

# HOW DO INNOVATIVE BANKING CHANNELS REDUCE COSTS IN DOWNSCALING?

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## Abstract

*This paper analyzes and quantifies cost structures of agent-assisted banking beyond branches channels (ABCs) and compares them to the costs of branch channels<sup>1</sup>. This addresses a gap in the existing literature. The qualitative review finds that ABCs maximize the proportion of variable costs that depend on realized transactions, which match revenue flows. ABCs reduce investment and operating costs, since existing agent business infrastructure is enhanced and shared. In the context of downscaling, ABCs bridge the major barrier for commercial banks: the expensive last mile to the customer. The quantitative review finds that POS / PC terminal-based ABCs reduce transactional costs to 58 percent of branch channel costs and mobile-based ABCs to 15 percent. Apart from analysis and quantification of cost structures, this paper develops a comprehensive definition of ABCs. Likewise, downscaling is defined; the two research fields are linked and investigated from a commercial banking perspective. This addresses gaps in the existing literature.*

**Keywords:** Agent banking, mobile banking, branchless banking, last mile to the customer.

**JEL codes:** G210, M210, L110, D400, O140, G200, L8, M110, D610

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## 1. INTRODUCTION

Today, in most sub-Saharan countries, less than 30 percent of the population is banked. Why has this remained the case for so long? It is because

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<sup>1</sup> Agent-assisted banking beyond branches channels (ABCs) are commonly referred to as *branchless banking, mobile banking, and correspondent banking*.

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serving this type of customer is not deemed profitable, especially with traditional credit and savings products. Informal schemes have filled the gap, but the digital revolution and the onset of mobile money have changed the landscape as they allow for radical new product innovations. (Hughes et al., 2012, p. 40)

This paper describes and quantifies cost structures of agent-assisted banking beyond branches channels (ABCs) within a microfinance-through-commercial banking approach, also called *downscaling*, and compares them to the costs of branch channels. The intention is to highlight how innovative banking channels reduce costs in downscaling. The paper investigates its research question through a synthesis of qualitative and quantitative literature. Qualitative literature explores causalities using reasoned arguments and deductive conclusions. The qualitative literature presented in this paper describes *by which economic causalities* costs are reduced. Quantitative literature inducts data into causalities. The quantitative literature presented in this paper indicates *to what extent* costs are reduced by these economic causalities. The quantitative literature consists of World Bank case studies, which have not been presented in any paper before. The case studies follow a cost structure that is different from the one Mas (2009) presents, which is applied in the qualitative review. Bridging the consequent discretion in the qualitative and the quantitative analysis, the quantitative review attempts to link the two cost structures. The presented insights into economic causalities of ABC and branch channel costs as well as the extent of their impact combined intend to address the research question of how innovative banking channels reduce costs in downscaling.

This paper primarily considers meso level perspectives, which focus on financial services delivering intermediaries such as banks, mobile network operators (MNOs), and microfinance institutions (MFIs) as well as their distribution channels. Secondly, this paper also considers macro level perspectives, which focus on infrastructure, regulation, and policy, as well as micro level perspectives, such as shareholders, customers, and other stakeholders, so as to consider relevant cross effects in the attempt to draw a holistic picture<sup>2</sup>. This paper addresses practitioners and researchers associated with commercial banks. In its wider scope, it addresses other financial institutions, such as insurance companies and MFIs, and other institutions associated with financial services, such as MNOs, retail chains, post corporations, governments, regulators, and investors. This paper addresses an audi-

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<sup>2</sup> The classification into micro, meso, and macro level perspectives in research on financial services in developing countries derives from Duncombe and Boateng (2008).

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ence which is less informed about financial services in emerging markets, but informed about banking.

The reviewed literature includes academic publications from peer-reviewed journals, but also academic publications from other sources, such as conference papers and working papers<sup>3</sup>. Relevant literature also includes a high share of practitioner publications, such as in academic journals like *Innovations: Technology, Governance, Globalization* and in commissioned papers from institutions like *Consultative Group to Assist the Poor (CGAP)*, member of *The World Bank (WB)*. Duncombe and Boateng (2009, p. 1237) state in their extensive literature review on mobile phone-based ABCs in developing countries: "The review finds that research to date has resulted in a high level of practitioner involvement, providing valuable links [...] to the research community". Due to the high involvement and valuable links, practitioner publications are likewise considered in this paper.

The literature reviews in the fields on ABCs and downscaling revealed four gaps. First, there is much literature on ABCs and on downscaling, but no literature linking these two research fields. Second, literature revealed different terms for ABCs, which address overlapping ontological bases<sup>4</sup>. Third, there is some literature that describes cost structures of ABCs, but hardly any literature quantifying cost structures. Fourth, most literature in the two research fields investigates from a financial inclusion perspective rather than from a commercial banking perspective. This paper makes a first attempt to fill these gaps.

The remainder of this paper is organized as follows: Chapter 2 defines downscaling and reveals the major barrier for commercial banks to engage in downscaling. Chapter 3 defines ABCs. Chapters 4 and 5 reveal methodology, findings and synergies from the qualitative and quantitative reviews of costs and cost structures for ABCs and branch channels. Results from this paper are summarized and concluded in chapter 6. Moreover, suggestions for further research are outlined in chapter 6. Definitions of fundamental terms are developed in the course of this paper.

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<sup>3</sup> Search engines applied for literature research are Google Scholar, EBSCO, JSTOR, and ScienceDirect.

<sup>4</sup> Agent-assisted banking beyond branches channels (ABCs) are commonly referred to as *branchless banking*, *mobile banking*, and *correspondent banking*. However, these terminologies might not capture the precise connotation of the ontological basis of this paper. The term *ABC* is developed in this paper. For the concepts of ontological and epistemological basis, compare Mason (1996) and Soini et al. (2011).

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## 2. LITERATURE REVIEW ON DOWNSCALING

The term *downscaling* might be perceived as an antonym to the term *up-scaling* in the economic concept of economies of scale (Pindyck / Rubinfeld, 2005). However, this perception appears to be misleading. *Downscaling* connotatively captures how the commercial bank moves down the income stratification of customer segments, to low-income and unbanked populations (Delfiner / Perón, 2007; Ledgerwood, 2013; Mori, 2007). According to Ferrari and Jaffrin (2006), downscaling had been introduced by the Inter-American Development Bank (IDB) in the early 1990s, when the IDB targeted commercial banks with credit lines and technical assistance in Latin America. *Low-income populations*, according to McKay and Pickens (2010, p. 1), refers to the “majority of consumers in developing countries who are economically active and may earn up to US\$10 per day”. The economically active low-income populations “work on part-time jobs, own some private property or small business, and are capable of working and carrying out projects” (Delfiner / Perón, 2007, p. 7). These comprise “microenterprises, small farmers and [...] salaried employees, pensioners and poor households” (Delfiner / Perón, 2007, p. 7). In contrast, the economically inactive low-income populations “have insufficient resources to meet defined basic consumption needs, including people who are not qualified to work (due to age, health and ethnic origin reasons, among others) or whose income is so low that they are not able to meet their household basic needs” (Delfiner / Perón, 2007, p. 6). These are not included in the targeted customer segment for downscaling as this group has “prior needs such as food and shelter, and therefore requires tools distinct from financial services” (ibid.). *Unbanked* defines anyone who “does not have access to affordable, convenient, secure financial services” (McKay / Pickens, 2010, p. 1).

The main reason against serving low-income and unbanked populations is due to the high proportional costs on small savings deposit, transaction amounts, and accumulated *lump sums* (Alexandre, 2011; Alexandre et al., 2011; Diniz et al., 2012; Ferrari / Jaffrin, 2006). Bos and Millone (2013, p. 4) point out the prevailing economies of credit volumes: “In the presence of economies of scale, a higher average loan size will increase profitability, whereas a lower average loan size is traditionally seen as an increase in the depth of outreach”. Note that *outreach* usually depicts the ratio of customers that belong to low-income populations in the overall customer portfolio (Cull et al, 2011; Hermes et al., 2011). The economies of credit volumes also apply to other financial services and cause banks to limit their branch network to areas that ensure a larger average transaction sum and a higher

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turnover (Alexandre et al., 2011; Mas, 2009). This approach utilizes the concentration of transactions at specific spots to minimize proportional channel costs at the expense of the customer (Mas, 2009)<sup>5</sup>. Despite this, banks still show relatively high costs per customer according to Bos and Millone (2013) and Mas (2008). Bos and Millone (2013) ran regressions on a panel with 3,890 observations from financial institutions in 101 countries. In this case, the customer is a *borrower*, thus a loan-taking customer (Bos / Millone, 2013). In order to operate in low-concentration spots at low costs, not only high volume through scale, low costs through high-quality portfolios (Bosch Gual / Anson, 2008; Ferrari / Jaffrin, 2006; Mas / Siedek, 2008), but also low costs through reduced investment and operating costs for distribution channels are required (Ferrari / Jaffrin, 2006). Note that *high quality* foremost applies to credit portfolios, but also to savings account portfolios and the ratio of active customers over the overall number of customers (Ferrari / Jaffrin, 2006; Ledgerwood, 2013).

Mobile phones and existing distribution channels from MNOs and retailers represent potential low-cost distribution channels with permanent connections to target customers (Ledgerwood, 2013). Of the unbanked populations in developing countries, about one billion had a mobile phone in the year 2009, while this figure was projected to reach 1.7 billion by the end of 2012 (Dermish et al., 2012). Alexandre (2011, p. 4) expresses the potential for financial services and products delivery to low-income and unbanked populations: "Mobile services can take financial services outside bank branches, closer to where people live and work". Lyman et al. (2008, pp. 2 f.) concisely denote how retailers could complement the picture: "By tapping into existing infrastructure that already reaches unbanked people – such as mobile phones and local retail outlets that might be used as agents for the cash-in/cash-out function – delivering financial services [...] can be radically cheaper than delivering such services conventionally". These distribution channels are the ontological basis of this paper. For the concepts of ontological and epistemological basis, compare Mason (1996) and Soini et al. (2011). In the following sections, these distribution channels' inherent potential for decreasing costs is investigated from a qualitative and quantitative perspective.

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<sup>5</sup> The high proportional channel costs for commercial banks might reflect in the spread of distribution networks in the year 2009. There were eight bank branches per 100,000 adults in developing countries versus 24 in developed countries (Ledgerwood, 2013). There were 23 automatic teller machines (ATMs) in developing countries versus 78 in developed countries (Ledgerwood, 2013). Mas and Radcliffe (2011) even compare two branches per 100,000 adults in the poorest country quintile with 33 in the richest, and 1.3 ATMs in the poorest with 67 in the richest.

