

Master thesis for the Master of Philosophy in Economics degree

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# IVTS

*Informal Value Transfer Systems*

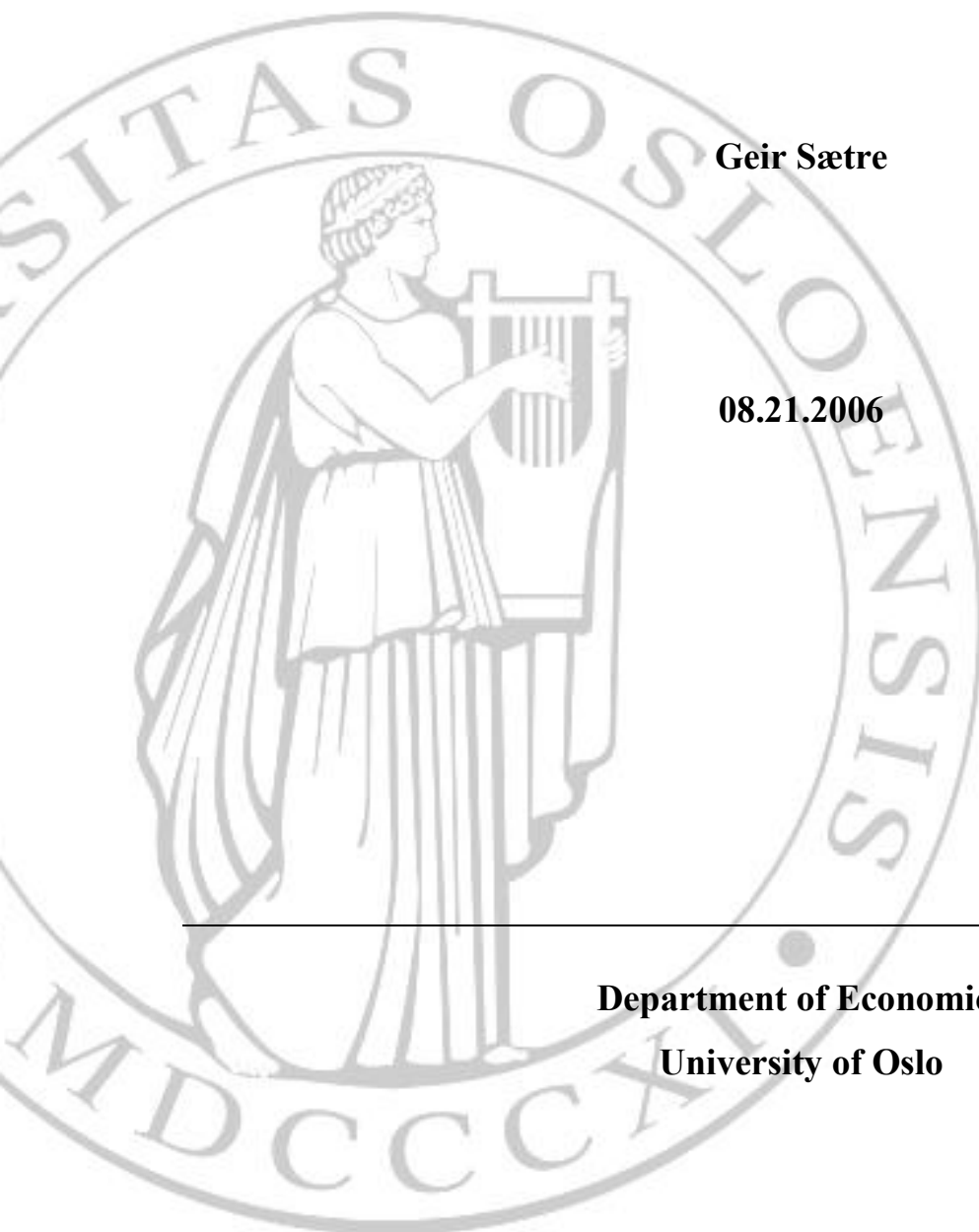
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## **Preface/acknowledgements.**

First of all, I would like to say that when you are on the “inside” looking out, it is hard to see the person on the “outside” looking in. Meaning that when you are writing a thesis like this it is not easy to be one’s own critic. On that note, I would like to thank my supervisor, Aanund Hylland, for being that person on the “outside” looking in. His comments and corrections have been invaluable and highly appreciated.

Secondly, I would like to thank Dr. Nikos Passas. Both for a fast response to my e-mails, but also for allowing me to quote and use images from one of his reports, although it stated “Draft: Please Do Not Quote.”

I would also like to thank my brother, Runar Sætre, and his former co-worker at the Office of the Auditor General of Norway (Riksrevisjonen), Susanne M. Abelseth, for inspiring me to write about informal value transfer systems and, last but not least, suggesting to use the theory of games to describe why these systems work.

This thesis was a long way in the making, and I would like to acknowledge each and everyone who has taken time out to contribute, in one way or another. Thank You.

Geir Sætre

Skien, August 14, 2006.

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### **Introductory Notes.**

When I first started the research for this thesis looking for an economic theory describing informal value transfer systems (IVTS), particular hawala at that time being, the more I looked and investigated, I realized that I was not going to find an economic theory that explained this phenomenon in a satisfying manner. During this process I read an article that criticised certain aspects of economics, in particular how “economics [in a major way]<sup>1</sup> is responsible for creating the world that we live in” (Yunus, 1998). How interrelationships among individuals and day to day activities of all people are shaped in a large way by the role assigned to them by economics (Yunus, 1998). Though a bit controversial, the article certainly made me dwell upon this criticism and guided me in the right direction, concerning this thesis. What better way to describe certain relations between human beings than by the theory of games. One might argue that economic theory cannot *fully* explain how informal value transfer systems work, however, by using game theory this thesis will at least give an explanation as to why IVTS work.

The first part of this thesis gives details on informal value transfer systems. The term “IVTS” is a more accurate definition of what used to be called “underground banking” or “alternative remittance systems.” The reason for this name switch is that the aforementioned terms could be somewhat misleading; banking is rarely involved in any of the transactions, and the word alternative implies there exist some other, more mainstream, remittance system. This is clearly not the case in the parts of the world where these systems operate in large figures. As a summary the term “IVTS” describes all kinds of traditional ethnic systems for sending and receiving funds or value across regions. IVTS include any network or mechanism that can be used to transfer funds or value from place to place either without leaving a formal paper trail of the entire transaction or without going through regulated financial institutions (Passas, 1999 and 2003).

The second part of this thesis portrays a basic IVTS transaction, represented by the informal hawala system. A hawala-type transaction involves a sender, two (or more) trusted intermediaries and a recipient. A simplified example could be the following story; a father, living in Pakistan, wants to send money to his son who is studying in the US. The father wants to use hawala because this gives his son more money, due to a better exchange rate deal with the hawala operator. Further on, the father contacts a hawala operator in Pakistan, who receives the money. The hawala operator in Pakistan contacts a similar hawala operator in the

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<sup>1</sup> Note: All brackets inserted in the middle of a citation are, in this thesis, inserted by the author.

US, where the son can get the money his father wanted to give him. After receiving his money, the son and his father are out of the picture. A settlement procedure between the intermediaries is now due. This example is just a simplification, and there are many other transfer systems, in addition to hawala, with different procedures.

The third part of this thesis gives a brief introduction on the scope of informal value transfer systems. The thesis develops a motivation, by comparing IVTS to formal remittance services, as to why many people engage in informal value transfer systems rather than formal remittance service providers, like banks and other money transfer services. There are different views on the overall scope of IVTS, however, the conclusion must be not knowing what the volumes are makes it impossible to estimate with any precision whether the use of informal value transfer systems are actually increasing or declining (Passas, 1999: 49).

By establishing what informal value transfer systems are and how they work, the fourth part of this thesis describes why they work. A key feature in all these methods (at least almost all) is the indispensable element of trust. Many of the informal value transfer systems have developed in an evolutionary way through trial and error. This may explain their existence and use over centuries. But this could not fully explain why IVTS work. Bear in mind there is no contract-enforcing power involved such as a state or jurisdiction. Contracts between parties involved have to be self-enforcing, and this brings about the theory of games. The thesis uses game theory in general and the strategy “Tit-for-Tat” in particular. To describe the situation we will be looking at a repeated Prisoners’ Dilemma game, where each player has the opportunity to establish a reputation for cooperation, and thereby encourage the other player to do the same. Players cooperate because they hope that cooperation will induce further cooperation in the future. Looking at an IVTS transaction we have a chain of relational contracts; contracts between intermediaries and contracts between clients/customers and intermediaries. The contract between the intermediaries can be looked upon as a club, and non-cooperative behaviour is punished severely by banning a member from the club, while the contract between a customer/client and an intermediary must be designed in a way as to prohibit non-cooperative behaviour by simply making it irrational. The formal theory describes the evolution of cooperation when there are positive costs of optimizing. The theory is based on J. M. Guttman’s (1996) article “*Rational actors, tit-for-tat types and the evolution of cooperation.*” Guttman’s (1996) theory is mainly used to describe a regional contract between a customer and a financial intermediary. The main result of this thesis is that, in the presence of optimizing costs, the “Tit-for-Tat” types will survive in competition with the rational actors, conditioned on the number of rounds in the Prisoners’ Dilemma game,  $N$ , being sufficiently large.

The result is based on the assumption that being rational is costly, while, on the other hand, being a “Tit-for-Tat” type entails no cost.

Hawala, and other informal value transfer systems, have been in the news with greater frequency during the last couple of years, often in alleged connection with terrorist funding, money laundering or some other criminal activity. Despite this negative publicity and association, especially after September 11<sup>th</sup> 2001, informal value transfer systems remain an economic phenomenon (Wilson, 2002: 12). This thesis focuses on their economic contexts and mechanisms, which seem to be, on many accounts, widely misunderstood. Therefore it is necessary to have in- depth knowledge about a topic before analyzing or passing judgement on it.

## 1. What are IVTS?

### 1.1 The Term IVTS.

Although there is no universally accepted definition of remittances,<sup>2</sup> this thesis will use the term “IVTS” (Informal Value Transfer Systems). The term “IVTS” was, at least to my knowledge, introduced by Nikos Passas<sup>3</sup> in 1999. With the term, Passas was referring to “any system or network of people facilitating, on a full-time or part-time basis, the transfer of value domestically or internationally outside the conventional, regulated financial institutional system” (Passas, 1999). Before this, different terms were used to describe informal remittance networks, “underground banking,” “alternative remittance systems” and “ethnic banking.” However, these latter terms are not very precise. They could be both misleading and misunderstood if not studied in-depth. The term “underground” might describe a system that is not operating in the open. However, this is not always the case, as, in some communities, informal funds transfer service providers operate openly – with or without the recognition of the government. The name “alternative remittance system” could be strongly confusing. A statement made by N. Chouchri back in 1986, from the article *“The Hidden Economy: A New View of Remittances in the Arab World”* may serve as an illustration.

