Human and non-human intermediation in rural agricultural markets

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ABSTRACT
A central trope of the information society is that of 'information flows.' The implicit assumption underlying such a vision involves the removal of gatekeepers and intermediaries who are perceived to impede such flows. Drawing from field research on information circulation, trade, and money in rural markets in Myanmar and India, we show why intermediaries persist alongside information and communication technologies (ICTs) in trade and financial transactions in the 'Information Age.' We examine the range of roles, (human and non-human) actors, and material practices that are involved in conducting financial transactions, and we show the importance of historical legacies and politics in explaining why both cash and financial intermediaries persist in the digital age. Focusing on the different value that human and nonhuman intermediaries bring to financial encounters helps explain what characteristics make each resilient or replaceable in a time of change. By situating intermediaries and mediations in the social relations within which they operate, we bring back the role of power and politics – an element that is often missing in accounts focused on the unmediated and 'free' circulation of information using ICTs – in explaining processes of mediation and circulation.

KEYWORDS Rural markets; intermediation; Myanmar; India; ICTs; information flows

Introduction

A central trope of the information society is that of flow. Castells' descriptions of the instantaneous and unimpeded circulation of information, communication, and capital (Castells 1996), or Appadurai's flow of mass-mediated images and sensations (Appadurai 1996), or Braman's work on transnational data flow (Braman 2009, 2016) are all examples of sometimes-messianic, sometimes-more critical visions of an information society based on information circulating widely and at increased speed, encountering little resistance or friction, and seamlessly reaching all those who need it. Since at least the First World Summit on the Information Society of 2003, the Global South has been cast as a potential beneficiary of this flow of information, which was suddenly available and directly accessible (and able to be acted on) through the increasing availability of information and communication technologies (ICTs). An implicit (and sometimes explicit) assumption underlying this vision involves the removal of gatekeepers and brokers of information, who are seen to impede its free flow. But does information flow quite as freely through ICTs as this view would suggest? And do middlemen only impede transactions? We argue that the path that information takes continues to traverse scores of intermediaries, who persist in their roles rather than giving way to a smooth flow.
In this paper, we look at agricultural brokers in rural markets in Myanmar and India to analyze why they continue to exist, and in fact thrive, even where people can and do have more direct access to information and markets. We describe the different roles played by human brokers – traders, middlemen, auctioneers – and non-human intermediaries – mobile phones, mobile money transactions, cash – in these markets. Focusing on the different value that they bring to

financial encounters helps us understand what characteristics make each resilient or replaceable in a time of change. By situating these brokers and their activities in the social relations within which they operate, we bring back the role of power and politics in explaining processes of mediation and flow, an element that is often missing in accounts focused on the unmediated and 'free' circulation of information using ICTs. By mapping out diverse intermediaries and the value they create in financial transactions, we challenge visions of how information 'flows' unimpeded by gatekeepers when ICTs enter the picture. We describe the range of roles, (human and non-human) actors, and material practices that are involved in conducting financial transactions, and we show the central role of politics in explaining why promises of complete disintermediation are rarely fulfilled and both cash and financial intermediaries persist in the digital age.

Defining brokers

Brokers, intermediaries, mediators, middlemen, translators. These are some of the terms used to describe a person who stands in the middle of a transaction between two actors and benefits from it, while profiting from (and sometimes creating value for) either or both parties involved. A typical case from both of our field sites would be a small trader, one who buys fish at auction on a beach in India or pineapples from a farmer in Myanmar. Such a definition, however, hides a complex reality, for this intermediation can be done by humans or non-humans and it could either and value to the transaction or extract value from it.

Different disciplines have dealt with the theme of intermediation, and in light of our focus on the role of ICTs in economic transactions in rural markets in the Global South, we present an overview of how the literature we draw from treats this concept.

Function-based intermediaries

Looking at the early incarnation of the World Wide Web in 1995, Sarkar et al. (1995) argued that despite the potential of networked information systems to bypass intermediaries, these same platforms were likely to entrench existing intermediaries and support the need for new ones. The authors suggested looking at the explicit and implicit services intermediaries provided in order to see how some roles might be replicated by new 'cybermediaries' as they called them:

> Intermediary functions that benefit consumers include assistance in search and evaluation, needs assessment and product matching, risk reduction, and product distribution/delivery. Intermediary functions that benefit producers include creating and disseminating product information and creating product awareness, influencing consumer purchases, providing customer information, reducing exposure to risk, and reducing costs of distribution through transaction scale economies. Finally, we note that often producer and consumer interests are in conflict, suggesting that another intermediary function is to balance and integrate these sometimes competing needs. (Ibid., p. 6)

Hopes on the potential of ICTs to eliminate intermediaries continued when such technologies started to become widespread among lower income populations in the Global South (Dahlman and Utz 2005, Satyanarayana 2005). Research in the ICTD field (Information and Communication Technologies and/for Development), however, showed that the diffusion of

ICTs created a new need for intermediation as a necessary part of the daily use of ICTs for people who would not otherwise have access to or be able to use them proficiently (Parikh and Ghosh 2006, Sukumaran et al. 2009, Medhi et al. 2010, Sambasivan et al. 2010, Donner and Marsden 2011, Oreglia, Liu and Zhao 2011). These studies show the different types of intermediation that exist in contexts where lack of access, literacy, and other factors prevent potential users from using technology independently. As we discuss elsewhere (Oreglia and Srinivasan 2016), from the perspective of mediated use of technology in the Global South, intermediaries are a translator not only of the technology, but also of the value systems represented by ICTs.[1] Their value lies not only in the concrete help they provide other people, but also in the fact that they can belong to different realms and move between them, providing a bridge to those who cannot. As we discuss below, a trader is equally at home in a village among agriculturalists or fishers as he is in town in the market, and this duality of roles is where a significant part of the value he brings to transactions lies.