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### 3. LITERATURE REVIEW ON AGENT-ASSISTED BANKING BEYOND BRANCHES CHANNELS

In literature, *branchless banking* appears to be among the most common terms for the ontological basis of this paper<sup>6</sup>. This term is carved out from a record of numerous publications. Some publications explicitly discuss the taxonomy (Alexandre et al., 2011; Dermish et al., 2012). In Brazil, *correspondent banking* appears to be common (Diniz et al., 2012; Jayo et al. 2012). This paper finds that *agent-assisted banking beyond branches channels* (ABCs) precisely captures the decisive attributes of its ontological basis. The following paragraphs describe how this term derives.

Diniz et al. (2012, p. 485) find that in Latin America, correspondents are “ICT-enabled points of service installed by banks on a partnership basis with non-bank businesses, such as supermarkets, pharmacies, grocery stores, post offices, microfinance institutions (MFIs) and other types of retail establishments in low-income areas underserved by traditional banking”<sup>7</sup>. In that context, *correspondent banking* might derive from, but not primarily address the term that describes the exchange of traditional distribution channels and retail banking services among banks: “One bank, termed as the correspondent, sells services to a purchasing bank, termed as the respondent” (Naughton / Chan, 1998, p. 153). Osterberg and Thomson (1999, p. 10) define correspondent banking as “the purchase (by banks) of input from other banks, central banks, and bank clearinghouses”. And indeed, Branches from other banks might serve as correspondents for downscaling banks (Diniz et al., 2012; compare Baptista / Heitmann, 2010). But branchless banking also involves banking outside traditional bank facilities, through “nonbank retail agents” (McKay / Pickens, 2010, p. 1; compare Mas, 2009). Since *correspondent* implies traditional correspondent banking among banks, the term *agent*, which literature on branchless banking refers to, is introduced in the following paragraphs.

The economic agent has to make a choice from a set of available alternatives according to his preferences and is going to act consequently (Rubinstein, 2012). In principal-agent literature, an agent tries to maximize his expected utility in imperfect information towards the actions he has to take or has taken, while the principal is applying a compensation system that intends to incentivize the agent in acting in line with the principal’s interest

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<sup>6</sup> Compare Alexandre, 2011; Cobourne et al., 2013; Duncome / Boateng, 2009; Ivatury / Mas, 2008; Kauffman / Riggins, 2012; Ledgerwood, 2013; Lyman et al., 2006; Lyman et al., 2008; Mas, 2008; Mas, 2009; Mas / Radcliffe, 2011; Mas / Siedek, 2008; Mas / Sullivan, 2012; McKay / Pickens, 2010, among others.

<sup>7</sup> ICT is the common acronym for *information and communications technology*.

(Stiglitz, 2008). These definitions from economics and new institutional economics may support the analysis of agent behavior and the conception of agent contracts in the context of ABCs, but are not sufficient to define *agent* in the specific context of the ontological basis of this paper. Ledgerwood (2013, p. 276) defines agent as a “third party acting on behalf of a bank or other financial service provider [...] in its dealings with customers”. Baptista and Heitmann (2010, p. 2) specify the agent’s role as: “A person or business that is contracted to facilitate transactions for users”. An agent facilitates transactions by providing them to customers and by taking care of the related customer interaction. The most important transaction an agent provides is cash-in and cash-out (CICO) services (Baptista / Heitmann, 2010). Reflecting on this connotation, much literature coins the agent as a *cash merchant* (Dermish et al., 2012; Kendall et al., 2012; Mas / Radcliffe, 2011; Alexandre et al., 2011). As Ledgerwood (2013, p. 292) illustrates: “An agent is essentially an aggregator for the cash requirements of a community. It is a cash-storing and transfer business that absorbs the risk inherent in handling cash”<sup>8</sup>.

The term *agent* is commonly applied, even if principal-agent relationships are not defined by law in the respective country (Ledgerwood, 2013). An agent might not be an agent in the legal sense, since often they are not licensed to conduct CICO services on their own behalf, but act on behalf of a licensed financial institution as a “*borrowed teller*” (Lyman et al., 2006, p. 1). Lyman et al. (2006) introduce the term *retail agent* to describe this relationship. Addressing a connotation that might highlight the agent’s role towards customers, the term *touch point* is occasionally used in the literature (Alexandre et al., 2011; Mas, 2009). Whereas *retail outlet* may rather respond to the agent’s role in the service delivery chain of the bank (Dermish et al., 2012; Mas, 2009; Jayo et al. 2012; Kendall et al. 2012; Kumar et al., 2006; Lyman et al., 2008). Other common terms are *merchant*, *retailer* (Baptista / Heitmann, 2010), and *banking correspondent* in equivalence with the above-mentioned correspondent banking (Lyman et al., 2006; Riggins / Weber, 2013; Jayo et al., 2012). In the context of agents, the provision of transactions and taking care of the related customer interaction is denoted as *services*. An agent commonly gets commission on the execution of services from the contracting bank (Ledgerwood, 2013). An agent might employ one or more subagents, such as in the agent network integrator (ANI) model (Assunção, 2013; Bosch Gual / Ansón, 2008; Ivatury, 2007; Ivatury / Mas, 2008; Kumar, 2005; Kumar et al., 2006). The following table 1 provides an overview of services outsourced to agents, and their outsourcing rationale.

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<sup>8</sup> Mas and Siedek (2008) published a similar statement.

**Table 1: Front-end branch business services outsourced to agents**

Front-end branch business service	Outsourcing rationale
Cash-in and cash-out (CICO) transaction	<ul style="list-style-type: none"> <li>• Aggregate service requirements</li> <li>• Local recognition and trust, absorb risks from handling cash</li> <li>• Absorb economic risk</li> </ul>
New customer registration	<ul style="list-style-type: none"> <li>• Aggregate service requirements</li> <li>• Local recognition and trust</li> </ul>
Explain customers how to access and use services	<ul style="list-style-type: none"> <li>• Aggregate service requirements</li> </ul>
Personal identification number (PIN) changes	<ul style="list-style-type: none"> <li>• Aggregate service requirements</li> </ul>
Basic customer management (monitor repayment, collect payment, communicate reminder to arrears)	<ul style="list-style-type: none"> <li>• Aggregate service requirements</li> <li>• Local recognition and trust</li> </ul>

Source: Own elaborations based on Baptista / Heitmann, 2010; Mas / Morawczynski, 2009; Riggins / Weber, 2013.

MNOs, retail chains, and post offices may serve as agents (Alexandre et al., 2011; Bruett / Firpo, 2009; Ledgerwood, 2013, Porteous, 2006; Sotomayor, 2011). Alexandre et al. (2011, p. 129) borrow terms from Ricardo (1817) when stating that banks, MNOs, retail chains, and post corporations should negotiate roles that allow each to optimize its “comparative advantages”. For Easy-paisa, Pakistan’s largest mobile banking service, Telenor Pakistan, a MNO, and Tameer Microfinance Bank split operations in the mobile value chain based on an organizational competencies audit (Dermish et al., 2012). The result should be a more economical service model (Alexandre et al., 2011). The following table 2 provides an overview of the comparative advantages and disadvantages of MNOs, retail chains, and post corporations in comparison when acting as agents.

As the definition of *agent* seems sufficiently precise, the following paragraph frames the definition of *branchless banking* and the complementary role of the agent. According to the comprehensive literature research from Dermish et al. (2012) the term *branchless banking* is coined by CGAP: “Branchless banking represents a new distribution channel that allows financial institutions and other commercial actors to offer financial services outside traditional bank premises” (Lyman et al., 2006, p. 2). New distribution channels outside traditional bank premises might also include internet banking and automatic teller machines (ATMs; Ledgerwood, 2013; Lyman et al., 2006), as well as mobile branches (Delfiner / Perón, 2007; Ferguson,



**Table 2: Advantages and disadvantages of mobile network operators (MNOs), retail chains, and post corporations in the context of agent-assisted banking beyond branches channels (ABCs) in comparison. Advantages are marked with “+”, disadvantages with “-”. Advantages that apply to more than one player stretch over more than one column**

MNOs	Retail chains	Post corporations
Recognized brand (+)		
Trained staff (+)		
Standardized products, services, and procedures (+)		
High-volume low-value real-time transactions at high availability and reliability (+)		
Transaction-based revenue model (+)		
Manage agent networks (+)	Operate store networks (+)	Operate and manage store and agent networks (+)
Smaller agent businesses (-)	Larger stores (+)	Post offices, larger agent businesses (+)
/	/	Semi-urban, rural, and remote profile complements with bank profile (+)
Customers are familiar with mobile phones (+)	Some customers might be familiar with point of sale (POS) devices or personal computer (PC) terminals and cards (+)	
/	Some do not allow bank brands in stores (-)	/
Some introduce electronic wallets (e-wallets) and transfers (+)	Some introduce banking products and services on their own (-)	/

Source: Own elaborations based on literature review.

2011; Ledgerwood, 2013; Westley, 2006). Internet banking as a distribution channel might reduce costs in some parts of the world; however, it requires significant investments in broadband infrastructure upfront and therefore has limited outreach in developing countries (Ledgerwood, 2013). Moreover, connection devices for bank customers, such as personal computer (PC), tablet, and Smartphone, are expensive and require significantly more electricity than mobile phone and point of sale (POS) device – the connection

devices required for ABCs (Ledgerwood, 2013). Electricity consumption needs to be considered, as rural populations in many developing countries do not have access to electricity. In some cases, electrical access may be unreliable and/or cost prohibitive (Ledgerwood, 2013). Likewise, ATMs cause significant investment and maintenance costs and have limited outreach in developing countries (Ledgerwood, 2013; Lyman et al., 2006; Mas / Radcliffe, 2011). Mobile branches in the form of trucks, vans, boats, and other moving vehicles are permitted by regulation in only 60 percent of 95 developing countries (Mas, 2011). Moreover, mobile branches' visiting schedules might insufficiently match target customers' cash flows (Mas, 2008). In contrast, Ferguson (2011) reports positive results from a mobile branches program that Opportunity International Bank launched in Malawi in the year 2007. The program has since been replicated by one competitor (Ferguson, 2011). McKay and Pickens (2010, p. 1) later define branchless banking as "the delivery of financial services outside conventional bank branches using information and communications technologies and nonbank retail agents, for example, over card-based networks or with mobile phones". The specification of *agent-assisted* branchless banking connotatively captures that one or more agents act on behalf of the bank outside traditional bank premises and thereby assist the bank in serving its customers through branchless banking channels. This specification was also introduced by Lyman et al. (2006).

