has enough room to extend its loan program further without stressing its security cushions and can grow the portfolio to a total amount of outstanding loans above EUR 10 million (MCF Annual Report, 2014).

Table 1 shows the different investors MCF has in its capital base, ranging from private investment organizations to public funding.
The blended capital structure and broad investor base of the MCF is exemplary for an impact-investing organization. The combination of grant money from public sources, debt capital from private investors and the use of first loss capital and technical assistance programs reduce the investment risks and serve as a structural risk reduction tool. At the same time, a blended or layered capital structure bridges the gap between financially

Investors and contributors	
Overseas Private Investment Corporation	De Grote Onderneming
Calvert Foundation	Bill & Melinda Gates Foundation
Soros Economic Development Fund	Deutsche Bank Americas Foundation
Health Insurance Fund/PharmAccess	FMO on behalf of the Dutch Ministry of Foreign Affairs
AIDS Fonds	IFC (G-20 SME Finance Challenge)

Table 1: Source: The Medical Credit Fund, 2013

oriented investors and social capital needed for the health care market. This attracts higher amounts of capital from different investor sources, making it feasible to invest into clinics in a so far underserved environment.

5.4.2 Stakeholder overview

This section provides a brief overview on the stakeholders in the MCF program and analyzes which parties are affected and potentially benefit from the investments of the MCF.

The MCF program and investments directly address stakeholders on 3 distinctive levels. At the first level are international investors and institutions that look for opportunities in the impact investment market through the MCF. The possibility to invest with the MCF provides them with a possibility to gain a return on their capital, depending on their risk-return appetite, while achieving a social impact. At this level, the MCF is an intermediary in order to realize investments that individual investors cannot realize by themselves. At the second level, the local economy and in this respect local banks are affected by the actions of the MCF. The MCF reduces investment risk in the local health care market, which opens up an opportunity for local banks to learn and offer products for that specific sector. Local banks increase their participation in the MCF loan program and understand the financial and strategic needs of the private health care market. Ultimately, local banks shall take over the investments of the MCF independently. At the third level, local entrepreneurs and doctors gain the possibility to invest into their facilities and develop their business further. The investments by the MCF should help them achieve growth in quality and health care capacity and therefore strengthen the business cases of SME in the health care market. By making the impacts of the MCF visible, local entrepreneurs can recognize that investments into quality helps their businesses while at the same time creating a social impact through the better provision of health care services in their communities. Finally, a major stakeholder of the MCF is the local population who benefits from increased health care services and better quality of treatments. Further, local governmental institutions are influenced by the development of the private health care sector through their increased health care capacities. As an example, the minister of finance of Uganda recognized the developments of the MCF in their neighboring country Kenya and is planning to implement the MCF program in their state as well (MCF Annual Report, 2014).

5.4.3 Loan Portfolio and investments

By the end of 2014, the MCF is active in four different countries in Sub-Saharan Africa. In total 617 loans were

disbursed, from which 334 are located in Kenya, 159 in Tanzania, 104 in Ghana and 20 in Nigeria. Together with eight local partner banks, the total amount of loans disbursed adds up to USD 4,071,780, with a current outstanding loan amount of USD 2,970,805 (MCF Annual Report, 2014). Strikingly, the repayment rate of the total loan portfolio is 97,5%, far above traditionally financed loan portfolios of local banks operating in these countries. With the majority of loans disbursed in Kenya, the activities in this specific country have driven the growth of the program over the past years. Activities in Nigeria for example have just begun in 2012, but are expected to experience growth in the near future. Figure 7 displays the amount of disbursed loan value per country.

Here again, it can be seen that Kenya and Tanzania are making up the majority of the loan portfolio, with about 90 % of the total outstanding loan portfolio.

The net revenue of the MCF is about USD 2,8 million in 2014. Fund management costs including portfolio management and general program management amount to about USD 2,7 million, including technical advisory costs and all activities that are concerned with the loan program and improving business and quality factors at clinics. In total, the net result in 2014 was positive, amounting to a net income of USD 197.360 (MCF Annual Report, 2014). In comparison to the size of the total investment and the overall growth stage of the MCF, this result is an indication of the success of the program. Through continuous growth in the coming years, better fund management and acceptance of the program in the different countries, the potential to generate sustainable profits is more than realistic. However, as the MCF is a non-profit organization, the mere possibility to generate some profit is sufficient to classify the business model a viable and self-sustaining.

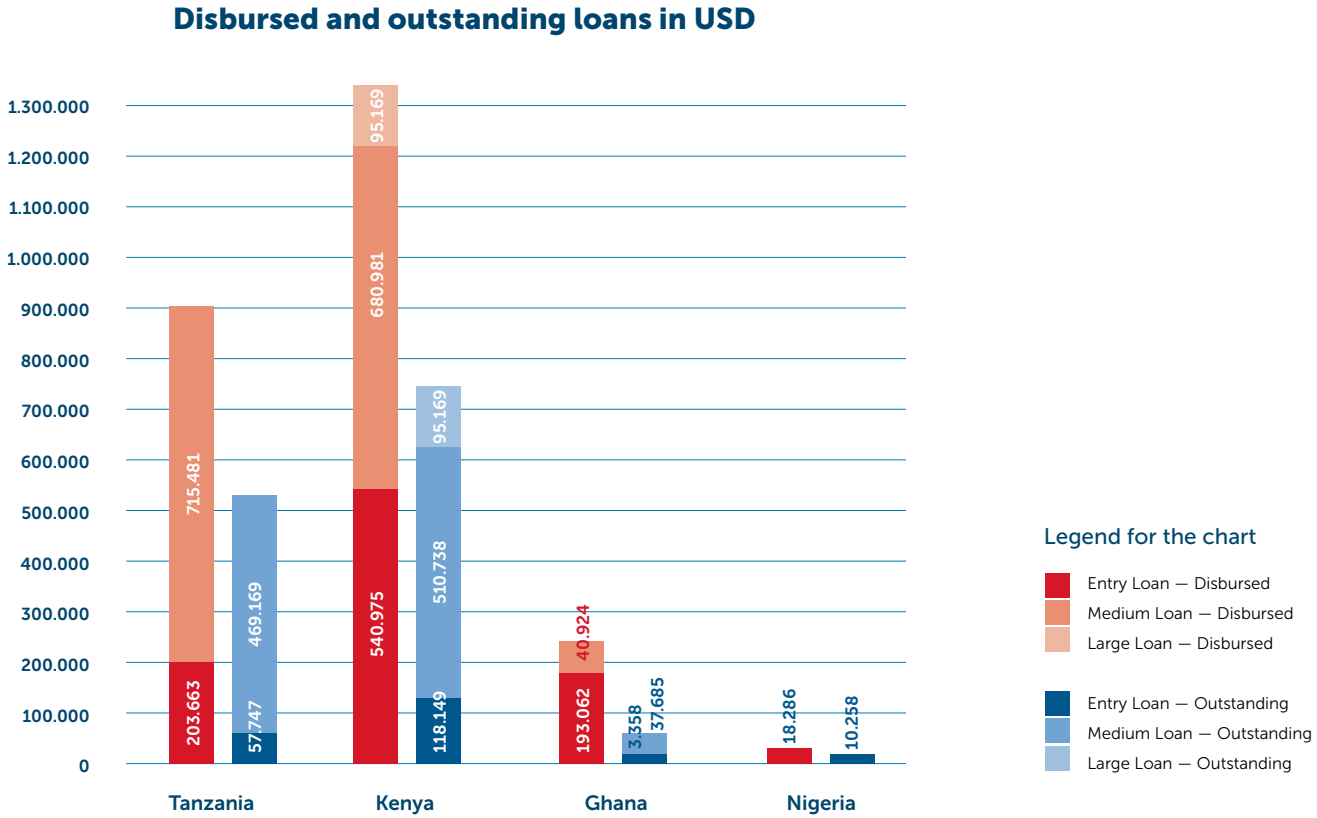


Figure 7: Source: The Medical Credit Fund 2014

6 | SafeCare

SafeCare is a separate organization of the PharmAccess foundation and is essentially a provider of quality assessments tools in health care markets. As governmental standards often lack clarity and transparency or institutions are simply non-existent in local markets, independent and international accreditation programs such as SafeCare can credibly assess the quality of services in health care markets irrespective of the governmental environment. Since 2011, SafeCare assesses the quality of clinics in different countries with a focus on Africa and provides an independent overview of quality standards of medical facilities for investors and customers.

The SafeCare quality improvement program is an integral and intriguing part of the MCF investment approach. As many states in sub-Saharan Africa cannot guarantee consistency of health care services and governmental quality programs are non-existent for health care facilities, objective measurements and ratings of health care services are rare. Most patients face uncertainty with regard to the quality of services of different clinics and hospitals and have to rely on word-of-mouth recommendations, as comparisons between facilities are not transparent (HIF Annual Report, 2015). Building up institutions and creating standards are therefore required in order to help patients making informed decisions about health care facilities.

SafeCare developed internationally recognized standards for the health care industry that can also be applied to resource-limited environments while at the same time evaluating quality levels accurately. SafeCare aims to overcome the lack of institutional bodies and focuses on "bottom-of-the-pyramid" healthcare facilities in the public and private sector (MCF Annual Report, 2013). The SafeCare methodology provides measurable steps for quality improvements. Through setting up universally accepted standards for health care, SafeCare has become a recognized external evaluation system that certifies

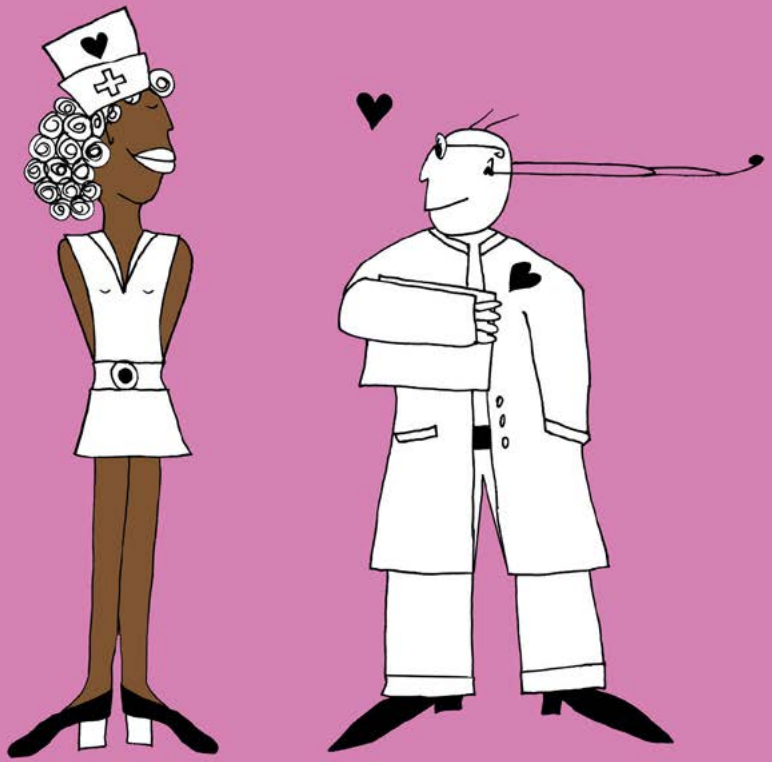
quality of care. As a result, the methodology and standards of SafeCare are firmly being embedded in the legislative framework of the countries where SafeCare is active in order to build up an institutional environment (MCF Annual Report, 2013).