“The reasons why I am reluctant to use even the word “alternative” are that some of these systems predate the conventional banking systems and because in many parts of the world these “alternatives” are actually the rule – the formal banking system is the exception, the “alternative” system” (As quoted in Passas, 1999: 11).

Finally, the term “ethnic banking” may strike as overly restrictive. The use of the informal value transfer systems at hand are often cross-cultural and multi ethnic.

In 1999 Passas introduced the term “IVTS” and at the same time gave us a preliminary definition of it. However, as time went along Passas has produced a slightly amended IVTS definition; “any network or mechanism that can be used to transfer funds or value from place to place either without leaving a formal paper-trail of the entire transaction or without going through regulated financial institutions at all” (Passas, 2003). This definition is the one that

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<sup>2</sup> “[Remittances] are broadly thought of as unrequited transfers sent by migrant workers back to relatives in their country of origin” (Reinke in Spatafora, 2005: 98).

<sup>3</sup> Dr. Passas is a Professor at Northeastern University in Boston. He specializes in the study of terrorism, white-collar crime, organized crime and transnational crime. Since September 11, 2001, he has been conducting research into the financial control of militant and extremist groups, trade diversion, hawala and other informal value transfer systems, crime vulnerabilities of the online payment infrastructure and financial misconduct hidden behind commodity trade transactions for the Financial Crimes Enforcement Network (FinCEN, US Dept. of Treasury) and the National Institute of Justice.

will be used throughout this thesis. Reading along the literature regarding the subject at hand one might run into several different terms describing the same topic, namely IVTS. One of those terms, which are quite similar, is “IFTS” (Informal Funds Transfer Systems). IFTS is used primarily by the IMF (International Monetary Fund). In their 2003 joint publication with the World Bank “*Informal Funds Transfer Systems: An Analysis of the Informal Hawala System*”, by M. El Qorchi, S. M. Maimbo and J.F. Wilson, the term “IFTS” is introduced but it lacks an exact definition. The paper only produces an explanation for using the term “IFTS” instead of IVTS; “(...) IFT[S] better captures the sense and nature of financial transfers akin to conventional banking that are of primary interest to this discussion” (El Qorchi et al., 2003). Yet, there is rarely any sort of banking involved when it comes down to IVTS.<sup>4</sup> Not to say that informal value transfer providers do not use banks when they carry out assignments, but commercial banking activities, like extending loans or credit, are seldom seen within these practices.<sup>5</sup>

## **1.2 Distinguishing between IFTS and IVTM.**

This distinction needs further explaining. The term “IFTS” (Informal Funds Transfer Systems) is actually a part of the IVTS definition. The other part of the definition is IVTM<sup>6</sup> (Informal Value Transfer Methods). At first sight this might look like a distinction without a difference. However, IFTS are for the most part older and rooted in the culture of several ethnic groups. IVTM, by stark contrast, emerged with the introduction of the internet and sophisticated technologies as well as in the context of globalization and the end of the Cold War, all of which affected trade patterns and financial practices (Passas, 2003). To make things even clearer one can sum up the main features of both IFTS and IVTM, as compiled by Passas (2003, 15-16).

The main features of IFTS:

- They constitute traditional ethnic fund and value transfer operations and businesses. They originated in the Indian sub-continent and in China, but spread throughout the globe following waves of immigration and processes of economic globalization.

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<sup>4</sup> This might be one of the reasons there are no economic theory fully describing informal value transfer systems.

<sup>5</sup> Sometimes informal value transfer providers are the only form of financial transfer system that can be offered. As there are no banks in these regions/countries, many of the providers serve as deposit takers for their customers. However, there is usually no interest to be made. The offer only serves as a matter of safe keeping.

<sup>6</sup> Examples of IVTM could be invoice manipulation, trade diversion, e-payments (internet based payments/transfers), stored value (e.g. pre-paid telephone or credit cards), credit/debit cards used by multiple individuals etc.



- They are currently subject to regulations designed for so-called “money service businesses”; and,
- Their clients and services are for the most part legitimate (even though they are just like any other businesses, open for abuse for crime facilitation).

The main characteristics of IVTM:

- They do not require the existence of widespread networks of people; most of them can be accomplished by a couple of individuals on either an ad hoc or regular basis (hence the use of the term “method” as opposed to “system” or “network”);
- They involve the use of the formal financial system, but they leave no trail for anyone wishing to monitor or reconstruct the route of a transaction intended to remain secret;
- They are very often part of legitimate or legitimate-looking trade transactions, which effectively obfuscate substantial value transfers;
- They are always criminal<sup>7</sup> and usually combine with other offences (e.g. tax evasion, subsidy fraud, embargo busting, capital flight, funding of militant groups, smuggling);
- They have the capacity to transfer very substantial amounts of money (much higher amounts than IFTS). So, not only terrorist financiers but, even more crucially, weapons proliferators (requiring significant amounts transferred) could potentially make use of IVTM.

These characteristics will be further emphasized in part two of this thesis. However, for now, one might perhaps say that IFTS represents various remittance systems, while IVTM, still being a part of these systems, concentrate more on the settlement between the informal funds transfer service providers or the financial intermediaries.

IVTS originated and are still found most prominently among Asian ethnic groups. They have spread to the other continents as a result of immigration and social mobility. Today IVTS are widely practiced in the Arab/Muslim world and the Middle East plus some other parts of Asia. But it is important to remember that we are not dealing with a single system.

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<sup>7</sup> This is quite a controversial statement made by Passas (2003), however, as the distinction between IFTS and IVTM is not the main topic of this thesis I will not use any more time dwelling on it.

### 1.3 An Overview of Different Systems.

This overview will take a historical perspective into account. It will also take a look at the origin of different words and names both from a geographical and linguistic point of view. We start off with China. In China the history of value<sup>8</sup> transfer systems can be dated back to the Tang Dynasty (618 – 907). With the prospering economic activity during this period, the need for a system to transfer funds/value, including tax revenues, became acute, which prompted the emergence of China's ancient remittance system. The creation of the fei-ch'ien (flying money) system seemingly goes back to this time, when business people and government attempted to reduce the inconvenience of carrying currency and facilitate the transfer of funds. Later, in the eighteenth century, the Chinese used the fei-ch'ien system not only to facilitate their trade, but also as resentment against financial intermediaries controlled by non-Chinese (El Qorchi et al., 2003: 10). In addition to fei-ch'ien there also exist other terms for Chinese informal value transfer systems. Hui k'u'an, which means to remit sums of money, and ch'iao hui, which means an overseas remittance. Both these names are Mandarin Chinese. Then we have the term chop shop. This term is used by foreigners for one of the Chinese methods. Finally, chiti banking refers to the "chit" used as a receipt or proof of claim in transactions introduced by the British in China. "Chit" is short for "chitty," a word borrowed from the Hindi "chitthi," which signifies a mark (Passas, 1999: 16).

In South Asia, in the 1950s and 1960s, the main method of payment in the Indian subcontinent was through the hundi, chiti or hawala, which was a draft drawn on a trading associate. Hundi (हुंडी / ہنڈی)<sup>9</sup> has different meanings; bill of exchange, promissory note, trust, reference and the alternative remittance system. The Hundi is an old system that was used in India before the advent of modern-day banking (see figure below). Hundi was either payable on sight ("darshani hundis") or at a later date ("muddati hundi") (Passas, 2003: 39). The existing literature on this topic contends that the hundi had been in vogue in India from time immemorial. Hundi is currently illegal in India, and is now mostly practiced in Pakistan. (El Qorchi et al., 2003: 11).

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<sup>8</sup> The history of *funds* transfer systems (...) is the word used by El Qorchi et al. Note: Emphasis added by author.

<sup>9</sup> The word hundi comes from the Sanskrit root meaning "to collect." In India, one of its most common meanings is for the collection box found in a Hindu temple (<http://www.interpol.int/public/FinancialCrime/MoneyLaundering/hawala/default.asp>).

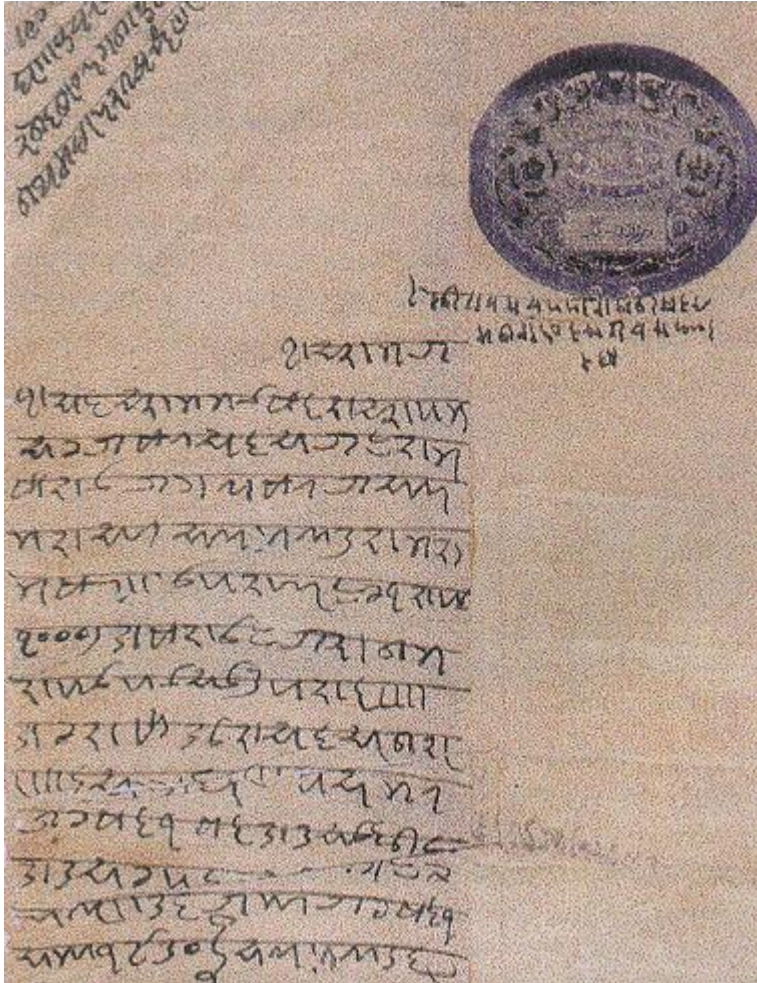


Figure 1: 19<sup>th</sup> Century Hundi (Source: Museum Cell; Reserve Bank of India, as showed in Passas, 2003).