The expression *branchless* might suggest that branch channels are irrelevant for the new distribution channels, possibly even replaceable and unimportant in the channel mix of the bank (Alexandre et al., 2011; also compare Mas / Sullivan, 2012). However, branchless banking is about introducing new distribution channels, not about eliminating existing channels (Alexandre et al., 2011). Branch channels even extend their roles beyond branch operations and support agent operations for cash management: "In the new cash ecosystem, retail outlets handle the last mile, but banks still do the long haul. Bank branches will thus retain a role as cash distribution nerve centers in support of the banks' nonbank retail outlets located in their catchment area" (Alexandre et al., 2011, p. 123). Bundling infrastructure and expertise, branch channels moreover propose suitable product mixes to customers, serve complex services, resolve customer-care issues, and conduct credit evaluation as well as loan recovery procedures (Alexandre et al., 2011). Thus, Alexandre et al. (2011) introduce the term *banking beyond branches* (also compare Alexandre, 2011; Mas / Sullivan, 2012). Concluding the discussion of taxonomies, the term *agent-assisted banking beyond branches channel* (ABC) applies to the ontological basis of this paper.

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## **4. QUALITATIVE REVIEW: COSTS FOR AGENT-ASSISTED BANKING BEYOND BRANCHES CHANNELS COMPARED TO COSTS FOR BRANCH CHANNELS IN DOWNSCALING**

### **4.1. Hypothesis**

As mentioned in chapter 3, the crucial channel infrastructure innovation about ABCs is that agent businesses with their facilities and equipment as well as their recognition among target customers are employed to provide banking products and services. ANIs can be employed to outsource management and integrate distribution channel networks, including subagent businesses. The intention is to attain a more economical service model. A survey from CGAP revealed that ABCs were pursued by 75 percent of banks because they were considered to be more efficient channels than traditional bank channels (Kumar, 2012)<sup>9</sup>. These findings suggest the hypothesis that the delivery of banking services and products in downscaling through ABCs comes at reduced costs, compared to the delivery through branch channels. This hypothesis is verified in the following sections.

### **4.2. Methodology**

For the qualitative review, literature is analyzed and tested against the research question. As both the ontological basis and the academic field are only a few years old, the entire existing relevant literature available through academic online search engines at the preparation of this paper is considered<sup>10</sup>. Relevant literature includes a high share of practitioner publications. Ignacio Mas (2009), having outstanding industry experience, and authors from CGAP, being among the leading institutions shaping the industry, contributed many of these. Without practitioner publications, the qualitative and quantitative analysis of this paper would downsize to a fraction of its present scale. The methodology with which much practitioner research obtains results is primarily based on aggregated industry experience. Many publicizing practitioners have experience that covers large parts of both the emerging industry and the young academic field. In order to categorize, integrate, and describe different costs revealed from the qualitative literature review in a structured approach, the cost structure from Mas (2009) is ap-

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<sup>9</sup> Kumar (2012) refers to a survey from the year 2010. This is a Microsoft PowerPoint document provided from the expert for technology-enabled business models for financial services at CGAP (Consultative Group to Assist the Poor).

<sup>10</sup> Search engines applied for literature research are EBSCO, Google Scholar, JSTOR, and ScienceDirect.

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plied as a framework<sup>11</sup>. Mas (2009) developed this structure to compare costs from ABCs to those from branch channels. Though the cost structure is “stylized” and might transform into a more complex structure, dependent on the actual business case (Mas, 2009, p. 69), it serves well as a basic framework.

### 4.3. Results

In order to relate cost structures from branch channels to those from ABCs, it might help to shed light on the respective corresponding revenue model and explain fundamental differences. Costs from branch channels are primarily matched with revenue generation from invested deposits and interest spreads, which are quasi-fixed revenues, based on estimations for average deposit funding size, investment landscape, and interest income (Mas, 2009; Mas / Radcliffe, 2011). Consequently, a cost structure composed of a high proportion of fixed costs matches incoming cash flows appropriately and implies little economic risk (ibid.). The side constraint includes that quasi-fixed revenues should exceed fixed costs. Besides, the average transaction produces net costs for branch channels (Mas, 2009). The crucial business model innovation for ABCs is transaction-based revenue generation (Mas, 2009; Mas / Radcliffe, 2011). Revenues from transaction fees are variable and few records on revenue inflow from the target customer segment are available to forecast revenues (ibid.). Consequently, a cost structure that is composed of a maximized proportion of variable costs that entirely depend on realized transactions matches revenue inflows appropriately and minimizes economic risk (compare Mas, 2009). The side constraint includes that variable revenues should exceed variable costs: the average transactions should produce net profit (Mas, 2009).

From an economics’ perspective, the major structural difference between ABCs and branch channels is that ABCs show a higher scale at the agent network-level and a lower scale at the agent-level (Mas, 2009). Initial investments and fixed operating costs at the agent-level would diminish profits from transactions and imply economic risk due to the lower scale (ibid.). Ergo, the consequence is to minimize these costs. They can be converted into variable costs that entirely depend on the number of realized transactions and be distributed to other parties, i.e. *outsourced* (Mas, 2009; Mas / Radcliffe, 2011). Mas (2009) states that a bank branch has the capacity to conduct many times the maximum number of transactions per month that an agent

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<sup>11</sup> The cost structures evolve from Mas and Siedek (2008). The authors assume that the commercial bank manages its agent network in-house.

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location might accomplish. This matches the changed economics of the channel network, in which agents operate at a lower scale than branches because the concentration of transactions at the agent location is lower. Mas' finding is valid for CICO transactions and transactions in POS device / PC terminal-based ABCs. In mobile-based ABCs, the customer can conduct cashless transactions such as balance inquiries and e-money transactions independently, therefore does not require the agent other than for CICO transactions.

The cost structure from Mas (2009, p. 68) is comprised of the following basic framework:

1. Fixed costs per branch and agent
  - 1.1 Investment costs
  - 1.2 Operating costs per month
2. Variable costs per transaction
  - 2.1 Communications costs
  - 2.2 Agent commission
3. Fixed costs per new customer
  - 3.1 Acquisition costs
  - 3.2 Credentials costs
4. Back office costs

This structure applies as a basic framework to categorize, integrate, describe, and compare different costs for ABCs and branch channels from the literature review. For easier orientation, the following sub-paragraphs reflect this structure in their titles.

#### *4.3.1 Fixed costs per branch and agent*

##### **Investment costs**

Costs from agent recruitment might be among the highest in the ABC rollout (Davidson / Leishman, 2010 I). Agent recruitment includes search, assessment, selection, hiring, installation, and training of agents (ibid.; Jayo et al., 2012). In order to be effective, the agent needs to be strategically located for the bank and conveniently located for customers (Ledgerwood, 2013). Moreover, the agent needs to have the trust of the customers (ibid.). Tangible and intangible resources of the agent need to be assessed and, depending on skills and expertise, the agent requires initial briefing and training (Ledgerwood, 2013; Mas, 2009)<sup>12</sup>. Banks have built capacities to recruit. However,

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<sup>12</sup> Likewise, branch employees might need initial training. Moreover, Gonzalez (2010) finds that investment in training increases productivity, portfolio quality, and financial performance – at least for microfinance institutions (MFIs). Gonzales (2010) ran regressions on panels with 121 to 159 observations from questionnaires to MFIs.

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agent recruitment does not count to the core competencies of banks, which might cause them to incur high costs. Therefore, rather than developing the required expertise in-house, outsourcing to specialized ANIs reduce costs for the bank.

The facilities of the agent, such as building, stand, or counter, are tangible resources that are leveraged to conduct banking services (Dermish et al., 2012, Kendall et al., 2012). The facilities should store floats securely; therefore, they might need some investments in additional security precautions to meet requirements (Mas, 2008). In comparison, a new branch building implies high investment costs, including security precautions (Hidayati, 2011; Kendall et al., 2012). Overall, leveraging facilities of the agent minimizes investment costs (Dermish et al., 2012; Mas, 2009; Kendall et al., 2012). If the agent is already equipped with electronic devices – a POS device or PC terminal and mobile phone – these can be employed to conduct banking services for customers (Dermish et al., 2012; Mas, 2009). The devices need to connect to the transaction platform; apart from optional installation of software and initial briefing to the agent, no further investment is required (Mas, 2009). However, usually the device and a communication line needs to be purchased and installed (Mas, 2009). Costs for a POS device are higher than for a mobile phone, but the device typically comes with a larger screen, higher quality keyboard, advanced data security, and the option to print transaction and balance receipts (Ledgerwood, 2013). In cases where partnerships are nonexclusive and ANIs serve multiple banks, ANI's can access equipment at economies of scale: a larger scale than the contracting bank could (Riggins / Weber, 2013). Hence, the resulting costs to the bank, channeled in agent commissions, decrease.

SIM cards act as smart cards in communication devices, including sufficient built-in security features (Alexandre et al., 2011; Duncombe / Boateng, 2008; Ivatury / Mas, 2008; Kousaridas et al., 2008; Ledgerwood, 2013). Some advantages that smart cards entail do not work with SIM cards (Cobourne et al., 2013; Garza, 2011; Rhyne, 2009). For example, the feature of customer identification through fingerprints does not apply for simple mobile phones (*ibid.*). However, voice identification might apply (*ibid.*). ABCs based on mobile phone banking devices leverage people's own SIM cards and mobile devices instead of having to distribute cards to customers and POS devices or computer terminals to agents (Dermish et al., 2012). This solution seems particularly appealing, given the number of unbanked populations that own mobile phones: Dermish et al. (2012) review several studies and state that out of 2.6 billion unbanked, one billion do have a mobile phone. Ledgerwood (2013) refers to 1.7 billion unbanked with access to a mobile phone. Al-

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so, the communication network is in place because of the mobile telephony networks operated by MNOs (Dermish et al., 2012). Leveraging the mobile phones of agent and customers minimizes investment costs (Mas, 2009; Mas / Radcliffe, 2010). For a branch, either of the two technology infrastructures likewise applies and causes the same investment costs.