For the MCF, financing quality improvement through the SafeCare program is a fundamental aspect of the technical advisory program and helps to build up a data and reference base of clinics. Further, through the collection of different variables on quality standards, SafeCare has build up a unique database on quality standards and business performance for private health care facilities in Africa. Measuring whether investments into healthcare facilities can improve quality of care and grow these businesses is a first-hand indicator of the impact of these investments. Essentially, SafeCare provides the MCF with a perspective on how good a health care facility performs and thus is a risk assessment tool in order to analyze whether an investment into a clinic faces risk from the business performance. Moreover, by incorporating SafeCare into the loan and investment process, MCF is not only incorporating financial aspects but also quality and business factors of the investment.

6.1 | Risk management through SafeCare

The cooperation between SafeCare and the MCF is essential in order to assess and diversify financial and non-financial risk of investments into clinics. Through the collection of data on quality performance, the MCF can assess the overall condition of medical facilities and develop a quality improvement and investment plan. As rating agencies such as Moody's or Fitch assess the quality of financial instruments, SafeCare can be regarded as a social rating agency by assessing facilities on their quality and non-financial performance, therefore identifying and mitigating the risks of investments on the medical and business level. Through the use of quality assessment tools, the MCF can identify risks, structure investments and measure the improvements of facilities. Further, SafeCare urges facilities to improve by assessing them in field, rewarding those facilities that improve or comply to quality standards and closing out facilities that fail to comply. Through SafeCare, required investments can be budgeted for upgrading facilities and can be combined with the technical advisory and business planning tools of the MCF. Especially for initial investments, SafeCare can identify the areas where investments can have the most direct and most realizable returns on financial and business or quality aspects.

Collecting data of medical facilities on business performance such as revenue, number of patient visits or use of treatments but also data on quality performance effectively serve as assessment tools for investments of the MCF. While most clinics do not have any credit history prior to investments of the MCF, business and quality data can help to classify facilities on their performance. This process is an alternative to classic financial assessments and is essential in order to improve the access to capital in this sector. In addition, clinics in the program can use the SafeCare information to build a credit history with the MCF and apply for regular bank loans when they weren't able to do so before. Finally, as the private sector has no direct regulation from the governmental side, quality standards and business screenings help to build transparency to consumers and build up professionalism of the health care sector in general. This increases the credibility of the private health care sector and help customer or patients to assess clinics not through word-of-mouth propaganda, but through independent and certified standards.



Health Care System

7 | Impact of the MCF

The capital of the MCF is employed to strategically develop facilities in local health care markets by professionalizing business processes and providing training on health and business management, thereby generating a return on the investment. While the MCF has been active for several years and has observed the development of clinics throughout the time of the program, the business model of the MCF can be called successful. Not only is the capital employed in the countries of current activities generating developments by building a sound health infrastructure, other African states like Uganda are planning to employ the model of the MCF in their country as well in order to strengthen their health care sector (MCF Annual Report, 2014). The success of the current initiatives and the increasing size of the MCF program in current countries and the demand of other African states also call for a sound reporting and assessment process of the operations. Although the MCF does report its progress in terms of clinics served and can also rely on standards and reporting of SafeCare, the relationship between investments and improvements of clinics in the program is observable but has not yet been tested empirically.

Similar to other impact investment fields, the reported data does indicate a relationship of impact improvements and helps to develop standards for reporting, but may not be able to attract and guide investors for the future. The development and analysis of relationships that prove the underlying actions in the field can help the MCF in the future to attract additional investors, improve their training program, stress the focus of the most important strategic business decisions while generating financial and social return for their investors. In addition, the MCF can prove their contribution to the impacts on health care facilities empirically and isolate third party effects such as general economic developments.

Developing an empirical foundation for the MCF is important

for three different stakeholder levels. On the first level, international investors recognize the investment opportunity through the reduced risk and sound returns on their investment. This broadens the investor base for the MCF, increases the attractiveness for future investors to invest in projects of the MCF or of a similar kind and strengthens the financial investment case. On the second level, local banks recognize a profit opportunity in their local markets through understanding the health care specific aspects. Organizations like the MCF can make an initial step into the market, but the greatest impact on this level is achieved when local banks start to offer specific financial products for the health care sector, thereby increasing the amount of capital of the entire system. Demonstrating the success of the program and good financial returns with low default rates incentivizes local banks to start investing into this important part of their local economy. Finally, on the third level, local entrepreneurs can observe that investments into quality help to grow their businesses. This creates an incentive to apply for loans, commit to investments and improve their facilities in order to provide more and better services for their clients, while at the same time increasing their profits.

This thesis aims to broaden the empirical horizon for impact investing and analyze the actions of the MCF with regard to the created impact and their underlying relationships. The result can be used by the MCF to show that significant impact can be created with their model while at the same time being attractive for the three stakeholder levels. It is therefore of direct interest whether the focus on social, medical and quality issues lead to a change in the risk profile of the investment and has an impact on the success of the involvement. Especially, how do clinics in which the MCF invested perform, not only from a financial perspective, but also on their business perspective? Do the investments of the MCF increase their quality of services, grow their business and increase the access to health care for the general population? More directly speaking: What is the impact of the MCF? In addition, it is relevant to explore the underlying relationships of the afore mentioned factors with regard to the MCF. If the relationships are understood and measurable, future investments can focus and stress certain areas to increase the efficacy of the investments and create a larger impact. The MCF can develop forward-looking measurements, increase the impact of their investment and scale up their operations. Investors can use these tools to analyze the work of the MCF and quantify the social return of their investment. With a more transparent reporting and better observable impact generation, impact investments such as those of the MCF can attract more investors and be exemplary in their reporting structure.

8 | Research Objective and Hypothesis development

The health care industry in emerging economies is different from classic industries or the healthcare sector in the developed world, as their clients vitally depend on the affordability and quality of services while at the same time clinics have to generate revenue and be profitable in order to prosper in the future. The objective of the MCF is to increase the positive feedback loop in the health care sector by improving access to capital in order to strengthen the business case of health care facilities. Further, improving clinics on quality and business performance evokes further need for investments and better performance of these investments. The fundamental relationship between improved access to capital, improvements of health care facilities and investment hypothesis of the MCF can therefore be summarized in Figure 8:

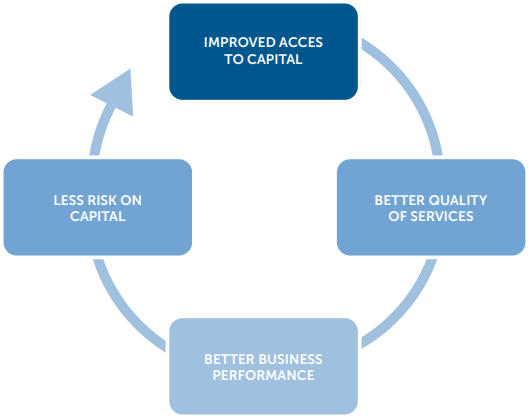


Figure 8: Investment hypothesis of the MCF

8.1 | Financial impact

Investments or more precisely loans from the MCF program come hand in hand with trainings in business

and clinic management from the SafeCare program. All clinics that apply for loans of the MCF are required to complete these trainings. The objective is to increase the quality of clinics with respect to their medical standards (measured by their respective SafeCare Score), but also to structure their business performance. These activities should ultimately lead to a reduction of risk and better loan performance through a more professional structure of the clinics in the program. Although one cannot expect jumps in quality improvements and SafeCare levels, continuous improvements in the SafeCare scores over time should indicate that these clinics are more determined in improving their business and therefore should have better loan performances throughout the process.

8.1.1 HP1 – Improving Access to Capital

The major objective of the MCF is to help health care facilities gaining access to capital and overcoming the barrier of underinvestment. Clinics and health care facilities often do not have a credit history and local banks are reluctant to lend money to a sector that they do not understand. The MCF absorbs this initial risk by providing first time and follow up loans to health care facilities and therefore increasing the access to capital of the entire sector. Ultimately, this should increase the development of the business performance and quality of the clinics in the program.

When providing capital, the MCF distinguishes between entry loans or first time lenders, and loans to clinics that have more mature loan histories. Especially entry loans bridge the gap of a lack of finance for these clinics that do not have any information on their quality levels. Medium or large loans can be used for greater investment project but also require higher standards before being made available to clinics. With information on quality perspectives and various loan sizes, the impact and disciplining role that a loan agreement has could be measured alongside quality dimensions. While entry loans should be a door opener for clinics to receive first-time access to capital, higher quality scores should especially for follow up investments such as medium or large loans underline their willingness improve the services of their clinic. Hence, besides initial access to capital, it is also interesting to investigate whether quality of services influences the probability of receiving follow-up financing through medium or large loans. Therefore, the first hypothesis focuses on investigating whether clinics that have access to capital have also better quality scores.

HP1: Access to finance has a positive relationship with quality of services.

8.1.2 HP2 – Return on Impact

Impact investments can take different forms, either through direct equity participation in firms, investment funds that invest into intermediaries or through providing loans and capital to facilities or impact projects directly. As in the case of the MCF, investments into health care facilities are made through the provision of loans, thereby increasing the access to capital and making investments into quality and business improvements possible. Many social and environmental issues in impact investing can be found in markets that are underdeveloped or do not have a regulatory environment that is comparable to OECD standards. Although the investments are critically needed and have significant impacts on the community, investors must adopt high levels of risk. While on one part blended capital structures help to distribute risk according to the specific risk appetite of an investor, capital structures alone cannot completely mitigate risk or guarantee the success of an investment. A sound measurement of the performance of an investment, not only on financial aspects, is therefore needed in order to reduce investment risk. In the case of the MCF, the assessment through SafeCare and the provision of training to health care facilities help to better understand and manage the investment context and essentially work as risk mitigation tools for their loan provisions.

It is therefore important to investigate whether a positive relationship exists between the quality of a facility and their performance on loans provided by the MCF and which specific quality aspects of a clinic have the highest influence on loan performance. Understanding the relationship which quality aspect has the most direct influence on a good loan performance or going into default can help to predict payment problems and reduce investment risk beforehand.