Intermediaries, mediators and agency

In the field of Science, Technology, and Society (STS), a central debate on intermediaries is located on their agency. As Maurer et al. (2013), recalling Latour, remind us, there is a distinction to be made between intermediaries and mediators based on the presence or absence of agency:

> Intermediaries are black boxes that transfer an input to an output without changing it; the agency of intermediaries is not transformative, but merely conductive. Mediators, by contrast, transform inputs and generate multiple outputs (Latour 2005, p. 39). Mediators become intermediaries, and vice versa, over time or under certain conditions. Such transformations are an effect of the wider ecology of relations in which agentive entities are embedded. (Ibid., p. 57)

In this view, an intermediary is a 'dumb pipe' (ibid., p. 68) that has no agency in the interaction, while a mediator has agency (and often expertise) and adds value to the transaction. Analyses of middlemen thus become about understanding when they are 'a mere pass-through' and when 'a social creature whose social knowledge and tacit understanding of his social world adds value to the mobile money enterprise' (Elyachar 2012 cited in Maurer et al. 2013, p. 62). Maurer et al.'s analysis is centered around mobile money agents. Their 'intermediary as conductor' argument casts intermediaries as channels that extract money from the financial operation without adding value – e.g., a mobile money company finds such 'dumb pipe' attributes in mobile money agents as it seeks to scale its business. Other roles that mobile money agents take on, however, can be as mediators, where their 'social knowledge' becomes critical. Maurer et al. offer the example of the need for agents to be seen within a community as being trustworthy and reliable in operating their services. It is when they act as mediators that 'they allow the hurly-burly of interaction to enter into the system.' Maurer et al. ask pointedly if this 'hurly-burly' is 'the social glue that makes the system appeal to clients and helps it to function,' or whether it is the 'noise interfering with profitability, allowing perhaps "too much" agency for agents' (ibid., p. 66).

Maurer et al. extend to mobile money agents a debate over the role of agency and intermediation that was started by Latour. While we appreciate his conceptual distinction between intermediaries and mediators, from our work with financial brokers we argue that when

seen from the viewpoint of users, no middleman is purely a 'dumb pipe.' Maurer et al. focus on the concerns of mobile money companies in distinguishing between the mediator and intermediary roles of mobile money agents, but we shift the attention to their role as translators between different realms, and the value (a word that we use in a neutral way, as it can be positive or negative) they bring to financial interactions. Their agency might be less visible, or might not be related directly to the transaction at hand, such as when a mobile money agent suggests alternative ways of moving money to a client, but it is what ensures the persistence of intermediaries themselves, and should be analyzed as such. In this paper, we focus on the role of people who mediate financial transactions between individuals or between them and technological artefacts. They can be mobile money agents, but in our research they tend to be other types of intermediaries: traders, shopkeepers, or family members. Further, we extend Maurer et al.'s argument to the technological artefacts of finance at our sites. By this we mean the old-fashioned financial technology that is physical money (Maurer 2010), as well as different types of mobile money. Mobile money is a loose term, often used by both academics and practitioners to indicate a wide range of services that go from simple fund transfers from one mobile phone to another (ibid.) to any kind of financial service accessed through a mobile phone (GSMA 2010). In Myanmar, fieldwork coincided with the early deployment of mobile money transfer services, that is transactions where 'one person transfers digital value, denominated in state-issued currency, to another. At one end of this transfer, the sender "cashes in" by trading cash for electronic credits, effectively purchasing those credits from a mobile money agent' (Rea and Nelms 2017, p. 8).[2] In India, telecom companies offered mobile wallets such as M-Pesa and Airtel Money, where electronic credits as described above are stored and transferred to/from. The important difference is that in India at the time, 'cash out' was not permitted (see footnote 4 for details), so money in mobile wallets had to be transferred to other wallets or spent in digital transactions. In Myanmar, mobile money could be cashed out through an agent. In this paper, we use 'mobile wallets' when we refer to their specific characteristics, and 'mobile money' when we discuss more general issues.

We treat human and technologies symmetrically. First, we examine whether/how technologies (including paper money) bring in/keep out of the 'hurly burly of social interactions' and when users find this valuable/not. Then, we highlight how the expertise inscribed into technological artefacts such as mobile phones tends to be fixed, whereas human expertise can be flexible and quicker to react to changing political or economic situations.

To develop our argument, we look at the value added by humans and/or technologies around two axes: time/space and expertise – each inscribed differently in human behavior and in machines. When users choose a human or a digital intermediary, they make a series of trade-offs that are based on the values inscribed into the platform as well as in the political economy and the social organization of their lives. Thus they can rarely be understood from a strictly economic perspective or without taking into consideration a longer temporal scale. Cash might be more expensive or less convenient than mobile money, and yet still used for reasons that are not necessarily compatible with the behavior of a rational economic agent but that make sense in the specific context of the transaction. Single transactions are also often not stand-alone transactions, but rather points of exchange
in a web of relationships that goes beyond the market encounter and that include values like trust,
which are often based on historical legacies – such as trust based on ethnic ties in Myanmar, as we

discuss below. Before moving to the details of these interactions and choices, however, we take a step back and describe our field sites and methods.