So far, tangible resources of the agent have been considered in this chapter. Regarding intangible resources, local recognition of the agent as an established and trusted business can increase sales (Ivatury / Mas, 2008; Jayo et al., 2012; Kendall et al., 2012; Mas / Radcliffe, 2010). Therefore, initial marketing investments might decrease, as compared to bank branches, which have little to no recognition when they start operations. Substantial investment costs for both, ABC and branch channels may benefit from regulation. The agent might have to complete training courses and receive licenses from a regulatory authority (Hidayati, 2011, Ivatury / Mas, 2008, Mas, 2008). These requirements incur costs to the bank instead of the agent who usually does not have means or economic incentives to compensate for costs resulting from regulatory requirements (Hidayati, 2011). In case the regulatory authority introduced facilitated *light* regulation for agents, so they may collect savings and issue accounts under e-money or *narrow bank* licenses, costs for banks would decrease (Alexandre et al., 2011; Lyman et al., 2008). It is crucial for the bank to verify the regulatory situation as uncertainty about corresponding regulatory frameworks and framework changes, might impose economic risk, actual limitations, and even prohibit ABCs.

In contrast to uncertain and incomplete regulation of agents, regulatory frameworks for the installation of branches are commonly established. First, formal approval for each branch opening is required in 78 percent of developing countries (Mas, 2011)<sup>13</sup>. In several countries, such as in Kenya, physical inspection from a central bank representative is required as part of the approval process, which may substantially delay a branch opening in remote areas (ibid.). In several countries, such as in India, regulating authorities limit the number of branches in geographical areas (ibid.). Whether a branch opens and when a branch opens therefore depends on administrative processes. These regulations impose restrictions to efficient branch installation, thus may substantially affect investment costs and the profitability of branches (Mas, 2011). Second, the construction and facilities of bank branches are subject to regulation and therefore cause substantial investment costs. Regulated security requirements come at particularly high costs (Kumar et

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<sup>13</sup> Mas (2011) refers to a study from Consultative Group to Assist the Poor (CGAP), which examined regulatory frameworks in 95 developing countries.

al., 2006). Regulators commonly specify the following construction characteristics for branches (ibid.; Mas, 2011):

1. Minimum size of the building
2. Building characteristics, such as thickness of glass between tellers and customers
3. Physical layout, such as characteristics of the vault and cameras

The specifications, which assume one concept of a branch, unrelated to the location and volume of business, often cause inefficiencies that result in additional costs and prevent innovation (Kumar et al., 2006; Mas, 2011). Local government and police might even add security requirements, raising compliance costs (ibid.). Tiered requirements by type of branch might evade inefficiencies but are only allowed by 11 percent of developing countries (ibid.).

In summary, investment costs from ABCs incur as much as the bank needs to provide additional tangible and intangible resources. These depend on the qualifications of the agent and resource requirements for the provision of services for the agent (Mas, 2008). Regulations of branches are advanced and deriving investment costs predictable, whereas regulation of agents tends to be uncertain and incomplete, depending on local authorities and advancement of regulatory inclusion. When delivering through ABCs, the bank primarily enhances existing infrastructure rather than investing in new infrastructure and reduces investment costs, compared to deliverance through branch channels (Hidayati, 2011; Kendall et al., 2012). Outsourcing agent recruitment and equipment purchase to specialized and scaling ANIs further reduce investment costs to the bank.

### **Operating costs per month**

As the facilities of the agent are leveraged, fixed operating costs from rent do not incur in comparison with a rented branch building (Mas, 2009). In comparison with a built branch, investment costs decrease. For the same reason, fixed operating costs from facility and equipment maintenance, electricity, heating, etc. do not incur to the bank (Mas, 2009). Equipment maintenance and supplies for POS devices, such as repair service and paper, might be provided by the bank and incur costs for either ABC or branch channel (Mas, 2009). These do not incur if mobile phones are used as banking devices (ibid.). In addition, marketing materials could be provided by the bank (ibid.) and would incur costs for either ABC or branch channel.

Once the bank integrates a customer's mobile phone into its distribution channel, SMS messages can facilitate communication between the bank and the customer. One example would be automatically reminding the customer

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of intended savings installments and due loan payments, rather than having a field officer visit the client (Ledgerwood, 2013). With an integrated mobile phone, the customer may also conduct cashless transactions such as inquiries and e-money transactions on his own, independently from the agent (ibid.)<sup>14</sup>. Evidence confirms that agents administer loan funds more quickly and receive customer payments faster than branches (Riggins / Weber, 2013). This might also result from agent recognition and lower transaction concentration at agent locations. In any case, it reduces operating costs from client management for the bank and reduces portfolio risk (Ledgerwood, 2013).

In a branch channel, salaries for employees are a source of fixed operating costs (Mas, 2009). In countries such as Brazil, labor policies themselves can cause the bank to incur additional fixed operating costs (Kumar et al., 2006). The agent, in contrast, receives variable commission instead of a fixed salary. Commission depends on revenue streams and reduces economic risk for the bank (ibid.). This point is further addressed in the following section “agent commission”. For ABCs, training and control procedure obligations are another ongoing cost factor (Alexandre et al., 2011). This cost might reduce if the agent derives high intrinsic benefit from ensuring service quality and bank regulation standards (ibid.)

Regulatory authorities moreover specify staffing of branches, such as number of security guards and management structure (Kumar et al., 2006; Mas, 2011). For branch operations, 43 percent of developing countries specify minimum opening hours for branches (ibid.). This restricts the exact matching of business hours with community life, such as market days (ibid.). In some countries, notice is required at least six months prior to permanently closing a branch (Mas, 2011). As mentioned in the previous section, these regulations impose restrictions to efficient branch operations, thus may substantially affect profitability of the branch (ibid.). Usually such regulations do not interfere with agent operations (ibid.). However, uncertainty about corresponding regulatory frameworks and framework changes might impose economic risk, actual limitations, and even prohibit agent operations (ibid.). Some regulatory frameworks also define service requirements, such

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<sup>14</sup> Research from the Consultative Group to Assist the Poor (CGAP) in South Africa revealed that 50 percent of customers as well as non-customers of mobile-based agent-assisted banking beyond branches channels (ABCs) prefer interaction with a person rather than entirely mobile-based banking (Ivatury / Mas, 2008). Non-customers also owned and used mobile phones, but not for mobile banking (ibid.). The degree of mediation is important for less literate customers, thus introduction and trouble-shooting should be guided by agents (Medhi et al. 2009, p. 492).

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as a maximum number of transactions per time unit, printed income statements to be sent to customers, clear and visible complaints' procedures, and consumer awareness safeguards (Dermish et al., 2012; Mas, 2011). Though most of these may protect customers, some regulations can result in inefficiencies and increased operating costs for both ABC and branch channel.

One of the major fixed operating costs from ABCs is float management (Ledgerwood, 2013). The agent has to maintain sufficient cash float and e-money float to meet CICO transaction requirements at business times (ibid.)<sup>15</sup>. Businesses employed as agents might leverage excess cash from their own turnover and profits to provide the required float for CICO transactions (Porteous, 2006; Riggins / Weber, 2013). Considering the target customer segment, these are small-value transactions (Alexandre et al., 2011). Mas (2008) argues that small-value CICO transactions of the target customer segment do not exceed float requirements of retail products and therefore match float at the agent business. Mas and Siedek (2008) provide an exemplary overview of cash flows, net cash per day, and cumulative net cash at the agent business. In that overview, the agent needs to settle float as frequently as every four days due to the dominance of cash-in transactions from customer savings (Mas / Siedek, 2008)<sup>16</sup>. In cases where the bank focusses on savings, transmittances, and payments to meet the specific needs of low-income and unbanked populations (Cole et al., 2011; Morawczynski, 2009; Singh, 2009; World Bank, 2011), cash-in transactions result in a positive cumulative net cash flow at the agent in early stages, so that the he has to settle excess cash for e-money. Once savings accounts are built up, cash-out transactions may dominate. Extreme values in the distribution of cash-out transaction amounts cause the risk of running out of float (Mas / Siedek, 2008). For a consistent customer experience and in order not to discourage customers, adequate float management has to ensure sufficient float to meet cash-out requirements at business times (Ledgerwood, 2013)<sup>17</sup>. The ideal

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<sup>15</sup> In the following, *float* refers to cash and electronic money (e-money) float.

<sup>16</sup> The example from Mas and Siedek (2008) includes a cash limit due to security concerns set by the bank. During the first weeks and months of agent operations, the bank needs to adjust that cash limit.

<sup>17</sup> In his study on the adoption of mobile banking, Tobbin (2012) reports customer claims from situations in which agents were out of cash. Likewise, frequent cash shortages at M-PESA agents occurred in Kenya, as Safaricom faced cash management challenges at the beginning (Dermish et al., 2012). In order to reduce the probability of extreme value transactions, cash in and cash out (CICO) transactions should evenly distribute over maximized time units; local service companies might agree to call for bill payments on a weekly basis at smaller amounts, instead of a monthly or annual basis at higher amounts (Mas / Siedek, 2008). Local service companies might moreover time bill payments with formal salary payments and welfare payments (ibid.).

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agent and branch is float-neutral at the end of every day (ibid.). Obviously, this depends on the average size and deviation of CICO transactions, but also on the size of the agent business and its average excess cash (Mas / Siedek, 2008). MNOs tend to choose smaller agent businesses than banks do (Ledgerwood, 2013).

Bank branches might serve as “*cash distribution nerve centers*” for agents (Alexandre et al., 2011, p. 123). Banks could also collaborate with other banks, access extended branch networks in exchange for fees (Mas / Siedek, 2008), and establish traditional banking correspondent relationships (Naughton / Chan, 1998; Osterberg / Thomson, 1999)<sup>18</sup>. The decision on the frequency of float settlements at the nearest branch is a tradeoff between risks and costs from float level changes at the agent’s site and, second, settlement costs. Risks from float level changes at the agent location derive from increasing and decreasing float. Increasing float implies increasing security risk and increasing opportunity costs, given a level of interest rates (Mas, 2008; Mas / Siedek, 2008)<sup>19</sup>. Decreasing float implies increasing risk from running out of float because of extreme value transaction amounts (ibid.). Float represents potential working capital for the agents’ business, which they might want to invest in stock and other supplies (Davidson / Leishman, 2010 II; Mas / Radcliffe, 2011). Additional operating costs incur to the agent in case he retains insufficient float levels and has to take a loan to meet cash-in and cash-out (CICO) transaction requirements (Baptista / Heitmann, 2010). Security risk, opportunity costs, and business risk need to be measured against settlement costs. Settlement costs include travel between agent and branch, including opportunity costs, given a level of service (Mas, 2008; Mas / Siedek, 2008). In order to reduce opportunity costs, bank branches may introduce a fast lane for agents, so that they do not have to queue for long (Mas / Siedek, 2008). Frequent trips to the nearest branch cause high operational costs to the agent (Baptista / Heitmann, 2010; Mas / Siedek, 2008). The bank should consider whether setting incentives for the agent to retain sufficient float from his business or settling his float frequently seems more economic (Davidson / Leishman, 2010 II; Mas / Radcliffe, 2011; Mas / Siedek, 2008).