Hawala (حوالة)<sup>10</sup> (havalala in Iran) is defined as a bill of exchange or a promissory note. The term hawala has widely acquired a negative connotation in India. This is due to its association with illegal payments (bribes) to politicians and also the use by companies for a variety of advances, payments and transfers (El Qorchi et al., 2003: 10). Other IVTS in South Asia include: Phoe kuan, which is practiced in Thailand, nging sing kek, which means something like ‘money letter shop,’ and is used by Tae chew and Cantonese speaking groups, we have padala in the Philippines. Finally, we have hui or hui kuan, which means association and is practiced by Vietnamese living in Australia (Passas, 1999: 12).

In the Middle East, hawala as an IFTS helped to facilitate trade not only within the same areas but also between regions and fiefdoms. Historical accounts refer to instances where hawala-type instruments were widespread in the Middle East centuries ago.

<sup>10</sup> The word hawala comes from the Arabic root h-w-l (حوال), which means “to change” or “to transfer.”



Figure 2: A hawala/hundi slip (Sandhu, 2004: 8 as showed in Müller, 2004: 37).

Some observers note that hawala developed more than a century ago when immigrant South Asian communities in East Africa and Southeast Asia used it as a means of settling accounts. Others observe that the hawala system dates to Arabic traders who established it as a means of avoiding the endemic robbery of caravans. But the precise antecedents of hawala in the Middle East have not been well documented (El Qorchi et al., 2003: 11).

Hawala as an IVTS are also practiced on the African continent, with al Barakaat<sup>11</sup> and the Nigerian Naira markets being two of the most well-known systems. Other systems are kyeyo money in Uganda and mali mbeleko in Zambia.

The origin of IVTS in Europe could be seen through the history of a similar system – the bill of exchange<sup>12</sup>. Operating in similar principles as the modern-day informal hawala, a

<sup>11</sup> Four people in Norway, allegedly in connection with al Barakaat, were in August 2005 sentenced by the Norwegian Supreme Court (<http://www.hoyesterett.no/news/5524.asp>).

<sup>12</sup> (...). “In the thirteenth century, the Northern Italians took this clearing of books one step further and developed bills of exchange, a debt instrument drawn on the buyer of goods that promised payment of a specified amount in the buyer’s home town at some date in the future.” “In the simplest case, it could be sold for

bill of exchange is an obligation in the form of a payment order addressed to the person responsible for honouring the payment. The bill of exchange requires that a person make payment to another individual on an agreed-upon future date. The bill in its present form was widely used in fourteenth-century Italy. This remittance trade was pioneered by the money exchange dealers who used to display their different moneys on the banco (bench) in Italian cities (El Qorchi et al., 2003: 11).

In North and South America, the Black Market Peso Exchange (BMPE) is often mentioned in the same context as hawala, with the implication that it is comparable in operation and purposes, often as an important route to launder drug money. The loose association of the BMPE with the hawala remittance system needs careful review, not only because the primary use of the BMPE is money laundering but also because the accounting sequence of the BMPE, as generally portrayed, can differ substantially from that of the informal hawala system (El Qorchi et al., 2003: 11-12). IVTS in these parts of the world are commonly referred to as stash houses and/or Casa de cambio. Some literature on this subject might touch upon the BMPE as the Colombian black market for pesos. This is basically describing the same underlying system. The difference is taking Colombia as a starting point. The Colombian black market for pesos operates with methods similar to hawala, in order to bypass currency restrictions and launder drug money (Passas, 1999: 23). In other words the sole purpose is, in comparison to several other aforementioned IVTS, illegal.

## **2. IVTS – How Do They Work?**

### **2.1 An Example of an Informal Value Transfer System.**

This part will describe how a specific informal value transfer system works. More specifically it will portray the features of the informal hawala system, which will be the chosen system at hand. The reason for choosing hawala, and not any other system, is that hawala is perhaps the most well known informal value transfer system there is. The informal hawala system provides an analytical framework for understanding the incentives for using non-banking channels to transfer funds and the possible economic, legal and regulatory challenges presented by these specific channels.

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cash by the seller to another trader who needed funds for purchases in the buyer's home town." "In more complicated cases, there could be a whole chain of transactions in a variety of different places before the bill of exchange eventually returned to the original issuer." (...) (Allen and Gale, 2001: 27).

## 2.2 The Informal Hawala System.

As already mentioned hawala means “transfer” in Arabic. As a consequence, formal bank transfers are conducted in “hawala departments” in parts of the Arab world. For example, in Saudi Arabia, this often refers to a bank’s wire transfer department (Passas, 2003: 36).

Therefore, it is more accurate to separate formal from informal hawala.<sup>13</sup>

Ever since September 11<sup>th</sup> 2001<sup>14</sup>, hawala has appeared numerous times in the media, often due to speculation regarding terrorist funding. Prior to “9/11,” hawala had also been mentioned in different media, however, then only concerning money laundering and drug trade. Needless to say, media<sup>15</sup> often portray false images of popular topics, hawala being one of them. An example is taken from the Norwegian National Authority for Investigation and Prosecution of Economic and Environmental Crime (Økokrim). Although not a tabloid, they state in an unpublished presentation about the hawala system, that it was formed in the Middle East in the 1960s in order to bypass laws and currency restrictions.<sup>16</sup> Several other authors<sup>17</sup> also claim that hawala originated in times with political turmoil, and that hawala developed in order to bypass rules, laws or currency restrictions. It seems like we are dealing with a case of “facts by repetition,” as Passas (1999) so elegantly has put it. An analogy to explain this trend could be the following: If you tell a lie *so* many times, you might start believing in it yourself. Another “fine” example is the following excerpt from Passas (1999):

“Another erroneous statement is that hawala was “[b]orn out of political turmoil and a distrust of banks...”(O’Hara and The Wild Palms Foundation, 1997: 1). Note the self-contradiction of this author who goes on to state that: “The system dates to Arabic traders who established hawala as a means of avoiding the endemic robbery of caravans. It predates the establishment of western banking by several centuries” (O’Hara and The Wild Palms Foundation, 1997: 1).How can something be caused by mistrust of something that does not yet exist?” (Passas, 1999: 13).

As one can see, all this makes it even more important to establish facts as much as possible on reliable sources. It is important to review secondary data, but also, at the same time, practice a

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<sup>13</sup> Hawala is used only as short for informal hawala in this thesis.

<sup>14</sup> “9/11” was a crucial day in the history of the USA. Several aeroplanes were hijacked. Two aeroplanes crashed into the two highest buildings on the Manhattan skyline, the “twin towers”, while another aeroplane crashed into the Pentagon building.

<sup>15</sup> By media I’m not only talking about the press, but all kinds of published material.

<sup>16</sup> Note: Translation by author. (From the presentation: “Økokrim Presentasjon ”Hawala – systemet”).

<sup>17</sup> Bosworth-Davis & Saltmarsh, 1995; O’Hara and The Wild Palms Foundation, 1997 and Malhotra, 1995, all in Passas (1999).

critical view when it comes down to establishing these facts. Summing up, the precise origin of hawala is still a matter of debate, but some consensus has been established.

“The origin of hawala lies in India and South-East Asia and predates western banking. The system existed for centuries before it was regulated by Islamic Law in 1327 A.D. through Abu Bakr bin Masud al-Kasani, a Hanafi erudite” (Müller, 2004: 9).<sup>18</sup>

Another object that most authors agree on, is the fact that hawala facilitated trade and helped avoid the risks of physical transportation.

### **2.2.1 The Theory of a Hawala Transaction.**

A basic hawala-type of transaction involves a sender (remitting party), two trusted intermediaries (remittance service providers) and a recipient. In other words, there are two main aspects of the hawala business. The first is the sending and receiving of money/funds the clients wish to transfer. The second is the settlement process. The former is an economic relation between a hawaladar (हवालादार).<sup>19</sup> and its client, while the latter is an economic relation between two financial intermediaries. A widely used definition of a financial intermediary is “an economic agent who specializes in the activities of buying and selling (at the same time) financial contracts and securities” (Freixas & Rochet, 2002: 15). Using the terms of “agency theory<sup>20</sup>,” the clients are the principals, that each is represented by an agent (hawaladar) in the hawala transaction.

To fully comprehend what a hawala transaction is all about, one needs to get more into detail. Basically, a hawala transaction encompasses financial transfers from A to B. We have two clients, CA and CB, located in countries A and B, respectively. Typically, CA is about to send funds to CB, using a hawaladar, HA, which is situated in country A. The hawala service provider in country A then contacts his peer in country B. These designated hawaladars, HA and HB, operate outside the formal financial sector, regardless of the use or purpose of the transaction and the country of remittance or destination (El Qorchi et al., 2003: 6). When HA has received funds from CA, HA will typically ask HB to advance the amount to CB in country B's local currency. For example, if country A is USA and country B is Pakistan, HA will

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<sup>18</sup> Hanafi is a school (madhab) of religious law (fiqh) within Sunnite Islam named after Imam Abu Hanifa (Müller, 2004: 9). Note: An erudite is a man characterized by extensive reading or knowledge; learned.

<sup>19</sup> Hawaladar is a name for a hawala operator.

<sup>20</sup> “Agency theory” is the term used to describe the relationship between a principal and an agent. The theory has been developed since the 1970s, at least in the aforementioned terms.

receive U.S. dollars from CA and CB will receive Pakistani rupees from HB. However, for hawala to operate optimally there must be pools of cash on both ends of the transaction. This is how each hawaladar will make payments for the other’s clients and will not have to move money across borders (Passas, 2003: 41).<sup>21</sup> A hawaladar can also use a reverse transaction to facilitate transfer of funds from a client in country B to a client in country A. This is all a part of the mechanics of the hawala system. But, herein lays also the weakness of hawala.

“Hawaladar A will draw on cash pool A to make payments requested by hawaladar B. Conversely, hawaladar B will draw on cash pool B to honour requests from hawaladar A. This means that even if clean money is sent from the US, dirty money may be used to make payments to law-abiding citizens overseas” (Passas, 2003: 45).