Places and methods

This paper is based on ethnographic fieldwork on traders, mobile phones, and mobile money in rural markets in Myanmar and in India. The fieldwork in Myanmar took place in Mandalay, the second largest city in the country, which serves as an important agricultural hub, and a small market town in the state of Shan, to the north of Mandalay. Interviews and participant observation took place in June-July 2016 and focused on smallholder farmers, market traders, and financial middlemen such as traders and gold sellers. The introduction of mobile money in early 2016 came a short time after the opening up of the economy in 2011, which saw a remarkable increase in the number of banks and banking services. At the time of fieldwork, different companies had just launched or were carrying out pilot projects on mobile money, which included money transfers via agents or through apps. Neither was used much at the time, but it is worth noting that places like the small town in Shan were experiencing, at all once, the arrival of physical bank branches and of mobile money, a significant change from earlier times when all that was available was one state-controlled bank branch and the informal sector.

Fieldwork in India took place in fishing communities of the coastal state of Kerala in south western India. Fieldwork consisted of interviews and participant observation between July and September 2012 and again in May 2016. It focused on mobile technology use among fishers, fish vendors, traders, and auctioneers in a fish landing center in south Kerala (Trivandrum district) and one in the north (Kozhikode district). The use of mobile phones to find price information among fishers in Kerala has been repeatedly brought up in academic writing (Abraham 2007, Jensen 2007), in reports from development organizations, and in the popular press[3] as an example of correlation between technology uptake and improved livelihoods. This motivated us to analyze the technology practices of the varied actors involved in this economy in 2012 and observe how they translated to mobile money in 2016. During the 2012 research, fishers were routinely using multiple SIM cards from different operators in order to minimize their costs and to maximize coverage. But mobile money was a different story altogether. Telco-based mobile wallets such Airtel Money or Vodafone's MPesa were absent in 2012. By 2016, mobile wallets were starting to make an appearance in the telecom stores of Vizhinjam; however, their uptake was very low and almost completely absent among the fishing community. Regulation was a major reason for the slow rollout and cumbersome constraints on mobile wallet use.[4] Given this reality, the research on mobile money also included interviews

with telecom companies that were starting out with mobile money platforms in Kerala.
The entrenchment of the informal sector and the frequency of financial crises in both countries (including several demonetizations in Myanmar and the 2016 demonetization in India) have important
consequences on how people view and trust (or not) formal financial and banking institutions. In Kerala, however, formal financial channels – banks and money transfer services such as Western
Union – have a longer history than in Myanmar. They are also more present in rural areas due to the
development history of the state, its narrow geography and its long history of financial connections
to the Middle-East because of migration. The introduction of mobile money services merely adds to
the range of formal financial channels available.
Despite the very different situations in the two countries, they share the fact that mobile money is not used by the very segments of the population that could benefit from it the most, at least according
to the narrative of the countries' respective governments and NGOs involved in financial inclusion
(Shrader and Htun 2015, Upadhyay 2016). Aside from still-present issues such as mobile phone coverage,
especially in Myanmar, and the difficulty and cost of using mobile phones, established practices and relationships with traders don't make mobile money a particularly winning proposition at the moment. A second commonality is the continuing importance of cash: universally accepted, less
dependent on the larger infrastructure to fulfill its role (although the Indian demonetization has brought to the fore the importance of financial infrastructures in allowing money to play its role), a tangible asset that is a visible reminder of gain or loss, expressed in how people keep their cash,
count it, exchange it. In the next section, we discuss all these practices, and how traders and ICTs are interweaved in them.
Value added in (human and non-human) transactions
We analyze the value added by human brokers, on the one hand, and cash and mobile phones, on the
other, along two axes: time/space and expertise. We describe how humans and non-humans occupy
these axes differently and add value in different areas in ways that are sometimes complementary,
sometimes substitutable, sometimes incompatible.

Time/space

A tenet of Information Society theorists, echoed in the ICTD field, has been that digital technologies, including mobile money, compress time and space. So mobile money transactions can be instantaneous in time and eliminate the need to negotiate space (Castells 2004, p. 37), for example by having to be physically present where the payment takes place. We did witness many

instances of mobile phones used to make quick coordination decisions around financial transactions: in India, to ensure an auctioneer and fishers reached the shore at the same time in order to make a sale or to ensure there was ice to preserve a large catch (Srinivasan and Burrell 2015), or in Myanmar, to confirm the shipping or receiving of produce using the local bus system. However, human brokers are also involved in increasing the time efficiency and/or negotiating spatial aspects of transactions. Time-wise, the value humans provide is not so much in supporting instant transactions as it is in being able to mediate the entire transaction cycle and the various differences in time and space between the harvest/fishing and sale. A fish seller explained how exporting fish is more profitable than selling it in the local market, but waiting a few months to be paid makes it a difficult proposition for small players:

> If you have to get better price, the fish has to go outside. But the pay will be late…June, July, August, September, October, these five months, since the items that turn up are exporting items, it is difficult to get finance [money/pay]. (fish seller, Kerala)

A completely different sector experiences the same time lag: in Myanmar, tea is harvested ten months a year, but the wholesale and retail markets do not follow the same schedule. Small traders and even growers can theoretically give their tea on consignment to the wholesalers who control the distribution networks throughout the country, but they receive their payment only once the tea is sold, and they risk losing money if the retail price softens in the meanwhile:

> The big traders, they don't pay right away. In April, I always send my tea to K. [a nearby town], but after that I tend to keep it here to sell it at the local market. They tend to pay a little higher in K., but you have to wait 2–3 months for payment, so it's not worth it. (tea grower/small trader, Shan)