While it is difficult to measure how well a facility is performing on a loan, it is rather easy to observe facilities that do not perform well on their loans and estimate the probability of default given certain quality levels. The probability of default can be estimated by the Portfolio at Risk (PAR), which is also a measurement standard recognized by IRIS and widely accepted as an financial variable in the impact investment environment (IRIS & GIIN, 2011). Overall, the second hypothesis focuses on how quality levels influence investment performance of health care facilities. The probability of defaulting on a loan is a relevant proxy, measuring loan performance of facilities in the program. This will indicate whether the technical training programs, business development and focus on quality improvements of health care facilities are effective in reducing investment risk for the MCF.

HP2: Facilities with high quality scores or high quality improvements on financial and/or medical standards have better loan performance.

HP2A: Facilities with high quality scores or quality improvements have a lower probability of entering PAR1 (PAR30).

8.2 | Strategic impact

As the health care market in sub-Saharan Africa can be generally described as being underdeveloped, growth and development of health care capacities and quality of service is very important. Through the investments of the MCF, health care facilities can increase their capacity, provide additional services to its clients and improve their quality. Facilities in the MCF program should experience a positive feedback loop through the increased access to capital and additional business and quality trainings. Thus, an important aspect to investigate is whether higher quality of services also indicates better business performance of clinics. Health care facilities that constantly improve on their quality, measured by their respective SafeCare quality score, should therefore show a positive relationship between SafeCare scores and business performance indicators.

Investigating the relationship of investments into quality on the business performance of health care facilities should yield insights on what impacts can be created for the local community and economy. In particular, what effect do the investments and training efforts of the MCF have on the business development of health care facilities? The loans of the MCF aim to strengthen the business case of health care facilities and therefore creating a direct impact at the facility level. For investors and investees, it is important to understand whether these direct effects are measurable and if they increase the impact of the investment while at the same time lowering the risk of inefficient business management. Investments in quality improvements and business developments should therefore increase the impact of an investment, especially in the health care market, and prove that investing into quality is a sound business plan not only for local entrepreneurs, but also for investors of the MCF. Thus, the third hypothesis expects a positive relationship between quality levels of health care facilities and their respective business performance.

HP3: Higher quality levels of health care facilities have a positive relationship with business performance.

8.2.1 HP3A – Increasing Health Care Capacity

In contrast to classic industries, health care facilities cannot entirely focus on profit, but have a responsibility to provide affordable and quality services to its customers. While the third hypothesis broadly outlines the positive relationship between quality of services and business performance, selecting appropriate proxies for business performance in the health care environment should specify this relationship. In order to measure the impact of investments into quality on health care capacity, the number of patient visits per facility can indicate whether better quality services attract also more patients to a facility. While this relationship may appear straight forward, the possibility remains that low quality health care facilities still attract high amounts of patients due to the lack of alternatives in the region. However, through the actions of the MCF, higher quality of services should lead to more patient visits per facility, thus increasing the health care capacity in the regions.

HP3A: Higher quality levels of health care facilities have a positive relationship with number of patients per facility.

8.2.3 HP3B – Growing health care businesses

Private health care facilities cannot depend on public funding and must therefore be economically viable in order to survive and prosper. Better access to capital helps health care facilities to make investments into their business, increasing their services and improving their quality. Whereas the previous hypothesis focused on the impact on health care capacities, a relevant proxy to measure the impact of investments into quality on business performance of clinics must be specified. Thus, the ability to generate revenue will be used as a proxy for business performance. Through the investments of the MCF, a positive relationship between quality scores of facilities and revenues is expected. While this relationship again may be genuine, facilities with low quality scores could still generate high amounts of revenue due to the lack of alternatives for local customers or charging especially high prices. With investments into quality and the transparency of SafeCare assessments, higher quality of health care services should lead to higher revenue generation, thereby creating a relevant business impact in the health care market.

HP3B: Higher quality levels of health care facilities have a positive relationship with revenue per facility.

Health Management

9 | Methodology and Data description

9.1 | Data

The MCF can provide a unique sample on financial and business factors of health care facilities in Africa. This research focuses on health care facilities in Kenya, since Kenya has the highest amount of disbursed loans and the longest history in the MCF program, thus provides the largest data set of a single county. Further, cross country analyzes may run into difficulties as local economies can be in different developing states and other factors may have higher influences in one or the other. While many data sources in Africa lack sufficient quality, the data collection of the MCF and SafeCare is supervised and mandatory for all facilities in the program, therefore ensuring accurate data collection and a unique database on the health care sector. Kenya has been in the program since the beginning and provides the richest data set since the data is more complete in comparison to other countries in the program. The sample period ranges from the first investments in Kenya in 2011 to 2015 and covers 309 collection points on 266 health care facilities. According to the different hypothesis and research models, the sample will be adjusted respectively.

Primarily, the data contains health care facilities that participate in the MCF program, have one or more SafeCare assessments and have data on loan performance and business variables such as revenue or capacity of health services. Since SafeCare data, loan information or business reports are collected at different points in time and on different occasions, the data points are matched according to the closest date, with no more than 6 months difference between for example a SafeCare assessment and the collection of business information, such as revenue. This avoids that the effect of quality scores does not influence business or loan performance since the periods may not overlap.

Besides data on overall quality assessments, the SafeCare

scores can be divided into 11 sub-categories that summarize scores on categorizes such as Management & Leadership, Human Resource Management, Patient Rights & Access to Care, Management of Information, Risk Management, Primary Health Care Services, In-Patient Care, Laboratory Services, Medication Management, Facility Management and Support Services. This differentiation of data on quality makes it possible to further derive insights on what specific categories may have the highest impact on business variables such as revenue and provide more depth to the analysis.

9.2 | Methodology

In order to test what impact the MCF achieves and how it can be made observable, several adjustments on the data have to be made. Also, while the hypothesis predict a specific relationship, it is necessary to translate the theoretical implications into the specific context of the MCF and relevant proxies for quality of services, business performance, loan performance as well as control variables have to be developed. The following section will describe the statistical models to analyze the hypothesis developed in section 8. An overview of the variables used can be found in Appendix A.

9.2.2 Access to Capital

The first hypothesis focuses on a fundamental impact objective of the MCF. In order to develop a model, all clinics that applied for a loan at the MCF are selected from the database and information on whether the clinics received a loan, which type of loan they received and their SafeCare scores are collected. To test the relationship, a logit model or logistical regression is developed. The explanatory variable, whether or not a facility has received a loan, is qualitative and can be classified as a limited dependent variable (Brooks, 2008). This variable is coded as a binary dummy, where the value of 0 represents a facility not receiving a loan and 1 representing a facility that has received a loan of the MCF. The logistic function F for this model would then be:

□□ = □□□1 + □□□ = 11 + □ - □□

The function F is a cumulative logistic distribution, which can be estimated as:

/// Please sent me a JPEG of the formula ///

This model is nonlinear and cannot be estimated using Ordinary Least Squares (OLS) analysis. Hence, Maximum Likelihood (ML) is used, choosing the parameters in such a way that they maximize a log-likelihood function (LLF) jointly (Brooks, 2008).

The MCF database provides vast amounts of information on facilities that applied for the loan program, ranging from amount disbursed, date of disbursements and repayment performance. For the first hypothesis, the relationship between quality and access to capital will be assessed. Loan applications from 2011 – 2015 are included into the sample period. Later, several control variables are included in the model, indicating whether geographical factors or types of clinics have any relevant effect on the relationship. The model for the first hypothesis on the relationship between quality scores and the likelihood of accessing capital can therefore be written as:

(0.1) Access to Capital $= \alpha + \beta 1 * ??? + e$
(1.2) Entry Loan $= \alpha + \beta 1 * ??? + e$
(1.3) Medium Loan $= \alpha + \beta 1 * ??? + e$

Where:
Access to Capital = Binary dummy, 1 if facility i received a loan, 0 if otherwise
Entry Loan = Binary dummy, 1 if facility i received an entry loan, 0 if otherwise
Medium Loan = Binary dummy, 1 if facility i received a medium loan, 0 if otherwise
??? = SafeCare Score of facility i (independent of the access to capital)

9.2.3 Return on Impact

The second hypothesis states that facilities with high quality scores have a better loan performance. Loan performance of all health care facilities in the MCF program from 2011 – 2015 will be analyzed and similar to the previous model, a logistic regression model will be used in order to test the probability of default of a health care facility. The Portfolio at Risk (PAR) will serve as the dependent variable, taking the value of 1 if any facility entered the state of *PAR1* (*PAR30*) or 0 if no payment delays have occurred. *PAR1* measures whether a facility is late with its payments by at least one day, while *PAR30* measures the delay of payments by 30 days or above. The SafeCare score of each facility will serve as a proxy for quality. In addition, sub-categories of the SafeCare scores will be analyzed in order to derive a deeper understanding which quality factors have the highest influence on the probability of default. Besides these independent variables, several control variables are later included in the model,

controlling for geographic areas or facility categories. For example, the probability of default could be influences by the location of a clinic in urban areas or by a certain facility type that may be exposed to higher business risks. The model for the second hypothesis on the relationship between facilities that have a high quality scores and loan performance can be written as:

(2.1) PAR(1) = α + b * ? ? ?
(2.2) PAR(30) = α + b * ? ? ?

Where:
PAR(1) = 0 if Facility has no loan entering PAR1, 1 if Facility has a loan entering PAR1
PAR(30) = 0 if Facility has no loan entering PAR30, 1 if Facility has a loan entering PAR30 or above
? ? ? = SafeCare Score of facility i

Replacing the overall SafeCare score with the SafeCare sub-categories extends the previous model. Essentially, the overall SafeCare score is composed by the individual sub-categories. Investigating the sub-categories should provide a deeper understanding which quality factors has the highest influence on loan performance.

(2.3) PAR (1) = α + b1 * ML + b2 * HR + b3 * MI + b4 * RM + b5 * Primary + b6 * LAB + b7 * MM + b8 * FM + b10 * SS
(2.4) PAR (30) = α + b1 * ML + b2 * HR + b3 * MI + b4 * RM + b5 * Primary + b6 * LAB + b7 * MM + b8 * FM + b10 * SS

Where:
ML = Quality score on Management & Leadership
HR = Quality score on Human Resource Management
MI = Quality score on Management of Information
Primary = Quality score on Primary Health Care Services
LS = Quality score on Laboratory Services
MM = Quality score on Medication Management
FM = Quality score on Facility Management
SS = Quality score on Support Services

In addition to investigating the relationship between overall quality scores and the loan performance of facilities, the data quality and quantity on financial performance also allows to investigate the relationship between quality improvements and loan performance. Therefore, an extension to the model analyses the relationship between improvements in quality score and the likelihood to have payment problems with respect to their loan, which can be written as:

(2.5) PAR(1) = α + b * Δ ? ? ?
(2.6) PAR(30) = α + b * Δ ? ? ?

Where:

Δ [?][?][?] = SafeCare growth rate between SC1 and SC2, calculated as

(SC2 – SC1)(100 – SC1)

as the SafeCare score maximum is limited to 100.