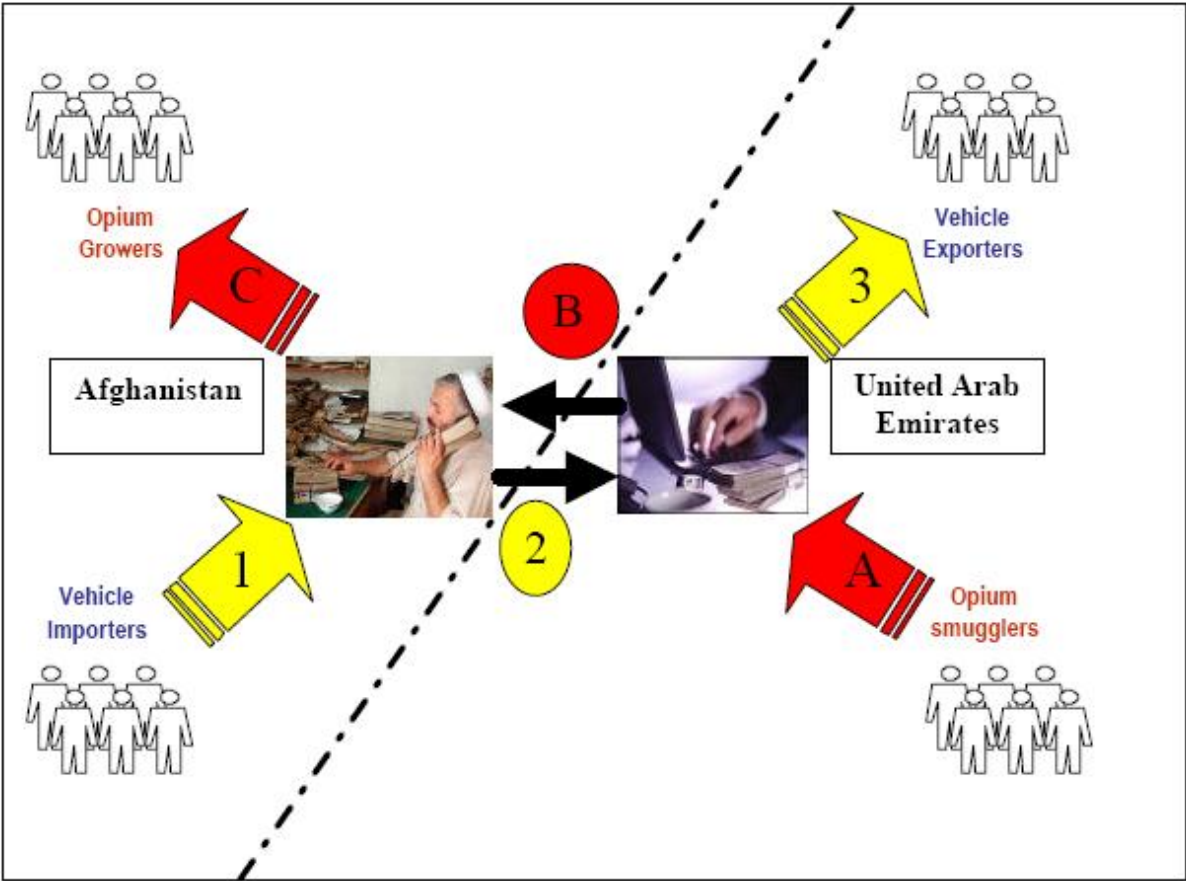


Figure 3: Hawala transactions combining legitimate and illegal activities (Maimbo, 2003: 16).

<sup>21</sup>Actually, this may be the cause of the misleading statement, that hawala is a mysterious system for “moving money” without moving money at all. As we shall see later this is simply not the case.



The figure above is an example of how a legitimate vehicle importer from Afghanistan approaches a hawaladar in Kabul with Afghanis for the import of vehicles from a Dubai based car exporter. The hawaladar in Kabul communicates payments instructions to a Dubai based hawala service provider. Further on, the hawaladar in Dubai gives the legitimate vehicle exporter U.S. dollars equivalent as requested by the client in Kabul. Finally, the figure shows an illegal transaction, where drug dealers approach the same hawaladar in Dubai with U.S. dollars for the purchase of opium from Kabul based drug dealers. The hawaladar in Dubai communicates payment instructions to the hawaladar in Kabul. Then, the hawaladar in Kabul gives the drug dealers afghanis equivalent as requested by the opium smugglers in Dubai. This example shows how dirty money can get intertwined with a perfectly legal import-export trade in the hawala system.

More generally, to sum up, one could say the requested transaction is set in motion by a communication from the intermediary in country A to the one in B detailing to whom the payment is to be made along with an agreed-upon way by which the recipient in country B can be identified. At this point in time, both remitter and recipient have completed their roles in the hawala transaction. Now the intermediaries will have to reach an agreement on how to settle the transaction between them.

### **2.2.2 The Settlement Procedure.**

In theory, the hawaladar in country A, HA, has received funds from his client, CA, based purely on trust without making a concrete payment. At the same time, the hawaladar in country B, HB, has made a payment to the client in country B, CB, without receiving any compensation. In other words, both HA and HB have taken a financial position in the hawala deal. Making a comparison to the banking business, one might say that HA has been granted a loan given by HB. HA has a liability to HB, and HB has a claim on HA. This leaves the principals out of the transaction, while the agents must settle their positions in the transaction.

To quote El Qorchi et al. "...there are numerous means by which outstanding positions can be settled" (El Qorchi et al., 2003: 14). However, personal relationships among hawaladars can make the process much easier. Kinship and family ties make hawala work smoothly. Nevertheless, in the contemporary global economy, given the substantial amounts that are moving about, hawaladars also rely on people beyond kinship or even ethnic ties. This is feasible and likely in relatively small operations (Passas, 2003: 46).

“There is little mystical about the settlement, which is very similar to the way formal banks go about their business. There is slight to no actual movement of funds in Western banking also. The main difference with hawala is that hawaladars are not restricted by rules on how and with whom to transact in this process. In other words, banks must follow the laws of each country in which they operate and transact with properly authorized people and institutions. Not so with hawala, where the informality of networks renders them flexible and free to bend or disregard laws, as they must do in India, Pakistan, Sri Lanka, France, Spain, Saudi Arabia and elsewhere. There is no doubt that the “underground economy” or “black markets” play a large role in this part of the business. Some interviewees from South Asia have gone as far as to argue that this is precisely what gives hawala a competitive edge over money changers and other financial channels. This may or may not be entirely accurate, but no one seriously questions the interface of hawala with unauthorized dealers, “black money,” and illicit fund transfers” (Passas, 2003: 48).

“The hawaladars’ positions can also be transferred to other intermediaries.” “These other entities can, by various means, assume and consolidate the initial positions and settle at wholesale or multilateral levels” (El Qorchi et al., 2003: 7).<sup>22</sup> In theory, the definition of a wholesale hawaladar is “someone presumably involved only in the settlement process.” “In other words, he would not be transacting with retail customers, but would play a role in the balancing of accounts for several smaller-scale hawaladars operating in several jurisdictions.” “Wholesalers would have no connection with individual remittances but would play purely a role of financial intermediary by buying, selling and consolidating the claims and liabilities of lower-level intermediaries” (Passas, 2003: 49). However, a number of interviews with hawaladars suggest otherwise. These interviews<sup>23</sup> show that there is no credible evidence supporting the idea of a wholesale hawaladar. Contrary to what is often portrayed in the media, the financial centre of hawala transactions, Dubai being one example. This shows that theory on the matter may differ from what one might observe “in the real world.” However, other authors have also emphasized that it must be intuitively clear that it will be difficult, not to mention costly, to settle, bilaterally, scads of positions among small operators (Wilson, 2002: 6). “Thus, it is fairly well agreed that small balances are “consolidated” at one or more higher levels of the hawala network; there are other intermediaries in the system” (Wilson, 2002: 6).

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<sup>22</sup> There is no doubt that there are several layers of hawaladars who may play a part in the global networks. Indeed, most of them settle up through centres like Dubai, New York, London, Hong Kong, Singapore and Switzerland, as this offers economies of scale [definition: divide transaction costs, coalition of investors, less risky, more diversified] and better currency rates (Passas, 2003: 48).

<sup>23</sup> Interviews are taken from a case study performed by Passas et al. (Passas, 2003).

One might perhaps say that Wilson (2002) “hits the nail on the head” with that statement, implying that the expression “fairly well agreed upon” does not include all authors. For now, let us leave that discussion and return to the different settlement procedures.

Returning to the prototype hawala remittance discussed earlier, there are, as already mentioned, numerous means by which outstanding positions can be settled. One of them is a *simple reverse hawala transaction*. This is the most obvious settlement procedure. The money which went from country A to country B now goes the other way around. An example of this could perhaps be Figure 3. However, this settlement procedure is not very likely. The reason is that aggregate remittance flows tend to be highly asymmetrical among countries. A country like the USA, who has a large number of migrant workers, would seemingly be sending out large cash flows, while a country like Mexico, on the other hand, would probably have a net inflow of cash.<sup>24</sup> Another way to settle a hawala account is by a so-called *complex reverse transaction*.

“Hawaladars could use more complicated reverse informal hawala transactions for settlement purposes. In a country subject to exchange or capital controls, HB could receive local currency from an individual interested in having funds abroad (country C). If the initial transaction is not settled, HB might ask HA for assistance. HA would recommend another hawaladar in country C (HC), either because they are correspondents or because an open position between them had remained unsettled from an earlier transaction. Alternatively, HA can instruct HC to make funds available to any beneficiary in country C. In other cases, HB would deal directly with HC and instruct HA to settle the transaction, which would also clear the initial position. Complex or multilateral reverse transactions assume the existence of a large network of hawaladars across countries” (El Qorchi et al., 2003: 14-15).

The easiest way to settle a hawala transaction, at least in theory, is when HA makes a payment directly into HB’s bank account. This is called a *bilateral financial settlement*. A problem with this method of settling accounts, is the fact that banks may not even exist in country B. So, when this method is used, it must be the case that HB has a bank account outside his home country. This, however, is another method called *multilateral financial settlement*. In other words, a multilateral financial settlement is a bilateral financial settlement using third country accounts.

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<sup>24</sup> In 2003, according to data from the Mexican central bank [Banco de Mexico], remittances were the second-largest source of external finance after crude oil exports,(...). (Hernández-Coss in Various, 2005: 18).

Another possibility, when it comes to settling a hawala account, is *bilateral trade*. A bilateral trade takes place when HB decides to accept goods instead of cash from HA. HB satisfies his claim on HB by importing goods to country B from country A. So far, these methods are not very complex or sophisticated. With *multilateral trade*, the potential complexity and variety of hawala settlements come into a sharper perspective. Multilateral trade is the case in which exports originate from a third country.