The same dynamic is visible in local markets, where the value of time is expressed in days lost in the field for farmers, rather than in time spent waiting for payments for small traders:

> When they first got motorbikes, the tea growers [from the village] came here to sell, but now they give their tea to the shop keeper [in the village] to sell. [Q: Why have they stopped coming?] It's not worth it, they have to spend the whole day, and the gas, and the difference [of price] is not much. So they give it to him to sell. (tea broker, Shan)

When dealing with markets that are further away or even international, payment is delayed, and neither fishers nor farmers can – or want to – always wait. For a fee, which embodies the difference between what they would get from selling directly and what they would get if they could wait the time it takes to get their goods sold, they might decide to take less money sooner rather than more later. A similar negotiation takes place around space: a broker's job is to go around villages and markets. The farmer's job is to farm, so spending time going to markets, even assuming the existence of acceptable roads, is often a loss bigger than the loss of income from having an extra broker take his cut. These are decisions that are often made in the context of their life at a given moment: are there children to send to school? Are there other people going to the market that could be trusted? Is the fisher/farmer older and more worried about certain cash now rather than a bigger amount later? Are there debts to be repaid that cannot wait any longer? If a fisherman returns after a few days at sea and wants to buy himself a drink, he might

care about selling the fish quickly through his usual intermediary at a known market in order to get the cash he needs for that drink, rather than waiting to find the best price and market. These decisions, in turn, are shaped by the political economy of the area (and the country – the two sometimes overlap, sometimes do not, with local conditions and politics having a more direct and immediate consequences on farmers and fishers). Are there subsidies for smallholder farming or fishing? Is there a welfare program for impoverished families that might make the difference between having to pay school fees and thus needing money immediately, or being able to wait? This is the backdrop of politics against which the individual decisions, enmeshed in them and without much control over them, play out.

Paper cash is an important factor in the transactions, as it is universally accepted, for example at smalltime liquor stores, a point that came up repeatedly in conversations at the Kerala beach, or at the gold store, where it is used to purchase gold, a longer-term investment for Myanmar farmers. In addition to instant payment, brokers also take the risk of having to sell the fish or the produce, and to recoup the money paid to the seller. Although much emphasis has been put on the fact that brokers charge handsomely for taking such risks, these are not insignificant risks. The same thinking around risk is expressed in this farmer's quote that expressed the value of time in days lost in the field:

> I usually sell the pineapples to the trader when they're still in the fields. The trader pays for harvesting and then sells them, maybe after two months. If the price he offers is ok for what I need, then I just sell to him. I used to harvest the pineapples myself, but now it's too much trouble. It's luck: if he [the trader] is lucky he gets more than he paid for, but he doesn't know what he will get…I have never been to a bank, I don't have a bank account. The cash I get, I buy gold for when I'm old, and I build [pieces of] house for my children. (pineapple farmer, Shan)

During our fieldwork, mobile money services in the regions we studied did not include credit lines or overdraft, which could potentially be useful in these circumstances. Formal financial institutions such as banks did, but the obstacles faced by smalltime fishermen and farmers to become clients, provide guarantees, and negotiate loans were and still are too high. Paradoxically, the instant transaction time that mobile money offers as its primary advantage is often a mismatch for these farmers and fishers. It is either not instant enough, as in the case of the fisher who wants to purchase a drink in a place that might not accept mobile payments and would thus force him to cash out his mobile wallet in order to spend it. Or the instantaneousness is not the important part of the transaction, as in the case of the tea farmer/trader and the pineapple grower, who do not think it is worth the risk or the extra gain to wait to sell later, at a higher price. It is hard to overstate how much risk farmers and fishers already face in their jobs and how important it is for them to have a certain amount of immediate cash rather than a potentially larger amount in the future, however near. In agriculture and fishing, too many things can and do go bad, and small enterprises do not have the resources to cushion themselves against downturns. In interviews, time came up over and over as a potential risk, rather than as a potential source of financial gain.

Negotiating space also contains an element of risk, which leads to trade-offs. For example, going from the village to the market town in Shan meant wasting a day that could be spent in the fields. In the rainy season, finding the road impassable on the way up or down, additionally meant incurring costs to spend the night in town or walk back to the village.

There are also risks related to the political economy surrounding our research participants. In Myanmar there is a legacy of mistrust towards the formal financial system, a consequence of a disastrous management of the economy during the military regime (1962–2011). This included demonetizations without conversion and a series of bank failures in the 2000s that wiped out savings and any trust in the system (Turnell 2009). Several of the interviewees in Shan remembered clearly the 1987 demonetization, when the 25, 35, and 75 kyat notes (the local currency) suddenly ceased to be legal tender and could not be exchanged. This brought the economy to a halt, causing huge losses to traders and pushing people towards gold and land as the only reliable forms of savings. The memory lingers, even under the new government, and makes people who have experienced it keen to deal in cash for quick transactions and in gold, real estate, or land for savings.