9.2.4 Increasing health care capacity

The third research question focuses on how to measure the strategic impacts of the MCF. The same sample is used compared to the previous hypothesis, yet several adjustments have to be made. Since SafeCare data and business performance data are collected in two different procedures, both data points have to be matched according to each respective facility and according to a matching time period. Data on business performance was matched to each quality score assessment if both data points had a collection difference of maximum three months. Matching quality and business data ensures that the effects occurred around the same time period and no other unobservable variable influences the relationship. Further, as absolute patient visits can vary substantially between facility types, the number of patient visits has to be standardized. A direct approach would be to use facility categories or facility assets as a standardization tool, but data on assets per facility is not reliable and varies substantially across facilities even in the same category. For facility categories, dummy variables are used instead. Thus, patient visit data is standardized using the natural logarithm in order to make the absolute patient numbers comparable across facilities. This transformation is a popular tool in order to adjust for highly skewed data sets or absolute measurements in business such as revenues or expenses (Benoit, 2011). As Figure 9 on the next page shows, the transformation using the logarithm leads to a normally distributed patient number dataset.

In addition to the overall SafeCare scores, sub-categories scores will be used in a second model in order to derive deeper insight on the influence of specific quality dimensions on patient visits per facility. The model for the third hypothesis on the relationship between facilities that have high quality scores and larger health care capacities can be written as:

(3.1) Log_Patient_Visits = α + b * [?][?][?]

Log_Patient_Visits = Logarithm of patient visit per facility

[?][?][?] = SafeCare Score of facility i

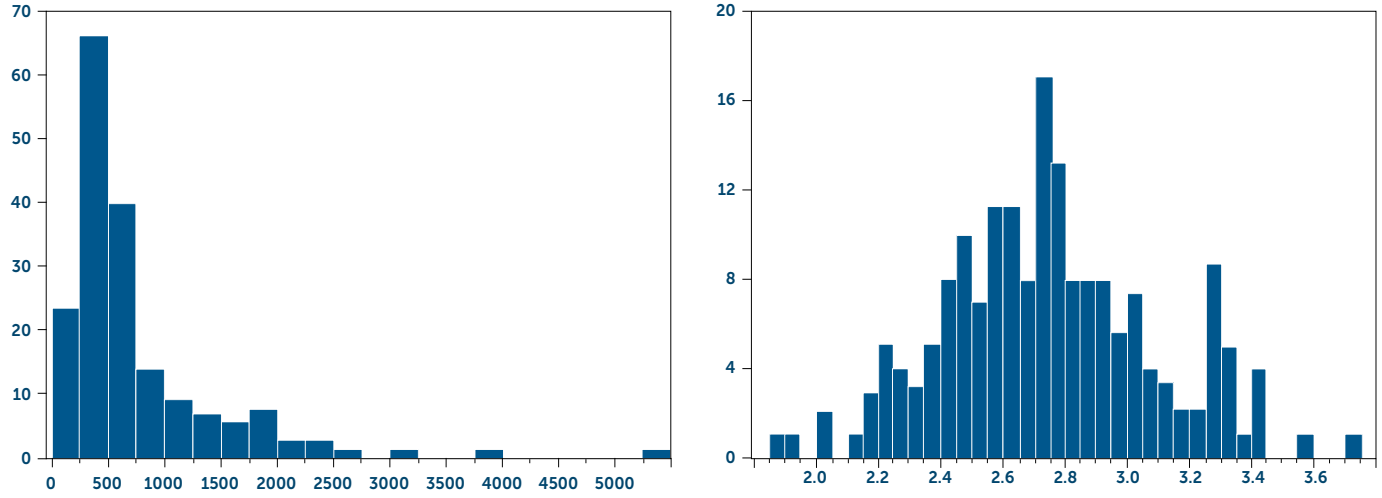


Figure 9: Logarithmic Transformation of absolute patient visit data

A higher score on Quality Score Elements (ML, HR, ..., SS) positively influences patient visits:

(3.2) Log_Patient_Visits = α + b1 * ML + b2 * HR + b3 * MI + b4 * RM + b5 * Primary + b6 * LAB+ b7 * MM + b8 * FM + b10 * SS

ML = Quality score on Management & Leadership
HR = Quality score on Human Resource Management
MI = Quality score on Management of Information
Primary = Quality score on Primary Health Care Services
LS = Quality score on Laboratory Services
MM = Quality score on Medication Management
FM = Quality score on Facility Management
SS = Quality score on Support Services

9.2.5 Growing health care business

The second part of the third hypothesis focuses on the business impact of the investments of the MCF and how clinics can increase the size of their business. Here, the amount of revenues per facility will be used as a proxy for business development and to investigate if investments into quality also lead to more revenue generation. The source for higher revenues can be either the growth of the business or more cost efficient processes at the clinics. Clinics can use investments to either increase their business or implement more efficient processes. Especially with regard to revenue, the SafeCare score can simply measure whether better quality of services has a positive influence on revenue, but cannot identify the source for a possible gain in revenue generation. The same sub-sample as in Section 9.2.4 will be used and again the absolute revenue figures for each facility will be transformed using logarithms. The model for the third hypothesis on the relationship between facilities that have high quality scores and larger health care businesses can be written as:

(3.3) Log_Revenue = α + b * ? ? ?

Log_Revenue = Logarithm of the amount of revenue per facility
? ? ? = SafeCare Score of facility i

Similar to the previous section, a higher score on Quality Score Elements (ML, HR, ..., SS) positively influences revenues:

(3.4) Log_Revenue = α + b1 * ML + b2 * HR + b3 * MI + b4 * RM + b5 * Primary + b6 * LAB + b7 * MM + b8 * FM +b10 * SS

ML = Quality score on Management & Leadership
HR = Quality score on Human Resource Management
MI = Quality score on Management of Information
Primary = Quality score on Primary Health Care Services
LS = Quality score on Laboratory Services
MM = Quality score on Medication Management
FM = Quality score on Facility Management
SS = Quality score on Support Services

10 | Empirical Analysis & Results

The following paragraphs will present the results of the statistical models and analyze the outcomes of the regression models. Descriptive statistics are presented in Appendix B.

10.1 | Financial Impacts

10.1.1 Access to Capital

The results of the first hypothesis, which analyzes the relationship between quality scores and the likelihood of gaining access to capital, are provided in Table 2. The model is based on the relationship between quality scores and access to a loan and consequently extended including control variables for location and clinic category as well as looking at different types of loans. For all logistic regressions, the McFadden-R is shown, a pseudo-R squared, maximizing the value of the log-likelihood function and taking into account that the dependent variable can only take the values of 0 and 1 (Brooks, 2008). The values found here range between 0.029 and 0.0829, which is rather low but not unusual for the case of limited dependent variable models (Brooks, 2008).

In total, about 68 facilities did not receive a loan at all. While the quality score for entry loans is independent to gain access to capital, several other reasons could hinder facilities to receive an entry loan. For example, a collateral, which normally is the building or land of the facility, has to be posted. However, ownership rights are often unclear and are not fully recognized and proofed by local authorities. In addition, administrative or communicative issues may extend the loan issuance process or result in a cancelation of the deal. In total, 158 facilities received an entry loan with an average SafeCare Score of 31,73, whereas 78 facilities received medium or large loans with a SafeCare Score of 44,28. These descriptive statistics give a first indication that a large number of facilities with relatively poor SafeCare scores have the opportunity of entering

Table 2: Results of logistic regression model with dependent variable Access to Capital (0=NO, 1=YES), Entry Loan (0=NO, 1=YES), Medium Loan (0=NO, 1=YES)

Variables	Access to Capital (1)	Access to Capital (2)	Entry Loan (3)	Medium Loan (4)
C	-0.3584 (0.4125)	-1.0768** (0.5043)	0.2182 (0.3824)	-2.9457*** (0.4911)
SafeCare Score	0.0404*** (0.0101)	0.0515*** (0.0116)	-0.0165** (0.0076)	0.0321*** (0.0087)
Urban		0.3990 (0.2942)	0.0863 (0.2250)	0.1793 (0.2679)
Dispensary		0.5375* (0.2932)	0.5512*** (0.2292)	0.3355 (0.2795)
Primary Health Center		-0.8671 (0.7477)	-0.4134 (0.6999)	-0.1315 (0.7193)
McFadden R-squared	0.0489	0.0829	0.0290	0.0416
Total Observations	357	345	345	345
Observation with Loan=0	77	68	186	267
Observation with Loan = 1	280	277	159	78

Notes: The base of the regional dummies is rural. The base for the facility category dummies is “other”. All models are tested on robustness. Standard errors are indicated in between the brackets. * indicates significance at the 10 percent level. ** indicates significance at the 5 percent level. *** indicates significance at the 1 percent level.

the program and gaining access to capital. Further, those facilities that receive follow-up finance through the provision of medium loans have a higher mean SafeCare Score, indicating that investments into quality open up additional financial resources.

Except for entry loans, the coefficient for SafeCare Score is positive and significant, indicating that higher quality scores increases the likelihood of gaining access to capital. In the third model, which uses entry loans as a dependent variable, the relationship between quality scores and gaining access to capital is negative, implying that first time lenders may receive funding independent of low quality scores, which supports the provision of capital to facilities that have no credit record. The fourth model further supports this interpretation, since the sign of the SafeCare coefficient is again positive, indicating that the likelihood for receiving a medium loan increases when quality scores are high.

The logit models calculate the predicted log odds

= Log [?] 1 – [?]

of Access to Capital = 1, where the coefficients indicate the amount of an increase or decreases that is predicted by a 1 unit increase or decrease in the independent variables. Since the coefficients are in log-odds units, a conversion into odds ratios by exponentiating the coefficient results in a more straightforward interpretation (Dayton, 1992).

Model 2 has the highest McFadden R-squared and can be written as:

/// Please sent me a JPEG of the formula ///

Converting the log odds into odds ratios results in:

/// Please sent me a JPEG of the formula ///

After the conversion from log odds into odds ratios, the exponential coefficients indicate proportional changes in the odds that are associated with a 1-unit increase of an independent variable where all other coefficients stay constant. Since the SafeCare coefficient is significant at 1%, the odds of gaining access to capital increase by 5,28% for each point increase in the respective SafeCare Score of a facility. Increasing the quality of facilities therefore significantly increases the likelihood of gaining access

to capital and thus supports hypothesis 1. However, to further proof this relationship an overview of the development of quality scores of clinics is needed that show quality scores from pre-entry stage to entry loan scores up until quality scores when receiving larger financing. Being able to proof a constant improvement of quality scores throughout the loan process should provide additional evidence on the capital inducing activities of the MCF and the success of their approach.

10.1.2 Return on Impact

Hypothesis 2 states that higher quality scores should lead to better loan performance and decrease the probability of default. This hypothesis directly analyzes the effectiveness of the loan program of the MCF and whether investments into quality improvements help to generate an impact in the health care market. Table 3 shows models (2.1) and (2.2) that test the relationship between overall quality scores and the probability of default measured by the Portfolio at Risk. The McFadden R-squares of the regression have values between 0.1001 and 0.1111, which are reasonably high values for a logistic regression.