However, the tradeoff might exceed the experience and expertise of the agent, therefore causing high risk to the agent’s business. The bank might

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<sup>18</sup> Lemon Bank in Brazil entirely relies on branch networks from other branches (Mas / Siedek, 2008). The Bank of Papua New Guinea, the post corporation, government, and other financial institutions in Papua New Guinea access the branch network from Bank South Pacific for their cash distribution (Bruett / Firpo, 2009).

<sup>19</sup> Opportunity costs only incur to the extent that the agent cannot invest the increasing float in his business, nor operate with it.

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therefore handle float management on behalf of the agent or assign float management operations to specialized players. Due to security concerns MNOs in the Philippines tend to outsource float management to specialized agents who settle cash for e-money at bank branches and handle the resulting risks (Bruett / Firpo, 2009). Mas and Morawczynski (2009; also compare Mas / Radcliffe, 2010) describe *master agents*, assigned at M-PESA in Kenya, that arrange cash management services on behalf of Safaricom and receive an increased share in overall agent commission in return. Float management corresponds to core competencies of banks, who can provide expertise, infrastructure, and contacts that are required for secure float management (Alexandre, 2011).

Regardless of the way the float management issue is solved, it represents a significant fixed operating cost (Baptista / Heitmann, 2010). Operating costs from float management can amount to 35 to 60 percent of the overall costs for ABCs (Ledgerwood, 2013). However, as other costs decrease, the proportional share of float management cost increases. In comparison, traditional branch channels are limited to areas that ensure larger average transaction sums and sufficient turnover to cover their costs from float management (Alexandre et al., 2011). Cash transports in particular are expensive due to security requirements (Mas, 2011). The largest stake represents costs from secure cash transport and insurance premiums (Ledgerwood, 2013). About 10 percent are opportunity costs (ibid.). How severe frequent transports of large amounts of cash affect the profitability of ABCs is uncertain (ibid.). For customers, holding visible and anonymous cash implies higher risk, due to demanding friends and family members, theft and loss (Alexandre, 2011). Costs from handling cash could be minimized for the agent and branch, but also for customers and the entire economy, if the bank, customers, and retailers locally switched to electronic payments via mobile phones, so called *mobile payments* (Mas / Sullivan, 2012). While long-distance transfers are electronic, local economies still rely on cash because consumers and retailers are conditioned to use it (ibid.).

In summary for float management, the agent manages CICO transactions, which reduces operating costs and mitigates risk for the bank, as compared to a branch (Kumar et al., 2006)<sup>20</sup>. Operating costs from float management incur to either the agent, specialized *master agents* or the bank. In case of a branch channel, these costs incur to the bank. However, the settlement fre-

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<sup>20</sup> Operating costs and risk incur to the agent business. The bank should carefully assess whether the agent meets the required qualification to cope with costs and risks (Mas, 2008, Alexandre et al., 2011).

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quency and the number of cash transports might be higher for ABCs than for branch channels. In summary for operating costs, expenses from employing facilities, equipment, and personnel are reduced for ABCs as compared to branch channels, as the agent business' infrastructure, personnel, and possibly the agent's and customers' mobile phones are leveraged (Dermish et al., 2012; Hidayati, 2011; Sotomayor, 2011). Regulations cause significant costs for branch channel operations that do usually not incur to ABC operations, but uncertainty about the advance of regulations and regulatory changes can impose economic risk and actual limitations to ABCs. Operating costs from float management and particularly from cash transports can tip the scales for or against the profitability of ABCs; costs and risk could be mitigated through outsourcing to the agent or to specialized float management agents.

#### *4.3.2 Variable costs per transaction*

##### **Communications costs**

For each transaction, connection and data transmission costs incur. These comprise variable costs for connecting the banking terminal at agent and branch as well as the customer phone to the server of the bank, dependent on the banking device (Mas, 2009). Example for connection and data transmission costs are costs for sending SMS and uploading or downloading from the banks' IT platform (ibid.). Mas (2009) indicates that costs for a mobile-based transaction might be higher than for a POS device-based transaction at the agent site, and costs for both might be higher than for a transaction at the branch, where a steady connection line is installed (Mas, 2009). However, the difference appears to be marginal if compared to investment and operating costs (ibid.).

##### **Agent commission**

Agent commission compared to salaries and benefits for bank employees represents a significant reduction in costs (Lyman et al., 2008; Mas / Radcliffe, 2011; Riggins / Weber, 2013). Moreover, costs from commission depend on realized sales, e.g. the number of transactions billed to the customer (Mas, 2008; Mas, 2009; Mas / Radcliffe, 2011). Therefore, commission represents variable costs, covered by sales revenues (ibid.)<sup>21</sup>. Salaries for branch staff, in comparison, represent fixed costs (ibid.). Consequently, agent commission reduces economic risk for the bank (ibid.). In the case of M-PESA in Kenya, Safaricom subtracts agent commission from client accounts on the account platform, thus the agent is not authorized to charge any fees to cus-

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<sup>21</sup> Assuming that services and products are sold at cost-covering prices.

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tomers, which reduces the potential for abuse (Mas / Morawczynski, 2009; Mas / Radcliffe, 2010). Subsequent control costs for the bank decrease. Safaricom also outsourced the management of agent commissions to the above-mentioned *master agents*. An online tool allows monitoring transactions conducted by the agent and online transfer of commission to the agent (Mas / Morawczynski, 2009). This outsourcing further reduces costs for the bank.

Given that the agent usually runs his own business, opportunity costs are incurred when he turns to agent services. The agent might need incentives to conduct any service not billed to the customer (Mas / Radcliffe, 2011; Davidson / Leishman, 2010 II)<sup>22</sup>. Commission and remuneration for non-revenue-generating services cause variable operating costs that result in economic risk (*ibid.*). The configuration of commissions involves a tradeoff between three objectives. First, the bank should maximize the agent's revenue share for providing, marketing, and selling services in order to offer competitive economic incentives (Alexandre et al., 2011; Ledgerwood, 2013)<sup>23</sup>. Second, commission costs passed on to the customer as additional fees translate into entry barriers and should be minimized for revenue generation from scale (compare Bosch Gual / Ansón, 2008; Ferrari / Jaffrin, 2006; Mas / Siedek, 2008). Third, commission costs taken by the bank should be minimized for profit generation from margins (*ibid.*). Economic risk from agent commission for non-revenue generating services is minimized in mobile-based ABCs, in which the customer may conduct cashless transactions such as inquiries and e-money transactions from his mobile, without the agent (Lyman et al., 2008)<sup>24</sup>.

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<sup>22</sup> If traffic from bank customers exceeds the agent's capacities, he needs to decide whether to serve a bank customer or his business customer. In such conflicts of interest, agent commission might compete with margins for sold products from the agent's business. In the case of Smart Money in the Philippines, one percent agent commission did not cope with 12 percent commission for airtime sales at agent stores (Mas, 2009). Commission-based airtime agent incentivization entails preferable economical preconditions if commission for airtime sales is comparably low (Mas / Radcliffe, 2010). However, as volumes from financial services and products can be higher than volumes from airtime and therefore generate greater overall revenues, a certain gap can be bearable (*ibid.*). It is reported that bank customers increase foot traffic at the agent business, which potentially increases sales and implies additional economic incentive for the agent to serve bank customers (Mas, 2008).

<sup>23</sup> In new institutional economic theory, the principal wants the agent to act in his interest and designs economic incentives accordingly, for instance a specific compensation scheme, while "the agent will undertake the action(s) which maximizes his expected utility, given the compensation scheme"; however, he must still want to accept the contract (Stiglitz, 2008).

<sup>24</sup> Cashless transactions can be information-only transactions such as balance inquiries, customer transfers, and payment of services such as electricity bill payments (Alexandre et al., 2011; Garza, 2011; Ivatury / Mas, 2008; Mas, 2009)

### 4.3.3 Fixed costs per new customer

#### Acquisition costs

Customer acquisition incurs fixed costs from sign-up and processing information (Mas, 2009). Costs from processing information are equivalent to *connecting and data transmission costs*. Know your customer (KYC) requirements impose sign up costs and procedural complications to account openings (Alexandre et al., 2011; Dermish et al., 2012)<sup>25</sup>. Required customer due diligence incurs costs and might even make low-balance and small transactions accounts unprofitable (Alexandre et al., 2011; Roman-Tayag, 2011)<sup>26</sup>. In some regulatory frameworks, only branches are permitted to perform customer due diligence, which limits the effectiveness of ABCs in outreach to target customers (Roman-Tayag, 2011). The institutional separation of account opening and CICO transactions can lead to an increased ratio of inactive customers, as also those open accounts that do not have access to CICO agents and/or do not need services (Ledgerwood, 2013). The temporal link between initial customer contact and first service delivery is crucial to retain active customers (ibid.). The time between account application and first savings deposit or credit payment should be minimized (ibid.)<sup>27</sup>. Even if agents are permitted to perform customer due diligence, they might not have access to necessary equipment and infrastructure such as copy machines and stable electricity supply (Alexandre et al., 2011). Depending on the customer documents required, KYC might exclude parts of the target customer segment, as in some countries no national identification document (ID) schemes are in

<sup>25</sup> Know your customer (KYC) norms comprise customer identification procedures to prevent and prosecute criminal acts such as terrorism and money laundering (Alexandre et al., 2011; Dermish et al., 2012).

<sup>26</sup> Easypaisa in Pakistan faced procedural complications for account openings from regulations at the beginning (Dermish et al., 2012). However, after resolving these, Easypaisa recorded more than five million bill payments and domestic money transfer transactions in its first year of operation (ibid.).

<sup>27</sup> Evidence suggests that banks work around such obstacles. Bank South Pacific (BSP) in Papua New Guinea applied tablet technology and instant card issuance along with travelling employees to enable account opening procedures within five minutes, in line with regulatory frameworks (This information originates from BSP's annual report 2012: <http://www.bsp.com.pg/Investor-Relations/Investor-Resources-Stock-Information/annual-report/BSP-Annual-Report-low-res-no-pic.pdf>, visited on April 4, 2015). BanColumbia in Columbia operates Puntos de Atención Móviles (PAMs) through its employees to provide temporary sales points at which accounts can be opened and the full range of products be accessed (This information originates from BanColumbia's annual report 2012: <http://www.grupobancolombia.com/contenidoCentralizado/informacionEmpresarial/relacionInversionistas/gobiernoCorporativo/resultadosFinancieros/resultadosAnuales/anuales/2012/InformeGestion2012.pdf>, visited on April 4, 2015).

place, thus leaving major parts of unbanked populations without access to banking services (Alexandre et al., 2011; Dermish et al., 2012)<sup>28</sup>.