The instantaneousness of digital financial transactions, however, is appreciated by a different category of traders and middlemen in Myanmar: the (now illegal) network of agents that has been acting as an informal banking network across the country through the 'hundi' system,[5] that is 'bills of exchange that could be used both to remit funds and to advance credit' (Turnell 2009, p. 29). These agents are often commodity traders, with a side-business in money transfers and lending. For example, a medium-size tea trader in a town in Shan will have a network of correspondents throughout the country and will send them trucks of tea that he purchases from tea growers. In the past (and occasionally, even now), he would have sent money with the trucks to settle his accounts or on behalf of other traders with whom he was doing business. He would also send money around on behalf of tea growers and their families. Later on, if the trader had a landline, the money could be moved through a phone call; but in fact, it did not move at all. The trader simply coordinated with his correspondents, and the accounts would be cleared once in a while. Thus, the instantaneousness of the transaction could be achieved before banks and mobile money reached the country, and often for free: if the trader was already dealing with the client, sending money around for free or for a small fee was (and is still) seen as a low-cost way to maintain good relations.6 Such traders/agents, typically financially better off than the traders and agriculturalists they deal with, are also quick to adopt technological innovations that can help consolidate and extend their business: the landline first, then bank accounts, and now all types of digital financial services. Thus, when the tea grower transfers his money through the hundi system, he might in fact be using an online bank transfer carried out on a computer, or on a mobile phone, but indirectly. He pays cash (or tea) to the trader, who then transfers it in one of many ways to another broker, who then gives cash for the receiver. The work of the broker is thus not only a substitute for direct use, but rather a work of finely tuned translation of local practices and cash into digital form and back. It is also a work of translation between different social milieus: the village and the market town on one side, and the regional/national and even international on the other, that deals with technologies and financial practices that are not present or relevant in the local context. The translation is one of social as much as of technological practices. Brokers become the nexus where cash, practices and technology come together, and are the ones who allow farmers and fishers to participate in a system that extends much further than their local realm.

The practices we describe above show that time and space are key elements in financial transactions,
and they are mediated differently by humans, the formal and informal financial systems, and ICTs. Mobile money offer instantaneousness for a small fee; but this is not necessarily the priority of the potential adopters. When it is, it can be achieved through different means that are

not necessarily visible to the official system. Mobile money can mediate time and space by making the transaction instant or offering the option of keeping money in a mobile wallet. It cannot mediate risk, though, which is what traders take on when they buy crops or fish before they are sold to the market. In many of the transactions that farmers and fishers carry out, timeliness cannot be de-coupled from risk, and human brokers offer both at once.

Despite the common perception that brokers and traders are charging excessive fees and exploiting the lack of choice that befalls people outside formal financial systems, we found that there can be significant competition in offering these services, and thus rates can be lower than the ones in the formal sector. In this context, the arrival of mobile money or the increased availability of formal financial services means that there is an increase in choices, rather than a whole new range of opportunities.[7]

Expertise

Expertise is an umbrella category that encompasses a variety of practices, some of which are very hard to break into their components and codify and thus very hard to translate into features to be inscribed in ICTs. This is not to say that ICTs do not have expertise successfully written into them, but rather that some types of human expertise consist of several different types of expertise layered upon each other and difficult to assess separately. These include expertise about products and their market; expertise connected with the social standing of traders and their bridging role discussed above; and expertise in negotiating the visibility of financial transactions. We will describe each of these areas in turn.

Product and market expertise is clearly seen in Kerala, where fish auctioneers are recognized by fishers as having experience with both the local fish economy and with auctioning. They are thus see as experts on the prices of different varieties of fish, their seasonal availability, and demand across geographies. Auctioneers were also trusted with price negotiations, as most auctions were characterized by a certain ambiguity and allowed some room for negotiation on prices. The bids were seldom placed in words by potential buyers. Instead, they would mouth a number, nod their head, raise an eyebrow, or gesture with their fingers to let the auctioneer know how much more they were willing to pay. These gestures would sometimes be contested. For example, in an auction for squid, when an auctioneer looked towards one of our research participants to raise the bid to Rs. 900, she shouted back ‘Who said 900? I only said 890.’ In another instance, at an auction for crabs, the auction was closed at Rs. 340 – or so the auctioneer said, insisting the vendor had last bid Rs. 340. A few vendors supported him as well, but the vendor insisted she had only said Rs. 330 and started to take the crabs, thrusting that amount in the auctioneer’s hands and moving on. From observing several more instances of such altercations, it was clear that once the fish had been collected or deposited into a basket, it went with the vendor, regardless of what rate had actually been reached, who had misunderstood or was willfully misleading, whose voice was louder, or who was more popular or powerful in that scene. Here we see the value and the mediation brought to the auction by humans (the auctioneers who deal with ambiguity) and by cash and its materiality, which aids some level of negotiation. We see from the example above how the ‘hurly burly’ of the political economy of the auction ground is also factored in the way cash is used. In the initial auction, a certain price is fixed for a small quantity of fish. A few small scale buyers bid for it and purchase lots of fish. However, they pay a slightly lower price than decided, by handing over the cash and moving away. Since these are regular auctioneers and buyers, and are recognized as small-scale buyers

with limited means, they are able to get away with small-scale acts of noncompliance. Similarly, in Shan, traders of crops that had a national and international market were recognized as those who knew what buyers wanted in terms of product but also in terms of guarantee of quality. For example, the Burmese-Chinese minority dominates the tea trade (and many other agricultural commodities) because of language and of family networks that extend well beyond the state. However, tea is grown in the mountains by the Da'ang minority. They have the land and the expertise to grow tea, but it is difficult for them to make the transition to being national and international traders. They do not have the extensive networks or the skills to enter the international market, even when they possess the financial resources to do so, as this quote shows:

> Tea is a lot of money on the ground and in the warehouse…a tea trader needs money to buy tea and to be able to survive while he waits for his sales to go through. The Chinese have money, are better than others at doing business, and have an extended family network [they can rely on]. (Da'ang tea trader, Shan)