The coefficients for SafeCare Scores are negative and significant in every model of the regression analysis in Table 3 and indicate a negative relationship between quality scores and the probability of default, supporting hypothesis 2. Exponentiating the log-odds coefficients for SafeCare Scores of model (2) and (4) of Table 3 indicate that the probability of entering PAR1 or PAR30 decreases by 7,4% or 8,5% with a 1 unit increase in SafeCare quality scores, respectively. These findings significantly support hypothesis 2 and show that the investments into quality reduce the probability of default for health care facilities in Kenya.

Since the negative relationship between overall quality scores and the probability of default could be established, it is interesting to investigate which quality dimension may have the highest impact on this relationship. SafeCare scores can be divided into several sub-categories, which represent various quality dimensions for health care facilities. Table 4 shows the models (2.3) and (2.4) that investigate the relationship between quality dimensions and the probability of default.

For the interpretation of Table 4, the focus will be on model (2) and (3), as model (1) did not produce any significant results. Model (2) and (3) indicate less significant but insightful results. The majority of the coefficients on the different quality dimensions indicate a negative relationship on the probability of default, in this case measured by

Table 3: Results of logistic regression model with dependent variable PAR1 (0 = NO, 1 = YES) & PAR30 (0 = NO, 1 = YES)

Variables	PAR1 (1)	PAR1 (2)	PAR30 (3)	PAR30 (4)
C	1.4206*** (0.5273)	1.6035*** (0.5999)	0.829514 (0.6592)	1.2302* (0.7629)
SafeCare Score Advanced	-0.0769*** (0.0158)	-0.0768*** (0.0164)	-0.0844*** (0.0211)	-0.0897*** (0.0224)
Urban		-0.3344 (0.3115)		-0.2820 (0.4008)
Dispensary		-0.1292 (0.3135)		-0.3142 (0.3992)
Primary Health Center		0.7048 (1.1761)		1.6937 (1.2345)
McFadden R-squared	0.1024	0.1058	0.1001	0.1111
Total Observations	286	285	286	285
Observations with PAR1 = 0	221	221	251	251
Observations with PAR1 = 1	65	64	35	34

Notes: The base of the regional dummies is rural. The base for the facility category dummies is "other". All models are tested on robustness. Standard errors are indicated in between the brackets. * indicates significance at the 10 percent level. ** indicates significance at the 5 percent level. *** indicates significance at the 1 percent level.

Table 4: Results of logistic regression model with dependent variable PAR1 (0 = NO, 1 = YES), PAR30 (0 = NO, 1 = YES)

Variables	PAR1 (1)	PAR30 (2)	PAR30 (3)
C	1.2780* (0.7698)	0.8261 (1.0633)	0.5407 (0.6381)
ML	0.0166 (0.0331)	-0.0187 (0.0435)	
HR	-0.0207 (0.0259)	0.0165 (0.0332)	
PR	0.0211 (0.0252)	0.0189 (0.0368)	
MI	-0.0488 (0.0379)	0.0501 (0.0515)	
RM	-0.0123 (0.0317)	-0.0928* (0.0516)	-0.1137*** (0.0316)
PHCS	-0.0334 (0.0283)	-0.0346 (0.03829)	
MM	0.0169 (0.0207)	-0.0129 (0.0302)	
FM	-0.0278 (0.0240)	-0.0156 (0.0341)	
SS	-0.0059 (0.0117)	-0.0161 (0.0171)	

Urban		-0.0917 (0.4883)	-0.4134 (0.4086)
Dispensary		-0.3476 (0.4864)	-0.4755 (0.4001)
Primary Health Center		1.7671 (1.4396)	
McFadden R-squared	0.1145	0.1497	0.1189
Total Observations	233	232	288
Observations with PAR1 = 0	183	206	255
Observations with PAR1 = 1	50	26	33

Notes: The base of the regional dummies is rural. The base for the facility category dummies is "other". All models are tested on robustness. Standard errors are indicated in between the brackets. * indicates significance at the 10 percent level. ** indicates significance at the 5 percent level. *** indicates significance at the 1 percent level.

PAR30, which is a stronger indicator of an actual default of a facility. Most strikingly, the coefficient for risk management (RM) is the only significant variable, although only at the 10% threshold in model 2. However, this indicates that facilities that have high scores on risk management are less likely to default on their loan, especially with regard to the "stronger" default proxy of PAR30. The standard errors of the other variables are too high in order to derive meaningful insights and can only be taken as trend indicators, which may be due to the relatively young database and variation in measurements. Yet, these results refine the relationship between quality and probability of default and can be used to strengthen actions in the risk management area for facilities that struggle to repay their loans. Also, low scores on risk management can be used to predict payment troubles beforehand and take special training in order to avoid default in the future.

Finally, the regression models (2.5) and (2.6) examine whether quality improvement over time has an effect to decrease the probability of default. The SafeCare growth rates are calculated using the following formula:

/// Please sent me a JPEG of the formula ///

Calculating the growth in this manner emphasizes the effort for higher quality scores and achieving those. For example, a facility that improves from a SafeCare score of 70 to a score of 80 has to put much more effort into the process than a facility improving from 20 to 30. This ensures that improvements on higher scores are given more weight. Table 5 shows the results of the regression models.

Models (1) – (4) in Table 5 show a clear trend that improvements into quality reduce the probability of default. Although Vittinghoff & McCulloch (2006) argue that less than 10 event observations can be used in logistic regression, the results have to be interpreted with caution, as the number of observations for events where PAR30=1 is very low. The results of Table 5 can therefore indicate a tendency that higher quality improvements decrease the probability of defaults, but future research may have to use a larger sample to retest this relationship in order to derive significant and relevant insights. Finally, it has to be noted that any conclusion beyond the significance of the relationship between the level of quality and loan performance may need further analysis. For example, the relationship does not yet proof that investments into quality reduce investment risk per se, but the way the investment are taken out through for example

Table 5: Results of logistic regression model with dependent variable PAR1 (0 = NO, 1 = YES), PAR30 (0 = NO, 1 = YES)

Variables	PAR1 (1)	PAR1 (2)	PAR30 (3)	PAR30 (4)
C	-1.5581*** (0.3826)	-1.3407*** (0.5065)	-2.1548*** (0.4941)	-2.0482*** (0.7813)
SafeCare Growth	-3.5177 (3.4710)	-3.4591 (3.6504)	-11.2760* (6.4209)	-16.9714** (8.6112)
Urban		-0.7005 (0.5876)		-1.9701 (1.2073)
Dispensary		0.1320 (0.5710)		1.2662 (0.9896)
McFadden R-squared	0.0128	0.0302	0.0789	0.1815
Total Observations	111	111	111	111
Observations with PAR1 = 0	96	96	105	105
Observations with PAR1 = 1	15	15	6	6

Notes: The base of the regional dummies is rural. The base for the facility category dummies is "other". All models are tested on robustness. Standard errors are indicated in between the brackets. * indicates significance at the 10 percent level. ** indicates significance at the 5 percent level. *** indicates significance at the 1 percent level.

special training have the most direct impact. However, the findings for hypothesis 2 support the MCF investment approach and show that quality improvements effectively help facilities to perform better on their loans.

10.2 | Strategic Impacts

The third hypothesis examines the relationship between quality scores and business performance of health care facilities in the MCF program. In the following section the results of the sub-hypothesis 3A and 3B will be presented. The descriptive statistics can be seen in Appendix B.

10.2.1 Increasing Health Care Capacity

Hypothesis 3A focuses on relationship between quality scores and the capacities of health care facilities, measured by patient visits per facilities. Since patient visits per facility are absolute observation, the figures are standardized using logarithm and outliers of the dataset are removed. The Log_Patient_Visits is then used as the dependent variable in an ordinary least squares regression model. Table 6 below shows the results of the models (3.1) and (3.2).

Model (1) of Table 6 investigates the relationship between the overall SafeCare score and patient visits, where the coefficient of SafeCare Score is significant at the 1% threshold. Since the dependent variable is expressed in logarithms, the relationship can be expressed using percentage values. Thus, a 1-unit increase in the quality score leads to a 0,94% growth of patient visits. Despite being statistically significant, the economic effect is rather small, thus providing only limited support for hypothesis 3A.

Models (2) and (3) of Table 6 examine the relationship between SafeCare sub-categories and patient visits, but only the coefficient of management & leadership is significant at the 10% threshold. The Management & Leadership coefficient constitutes all the work related to planning and policy development in order to reach the mission of the respective facility and coordinate and integrate the health service's activities (SafeCare, 2013). This indicates that a sound planning process and a structured and strategic business approach can help health care facilities to credibly signal good services and strengthen their business case by attracting more clients. Moreover and not surprisingly, the coefficient for primary health center is positive and significant, indicating that larger facilities attract more patients than smaller categories. Overall, the results yield only limited support for hypothesis 3A, as the coefficient for the SafeCare Score in model (1) is significant, but relatively small in economic terms and models (2) and (3) do not produce meaningful insights.

Table 6: Results of ordinary least squares regression model with dependent variable Log_Patient_Visits

Variables	(1)	(2)	(3)
C	2.4484*** (0.1005)	2.2189*** (0.1260)	2.2869*** (0.1360)
SafeCare Score	0.0094*** (0.0021)		
ML		0.0088* (0.0047)	0.0076* (0.0047)
PR		0.0018 (0.0037)	0.0033 (0.0038)
MI		0.0062 (0.0050)	0.0045 (0.0051)
RM		-0.0026 (0.0045)	-0.0019 (0.0046)
LAB		0.0055 (0.0042)	0.0051 (0.0041)
MM		-0.0050 (0.0037)	-0.0039 (0.0037)
FM		0.0044 (0.0033)	0.0029 (0.0035)

SS		-0.0049 (0.0030)	-0.0053 (0.0030)
Urban	-0.0113 (0.0523)		0.0166 (0.0569)
Dispensary	-0.0665 (0.0558)		-0.0602 (0.0629)
Primary Health Center	0.2261** (0.1139)		0.2134** (0.1149)
R-squared	0.1781	0.2354	0.2769
Total Observations	136	116	116

Notes: The base of the regional dummies is rural. The base for the facility category dummies is "other". All models are tested on robustness. Standard errors are indicated in between the brackets. * indicates significance at the 10 percent level. ** indicates significance at the 5 percent level. *** indicates significance at the 1 percent level.

10.2.2 Growing health care business

Hypothesis 3B focuses on the relationship between quality scores and revenue per facility. Table 7 shows the results of models (3.3) and (3.4). Similar to the previous section, the data on revenue per facility is standardized using logarithmic transformation in order to make revenue data comparable and outliers are removed. As can be seen in table, the R-squared of regression (1) is 0,4531, yielding a higher value than the more elaborate regression models (2) and (3).