In order to accelerate customer scale, the bank could remunerate the agent for each customer registration so as to set economic incentives (Davidson / Leishman, 2010 II; Mas / Morawczynski, 2009; Mas / Radcliffe, 2011)<sup>29</sup>. This would incur additional fixed costs per new customer (*ibid.*). Moreover, these costs would not depend on revenue generating services and cause economic risk. In cases where the bank decides in favor of accelerating customer scale, such costs would also incur to a branch channel. Overall, Mas (2009) estimates that customer acquisition costs are lower for ABCs than for branches.

### **Credential costs**

Credentials comprise card issuance to customers and card maintenance in cases where POS devices serve as electronic banking devices (Mas, 2009). Resulting costs also incur to branches (*ibid.*). As issuance and maintenance come at high costs, mobile-based ABCs operate at minimized costs (Mas / Radcliffe, 2010).

#### *4.3.4 Back office costs*

Back office costs comprise overheads from the electronic transaction platform, the account platform, network-wide marketing, and data management. The electronic transaction platform causes fixed costs for development and/or purchase, installation, and periodic operation (Ledgerwood, 2013; Mas, 2009). Existing electronic prepaid platforms from MNOs do not meet

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<sup>28</sup> The implementation of a tiered know your customer (KYC) model, as proposed by Alexandre et al. (2011), would facilitate new customer acquisition: Such a model permits immediate account opening for low-income customers, without extensive customer due diligence, and progressively tightens customer assessment standards while the customer accesses more financial services and increases transaction amounts. Such a tiered model would facilitate the financial inclusion of unbanked populations, thereby creating complete electronic financial records that allow tracking as well as investigation of criminal acts (Alexandre et al., 2011). Moreover, such a tiered model would contribute to the stabilization of the financial system, as Alexandre et al. (2011, pp. 128 f.) explain: "central bankers will gain more visibility over individual financial flows, exercise more control over monetary aggregates, and gain broader oversight over the stability of payment systems across the economy".

<sup>29</sup> When some agents focused on registering new customers instead of providing services to current customers and others did not complete the registration process, the management of M-PESA decided to pay half of the registration remuneration only after the registered customer had made its first deposit (Mas / Morawczynski, 2009). Moreover, agents were limited to registering customers only within a certain geographic radius (*ibid.*).

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the robust technical requirements necessary to process high transaction volumes (Dermish et al., 2012; Ivatury / Mas, 2008). Therefore, they cannot serve ABCs effectively and efficiently (ibid.). Nevertheless, MNOs have the in-house skills and relationships with vendors required for platform upgrades to meet ABC standards (Ivatury / Mas, 2008). The same costs apply for the electronic account platform, through which customer accounts are accessed. Initial investments into software, testing, etc. as well as maintenance and operation incur fixed overheads (Mas, 2009). In cases where the bank decides to use electronic transactions and account operations, such costs would likewise incur to a branch channel. Electronic transactions and account platforms facilitate data management as compared to manual data management and therefore reduce data management costs (Hughes et al., 2012). Moreover, electronic data management facilitates the recording of financial histories for customers; therefore credit bureau and credit scoring can be used to evaluate and monitor repayment prospects for credit products (Dermish et al., 2012; Riggins / Weber, 2013; compare Mas, 2009). This aspect appears particularly relevant to risk management and consumer protection, responding to *multiple lending* and *over-indebtedness*. However, data protection might be a concern<sup>30</sup>.

As for network-wide marketing efforts, collaborating with an ANI might reduce fixed costs, as MNOs, retail chains, and MFIs contribute recognition and trust among target customers (Alexandre et al., 2011; Baptista / Heitmann, 2010, Mas / Radcliffe, 2011; Medhi et al., 2009; Porteous, 2006; Pousttchi, 2008; Riggins / Weber, 2012; Tobbin, 2012). This may increase sales from the beginning (compare chapter 4.3.1); though the effect probably diminishes more and more after target customers are acquired. Afterwards, new customer segments will need to be reached and new products and services marketed to current customers. Regardless of this benefit, large investments in marketing might be required at the agent level (Dermish et al., 2012), but also at network level (Mas / Radcliffe, 2011). These do also incur to branches and branch networks.

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<sup>30</sup> Some publications briefly touch upon data protection in terms of technical solution and on an inter-institutional level between agents and subagents (Alexandre et al., 2011; Kumar et al. 2006; Lyman et al., 2006; Lyman et al., 2008; Mas, 2008; Mas / Siedek, 2008). However, no publication was found in the literature research conducted for the preparation of this paper that connects data protection with political dimensions. Target customers might hesitate over receiving services through agent-assisted banking beyond branches channels (ABCs) as they are concerned about their customer due diligence and transaction information being not only stored at the serving financial institution, but also potentially exposed to the political regime.

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#### 4.4 Summary and discussion

In line with technological innovation, channel infrastructure innovation, and business model innovation, the essential cost structure innovation of ABCs is the maximized proportion of variable costs that entirely depend on realized transactions. Revenues from realized transactions must exceed variable costs to minimize economic risk. In comparison with branch channels, ABCs reduce investment costs, as existing infrastructure is enhanced rather than new infrastructure established. Likewise, operating costs decrease for ABCs, as the agent business' infrastructure and personnel are leveraged. Float management comprises the largest item in operating costs and requires careful assessment, as it appears to be decisive for profitability. Agent commission as compared to salaries and benefits for bank employees reduces operating costs substantially. In particular, mobile-based ABCs reduce costs, as these leverage extant mobile phones of bank customers and agents.

Overall, the qualitative literature review conducted for this paper suggests that ABCs reduce costs in downscaling. Consequently, the hypothesis described in chapter 4.3 is confirmed. Likewise, literature appears to confirm this finding, though in closed statements, without providing a detailed quantitative analysis of actual cost structures and costs<sup>31</sup>. Kumar et al. (2006) express that costs from regulations might be reduced in ABCs, Mas and Siedek (2008) conclude that ABCs might be subject to lower levels of regulation than branch channels. However, regulation of branch channels is advanced, deriving investment and operating costs predictable, whereas regulation of ABCs tends to be uncertain and incomplete. Depending on local authorities and the advancement of regulatory inclusion, regulation can impose economic risk and actual limitations to ABCs.

### 5. QUANTITATIVE REVIEW: COSTS FOR AGENT-ASSISTED BANKING BEYOND BRANCHES CHANNELS COMPARED TO COSTS FOR BRANCH CHANNELS IN DOWNSCALING

#### 5.1 Hypothesis

Findings from the qualitative literature review in the previous chapter suggest that ABCs reduce costs in downscaling, as compared to branch chan-

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<sup>31</sup> See Alexandre, 2011; Assunção, 2013; Duncombe / Boateng, 2009; Hughes et al., 2012; Kendall et al., 2012; Kumar et al., 2006; Mas / Siedek, 2008; Mas / Sullivan, 2012; Nduati, 2011; Riggins / Weber, 2013.

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nels. Based on qualitative findings, this conclusion serves as a hypothesis for the quantitative review and is verified in the following sections.

## 5.2 Methodology

The quantitative review presented in this paper reveals data from case studies that comprise information on methodology, i.e. transparent information sources, assumptions, context, cost structure, underlying model, etc. that allow for the assessment of internal and external validity<sup>32</sup>. The case studies follow a cost structure that is different from the one Mas (2009) presents and which is applied in the qualitative review. Bridging the consequent discrepancy in the qualitative and the quantitative analysis, the quantitative review attempts to link the two cost structures in order to verify the essential deductions from the qualitative review.

Among the existent relevant literature reviewed for this paper, none quantifies cost structures of ABCs<sup>33</sup>. Dermish et al. (2012) present a similar finding in their literature review, when explaining that there is little official data on ABC operations<sup>34</sup>. The cost structure from Mas (2009, p. 69) also provides quantifications, but these are “idealized and do not correspond to any specific country or provider”. There are occasional details in the literature, such as agent commission for customer registration, for which Safaricom pays 0.95 USD (Mas / Radcliffe, 2011). Safaricom did not release official statements on the program’s roll out investments (ibid.). Mas and Radcliffe (2011) estimate investment costs of 25 to 30 million USD over the first two years, including platform costs, customer acquisition commission, television and radio marketing, and aggressive agent acquisition and training. However, these figures do not relate to branch channels.

There is comparable data on consumer prices for ABCs and branch channels. The methodology of McKay and Pickens (2010; compare Dermish et al., 2012) is to analyze comparative prices of products and services delivered through 16 ABCs and 10 traditional banking channels in 10 countries. Services delivered through ABCs are 19 percent cheaper than those delivered through

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<sup>32</sup> For the concepts of internal and external validity in quasi-experimental field research, compare Cook and Campbell (1979).

<sup>33</sup> There is another paper from Mas, with the promising title “an analysis of cost savings through mobile money platforms” quoted by Tobbin (2012) as mimeo. However, this paper has not been published; at least it could not be found through the indicated search engines.

<sup>34</sup> Statistics from Central do Brasil, Banca de las Oportunidades in Columbia, and Superintendencia de Bancos y Seguros in Peru provide data for agent operations; the GSMA provides data on mobile banking operations, however, this data is aggregated and does not explicitly quantify cost structures (Dermish et al., 2012).

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traditional banking channels (McKay / Pickens, 2010). For medium-term savings and bill payments, ABC prices are 50 percent cheaper on average (*ibid.*). Likewise, Ivatury and Mas (2008) argue that through ABCs, basic products and services could be offered at a price of at least 50 percent lower than traditional banking channels. These results might indicate that total costs are lower for ABCs in cases where margins are equal. However, this assumption is highly speculative and does not reveal any data on quantified cost structures.