In addition to ethnicity, gender and educational level contribute to make people feel out of place in certain places. The hundi system described above, for example, has been integral part of local economies that were mostly ignored by national financial institutions and before them by colonial ones. Chettiars, money-lenders of Tamil origin who settled in Myanmar during the British colonial times, provided a systems of loans and banking for both agricultural and trading. They took financial services to areas that had been neglected by mainstream institutions (Turnell 2009), and they connected small rural areas to the wider sphere of international commercial credit lines in Asia (Ray, as cited by Turnell 2009, p. 20), while providing a reliable system of informal infra- and inter-national payments throughout the vagaries of the economy.[8] This kind of expertise in navigating and bridging different social worlds is perhaps the hardest to delegate to ICTs. Whereas in principle social barriers to entry are lowered in the class-less and ethnicity-blind world of ICTs, in reality such experiences are highly mediated by the offline world people belong to. Hence the success of farmer support programs such as Digital Green (Gandhi et al. 2009), where farmers exchanged advice with each other rather than receiving it from experts, and the relative failure of digital programs based on pure expertise but decoupled from the source of expertise (Oreglia 2013). Still, the flexibility of human expertise, compared to the more rigid expertise inscribed into ICTs, can be a positive or a negative element in financial transactions. The chettiars saw a business opportunity where the formal banking system saw excessive risk, but they brought their own human biases when deciding to whom to lend and how to insure re-payment–biases that were different from formal rules related to the same issues inscribed into ICTs and the regulatory system of which they are part.

A final aspect of social expertise lies in negotiating the visibility/legibility/trackability of financial transactions. Here the flexibility of human mediation is particularly visible, vis-à-vis the mediation provided by a machine. ICTs bring automatic visibility to transactions, which can be desirable, e.g. when wanting to build a credit history, but might be less desirable when it entails negative effects, e.g. being taxed. It is undeniable that the markets we study are largely steeped in the grey economy, not necessarily illegal, but certainly involved in avoiding certain legal requirements. One of the goals behind pushing people towards official financial institutions such as banks or towards mobile money is exactly to make visible all these transactions, savings, expenditures that are taking place, particularly for the purposes of taxation. This is often resisted,

again for sound historical and/or social reasons, e.g. the demonetizations and bank failures. In India, visibility of cash was a clearly stated goal for mobile money:

The Reserve Bank of India requires is if the cash in the system moves on, the major headache of black money… This way all the loose cash that's lying around in the wallet—they want a visibility into all this. (telecommunication expert, Kerala) The Reserve Bank of India partly envisions digital financial transactions as a way to get a better and more reliable sense of the volume (and location) of financial transactions taking place in the country.[9] For medium-to large-scale market actors in particular, being tracked by a telecommunication company or by the state is not necessarily an attractive proposition. Thus, informal brokers and cash transactions keep these actors much less legible to the state. For example, when a fisher auctions their fish with an auctioneer in Kerala, and money exchanges hands, various kinds of tracking by different entities could take place. The auctioneer – who has typically financed the fishers' equipment – is tracking the fishers' loan repayment in a notebook. The auctioneer and the buyer also keep records of their transactions. So far, the state does not track these transactions of money or of volumes of fish at the auction ground. These transactions are currently all conducted in cash, which is only trackable by these brokers. Why is cash preferred to mobile money in this case? Diverse brokers are able to track the circulation of money to different extents, as are different technologies. The implications of this tracking are likewise different: tracking by a formal channel, for example, might have legal consequences, while the smaller-time brokers might neither have the wherewithal nor an interest in tracking and documenting transactions towards this goal in a comprehensive way (though as mentioned above, they do also 'keep track' of their transactions with their borrowers). Further, some technologies are designed to be and/or regulated to be more trackable than others. Thus electronic financial transfers, including mobile money, are more trackable (and by more actors) than cash. Of course, some points of these transactions can also be tracked by humans over and above the technology – but in this case, it is decided by human discretion when to track or not. This discretion is shaped by social knowledge, history of previous transactions, the changing economy, etc.

Thus, different users are more or less concerned about being tracked through technology or by humans. Larger-scale merchants are worried about being tracked through digital technology by the state. Smaller-scale vendors, on the other hand, already know they are tracked by local lenders and are not worried about the state tracking them as well, given their small earnings, although they have other reasons for preferring cash, as described above. An ability to negotiate one's 'legibility' to others (lenders, state, neighbors) à la Scott is something people would like across income levels (Scott 1998). It is to the extent that one technology allows them to do this more than another, and in the circumstances that matter to them, that technology is valuable to people. Expertise is thus inscribed into both humans and technologies, but in different ways and with different flexibilities. The language of inscriptions and technology scripts comes from Akrich's work on interactions between humans and technologies, where she shows how 'technical objects participate in building heterogeneous networks that bring together actants of all types and sizes, whether human or nonhuman' and discusses the 'obduracy' of objects that stabilizes both their meanings and the 'structure of links between diverse actants' (Akrich 1992, pp. 206–207). Users do appropriate technological scripts and adapt them to their circumstances, but this appropriation lays in practices as much as it does into the technology and consists of using the inscribed playbook for different purposes than the ones intended by the creators of technology and the legislators. This flexibility is discovered (or invented) by users in

specific circumstances. Here, we have seen how human brokers are more attuned and reactive to the changing political economy, or simply to politics. For example, brokers who used the hundi system in Myanmar are now increasingly using banks to move money around, which indicates that they are tentatively experimenting with trusting the new government's policies.