The results of the first regression model indicate a significant and positive relationship between quality scores and revenues of health care facilities. A 1-unit increase in SafeCare score yields a 2.14% increase in revenues, providing significant support for hypothesis 3B. Thus, higher quality of services tends to lead to higher levels of revenue. However, the source of the additional revenue generation remains unclear. Clinics may be able to attract more clients to their facilities and can use quality as a credible signal for sound healthcare services. Also, better quality processes can reduce inefficiencies and reduce costs and thereby increase the capacity and efficiency of a clinic.

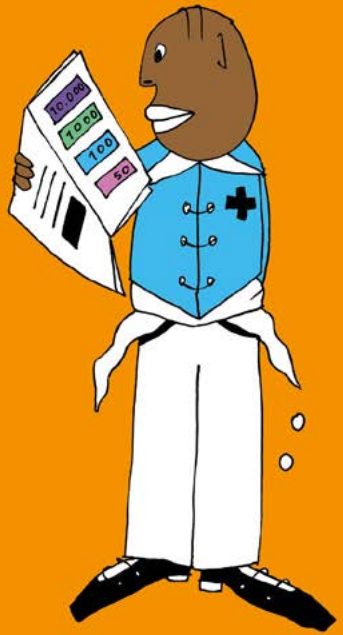
In addition, facilities in urban areas have much higher revenues than facilities from rural areas and as expected, smaller facilities such as dispensaries have fewer revenues than other facilities. Regression models (2) and (3) of Table 7 only yield limited insights on which quality sub-categories have any significant impact on revenues. While the coefficients for medication management and facility management are significant in model (2), they loose their significance when control variables are introduced into the model. Other coefficients are insignificant and therefore do not yield any relevant insights on the relationship between quality and revenues. While the overall quality score of facilities provides some significant insights on the relationship between quality and revenues of health care facilities, the individual sub-categories of SafeCare score do not reveal any deeper insight of the relationship.

Table 7: Results of ordinary least squares regression model with dependent variable Log_Revenue

Variables	(1)	(2)	(3)
C	4.8448*** (0.1516)	4.5351*** (0.3110)	4.7036*** (0.3212)
SafeCare Score	0.0214*** (0.0035)		
ML		0.0077 (0.0116)	0.0059 (0.0112)
HR		-0.0104 (0.0085)	-0.0071 (0.0084)
PR		-0.0029 (0.0090)	0.0025 (0.0091)
MI		0.0047 (0.0122)	0.0042 (0.0120)
RM		0.0162 (0.0111)	0.0098 (0.0111)
LAB		0.0138 (0.0107)	0.0134 (0.0103)
MM		-0.0159* (0.0090)	-0.0121 (0.0088)

FM		0.0177** (0.0080)	0.0086 (0.0083)
SS		0.0048 (0.0079)	0.0053 (0.0077)
Urban	0.1310*** (0.0632)		0.1804 (0.1375)
Dispensary	-0.2308** (0.0685)		-0.3806** (0.1521)
Primary Health Center	0.1999 (0.1371)		-0.0047 (0.2536)
R-squared	0.4531	0.3043	0.3716
Total Observations	123	110	110

Notes: The base of the regional dummies is rural. The base for the facility category dummies is "other". All models are tested on robustness. Standard errors are indicated in between the brackets. * indicates significance at the 10 percent level. ** indicates significance at the 5 percent level. *** indicates significance at the 1 percent level.



Financial Theories

11 | Discussion & Conclusion

The aim of this research is to understand how impact investments can be measured and how financial and non-financial returns can be shown using the investments and activities of the Medical Credit Fund as an exemplary case study. With a focus on the impact investment area, the Medical Credit Fund provides a unique case to investigate how impact investments can shape a market, provide financial returns and at the same time significantly influencing the social development of communities in Africa. The main objective of this thesis is to provide empirical evidence for impact investments of the MCF.

Understanding and developing impact investing is important in order to broaden the academic field and show how financial and non-financial activities can be linked. Reporting how impact investments generate returns and create social change in a throughout and comprehensive way is important in order to create more opportunities to create shared value in societies and attract a broader investor base. This study therefore established a fundamental understanding of the field and developed an empirical research model in order to show how impacts can be made observable.

Increasing the access to capital

Increasing the access to capital is a major impact objective of the MCF and helps health care facilities in sub-Saharan Africa to overcome the barrier of underinvestment. Clinics and health facilities do not have a credit history and the local banking market is reluctant to lend money to a sector that they do not understand. The results for hypothesis 1 have shown that especially for entry loans, which are the door opener for many clinics to the financial system, the MCF adapts risk and uncertainty of these investments without any concerns of the quality of these clinics. Entry loans are small, have a high risk due to a lack of information on facilities and rather low absolute returns, yet the MCF provides them to clinics irrespective of their overall

quality. Giving health care facilities a chance to gain access to capital and improve the quality of their business is an essential impact created by the MCF.

Through entering the MCF program, facilities that improve and provide good quality scores are more likely to receive more funding. The results clearly show that facilities with higher quality scores are more likely to obtain a follow-up loan or medium loan. This incentivizes health care facilities to implement the quality improvement plans of SafeCare and the MCF in order to receive new financing rounds and grow their businesses. Higher quality scores therefore promote better access to capital in regions where health care facilities chronically lack funding. The findings of table 2 support this notion and are statistically significant.

In order to qualify for impact investments, the loans of the MCF have to be paid back and generate a financial return. While increasing the access to capital is generating impact in an underfinanced health care market, it must be ensured that facilities in the MCF program comply with the quality improvement plans. Gaining access to capital through entry loans is therefore an important step, but only through follow up financing, training and assessments the development of clinics can be controlled and supported. The MCF is focusing on decreasing the investment risk, which is the major obstacle in the health care market in Africa. This creates an impact itself by making financial capital available and generating an investment opportunity.

Loan performance and implications for the MCF program

Impact investments are designed to achieve both a financial and non-financial return on their investments. As the increased access to capital can be regarded as a fundamental impact in health care markets, the performance on the investments has to be guaranteed as well. Although the MCF achieves a 97,5% repayment rate of their loan portfolio, the question whether their fundamental business model of financing and investing into quality is creating not only non-financial impact but also ensuring financial returns has been tested with hypothesis 2. Higher quality scores significantly reduce the probability of defaults and thereby increasing the loan performance of facilities. Especially, higher scores in risk management predict lower default probabilities and can indicate the MCF which facilities may run into payment problems after receiving first or second SafeCare assessments. These finding support the business case of the MCF and underline that financing quality improvements help to grow

health care facilities, reduce investment risk and promote a viable financial model for this market.

In the broader context, the findings of hypothesis 2 are especially relevant for the first and second stakeholder level of the MCF. On the first level, institutional investors recognize the investment opportunity and the effective risk management procedures of using SafeCare and investments into quality in order to generate constant and sound returns on capital. Being able to show that the investment procedures and actions have a direct effect on the outcome of the investment is vital in order to convince investors to provide capital for impact projects in developing markets that lack institutional infrastructure. On the second level, local banks, through participating in the loan program, understand the health care market, reduce the risk of health care facilities and recognize the financial opportunities in this market. The ultimate goal is to incentivize local banks to provide their own banking products for the health care sector and support organic growth for the sector. In fact, a local partner bank of the MCF offers first health specific banking products in Kenya (Chase Bank Kenya, 2015). The reduction of uncertainty for investments into health care facilities and the active involvement during the loan tenure is therefore not only ensuring financial returns, but helps to build market specific knowledge of local financial institutions, which increases their willingness to invest. Organizations like the MCF do not have the scale to finance the entire health care system of a country but can promote growth in the local economy. Increasing the amount of capital is a vital component of the "Theory of Change" and helps to strengthen the entire health care system. Independent financial products of local MCF partner banks are a further step to strengthen the development of the health care sector in Kenya or other African countries.

Health care capacities and revenue growth

Hypothesis 3 expects a positive relationship between quality levels and the business performance of health care facilities. Technically, this hypothesis is tested via sub-hypothesis 3A and 3B, which fundamentally support this relationship. Investment into health care facilities by the MCF come hand in hand with a quality improvement plan and business training in order to grow and strengthen the business of health care facilities.

Financing quality improvements of clinics has a direct effect on the business of health care facilities, which should motivate local entrepreneurs to apply for these investments to increase the capacity of their facilities, increase their business and provide more services to their

clients. A valuable insight is therefore whether stakeholders on the third level, doctors and local entrepreneurs, are motivated to improve their businesses through the use of loans provided by the MCF. The findings of hypothesis 3B fundamentally support this view, showing a positive relationship between high quality scores of facilities and more revenue visits per facility. In addition, higher scores in management and leadership seem to attract more patients to a specific clinic. This indicates that better quality of services, trustworthy and experienced personnel, have an effect of attracting more clients to a clinic since patients in Africa rely on word-of-mouth recommendations to assess and trust health care facilities (HIF Annual Report, 2015). Facilities that have a higher quality profit from attracting more clients to their business and increase their revenues, which supports the fact that investments into quality pay off for the local entrepreneur.

However, the relationship between investments into quality and strategic impacts on health care facilities has to be seen with caution. Although the results are significant, the relationship between these factors can also be reversed, implying that health care facilities that have more revenues or more patient visits can more easily achieve higher quality scores in their SafeCare assessments. The investments of the MCF therefore amplify the effects and might help an already well performing health care facility to further improve their business, whereas lower quality clinics may struggle more to improve their quality and business performance. For struggling health care facilities, the challenge for the MCF is to provide additional technical assistance in order to overcome development obstacles and induce a positive growth process. In addition, the regression models on quality sub-categories for revenue did not yield meaningful results and it remains to be seen how investments into quality directly affect business performance of clinics. The rather young database, non-obligatory reporting process for business performance and inaccurate data on business factors make it difficult to derive significant and relevant insights from the data. Further, additional effects such a generally good economic development could lead to higher revenues or more illnesses in a certain region could be the reason for more patient visits at a specific clinic. Unfortunately, this research was not able to isolate these effects but future research may investigate this relationship further.

Finally, the relationship between absolute revenue or patient visit levels is interesting in itself, but from an impact point of view it would be interesting to investigate what effects quality improvements have on the growth of revenue or patient visits for each facilities. Investigating

whether improvements in SafeCare scores over time lead to higher growth in revenue or patient visits should underline the impact generated by the MCF on a business level. Unfortunately, this research was not able to fully conduct such an analysis due to a rather small sample when considering growth rates for revenues or patient visits. Future research could however investigate the growing database of the MCF and rely on richer and more comprehensive data points.

Practical implications

The practical implications of this research are relevant on various levels. The MCF and their stakeholders can derive valuable insights from this study, which supports the business model and investment case of the MCF. Investors, local banks and local entrepreneurs can use these results in order to increase their commitment and to increase investments in the healthcare sector. Especially for the first and second stakeholder levels, this research underscores the activities of the MCF and promotes more engagement in their approach. Through providing an empiric foundation, the level of trust in the actions of the MCF is increased, which in the bigger picture helps to support a systematic change of the health care system in the context of the Theory of Change of the PharmAccess Foundation.