“It is also possible to write plausible scenarios in which exports originate from a third country. Thus, the settlement counterparty to a hawala remittance (or various transactions) from the Middle East to a South Asian country could well be exports to that country from Europe that are paid for by the hawaladar in the Middle East. A second scenario might involve exports from a third country to a location that is not country B, that is, HB has transferred his claim to an associate in another country. This seems likely when HB has a liability to a hawaladar who is located in that other country. Cases like these, obviously, will entail a chain of transactions in which the original informal remittance is likely to be totally invisible” (El Qorchi et al., 2003: 16).

This excerpt may explain some of media’s beliefs, when they expose hawala as a “paperless” transfer system that leaves no trails whatsoever. A hawala transaction certainly leaves trails, but at a “high level”<sup>25</sup> in the settlement process links tend to vanish and funds are transferred across ethnic groups (Passas, 2003: 51). This makes it difficult for prosecutors or investigators to reveal any possible criminal activity involved in a hawala transaction.

*Misstatement of trade values* is another kind of procedure to settle a hawala account. This is a mis-declaration of the value of goods sent or imported. Under-invoicing the invoice practically means the sending of value, while over-invoicing leads to the receipt of value by the issuer of the invoice. “In other words, false invoices can assist hawaladars in two ways: to settle up and to generate demand for hawala services given that the balances must be paid up” (Passas, 2003:32). False invoices can also enhance hawala’s vulnerability towards criminal activity. In the case of under invoicing, the importer could also benefit from reduced tariff payments, tax evasion in practice. But, “just like formal banks, hawala is not by definition criminal.” “Yet, just like banks and other financial institutions, it is vulnerable to abuse.” “And it does get abused” (Passas, 2003: 64).

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<sup>25</sup> A so-called ‘high level’ in the settlement process, would be when hawaladars use sophisticated and crafty methods, like multilateral trade, to settle their accounts. In addition, there would be a chain of people involved in the settlement process, meaning that there might be a smaller number of players who each take larger financial positions than the initial intermediaries.

Another, more downright criminal procedure, would be *smuggling*. One hawaladar is “entitled” to some quantity of merchandise instead of cash. The value of the merchandise will be exactly the same as the value on the hawala payment. To “clear the books,” goods get smuggled into the “entitled” hawaladars’ country. The gold trade is an example of smuggling as a settlement process. For instance, India has had a long time ban on gold imports, but, at the same time the Indian people have had a popular desire for gold. In this context, it hardly comes as a surprise that gold has been smuggled quite frequently into India.

Finally, there are so-called *international services, investment transactions and capital flight*.

“Another acknowledged form of clearing/settlement for informal hawala transactions is the provision of travel or other international services to HB or other residents of country B, financed by HA or associated consolidators (...). In effect, residents of country B who want to travel or purchase services abroad, for medical or educational purposes, for example, but who might be constrained by foreign exchange rationing imposed by the authorities, may have an option to “purchase” these services with local currency from HB or local consolidators. (...). HB himself [or other residents of country B] is the potential consumer of international services, and this transaction is paid for by HA, which liquidates both accounts” (El Qorchi et al., 2003: 16).

When it comes to investment transactions and capital flight, one could consider an example where HB is not allowed to own any foreign assets. However, with a little help from HA, HB could acquire foreign assets (bonds, stocks, real estate etc.) without having to carry out an open purchase of foreign exchange. HB does so by exchanging his external claim on HA with a foreign asset of another desirable kind. In other words, both HA and HB could have assumed international financial positions without operating through the official sector.

As seen, nothing, or at least very little, in the sequence of a hawala transaction, or most of the settlement procedures, causes physical cash to move across borders. What “moves” are asset and liability positions. Once again, it must be emphasized that all this is in theory, and when it comes down to the “real world” it might be a slightly different story.

### 2.3 An Example: A Pakistani Hawala Network.

This example is a case of Pakistani hawaladars.<sup>26</sup> The case study<sup>27</sup> is based on extensive records seized by the authorities in Pakistan, and a two day long meeting with some of the hawaladars involved. There are three general or main levels of IVTS operators in the remittance-sending country (A, B and C). A similar hierarchy could be found in the recipient country, Pakistan. Let us call these IVTS operators D, E and F. The operators in Pakistan distribute funds received from the remittance-sending country, and they may also serve clients who wish to have funds sent out of Pakistan.

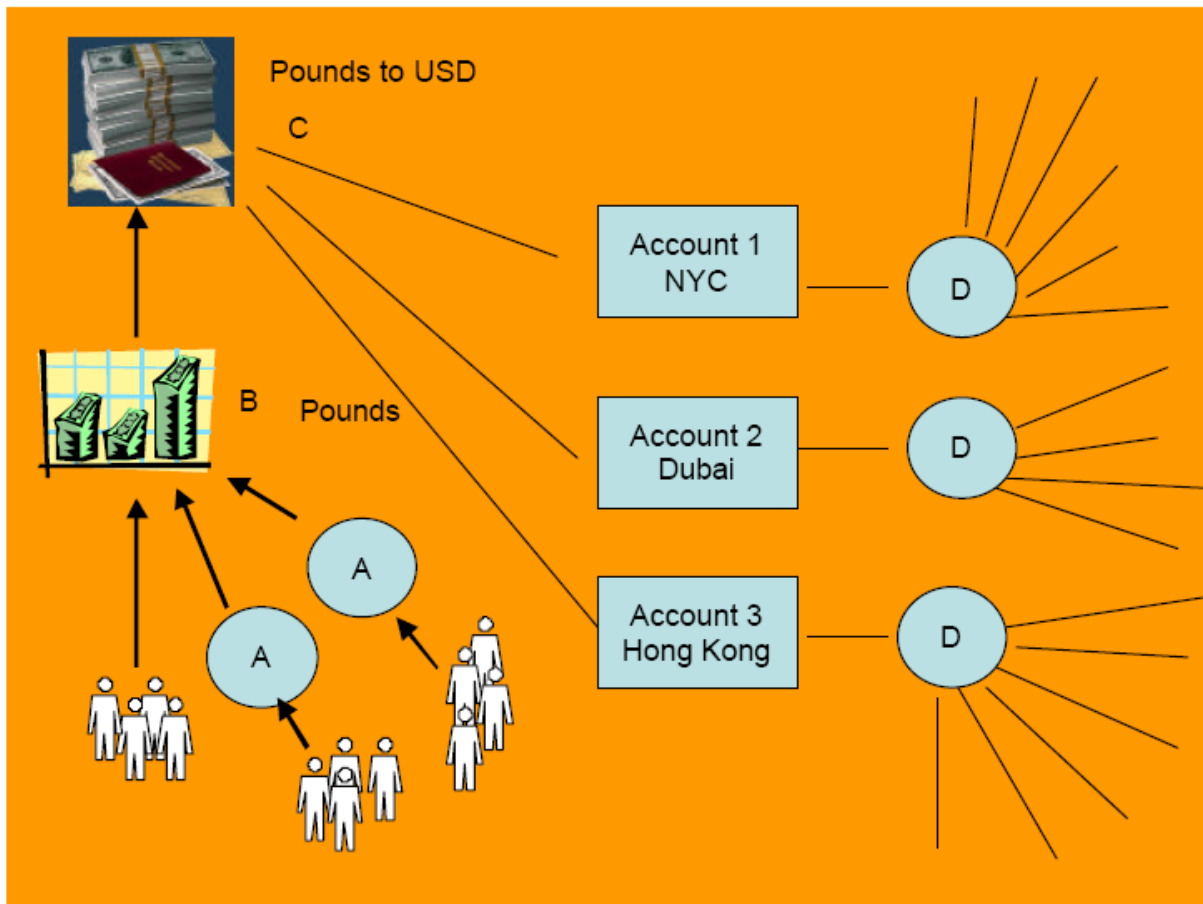


Figure 4: A Pakistani Hawala Network (Passas, 2005b: 22).

“The lowest level hawaladar (A) provides a funds transfer service to individual customers from a close vicinity or community and acts as an agent to bigger players. As remitting clients come in with local currency (British pounds, for example), a rate for rupees<sup>28</sup> is quoted to A by

<sup>26</sup> In some countries, such as Pakistan and Bangladesh, the term used to describe the practice of hawala is actually “hundi.”

<sup>27</sup> The case study appears in an article by Dr. Nikos Passas, ca. 2005.

<sup>28</sup> A code word used for rupees, by some hawaladars, is *cloth*.

Pakistan-based-hawaladars – these are based mostly in Karachi.<sup>29</sup> To the retail customers, that exchange rate is altered by a small margin, so that the hawaladar can make a (comparatively small) profit. There is no discussion of fees or commissions between hawaladars and clients – all they discuss is how many rupees will be paid out for a given amount of local currency. This amount is typically much better than anything offered by a bank or formal remittance service.<sup>30</sup> The profit A expects or hopes to make is built into the exchange rate offered to the retail client for the funds that are to be delivered to relatives in Pakistan (next day) or a check to be handed to the local customer (within a couple of days). This latter service is for expatriates who plan on travelling to Pakistan themselves or wish to send a check to their relatives. Effectively, this lower-level hawaladar sells checks, which he has to purchase from someone else, who has access to banking facilities” (Passas, 2005b: 20).

“In the next level of IVTS social organization, a hawaladar (B) has several agents (around 20),<sup>31</sup> sufficient turnover and a relatively large cash pool enabling him to negotiate or dictate the exchange rate to Pakistan-based hawaladars (Ds) and agents (As) acting on his behalf. In addition, B may have his own bank accounts in Pakistan, so he can sell checks to retail customers immediately, rather than have to wait for a couple of days for service he needs to obtain from another source” (Passas, 2005b: 20-21).

“He (B) still needs to convert his local cash into dollars, as this is the currency in demand from the Pakistani side. He purchases dollars from another hawaladar or a money exchange business (C) and then sells these dollars to his Karachi counterparts (Ds). Hawaladar C will wire the dollars to Karachi hawaladars (Ds) or to accounts they nominate. These nominated accounts could be maintained anywhere in the world and are mostly U.S. dollar accounts held either by large hawala dealers or of commercial hawala clients and their trading partners” (Passas, 2005b: 21).

“The Ds receive the faxed payment instructions in Pakistan at the end of each day, in order to make the local cash delivery. Again, no fee or commission would be recorded, as the profit of D is built into the rate of the dollar he offers to his Pakistani customers. A detailed set of accounts is kept for the running balance with the local agents on the one hand, and the Karachi counterparts on the other” (Passas, 2005b: 21).