Special qualities of humans and non-humans

We have shown in the previous sections how the combination of various technologies, including ICTs, and brokers such as traders and auctioneers translate the global reality of finance, financial tools, international supply chains, and political economy into an actionable reality for local farmers and fishers. A key feature of human brokers is that they are flexible and responsive to the changing political economy of their countries in ways that are not always possible for technology, by moving in the grey areas between official regulations and informal economies, thus leveraging gaps or strictures in the official economy. This flexibility is the constant value that users get from using human brokers rather than ICTs, all other things being equal. This is equally valid for brokers that bring in visible value to their clients (e.g. transferring their money for free) and for those who may look like they are simply passing along the way some kind of input or output (e.g. mobile money agents when they act as 'dumb pipes'), but are in fact adding other types of value. Because humans can leverage their social knowledge in their role as brokers, they are able to adjust to changes in a broader political economy as well as to the specific user they are working with. Thus, they can offer temporal and spatial fixes as well as their expertise in ways that are attuned to the times and their users. Technologies, on the other hand, face constraints on the extent to which they can be flexible based on what is inscribed into them, by both their creators and by the regulatory regime in which they operate. For example, the fact that mobile money makes financial transactions visible is a feature that is inscribed into both the hardware/software that power mobile money and into the regulatory framework that allows it to operate under certain conditions. Thus, low income/smallscale fish buyers are able to use the material affordances of cash to their advantage during auctions. This may not be possible with mobile money where the lack of change, for example, cannot be a reason to underpay. Similarly, it will not be possible for the smallscale vendors to try this outside of their spaces of everyday transactions. Finally, this same flexibility of cash will not work where the individual attempting to pull it off is a larger-scale merchant, because everyone knows they can afford to pay the extra amount. Thus, technologies can be flexibly used, but this flexibility has to be figured out by its users, and there are limits to how much flexibility a given technology can provide along a particular dimension. From examples such as the one above, it appears that cash may be a more flexible technology than mobile money, especially for those who stand to benefit by negotiating on their payments. We thus echo Akrich's observation on the obduracy of objects by noting the obduracy of human relations, in this case those of human brokers, whose behaviors are as inscripted into their communities as features and values can be inscripted into technologies. In other words, the agency of brokers and the network of people, practices, cash, and technology brokers are part of is a solid construct whose meaning and history is understood by the whole community.

A second point we want to highlight is how brokers are usually better equipped, financially and often socially, to appropriate ICTs and leverage them to strengthen their positions in the markets, sometimes undermining farmers and fishers and reducing them to mere recipients of their expertise, or even trapping them in relations they cannot escape. An example of the

former is a couple who worked as gold sellers in Shan. They had discovered early on that they could access Bloomberg Channel on satellite television and therefore follow the price of gold in the global market, without necessarily relying on the national gold market. This knowledge was something they leveraged to their advantage in dictating the prices of gold for local farmers, who prized it as a long-term, safe type of saving. All-too-frequent examples of the latter include fishers and farmers trapped in credit relations with their brokers and traders, who anticipate money before their crop or catch is sold, and who are at the same time creating debts that can never be repaid.

Thirdly, we proposed earlier that some characteristics of financial transactions can be mediated more efficiently or efficaciously by humans or technologies. In fact, as it should be clear by now, this is not a question that can be answered in the abstract, without referring to the specific conditions of a specific place. We will note, for example, that the problem ICT users might have with legibility over time and trackability is less of a concern where digital technologies are introduced together with system reforms that make the system less predatory. The axis of time/space is also amenable to technological, rather than human, mediation, once structural reforms change the material circumstances of people. When the road that links the tea-growing village with the market town is repaired and the weather is good, the trip takes less than an hour by motorbike. If the road were paved, instead of dirt, then the time and risk related to going to town in the rainy season would be substantially abated, which in turn could change farmer's behavior in terms of selling tea directly and using mobile money for it, rather than relying on brokers at both the village and the town level. Or the availability and accessibility of credit for specific segments of the population, such as micro-credit options for women, can change overnight established patterns of borrowing and make interacting with lenders through a mobile phone worth the effort and the expense of doing so.

Conclusion

Focusing on the different value that human and non-human intermediaries bring to financial encounters helps us understand what characteristics make each resilient or replaceable in a time of change. By situating these intermediaries and mediations in the social relations within which they operate, we brought back the role of power and politics in explaining processes of mediation and flow, an element that is often missing in accounts focused on the unmediated and 'free' circulation of information using ICTs. The most important point about human intermediaries is that they are part of the community, a complex network of people that is shaped by legacies, hierarchies, money, etc. Doing a comparative study has allowed us to find a happy medium between the generalizing perspective of economic theory and mobile money cheerleaders, who can lean towards technological determinism, and the embedding perspective of ethnography. While in dealing with financial transactions, digital and analogue, 'one size does not fit all,' as noted by (Rea and Nelms 2017), we found behaviors that are similar across field sites. This allows us to dare to propose two additional general abstractions that can be useful as guiding principles mediating between the push towards homogenization of financial products and the pull towards resilient local practices, as the field of mobile financial services becomes increasingly fragmented and complex. The first concerns the persistence of gold and cash and the historical reasons that explain that persistence. The second is about the resilience of the power structures that shape financial transactions, which are not easily displaced by new digital instruments. Regarding the first point, we have shown how our research participants continue to favor old