There is occasional data on aggregated costs for investing in and operating ABCs, some of which relates to comparable costs of branch channels. For example, Kumar et al. (2006) find that in Brazil, initial investment costs for an ABC range from 0.15 percent to one percent of the investment costs for a branch (compare Lyman et al., 2006)<sup>35</sup>. In Pakistan, this figure amounts to 3.33 percent (Ivatury / Mas, 2008). In Peru, initial investment costs for an ABC amount to 5,000 USD, whereas for a branch the costs amount to 200,000 USD (Rhyne, 2009). Kumar et al. (2006) report that operating costs for agent personnel amount to 50 of branch personnel, based on full-time employment<sup>36</sup>. In Pakistan, total operating costs for ABCs amount to 1.07 percent of operating costs for branches (Ivatury / Mas, 2008). In the Philippines, an average transaction through mobile-based ABCs could cost 20 percent of the transaction through a branch (*ibid.*). In Peru, a CICO transaction through an ABC costs 0.32 USD as compared to 0.85 USD through a branch (*ibid.*). This data seems to confirm the deductions from the qualitative review. However, none of the quoted literature provides details on its methodology and is therefore not transparent on internal and external validity in the context of the costs described and cannot be integrated in the model employed by Mas (2009) in the previous section.

Making a first attempt to close the literature gap on transparently quantified cost structures, the expert for technology-enabled business models for financial services from CGAP, Kabir Kumar, was interviewed<sup>37</sup>. Kumar confirmed that no published literature structures, quantifies, and compares cost,

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<sup>35</sup> Kumar et al. (2006, p. 37) consider the significantly lower initial investment and operating costs a “prime driver” for the replication of agent-assisted banking beyond branches channels (ABCs). Retail banks in Brazil increase the profitability of downscaling through ABCs (Kumar et al., 2006).

<sup>36</sup> The alternatives of part-time employment and commission-based remuneration would further reduce operating costs for personnel.

<sup>37</sup> The interview took place at the office of Consultative Group to Assist the Poor (CGAP) in Washington, DC, on July 10, 2013. Details are provided upon request. The information about Kabir Kumar originates from <http://www.cgap.org/about/people/kabir-kumar> (visited on April 4, 2015). This paper refers to the person Kabir Kumar with his full name to avoid confusion with Anjali Kumar.

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but he provided a Microsoft PowerPoint document that quantifies cost structures of ABCs and branches in comparison (Kumar, 2012). Jennifer McDonald, manager at Women's World Banking, moreover provided a Microsoft PowerPoint document from CGAP that contains complementary information to that document from Kumar (CGAP, 2011). Kumar assured equivalence of methodologies, while the two documents outline the cost structures and parts of the methodology, e.g. assumptions and model (CGAP, 2011; Kumar, 2012). The quantified cost structures originate from cases in Mexico, Columbia, and Brazil, which can be representative for developing financial services markets (compare CGAP, 2011). According to Kumar, bank managers from East Africa stated that the proportions of quantified ABC and branch channel cost structures also applied to East Africa. The findings were presented to the bank managers in a CGAP workshop. This information ensures internal validity and allows for assessment of external validity.

### 5.3 Results

The following paragraphs provide an overview of descriptive data from Kumar (2012) and CGAP (2011). First, quantified costs per transaction are reviewed for ABCs. The term *costs per transaction* is referred to as *transactional costs* in the following discussion. Corresponding to the cost structure from Mas (2009) introduced in chapter 4.3, these include fixed costs, variable costs, and back office costs (Kumar, 2012). Fixed and back office costs include depreciation and amortization of investments (ibid.). A representative quantified transactional ABC cost structure is available in illustration 1. Second, quantified transactional costs for branch channels are reviewed. These include the same cost components (CGAP, 2011). Illustration 2 depicts a representative quantified transactional branch channel cost structure. Third, quantified transactional costs for ABCs and branches are compared.

Looking at methodology, the underlying sample of the quantified transactional ABC cost structure consists of five Mexican and three Columbian banks, comprising bank-managed ABCs and ANI partnerships (Kumar, 2012)<sup>38</sup>. Transactional costs range from 0.27 USD to 0.58 USD, at an average of 0.53 USD in Mexico and 0.42 USD in Columbia, averaging 0.49 USD in total<sup>39</sup>. Agent commission represents the largest share in transactional costs; it accounts for 89 percent to 91 percent of transactional costs in Mexico and for 68

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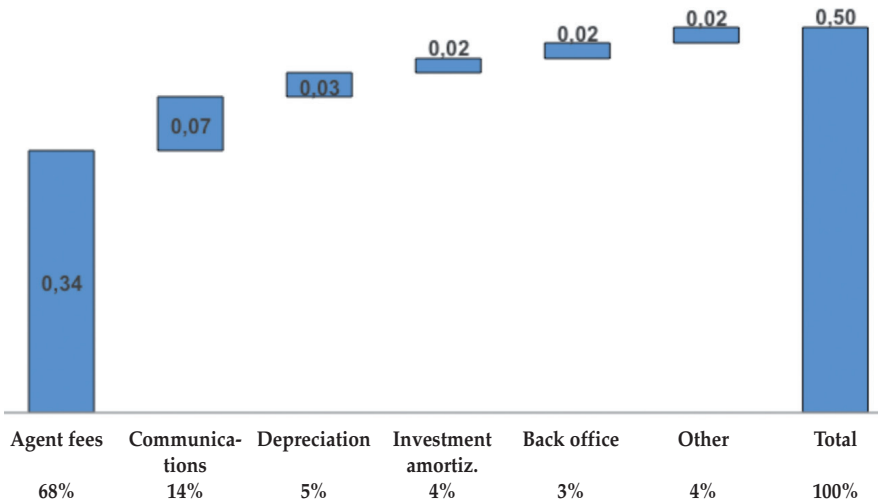
<sup>38</sup> Agent network integrator (ANI) partnerships involve retail chains in this case (CGAP, 2011).

<sup>39</sup> A bank from Brazil reports transaction costs of 0.40 United States Dollar (USD), a bank from Pakistan 0.53 USD (CGAP, 2011).

percent to 89 percent in Columbia (CGAP, 2011). Assuming that agent commission and parts of communications costs are variable costs that depend on the number of transactions, variable costs represent the largest share in transactional costs for ABCs (Kumar, 2012; compare CGAP, 2011). This finding confirms the corresponding deduction from the qualitative review.

Due to economies of scale, the decisive variable for transactional fixed costs is the assumed number of transactions per time unit (compare CGAP, 2011). The higher the number of transactions, the lower the fixed costs per transaction and the resulting overall transactional costs. Neither Kumar (2012) nor CGAP (2011) show the assumed number of transactions for the quantified transactional ABC cost structure. However, the assumed figures for branch channels are 4180 and 4060 transactions per month (CGAP, 2011). This paper therefore assumes 4100 transactions for the quantified transactional ABC cost structure<sup>40</sup>. Illustration 1 provides a representative overview of the quantified transactional cost structure for a bank-managed ABC (Kumar, 2012). The underlying case is a bank from Colombia (compare CGAP, 2011).

**Illustration 1: Representative quantified transactional cost structure for a bank-managed agent-assisted banking beyond branches channel (ABC) in United States Dollar (USD) per transaction.**



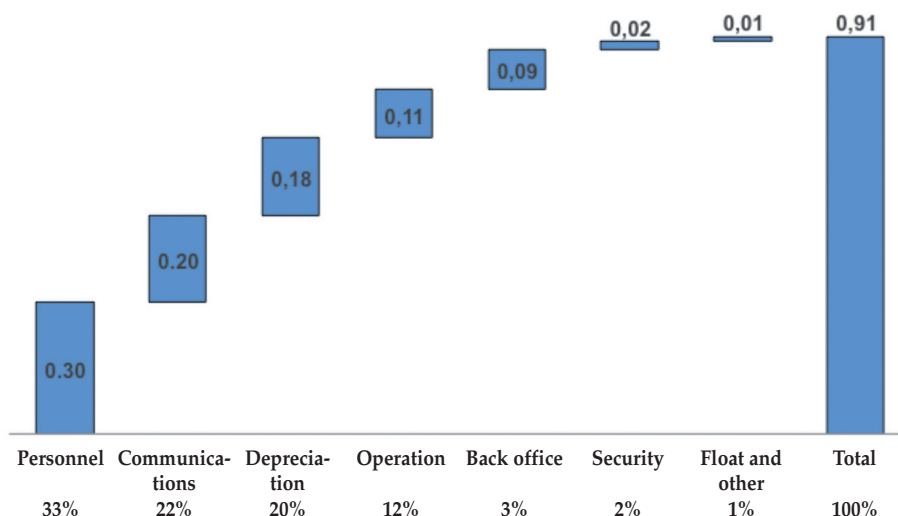
Source: Kumar, 2012, slide 12.

<sup>40</sup> The assumed figure for monthly transactions via automatic teller machines (ATMs) represents the average of four cases (CGAP, 2011).

*Agent fees and communications* correspond to *agent commissions and communications costs* in the cost structure from Mas (2009) and therefore represent *variable costs per transaction*. As deduced from the qualitative review, these represent a large proportion of overall costs. *Depreciation and investment amortization* correspond to *investment costs* in the cost structure from Mas (2009) and therefore represent *fixed costs per branch and agent*. *Operating costs per month* from Mas (2009) also count to fixed costs. These are included in *other* in illustration 1. As deduced from the qualitative review, fixed costs represent a minor proportion of overall costs. The cost structure in illustration 1 represents POS device / PC terminal based ABCs. Transactional costs are further reduced for mobile transactions to amounts between 0.05 USD and 0.25 USD, averaging 0.13 USD for three banks, one in Mexico and two in Columbia (CGAP, 2011).

In comparison, transactional costs for branch channels range from 0.70 USD to 1.00 USD, averaging 0.88 USD (CGAP, 2011). The underlying sample consists of two Mexican banks, at an average of 0.90 USD per transaction, and two Columbian banks, at an average of 0.85 USD (ibid.). Illustration 2 provides a representative overview of the quantified transactional cost structure for a branch channel (ibid.). Looking at methodology, the underlying

**Illustration 2: Representative quantified transactional cost structure for a branch channel in United States Dollar (USD) per transactions.**



Source: CGAP, 2011, slide 6.

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case is a bank from Mexico (ibid.)<sup>41</sup>. *Personnel, operation, security, float, and other* correspond to *operating costs per months* in the cost structure from Mas (2009). *Depreciation* corresponds to *investment costs*. These items represent *fixed costs per branch and agent* in the structure from Mas (2009). As deduced from the qualitative review, these represent a large proportion of overall costs. *Communications* corresponds to *communications costs*, as *variable costs per transaction* in the cost structure from Mas (2009). As deduced from the qualitative review, these represent a minor proportion of overall costs.