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<sup>29</sup> South Asia’s most important hawaladars are based in Karachi, Mumbai, Dhaka, Kabul and Colombo (Passas, 2005b: 20).

<sup>30</sup> The 3rd International Conference on Hawala revealed that the received amount of rupees, in Pakistan, for 100 U.S. dollars from Dubai in November 2004 is higher than any other method of remittance. Using hawala you will receive 5920 rupees, as compared, for example, to Western Union where you will receive 5858 rupees (Passas, 2005a: 6).

<sup>31</sup> “It is also possible that A-level hawala players work with agents of their own – sub-agents.” “Local store owners, students or others interacting with people from the same ethnic community may offer to assist friends in remitting funds home.” “The differentiation of A-, B- and C-level IVTS operators is to some extent analytical pointing to the types of functions and roles performed in these networks.” “In practice, variations and more complex structures may be encountered” (Passas, 2005b: 20).

“The deals occasionally involve a degree of currency speculation, as the exchange rate is quoted in the morning and kept the same for the whole day. Hawaladars A, however, would be free to set their own rate to their clients to ensure that they make some profit. The books close at around 4.00-5.00 pm and faxes are received from A and sent out to Pakistan (Lahore, Peshawar and mainly Karachi) with the consolidated requests for payment. In the meantime, the price of the dollar or other currencies may have moved in favour or against hawaladar B” (Passas, 2005b: 21).

“As a number of B-level hawaladars are able to accumulate substantial amounts (for example, hundreds of thousands of British pounds weekly), all of them would deal with C for U.S. dollars. C would have a security transfer arranged – three collections of cash per week. Agents (as well as sub-agents) would know when the collection is due and they physically bring the cash, which is counted by B and bundled properly (sub-agents often have idiosyncratic ways of counting and bundling the cash, which is not the way banks would like to receive the cash). The amount they transfer on behalf of their clients is almost never exactly the same as the amount delivered to B on a given date. Instead, each hawaladar would have a running balance with B. Hawaladar B would keep a separate book/ledger for each one of As” (Passas, 2005b: 21). “Bs own Pakistan bank accounts would also be kept separately for each Karachi hawaladar, who would be asked to deposit or transfer rupees into those accounts. At the highest level in this network is hawaladar C, who maintains a dollar facility and has a very large turnover<sup>32</sup>, a number of sub-agents, as well as retail customers who come from the vicinity. His service is the most efficient and can offer all services required in the community very fast and cheaply. C would regularly have his British sterling account credited from lower-level hawaladars. He would use funds from these accounts to purchase U.S. dollars from banks” (Passas, 2005b: 21).

Once again, this case study is a fine example of how hawala, and possible other IVTS, do occasionally interact with formal banks and institutions. It also sheds light on the misleading conventional wisdom about hawala and other IVTS being mystical, ethnic remittance services, which keep no records and operate entirely “underground.” Needless to say, these remittance services would be in a mess had it not been for the bookkeeping.

### **3. The Scope of IVTS.**

Why would people engage in IVTS? Why not use formal remittance service providers like banks and other money transfer services? This section will explain why informal value transfer

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<sup>32</sup> A *turnover* is the amount of sales of goods or services a company has. Note: This is the meaning of the term in Great Britain; the American equivalent is sales volume (Dictionary of Banking and Finance, 1999: 323-324).



service providers engage in, for example, the likes of hawala, and how this system performs competing with formal systems.

### 3.1 How Do Hawaladars Make Profit?

As already mentioned, “hawaladars (...) would be free to set their own rate to their clients to ensure that they make some profit” (Passas, 2005b: 21). In other words, hawala operators would take advantage of exchange rate differences. Possible profit is made by exploiting the difference between agreed upon exchange rate with the customer and the rate obtained in “black” or other markets around the world (Passas, 2003: 56).<sup>33</sup> This exchange arbitrage is illustrated in the figure below.

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Algeria	247	266	330	369	389	246	419	416	358	264	83	300	358	250	175	133	125	150	100	100
Bangladesh	41	41	42	45	130	218	211	272	210	199	136	67	40	30	19	19	11	0	0	0
Ecuador	29	96	64	91	85	0	31	38	16	23	19	10	6	5	4	2	5	11	0	0
El Salvador	84	34	98	100	204	82	100	195	85	36	12	12	18	15	15	10	10	11	0	0
Guatemala	22	25	70	24	45	15	33	28	9	22	14	4	5	4	4	2	2	0	0	0
India	9	13	28	16	17	8	13	14	12	15	18	4	5	5	6	6	3	2	2	2
Indonesia	4	1	0	2	0	11	16	16	3	1	4	26	9	7	5	0	6	11	5	5
Iran	403	379	320	562	557	977	1,576	1,030	1,965	1,965	3,252	3,360	88	100	150	193	186	150	400	200
Pakistan	41	25	30	11	0	1	19	10	0	6	9	8	8	8	6	6	11	25	20	20
Philippines	6	7	50	1	1	2	8	3	4	6	6	1	2	4	7	9	0	0	0	0
Sri Lanka	6	10	38	32	15	3	2	36	25	16	9	10	6	4	1	1	0	0	0	0
Sudan	3	57	54	102	43	122	85	270	344	915	52	95	78	50	25	10	0	11	5	5
Tanzania	193	205	301	287	281	248	139	100	35	50	59	36	9	8	6	4	7	11	5	5
Turkey	20	15	11	1	0	7	8	9	2	1	6	6	4	4	4	0	4	0	4	4
Zimbabwe	53	51	192	80	53	70	50	47	76	37	50	33	19	15	10	7	16	900	400	400

Table 1: Black Market Exchange Rate Premiums 1981-2000 (in percent of previous period official rate?) (El Qorchi et al., 2002; Levine and Remelt, 1985; Wood, 1984; World Bank Discussion Paper no. 35. 1988 all in Passas, 2003: 57).<sup>34</sup>

“As can be seen, the incentive for hawala can be extraordinarily high.” “In those cases, the services to retail customers may be offered for free, given the substantial profits to be made

<sup>33</sup> “In fact, many experts view the difference between the official exchange rate and the black market rate as one of the most important factors determining the choice of transfer channel.” “According to a study of six major labour-exporting countries of North Africa and Europe, a rise in the black market premium of 10 percent results in a decline in remittances through formal channels by 3 percent” (Buencamino and Gorbunov, 2002: 5).

<sup>34</sup> Note: Certain missing values interpolated by Passas (2003).

in the exchange arbitrage” (Passas, 2003: 58). The latter *modus operandi* is often called an indirectly way of making profit (Passas, 2003: 56). Hawaladars offer free money transfer service, in order to attract clients to their main business, which for example could be a travel agency. More direct ways of making profit could be, in addition to the aforementioned exchange arbitrage, the selling or “renting” of cash, charging commissions or flat fees, or financing legal or criminal trade (Passas, 2003: 56). People who pay bribes generate a demand for hawaladars. The hawaladars sell or “rent” (lend), or furnish, cash which is used to bribe officials (Passas, 2003: 61).<sup>35</sup> Some IVTS operators charge commissions on their services. The cost varies according to origin, destination, urgency, volume of transaction and the relationship between the IVTS operator and the client (Passas, 2003: 58). Clients could be charged anything from zero to 20-25 percent of the remittance’s value (Passas, 2003: 58; El Qorchi et al., 2003: 7). In the aftermath of “9/11”, the cost of each transfer has risen.

“It used to be that amounts up to \$5,000 would cost a flat \$5 fee, while higher amounts would cost \$10. The new rules requiring registration, licensing, record keeping and filing of suspicious activity report apparently increased the cost for those who stayed in the business legally and the legal risks for those who opted not to declare themselves to the authorities. So, the charges are now higher (most range between 2 and 5 percent depending on the destination)” (Passas, 2003: 59).

When hawaladars know, or suspect, they are engaging in criminal activities, they will typically charge a higher percentage fee of the remittance’s value. This is logical, since engaging in criminal activities enhances the risk affiliated with the transaction. On the other hand, if hawaladars choose to involve themselves in illicit fund transfers they could make a substantially amount of money, meaning, of course, that they sometimes feel the risk is worth taking. This is *not* to indicate that hawaladars usually engage in criminal activities, but just like in any other circumstance it may happen. However, in these cases the criminals are the main problem, not the way they choose to move their money.

According to a report<sup>36</sup> there have also been numerous cases in which particular clients were not charged anything for sending money to their families in the homeland. These cases are certainly exceptions. The main aim of engaging in different IVTS is to make profit. An

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<sup>35</sup> This is not to be mistaken as engaging in so-called *haram* practices. *Haram* is the Arabic word for “forbidden.” There are many things that are prohibited. In the context of banking, interest (*riba*) is forbidden. In a very general description, Islam forbids all distinct forms of economic activity that are morally or socially wrong (Müller, 2004: 10).

<sup>36</sup> Passas, 2003: 55-56.

example of hawaladars' main aim not being profit could be found in Norway.<sup>37</sup> In August 2005, three so-called hawaladars were given reduced sentences by The Norwegian Supreme Court, due, partially, to the fact that the informal transfer service providers had sent money to Somalia, on the behalf of their clients, and not charged them any transfer fees. The hawaladars' main aim was in this case purely humanitarian; there was no other way to send their money back home to Somalia. This example could also be an illustration of the fact that commissions may vary for various immigrants.<sup>38</sup> In the Norwegian case, both clients and operators were from Somalia, which might be an explanation why the clients were not charged any fees. This may, or may not be coincidental, so one must be careful not to generalize from this case.

Now that we have an idea of how informal value transfer service providers make a profit, it is time to find out how these systems perform competing with other, formal remittance systems, and try to get a scope of informal value transfers.

### **3.2 Comparing Hawala with Formal Money Transfer Services.<sup>39</sup>**

Most banks in the UK, Australia, New Zealand, South America and North America will allow customers with bank accounts to transfer money online to an overseas bank account. One will need to currently have, or sign up for, online banking with your current bank. Another thing one will usually need is to know the address of the receiving bank, the account details of the receiving bank, the account name and often also the receiving bank's SWIFT code.<sup>40</sup> This is a highly effective and secure way to transfer money. However, it could be pricey. Exchange rates are at the bank's rate which varies daily. Currency exchange rates for most leading banks in the world are not easily available online. This method can be used to send a money order online to, for example, your own home bank account or to a third party. Of course, this way of sending money has a clear limit; one cannot remit money to a country that does not have a well-functioning bank system. Aside from this, there are no restrictions on the countries between which one can transfer money. Another issue is security; there is no need to deal with a third intermediate party. The whole process constitutes a minor amount of paperwork, at least for you as a customer. A thing that does not speak in a bank's favour, is that banks tend to be more

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<sup>37</sup> A Norwegian situated office allegedly in connection with al Barakaat was in August 2005 sentenced by the Norwegian Supreme Court (<http://www.hoyesterett.no/news/5524.asp>).