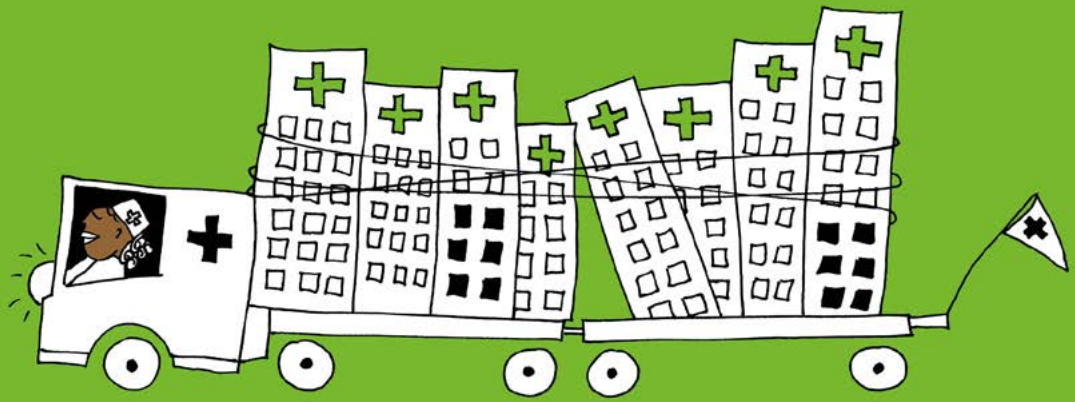
Academically speaking, this research broadens the horizon in the field of impact investment. As for any new academic fields, aggregated data is limited and case studies must pave the way in order to proof theoretical models with practical cases. Therefore, the insights of this study are somewhat limited to the specific context of the MCF but can be used in order to support general theoretical models of impact investments. The development of new intelligent metrics and the creation of statistical models to derive empiric insights of relationships in the impact investment environment are important to develop an academic interest and body. This study is therefore a further step in developing empirical support and proof for the impact investment community.

12 | Limitations & Future Research

Naturally, this research has some limitations. First, as for any case study, the focus on a single organization or situation limits the generalizability of the findings. Although practical insights and proof of underlying theories can be found and reported, the findings may be context specific and not hold in the general environment. A larger research setting and comparable studies with aggregated databases may help to overcome these limitations. In the context of the MCF, future research may investigate the relationship in other countries like Tanzania, Ghana or Nigeria, not only in Kenya. Further, a growing database and more accurate data on business performance may help to find valuable insights in the future that this research was not able to report.

Second, although the database is unique in terms of data sources, geography and industry type, some limitations exist. The data is collected diligently and certified by independent advisors, but measurement errors in the field may occur or clinics may not report the accurate number of a variable due to secondary incentives. A clinic may for example exaggerate their patient numbers or revenue in order to appear attractive for the MCF program. This error may be apparent in early assessments or initial business plans but will be adjusted as soon as an independent SafeCare assessment or follow up assessments reveal other data. Also, as the MCF program exists since 2011, some standards that are in place today may not have been applied in early assessments of clinics. This leads to missing data points for clinics, a smaller sample and makes comparisons of facility development difficult. Yet, the number of clinics and facilities in the program has increased steadily and provides a solid foundation in order to use the sample for empirical testing. The database is large and precise enough to derive relevant and accurate propositions today, however, future research can build upon a longer time frame and more accurate data points.

Future research can also focus on the market developments of the health care market where the MCF is active. The investments of the MCF together with the actions of Safe Care are a major contributor in turning the vicious circle of low quality health care into a self-enforcing virtuous circle to generate improvement in the health care system. Especially, the MCF is a first mover when it comes to lending capital to businesses with formerly no credit history. The ultimate goal is to show the financial sector of local countries that investments into health care facilities are not perceived as high-risk low-return investments, but provide a solid opportunity for a loan market. Therefore, future research can investigate whether local banks start lending themselves to health care facilities after the MCF made the initial loan agreement and start to develop their own financial products for the health care market. As has been stated in the previous section, local partner banks such as Chase Bank Kenya now offer specific financial products for the health care market (Chase Bank Kenya, 2015), but also the K-Rep Bank in Kenya, Unibank in Ghana or Diamond Bank in Nigeria have begun to offer financial products to the local health care market. This indicates first developments in practice and promise a rich research objective for the future. Research can focus whether the actions of the MCF have a structural impact at the market level.



Health Management

References

Ashley, B. C., Schramm, C., & Ellis, K. (2009). Approaches to assessing Business Impact on Development. *Overseas Development Institute*.

Benoit, K. (2011). Linear Regression Models with Logarithmic Transformations. *ReCALL*, 1–8.

Brooks, C. (2008). *Introductory econometrics for finance*. Cambridge University press.

Brown, A., & Norman, W. (2011). Lighting the touchpaper: Growing the Market for Social Investment in England. *The Boston Consulting Group, The Young Foundation*, (November), 30.

The Business Dictionary. (2015). Corporate Social Responsibility – Definition and meaning. Retrieved June 18, 2015, from http://www.businessdictionary.com/definition/corporate-social-responsibility.html

Chambers, R., Karlan, D., & Ravallion, M. (2009). Designing impact evaluations: different perspectives. *Development*. Retrieved from http://www.3ieimpact.org/admin/pdfs_papers/50.pdf

Cutler, D. M. (2002). Chapter 31 Health care and the public sector. *Handbook of Public Economics*, *4*, 2143–2243. http://doi.org/10.1016/S1573-4420(02)80010-6

Dayton, C. M. (1992). Logistic regression analysis. *Stat*, 474-574.

Donohoe, N. O., & Bugg-levine, A. (2010). An emerging asset class Rockefeller Foundation. *JP Morgan Social Finance*.

Evans, M. (2013). Meeting the challenge of impact investing: how can contracting practices secure social impact without sacrificing performance? *Journal of Sustainable Finance & Investment*, *3*(2), 138–154. doi:10.1080/20430795.2013.776260

Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. Journal of Financial Economics, 33(1), 3–56. doi:10.1016/0304-405X(93)90023-5

Financial Times Lexicon. (2015). *Environmental, Social and Governance Finance*. Retrieved June 18, 2015, from http://lexicon.ft.com/Term?term=ESG

Freireich, J., & Fulton, K. (2009). Investing for Social & Environmental Impact. *Monitor Institute*.

GIIN (2013). *Catalytic First Loss Capital*, Retrieved from www.thegiin.org

Godeke, S., & Bauer, D. (2008). Mission-Related Investing. *Rockefeller Foundation*.

Hart, S. L. (2010). *Capitalism at the crossroads: Next generation business strategies for a post-crisis world*. FT Press.

Hebb, T. (2013). Impact investing and responsible investing: what does it mean? *Journal of Sustainable Finance & Investment*, *3*(2), 71–74. doi:10.1080/20430795.2013.776255

Health Insurance Fund. (2015) *HIF Annual Report 2015.* Amsterdam, the Netherlands.

Hummels, H., & Roentgen, M. A. (2013). Stairway to successful innovation. *ECCE*.

Huppé, G. a, & Silva, M. H. (2013). Overcoming Barriers to Scale : countries. *International Institute for Sustainable Development*.

IRIS; GIIN. (2011). Data Driven – A performance analysis for the Impact Investing Industry. *GIIN*.

Jackson, E. T. (2013). Interrogating the theory of change: evaluating impact investing where it matters most. *Journal of Sustainable Finance & Interrogating*, *3*(2), 95–110. doi: http://dx.doi.org/10.1080/20430795.2013.776257

Joy, I., Casas, L. D. Las, & Rickey, B. (2011). Understanding the demand for and supply of social finance. *The Big Society Finance Fund*, 1–52.

Levitt, T. (1965). Exploit the Product Life Cycle. *Harvard Business Review*, *43*(6), 81–94. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=3866434&lang=es&site=ehost-live

McKinsey Social Sector (2010). *Learning for social impact.* April 2010, p.2, See also www.mckinsey.com

The Medical Credit Fund, (2013). *2013 Annual Report of the Medical Credit Fund.* Amsterdam, the Netherlands

The Medical Credit Fund, (2014). *2014 Annual Report of the Medical Credit Fund.* Amsterdam, the Netherlands

North, D. C., Wallis, J. J., Webb, S. B., & Weingast, B. R. (2011). Limited Access Orders : Rethinking the Problems of Development and Violence, 1–19.

OECD. (2014). Social Impact Investment – Building the evidence base. *OECD*. Retrieved from http://www.oecd.org/sti/ind/social-impact-investment.pdf

Porter, M. E., & Kramer, M. R. (2011). Creating Shared Value. *Harvard Business Review*, 63–77. doi:10.1108/09600039410055963

Prahalad, C. K., & Hart, S. L. (2002). The Fortune at the Bottom of the Pyramid. *Strategy+Business Magazine*, (26), 1–16. http://doi.org/10.2139/ssrn.914518

Rangan, V. K., Appleby, S., Moon, L., Schervish, P. G., & Initiative, S. E. (2011). The promise of Impact Investing. *Harvard Business School*, (November), 1–21.

Saltuk, Y., Bouri, A., & Leung, G. (2011). Insight into the Impact Investment Market. *Building Standards*, 5–7.

Shaw, R & Elmendorf, E. (1994) Towards Better Health in Africa, Washington DC: World Bank

Schellekens, O., Lindner, D. M. E., Lange, P. J. M. a, & van der Gaag, J. (2007). A new paradigm for increased access to healthcare in Africa. *IFC-Financial Times Essay Competition*, 1–15.

Sharpe, W. F. (1964). Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. The Journal of Finance, 19(3), 425–442. doi:10.2307/2329297

UN Millennium Project. (2005). Investing in Development – A practical Plan to Achieve the Millennium Development Goals. *United Nations Development Programme*.

Vittinghoff, E., & McCulloch, C. E. (2007). Relaxing the rule of ten events per variable in logistic and cox regression. *American Journal of Epidemiology*, *165*(6), 710–718. http://doi.org/10.1093/aje/kwk052

Wood, D., Thornley, B., & Grace, K. (2012). Impact at Scale. *The Rockefeller Foundation*.

Wood, D., Thornley, B., & Grace, K. (2013). Institutional impact investing: practice and policy. *Journal of Sustainable Finance & Investment*, *3*(2), 75–94. doi:10.1080/20430795.2013.776256

World Health Organization. (2006). World Health Report 2006: Working together for health – Statistical annexes. *World Health Organization*, *19*(3), 237. http://doi.org/10.1186/1471-2458-5-67

Appendix A | Variable Overview

Variables

SafeCare measures the quality of facilities in the MCF program on various aspects. However, due to differences in between facilities and collection of data, two SafeCare collection methodologies exist and have to be separated. On the on hand, the basic SafeCare score, *SCbasic*, measures the quality of a health care facility on the basis of a reduced collection method. On the other hand, the advanced SafeCare score, *SCadvanced*, uses a more throughout collection process. Therefore, it is important to discriminate between both measurements, as they cannot be directly compared. However, *SCbasic* and *SCadvanced* will serve as the proxy to measure the quality of health care facilities in the sample. Whenever possible, *SCadvanced* will be preferred due to the more accurate and elaborate measurement standards.