Transactional costs for ABCs amount from 27 percent to 83 percent of transactional costs for branch channels; 58 percent on average. Transactional costs for mobile transactions amount from only 5 percent to 36 percent of transactional costs for branch channels; averaging 15 percent. Variable costs represent the largest share in ABC cost structures, as described above, larger than in branch channels. These findings confirm the deductions from the qualitative review.

The findings moreover imply that ABCs dominate branch channels in marginal transactional costs at around 4100 transactions per time unit and below (compare Kumar, 2012)<sup>42</sup>. If variable transactional costs were lower for ABCs than for branches, ABCs would dominate branch channels in marginal transactional costs at any number of transactions per time unit. If in fact, variable transactional costs are higher for ABCs than for branches, so that branch channels dominate ABCs at 4100 transactions and above. This value is probably higher than the low concentration of transactions at locations where low-income and unbanked populations are served. Chapter 2 addresses that banks exclude these locations from their branch network. Reduced investment costs for ABCs support this finding, ranging from 0.03 percent to 0.07 percent of investment costs for branch channels (CGAP, 2011; Kumar, 2012)<sup>43</sup>. The difference in investment costs would require a higher number of transactions per time unit to reduce branch overhead investment

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<sup>41</sup> Details on the methodology are outlined in CGAP (2011, slide 6).

<sup>42</sup> Kumar (2012) estimates the impact of migrating 20 percent transactions at a Mexican bank from branch channels to agent-assisted banking beyond branches channels (ABCs) on cost reduction. This 20 percent represents only 13 percent of the migration potential from branch channels to ABCs (CGAP, 2011). However, the impact is 5.8 percent channel cost reduction, which equals 50 million United States dollars (USD) per year and results in a return on equity (RoE) increase from 17 percent to 17.3 percent (Kumar, 2012; compare CGAP, 2011).

<sup>43</sup> The significant investments in agents and marketing and low revenues result in negative profits for agent-assisted banking beyond branches channels (ABCs) in the initial period (Kumar, 2012). However, this effect would be more significant for branch channels. Breakeven is expected to be at around 2000 transactions per month for an ABC (Kumar, 2012).

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costs below ABCs. However, banks may reduce marginal overhead investment costs for ABCs through scale at the network level. Likewise, the figures for investment costs confirm the deductions from the qualitative review.

Kumar (2012) moreover finds that savings deposit collection through ABCs reduces funding costs and increases profits. Kumar (2012) estimates that profit before tax (PBT) is mainly driven by account fees, meaning that account balances and actual deposits have minor effects on revenue generation (compare CGAP, 2011). The estimated profit for a savings and a transactions account, considered as an entry product for the target customer segment, yields 5.03 USD per year (Kumar, 2012). Kumar (2012) also estimates that the aggregated PBT from 7.4 million accounts, at 974 million annual transactions, amounts to 9.2 million USD per year in a network primarily relying on branch channels (compare CGAP, 2011). The aggregated PBT for the same case, primarily relying on ABCs, amounts to 36.4 million USD per year; an increase by 296 percent (Kumar, 2012; compare CGAP, 2011). For large commercial banks operating through ABCs in downscaling, Kumar (2012) estimates a PBT increase of between 2.8 percent and 4.2 percent, and a return on equity (RoE) increase of between 0.4 percent and 0.6 percent. For small banks operating through ABCs in downscaling, a PBT increase of 19 percent and a RoE increase of 3.1 percent is estimated (Kumar, 2012)<sup>44</sup>. Kumar (2012) also quantifies cost structures for ATMs. Due to limited coverage and limited products and services (Duncombe / Boateng, 2009; Ledgerwood, 2013; Lyman et al., 2006; Mas / Radcliffe, 2011), these are not included in the research objective of this paper.

ABCs represent a cost efficient channel to distribute simple and standardized banking products and services to the target customer segment (compare Cole et al., 2011; Dermish et al. 2012; Ferrari / Jaffrin, 2006; Mas / Siedek, 2008). However, ABCs are only one element of a channel mix that serves various target customer segments with differing products and service requirements (Alexandre et al., 2011 Ledgerwood 2013). ABCs mitigate traffic from branches and facilitate expansion to geographic areas and customer segments that can be served through other channels once product and service

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<sup>44</sup> Even for large and small banks without downscaling ambitions, agent-assisted banking beyond branches channels (ABCs) result in profit before tax (PBT) increases of 2.4 percent and 11.1 percent respectively, as well as return on equity (RoE) increases of 0.3 percent and 1.2 percent respectively (Kumar, 2012). Through the increased channel network footprint, these banks can reach low-income and unbanked populations as a next step and develop services accordingly (Kumar, 2012).

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demands change (ibid.)<sup>45</sup>. Ledgerwood (2013) outlines an integrated view on ABCs in the channel mix of a commercial bank at varying customer support levels and investment costs (compare Mas / Radcliffe, 2010). In this channel mix, branches match the service requirements of specific target customer segments, as ABCs do for low-income and unbanked populations targeted in downscaling. Lyman et al. (2006, p. 2) conclude: “For banks, [...] banking through retail agents is used to reduce the cost of delivering financial services (potentially radically), relieve crowds in bank branches, and establish a presence in new areas”.

#### 5.4. Summary and discussion

The findings from the quantitative review confirm the hypothesis described above. Moreover, the deductions that ABCs reduce investment and operating costs in downscaling are confirmed. The quantitative review verifies that ABCs maximize the proportion of variable costs over investment and fixed costs and thereby minimize economic risk.

Measured in transactional costs, including fixed costs, variable costs, back office costs, depreciation, and amortization of investments, ABCs out-perform branch channels at an average cost reduction of 58 percent, and at 15 percent for mobile-based ABCs in particular. However, marginal transactional costs depend on the number of transactions per time unit. Branch channels out-perform ABCs at 4100 transactions per time unit; however, this value is likely to exceed the concentration of transactions at targeted service locations in downscaling scenarios. Branches and ABCs should be integrated into the channel mix of the bank, in which ABCs serve target customers in downscaling at reduced costs. Moreover, savings deposit collections through ABCs reduce funding costs for banks. The underlying cases for these findings are from commercial banks in Mexico and Colombia, which can be representative for commercial banks in developing countries. However, each bank should assess external validity with regard to its individual case<sup>46</sup>.

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<sup>45</sup> In a survey from the Consultative Group to Assist the Poor (CGAP), all responding banks state that agent-assisted banking beyond branches channels (ABCs) extend reach to customer segments and geographical areas (Kumar, 2012), and provide an effective channel for payments as entry product (Kumar, 2012).

<sup>46</sup> As Diniz et al. (2012) remark, the external validity of findings from such research must be treated cautiously as they derive from specific contexts that might not apply in other regions, cultures, and economies.

## 6. CONCLUSION

This paper highlights how ABCs as innovative banking channels reduce costs in downscaling. The paper moreover makes a first attempt to close the four gaps revealed by the literature review on ABCs and downscaling. As for the gap in investigating from a commercial banking perspective, the paper presents findings from qualitative and quantitative literature that takes a financial inclusion perspective, e.g. publications from Mas and CGAP, and looks at it from a commercial banking angle. The qualitative review finds that the essential cost structure innovation of ABCs is the maximized proportion of variable costs that depend on realized transactions, which match revenue flows and minimize economic risk. Commission-based agent remuneration instead of fixed salaries for bank employees decreases costs substantially. In comparison with branch channels, ABCs reduce investment costs as existing agent business infrastructure is utilized rather than new infrastructure being established. Given that ABCs share this infrastructure with the agent's existing business operations, operating costs decrease. In particular, mobile-based ABCs reduce costs since these utilize extant mobile phones of customers and agents as electronic banking devices. However, float management comprises the largest item in operating costs and requires careful assessment because it appears to be decisive for profitability.

The crucial technological innovation of ABCs are low-cost communication devices, such as mobile phones and POS devices or PC terminals connected through ubiquitous communication networks that enable secure information exchange and thus allow secure electronic cash transactions. The essential channel infrastructure innovation of ABCs is that existing businesses with their personnel, facilities and equipment, as well as their recognition among target customers, are employed to provide transactions and related customer interaction for banking products and services. Commercial banks should focus on the design of simple products and services that are easy to understand from a customer perspective and, in turn, minimize dependence on agent. Banks should moreover focus on marketing and branding of their services. Commercial banks might outsource front-end customer services to agents, but also management and integration of distribution channels to ANIs. As target customers accumulate small frequent *lump sums*, the crucial business model innovation is to shift revenue generation to transaction fees. The bank should follow a low-value, low-cost, high-volume, high-quality strategy for its portfolio of services and products.

As for the revealed gap in quantitative literature, data from case studies are presented in this paper, which have not been presented in any paper be-

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fore. However, the underlying cases are limited in number and external validity. Therefore, extended field research on quantification of cost structures and business cases may further contribute to closing this gap. The quantitative review finds that POS device / PC terminal-based ABCs reduce transactional costs to a range between 83 percent and 27 percent of branch channel costs and 58 percent on average<sup>47</sup>. Mobile-based ABCs further reduce transactional costs to a range between 36 percent and 5 percent of branch channels, at an average of 15 percent. Moreover, ABCs applied to savings deposit collection reduce funding costs for banks. ABC business cases reveal significant increases in PBT and RoE. One should note that these findings build on an estimated range of transactions per time unit at each agent / branch. Above that range, at higher numbers of transactions, branch channels might dominate ABCs in transactional costs. This is due to lower variable costs and decreasing marginal transactional costs. However, such higher numbers do not match the low concentration of transactions at the spots where target customers are served in typical downscaling scenarios. Nevertheless, each bank should assess the external validity of these findings with regard to its own business case. This appears even more important when considering that regulation of ABCs tends to be uncertain and incomplete, dependent on local authorities and the advancement of regulatory inclusion. These events can impose economic risk and actual limitations to ABCs. As for the revealed gap in linking the research fields of ABCs and downscaling, this paper finds that ABCs respond to the major concern for commercial banks in downscaling: high costs for the provision of services at the last mile to the customer.

As for the gap in defining ABCs, the paper presented different terms found in the literature review, and made an attempt to define the term in a way that precisely captures the decisive attributes of its ontological basis. The ontological basis and the academic field of ABCs are only a few years old thus, the definition of ABCs comprised a significant portion of this paper. Future research that investigates the linkage between downscaling and ABCs in greater depth might reveal greater synergies between the two research fields.

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<sup>47</sup> *Transactional costs* refers to costs per transaction, including fixed and variable costs, depreciation and amortization of investments.

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