<sup>38</sup> Passas, 2003: 59-61.

<sup>39</sup> This analysis is based on comparing hawala, being an example of an IVTS, with several formal money transfer services; Western Union, Forex Money Transfer, MoneyGram, Travelex, Tranzfers, EasyExchange, 1st Contact and of course banks. (<http://www.workgateways.com> and <http://www.forex.no>).

<sup>40</sup> An international bank identification system, SWIFT, stands for Society for Worldwide Interbank Financial Telecommunications; an organization for sending electronic messages round the world banking system. (Dictionary of Banking and Finance, 1999: 307).

costly than, for instance dedicated online money transfer services. As a requirement one must also have a bank account in the country from which one is transferring and which one is receiving (the latter is only required if you are sending to yourself). This could be a major obstacle for expatriates wanting to remit money to their home country. To get a bank account one must usually contact the specific bank. A communication problem may arise from such a situation; as an example, people from Mexico might not speak very well English when they are working in the U.S. This could lead to using informal value transfer service providers instead. One thing common for both banks and other formal money transfer services, is that they tend to use an exchange rate that is favourable to them. This is also the case when it comes to hawala, but as already seen, hawaladars operates in the black market, which could be favourable for both principal and agent.<sup>41</sup> As already mentioned, bank's currency exchange rates are not easily available. In the UK, for instance, generally the only way one can find out a certain bank's exchange rate for a particular currency is by going into a branch or calling them. However, companies such as Tranzfers and EasyExchange openly display their going rates on their home pages.

Most of these companies operate their transactions in the same manner as banks. First, one must register with them online and input details of the transaction one would like to make. Usually, one has to fax a certified photocopy of ones ID due to banking regulations in some countries. Once one has registered and been approved, you are given the money transfer company's bank account details. Through online banking at your financial institution, you deposit the amount you wish to transfer into their bank account. Based on your, or a third party's, recipient details you have already supplied during the registration process, the money transfer company will deposit your money into the recipient account. According to the home page of workgateways.com, a transaction with these companies cost around 7% of the remitted amount, including both transaction fee and exchange rate. One of the advantages of these companies is that all transactions can be done electronically. Further, one does not have to go in person to any retail outlets; hence the communication problem could be avoided. However, because of certain countries' banking regulations, other complications may occur, such as holding a real passport for an illegal immigrant. Again, this may lead to people using informal value transfer service providers.

“The more regulations restrict trade, currency exchange, or the movement of money and people, the wider the use of informal value transfer systems. It is important to note that,

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<sup>41</sup> For a comparison of rates see Passas, 2005a: 4-5, from the 3rd International Conference on Hawala.

notwithstanding several adverse consequences, the economy of many countries relies extensively on alternative value transfer systems and the networks which operate them” (Passas, 1999: 28).

Another disadvantage for online money transfer service companies are the limited eligibility of countries. Far from all countries are covered coming to online money transfers. Western Union and Travelex are two other formal money transfer companies. These companies advertise that no location is too remote.<sup>42</sup> As opposed to online money transfer service companies, Western Union and Travelex require no internet access and no local bank account. These companies send and receive cash, and they do it quickly. However, if you remit money your recipient must pick up in person, and this can evidently be subject to abuse.<sup>43</sup> These companies do have something in common with IVTS; they cannot transfer money from an account or from your credit card – cash only.

Other local or regional companies, like for example Forex, use an American money transfer system called MoneyGram. Using Forex is a quite simple procedure. “The sender goes to a Forex branch office and fills in a form with his/her and the receiver’s personal details and gets a receipt with a reference number.” “The receiver then goes to one of MoneyGram’s many agents around the world, fills in a form to receive the money, shows an ID card and the money is paid out.” “For most transactions, the money becomes available within ten minutes” (<http://www.forex.no>).

A contributing factor, to these formal money transfer systems’ disadvantage, is their unavailability or unreliability. As the aforementioned examples show, immigrants have repeatedly tried to send remittances to their families through formal money transfer companies, sometimes unsuccessfully (Passas, 2003: 32). In this context, one might say that formal remittance systems have gotten a bad name among expatriates. Informal remittance systems, like hawala, have also gotten a bad name since September 11<sup>th</sup> 2001. They are often mentioned in alleged connection with terrorist activities (Wilson, 2002: 1), but in this thesis we show

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<sup>42</sup> However, ”in [one] case, an Afghani refugee attempted to send € 500 from Greece to his sister for her tuition fees through Western Union (WU), but the funds had not reached her for weeks.” “His inquiries went unanswered and only two-three months later did he receive a “Dear Customer” later vaguely referring to 9-11 international rules.” “He assumed his name resembled someone else’s on one of the terrorist lists.” “In the meantime neither his funds nor the € 30 fee he had paid would be returned to him.” “After he sought legal counsel and many months later, the money arrived in Afghanistan.” “To this refugee and his sister, the € 500 represented a lot of money.” “They were both extremely upset with Western Union and resented deeply the impersonal and indifferent way they were treated (personal interviews)” (Passas, 2003: 32).

<sup>43</sup> “One interviewee reported how she attempted to send money to her relatives in Nigeria.” “When she notified someone to go and pick up the money, the relative was told that someone else had already received the money, probably using a fake ID.” “The company, according to the interviewee, could not do anything about it” (Passas, 2003: 32).

more interest on its economic context.<sup>44</sup> It is often said that hawala-type informal transfers are often faster, more reliable, reach more destinations, sometimes benefit from a better exchange rate, and can be much cheaper than transfers through established, licensed financial institutions (Wilson, 2002: 3).

“The informal hawala system has several characteristics that account for its widespread use. These characteristics include speed, convenience, versatility, and potential for anonymity. The system operates in the informal sector but hawaladars often hold accounts with the banking sector or sometimes use its channels for settlement operations. The system can be used for both legitimate and illegitimate purposes” (El Qorchi et al., 2003: 7).

According to El Qorchi et al. (2003), carrying out hawala transfers between major international cities takes, on average, 6-12 hours. “Generally, transfers between countries where the recipient is in a location with a different time zone or where communications are less reliable require 24 hours.” “Slightly more time may be required for payments in more rural regions or villages where the hawaladar does not have a local office or representative” (El Qorchi et al., 2003: 7). Even less than 6 hours is required if both sender and recipient is present at their operators’ respective offices at the same time (Maimbo, 2003: 10).

When it comes to the cost of making informal funds transfers, several different numbers have been implied. Some authors work with service charges in the range 2-5 percent (El Qorchi et al., 2003: 7; Müller, 2004: 11; Maimbo, 2003: 10), while others operate with fees ranging from completely free to 20-25 percent (Passas, 2003: 58). Rates tend to fluctuate during periods in time, considering Afghanistan as an example.

“Under the Taliban regime, hawaladars charged higher fees among the different regions, and a few dealers were willing to transfer funds within the country. Trade itself was difficult and even dangerous. Presently, however, there are so many dealers in the market that the fee structure has come down significantly to the stated average of 1-2 percent” (Maimbo, 2003: 10).

Payments made through the informal sector are often less expensive than payments made through the formal banking sector (El Qorchi et al., 2003: 8). Empirical evidence supports this claim.<sup>45</sup> The reason for this may be related to, exactly, the “informality” associated with the

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<sup>44</sup> For a fine reading about hawala and its alleged connection with terrorist activity see “*Money War: Hawala and Its Use for Terrorism*,” by S. R. Müller, 2004.

<sup>45</sup> Passas, 2003: 32-33.

former sector, meaning the lack of regulation and taxation.<sup>46</sup> However, in the aftermath of “9-11” several jurisdictions have imposed regulations on the informal sector.<sup>47</sup> It remains to be seen if these regulations lead to the approach of the informal- and formal sector, at least when it comes to the issue of cost. Another distinction between the two sectors is that the formal sector often charges a starting fee that remains the same for amounts up to a certain level. This being the case, the percentage becomes unreasonably high when expatriates remit smaller amounts of money (Passas, 2003: 32-33).

Another issue, noted by El Qorchi et al. (2003), is the cultural convenience connected with some IVTS.

“Absence of language barriers, trust among community members, solidarity among migrants facing the same situation, and cultural considerations have enhanced the development of IFT systems. Limited education levels and illiteracy also pose potential obstacles for expatriate workers, who would not feel comfortable dealing with banks and filling out forms to send money abroad or even open an account. Cultural considerations also apply to family members in the hawala-recipient country and shape social rules and behaviours, including respect for confidentiality and privacy. In many expatriate communities, only men tend to emigrate, leaving their spouses and other family members in the home country. In these communities, conservative and restrictive family traditions sometimes prevail. Women maintain minimal contacts with the “outside world” and do not establish relationships with institutions such as the banks or the post office. A trusted hawaladar, who is known in the village and aware of social codes, would be an acceptable intermediary in such circumstances” (El Qorchi et al., 2003: 8).

One might ask why certain informal value transfer systems continue being popular despite of recent globalization and the growth of multinational banking industry. Why do people use IVTS today? This is an important question, and it is possibly related to both, the infrastructure within IVTS and the higher cost, inefficiency and slowness of the formal banking sector (Passas, 1999: 34). In short, some of the main reasons for using IVTS today could be; the lack of confidence in the conventional banks; lack of access to the conventional banking system; when the local bank does not have the means to send the money overseas; an inefficient, costly, bureaucratic, unfriendly banking system; a lack of legitimacy of the tax system; a real or perceived need to bypass government regulations; as mentioned, cultural reasons –

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<sup>46</sup> “Unlike banks, little, if any, consideration is given to the commercial and tax aspects of accounting obligations or principles of formal accounting procedures” (El Qorchi et al., 2003: 8).

<sup>47</sup> El Qorchi et al., 2003: 41-48; International Monetary Fund in Various, 2005: 98-114.

following tradition, so to say. Lower costs; a faster service; in order to avoid reporting and ensure secrecy; in order to protect assets from nationalization; in order to make payments to intelligence operatives overseas; in order to bypass currency controls; and finally, solely for criminal purposes (Passas, 1999: 36).