As health care facilities are different compared to product-oriented companies, two different proxies, Log_Revenue and Log_Patient_Visits, measure business improvement. Whereas Log_*Revenue* is a classic indicator for the size of a business, the number of *Log_Patient_Visits* can directly show the growth of health specific capacities. Moreover, as health care facilities are not profit driven, the increase in *Log_Patient_Visits* can show the impact of investments on the ability to provide health care services to a broader population. Both variables focus on a 6-month period around the *SafeCare* assessment date in order to match quality and business data accordingly.

Loan performance cannot be measured in terms of higher returns, as the interest rates are fixed over the time period of the loan. The probability of default, where the Portfolio at Risk (PAR) is an adequate proxy, is used in order to identify when a facility may not be able to repay its debt and serves as a measurement of loan performance. As payment problems or delays may also occur due to infrastructural problems in Africa, two proxies are used, *PAR1*

and *PAR30*. *PAR1* measures whether a facility is late with its payments by at least one day, while *PAR30* measures the delay of payments by 30 days or above. Both variables will be defined as categorical variables, taking the value of 0 if a facility has no loan entering *PAR1* or *PAR30* and 1 in the case of a facility has a loan entering *PAR1* or *PAR30* or above.

All variables used in the empirical models can be found in Table A1 on the next page.

Variable	Description
SafeCare Score	The SafeCare quality score of a facility, measured on a scale between 0 and 100. Advanced SafeCare scores are used whenever possible
ΔSC	SafeCare growth rate between SC1 and SC2, calculated as
ML	Quality score on Management & Leadership
HR	Quality score on Human Resource Management
PR	Quality score on Primary Health Care Service
MI	Quality score on Management of Information
RM	Quality score on Risk Management
LAB	Quality score on Laboratory Services
MM	Quality score on Medication Management
FM	Quality score on Facility Management
SS	Quality score on Support Services
Urban	Regional Dummy variable, taking the value of 1 if a facility is located in an urban area and 0 if otherwise
Dispensary	Facility Category dummy, taking the value of 1 if a facility is a dispensary and 0 if otherwise
Primary Health Center	Facility Category dummy, taking the value of 1 if a facility is a primary health center and 0 if otherwise

Table A1: All variables used in the empirical models

Appendix B | Descriptive Statistics and estimation outputs

Covariance Analysis: Ordinary						
Correlation	Access to Capital	SC_Advanced	SC_Basic	Entry Loan	Medium Loan	Large Loan
Access to Capital	1.000000					
SC_Advanced	0.043943	1.000000				
SC_Basic	0.042662	0.976361	1.000000			
Entry Loan	0.375237	-0.312421	-0.268551	1.000000		
Medium Loan	0.214054	0.177284	0.156591	-0.581783	1.000000	
Large Loan	0.090274	0.232978	0.211766	-0.245358	-0.139964	1.000000

Table B1: Correlation analysis on Access to Capital and SafeCare quality scores

Covariance Analysis: Ordinary				
Correlation				
	PAR_1	PAR_30	SC_ Advanced	SC_Basic
PAR_1	1.000000			
PAR_30	0.688552	1.000000		
SC_ Advanced	-0.302140	-0.244618	1.000000	
SC_Basic	-0.292806	-0.237778	0.973761	1.000000

Table B2: Correlation analysis of Portfolio at Risk and SafeCare quality scores

	PAR_1	PAR_30	SC_Advanced	SC_Basic	SC_Growth
Mean	0.243728	0.129032	37.79578	47.03716	0.178204
Median	0.000000	0.000000	36.08099	46.29000	0.153166
Maximum	1.000000	1.000000	79.11253	93.08650	1.094728
Minimum	0.000000	0.000000	14.35496	14.43440	-0.321128
Std. Dev.	0.430102	0.335838	13.21064	15.63878	0.181766
Skewness	1.193824	2.213176	0.749006	0.370676	1.510807
Kurtosis	2.425216	5.898148	3.278411	2.694606	8.624017
Jarque-Bera	70.11317	325.4053	25.44032	7.473335	190.2120
Probability	0.000000	0.000000	0.000003	0.023833	0.000000
Observations	279	279	263	279	112

Table B3: Descriptive Statistics of the main variables in Models 2.1 – 2.6

	ML	HR	MI	RM	Primary	Patient Rights	LAB	FM	SS	MM
Mean	39.77	32.43	29.92	23.92	44.61	46.99	42.92	38.74	35.11	42.46
Median	38.10	27.50	27.42	20.10	44.06	45.60	40.55	38.05	32.02	42.50
Maximum	86.24	92.81	73.04	75.66	92.46	90.28	80.66	90.45	93.98	85.49
Minimum	16.91	16.18	12.96	9.22	14.21	18.79	11.14	10.61	11.23	11.06
Std. Dev.	13.26	16.17	10.94	13.96	14.20	15.20	15.64	15.17	17.07	15.48
Skewness	0.863	1.42	1.34	1.61	0.28	0.56	0.44	0.61	0.88	0.29
Kurtosis	3.70	4.60	5.22	5.66	2.75	3.04	2.64	3.47	3.56	2.84
Jarque-Bera	39.02	119.91	136.55	196.57	4.33	14.47	9.36	19.31	34.80	3.93
Probability	0.00	0.00	0.00	0.00	0.11	0.00	0.01	0.00	0.00	0.14
Observations	270	270	270	270	269	270	247	270	240	254

Table B4: SafeCare Subcategories Descriptive Statistics

Covariance Analysis: Ordinary		
Correlation	PAR_1	PAR30
PAR_1	1.000000	
PAR30	0.794123	1.000000
ML	-0.256235	-0.277250
HR	-0.178889	-0.108061
Primary	-0.281419	-0.241288
MI	-0.225434	-0.192452
RM	-0.218261	-0.187425
Patient Rights	-0.303763	-0.274396
MM	-0.206681	-0.188726
LAB	-0.324240	-0.261481
FM	-0.273429	-0.255525

Table B5: Correlation Table of SafeCare sub-categories and the Portfolio at Risk (PAR)

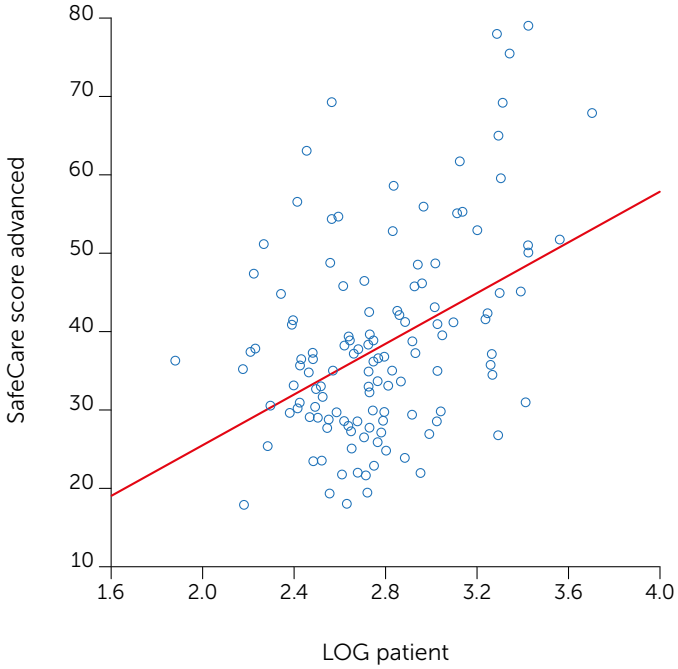


Figure B1: Scatterplot of advanced SafeCare scores and Log_Patient Visits

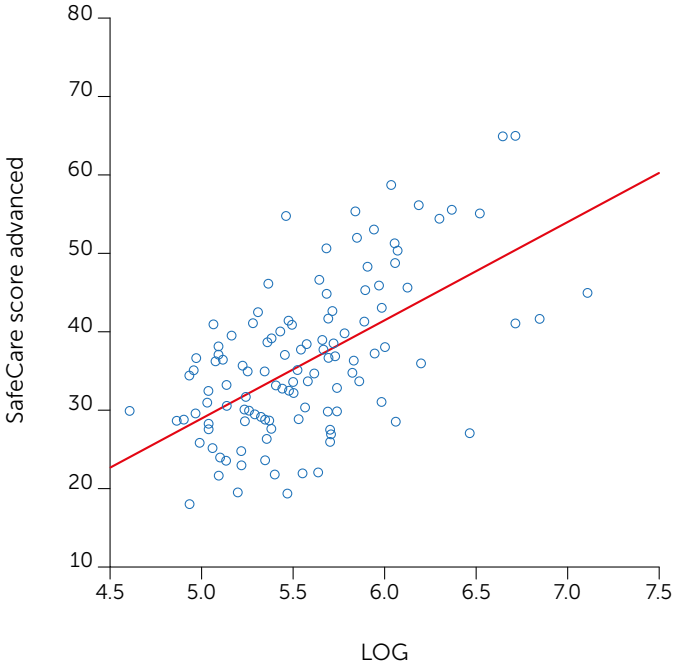


Figure B2: Scatterplot of advanced SafeCare scores and Log_Revenue

	Patient Visits	Log Patient Visits	SC_Advanced	SC_Basic
Mean	760.9607	2.742369	36.39820	43.78217
Median	530.0000	2.724273	34.76899	41.71644
Maximum	5051.000	3.703377	79.11253	93.08650
Minimum	75.00000	1.875061	14.17352	13.48680
Std. Dev.	707.4464	0.342260	13.21888	15.74729
Skewness	2.469529	0.200948	0.800076	0.562020
Kurtosis	11.51880	2.839167	3.363947	2.786473
Jarque-Bera	719.1521	1.389792	29.17356	16.85415
Probability	0.000000	0.499126	0.000000	0.000219
Observations	178	178	260	309

Table B6: Descriptive Statistics of Patient Visits (Hypothesis 3A)

	Revenue per Facility	Log Revenue	SC_Advanced	SC_Basic
Mean	234,000.000	5.524810	35.73444	43.85095
Median	297,391.3	5.469217	34.65918	41.71644
Maximum	3.94E+10	7.117928	79.11253	93.08650
Minimum	36683.33	4.564469	14.17352	13.48680
Std. Dev.	3.00E+09	0.469350	12.50305	15.81236
Skewness	12.99381	0.692591	0.710177	0.557989
Kurtosis	169.8941	3.520308	3.229707	2.765720
Jarque-Bera	204457.7	14.96123	21.99556	16.95799
Probability	0.000000	0.000564	0.000017	0.000208
Observations	172	164	255	313

Table B7: Descriptive Statistics of Revenue data (Hypothesis 3B)