financial tools such as gold for savings and cash for transactions. Both have been in use for generations, and they symbolize a specific attitude towards time and trust towards the state and formal financial institutions. For example, the Indian demonetization in November 2016 explicitly pitched a cashless economy as its goal. While digital payments went up immediately afterwards, they fell once the new banknotes became available (Pal et al. 2018). Several of the advantages of using cash – its familiar form, near universal acceptance, easy retrievability, materiality, and room for negotiating through change – also resurfaced in the debates around demonetization (Shreyas 2016). The sudden way the demonetization was carried out has also taken a toll on the relatively strong faith that Indians had in their banking system and the Reserve Bank of India, which regulates the sector (The Economist 2017). Drawing a comparison with the relatively frequent and occasionally much more dramatic demonetizations in Myanmar, we see that such changes have entrenched a deeply seated distrust of official financial tools and a strong tendency to differentiate savings, including some outside the reach of the state, and to put wealth into illiquid assets perceived as safer, such as land and gold (Maurer 2010). In both countries, therefore, demonetizations confirmed to certain segments of the population that the state was and is not a reliable financial counterpart. Such actions reverberate through time, and rhetoric alone is not sufficient to persuade the same people that the state is now concerned about their financial inclusion. The first abstraction that we offer is thus that the consequences of financial encounters, either between individuals or between individuals and institutions, extend through time, and that the latest ones take place in the shadow of those that happened before, thus needing the appropriate historical and political background to be fully understood. While 'one size does not fit all,' we argue that in places where the state and official financial institutions have a history of not being trustworthy, digital financial products that are perceived to be tied to either will struggle to be accepted.

The second point is related to the resilience of power structures. It is easier for existing power relations, social practices, and networks to adapt to innovation than to be changed by it. This is not a novel finding, but it is often overlooked when talking about the potential for the inclusiveness of digital technologies: they are more empowering for those who are already in a position of power, and who can thus acquire them earlier and deploy them alongside their existing tools and networks. Thus did traders acquire mobile phones before fishers and farmers and were able to reconfigure their own network to take advantage of them. If looked at purely from a transactional and financial perspective, fishers and farmers are perpetually catching up with the better established traders. Using (or not) ICTs and mobile money in their own way, rather than according to the expectations of the government and of financial institutions, is their own act of resistance, reclaiming their own well-established practices.

Notes

1. In a slightly different context, Visvanathan argues, in sharp contrast to the characterization of brokers as gatekeepers, that it is only brokers that allow the kinds of populations we are focused on entry to certain social networks (Visvanathan 2011).
2. At the time (2016), this service was offered by two of the three mobile network operators in the country, State-owned MPT and Telenor. The third company, Ooredoo, launched its own mobile money services in 2017.
3. See 'To Do with the Price of Fish' (The Economist 2007) and 'Dial "M" for "Mackerel": Can a New Mobile Phone Service in Rural India Help Promote Economic Empowerment?'

(The Wall Street Journal 2009). See also the World Economic Forum's Global IT report (2008–09), which (incorrectly) extrapolates Jensen's work to conclude that mobile phones reduces the role of middlemen (Dutta and Mia 2010), while the G20 argued that mobile banking is significant to financial inclusion and, by extension, to inclusive growth (G20 2010).

4. The Reserve Bank of India (RBI) regulates mobile banking in India. Initially, RBI only allowed non-banks (such as telecom companies) to participate in payment services in two restricted ways: they could build and manage an agent network on behalf of a bank; or they could issue a 'semi-closed' wallet which allow customers to cash in, buy airtime and other services, but not cash out – not seen as a particularly useful product for a poor customer. More recent regulatory changes (2014 onwards) have included the introduction of the concept of 'payment banks,' which allowed companies with significant distribution expertise (including mobile operators, retail chains, and existing agent managers) to offer deposit accounts and payments as a stand-alone business. These entities can take deposits, convey remittances, and dispense payments to recipients, but they can't lend to their customers. Payment bank licenses were issued in 2015, including to major Indian telcos. We found that the frequent changes in the regulatory framework also left telcos operating in Kerala uncertain on how to go about marketing their mobile wallets in the state, especially in more rural regions (from interviews).
5. The term hundi is often used to indicate the agents themselves. Although illegal, transfers through hundi is still very much present and used in Myanmar. This account of how the hundi system works through traders comes from interviews with tea traders, bus company drivers and owners, and a motorcycle part trader, who all took part in the system.
6. The issue of how much brokers, moneylenders, and traders charge is often difficult to ascertain, but from interviews with people involved with them it was clear that there was a wide range of charges, but also that there were several services thrown in for free, e.g. sending money around on behalf of an existing client. This was also true historically, as discussed by Turnell (2009, pp. 30–31).
7. Since 2015, there has been a big increase in the number of banks, banking services, and mobile money/mobile payment apps in Myanmar. For the time being, these services are all quite expensive for the final consumer, and they resemble more an attempt to occupy the market rather than to offer services to a new slice of the population.
8. Turnell also points out the role played by these moneylenders in mediating time for agriculturalists: 'Others (Chettiars) were less narrowly concerned with the sowing of crops, but with meeting the needs of agriculturalists more generally in covering the timing mismatch between their expenditure and income from the harvest' (Turnell 2009, p. 19). When such roles have been embedded into a community for a long time, there is a legacy of habit and trust that is difficult to replace, even when there are nominally better options at hand.
9. Interestingly, early assessments of the 2016 demonetization are showing that in some areas both the demand for cash and cash transactions have in fact increased since then (Rajshekhar et al. 2018).

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