IVTS also seem to be highly versatile when it comes to adapting to different forms of turmoil. This could be wars, civil unrest, conflicts, economic crisis as well as economic sanctions and blockades (El Qorchi et al., 2003: 9). An example is Jamaica, where the vibrant underground economy together with stringent government restrictions, slow licensing process, high tariffs and other prohibitions provide fertile ground for the growth of informal value transfer systems (Buencamino and Gorbunov, 2002: 5). IVTS have also experienced strong growth in times of political change and instability. “For instance, hawala significantly increased its operations after the partition of India in 1947 and subsequent introduction of foreign exchange controls that made illegal all transport of currency between India and Pakistan.” “It happened again in Southeast Asia during the Vietnam War, in tandem with the rise in a huge black market for foreign exchange” (Buencamino and Gorbunov, 2002: 5). Other places where the IVTS have long existed, but only recently gained prominence, due to various conflicts, are Afghanistan, Iraq, Kosovo and Somalia (El Qorchi et al., 2003: 9; Maimbo, 2003: 18-20).

### **3.3 The Scope of Informal Value Transfers.**

Due the informality of the systems at hand, it is very hard to obtain solid data on the scope of transfers. Individual amounts of an informal transfer can vary extensively. In single hawala transactions, amounts of \$20 up to \$7,000,000 have been observed. Smaller sums are usually the results of emigrants working in the Western hemisphere who support their families back home, while the larger ones are remittances of non-governmental organizations (NGOs) or aid institutions (Müller, 2004: 7; Maimbo, 2003: 18-20). According to estimates of Pakistan’s former Minister of Finance, Shaukat Aziz, hawala networks alone moved up to \$5 billion annually, which is more than the amount of foreign transfers through the country’s banking system. “In 1999, Institutional Investor Magazine identified 1100 money brokers in Pakistan and transactions as high as \$10 million apiece” (Vaknin, 2001: 1).



“Hawala networks closely feed into Islamic banks<sup>48</sup> throughout the world and to commodity trading in South Asia. There are more than 200 Islamic banks in the USA alone and many thousands in Europe, North and South Africa, Saudi Arabia, the Gulf States (especially in the free zone of Dubai and in Bahrain), Pakistan, Malaysia, Indonesia, and other South East Asian countries. By the end of 1998, the overt (read: tip of the iceberg) liabilities of these financial institutions amounted to \$148 billion dollars” (Vaknin, 2001: 1).

There are very few theoretical approaches to measure the volume of informal value transfers. El Qorchi et al. (2003) use a quantification model, where they examine 15 recipient countries that meet certain conditions for informal activity; “(1) [an] appreciable numbers of non-resident nationals, (2) a history of parallel exchange markets with statistically available data on parallel rates, and (3) available statistics on recorded private transfers” (El Qorchi et al., 2003: 33). With an increasing difference between black market exchange rates and official quotes as a so-called exchange rate incentive, the percentage of informal remittances increases. Additionally, a minimum and a maximum percentage of informal payments was fixed which would remain, regardless how large or small the exchange rate incentive would be. “The model has the following form for each country examined.” “The estimated share of hawala remittances in total private transfers is specified as”<sup>49</sup>

$$\frac{RI}{R} = a + bB + cB^2 - dB^3$$

“The model is specified as a cubic reaction function on the assumption that the “hawala share” of total remittances starts at some generally nonzero level if/when  $B = 0$ , and rises through a certain range of values for  $B$ , reaching a peak at some value beyond which  $RI/R$  stabilizes at  $MAX (RI/R)^* < 1$ .” “[...], this is just a way of saying that hawala transfers cannot exceed total remittances, measured and unmeasured” (El Qorchi et al., 2003: 33). The model is illustrated by the following summary overview of the results obtained by El Qorchi et al. (2003).

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<sup>48</sup> A useful definition on Islam finance is the following: Islamic financial institutions are those that are based, in their objectives and operations, on Koranic principles. They are thus set apart from “conventional” institutions, which have no such preoccupations (<http://www.islamicbanking-finance.com/definition.html>).

<sup>49</sup> Where  
 RI = informal remittances/transfers;  
 R = Total remittances/transfers;  
 RP = recorded private transfers in the BOP (balance of payments) accounts of each country;  
 $R = RI + RP$  (thus,  $R = RP/[1 - RI/R]$ );  
 B = “black market premium” (in percent of the official rate) on the currency;  
 MIN = intercept (= a), that is, minimum share of “hawala” in total remittances (when  $B = 0$ );  
 MAX = maximum share of informal transfers in total (when B is high).

Country	Total	Recorded	Unrecorded	Share of Unrecorded in Total (percent)
Algeria	53	14	38	73
Bangladesh	84	35	50	59
Ecuador	9	7	2	18
El Salvador	25	15	9	38
Guatemala	8	7	1	16
India	143	120	23	16
Indonesia	16	12	4	23
Iran, I.R. of	98	31	70	68
Pakistan	136	62	75	55
Philippines	55	50	5	9
Sri Lanka	23	14	9	38
Sudan	15	7	9	55
Tanzania	19	8	11	58
Turkey	87	72	14	17
Zimbabwe	6	3	3	44
<b>Total</b>	<b>776</b>	<b>456</b>	<b>319</b>	<b>41</b>

Table 2: Summary of Estimated Private Remittances, 1981-2000 (in billions of dollars).  
(El Qorchi et al., 2003: 35).

Although these results only describe the left-hand side of the aforementioned cubic reaction, “Results of this exercise suggest that the amount of informal remittances around the world can be considerable, especially in view of the fact that only a subset of participant countries is included here.” “If these results are in any way indicative of actual trends, the global total for informal remittances could amount to billions of dollars” (El Qorchi et al., 2003: 35). In this very limited sample of 15 selected recipient countries, an average of 41 percent of all transfers is undocumented. This corresponds to an estimate given by Jonathan M. Winer, the US Assistant Deputy Secretary of State, who assesses the share of unrecorded transfers between 25 and 50 percent (Napoleoni, 2003: 123). If this is an indication of how this model performs, one might say it produces an educated guess, and as far as quantification is concerned it might be the best that can be obtained.

“If these results have any significance at all, they just suggest that the “amount of hawala” can be fairly significant for certain countries that have the economic and cultural conditions that nourish this business, and certainly larger on a world scale than the figures generated by these selected sample cases. More importantly, these results may also suggest that the growth or decline in the use of IFT systems may be negatively correlated to the level of development of

the formal financial sector. Hawala-type operations appear to have been more dominant in countries where financial institutions are inefficient or financial policies restrictive” (El Qorchi et al., 2003: 39).

Although IVTS could be said to be highly versatile, perhaps even dynamic (Maimbo in Various, 2005: 62), a recent World Bank study concluded that the informal sector cannot be the “engine” for sustained long-term growth.

“The study rightly observed that international experience suggests that development beyond a certain point is accompanied by a decrease in the share of the informal sector. Informality does not protect property rights and reduces the possibility of formalizing and enforcing contracts, weakens incentives to invest, and diminishes opportunities for division of labour and trade (World Bank, 2004: 8)” (Maimbo in Various, 2005: 62).

This aspect of the informal sector, or rather IVTS, may be one of the explanations for the seemingly<sup>50</sup> downward trend of hawala system usage in the sample countries provided by El Qorchi et al. (2003).

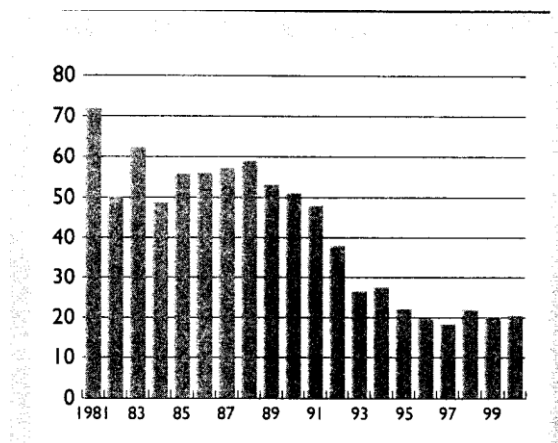


Figure 5: Estimated Hawala Share in Total Private Remittances (Percent of total, RI/R) (El Qorchi et al., 2003: 39).

<sup>50</sup> “Given the form of the simulation model, the reduction in overall black market exchange premiums during the 1990s naturally leads to a decline in the relative amount of hawala (compared to total remittances) that the model generates.” “It was built that way.” “If other priors are applied to the modeling effort, different results can be generated.” “Our results are plausible in the coarse sense of showing that the informal channel is potentially “large” when driven by large exchange market incentives, and it tends to recede when costs and incentives in official channels become more favourable” (El Qorchi et al., 2003: 40).

However, not all authors agree on this downward trend. According to Koutouzis (in Passas, 1999) IVTS have grown in recent years, but it is not out of control. There are also other stories backing up the latter argument. Interviews conducted by Passas state the following: “The clear impression one gets by talking to line investigators and law enforcers with practical experience in the matter is that the problem is generally under-estimated.” “They all suggest that we have only seen a tiny tip of a huge iceberg.” “Their opinion is based on more than a gut feeling.” “They have indeed encountered cases of individual IVTS dealing in tens of millions of dollars within a year or even a week” (Passas, 1999: 47). The conclusion must be not knowing what the volumes are makes it impossible to estimate with any precision whether the use of IVTS is actually increasing or declining (Passas, 1999: 49).

#### **4. IVTS – Why Do They Work?**

##### **4.1 Introduction.**

This section will, once again, use hawala as an example of an informal value transfer system. Using game theory as basis will hopefully provide an answer as to why IVTS in general, hawala in particular, work. A key feature when it comes to hawala is the indispensable element of trust. It is a decisive part of the infrastructure rendering global networks fast and effective (Passas, 2003: 30). Hawala, among other IVTS, has developed in an evolutionary way through trial and error. This may explain its existence and use over centuries, and the fact that it has adapted to an ever-changing environment. However, this alone could not fully explain why hawala works, bearing in mind that there is no contract-enforcing power involved, such as a state or jurisdiction. In other words, one way of reasoning is that contracts between parties involved have to be self-enforcing. This brings about the theory of games. Game theory is the science of strategy. It was invented, at least the mathematically theory of games, by John von Neumann and Oskar Morgenstern (Ross, Stanford Encyclopedia 2006).

##### **4.2 The Institutional Framework of Hawala.**

The system of hawala can be described as a network. The network contains of several relational contracts, both between financial intermediaries, so-called hawaladars, and between clients/customers and financial intermediaries. The former could be looked upon as a club, where non-cooperative behaviour is punished severely by banning a certain member from the club.<sup>51</sup> The members benefit from the institutional framework provided by the club.

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<sup>51</sup> The theory of clubs is described in more depth by James N. Buchanan in his seminal piece “An Economic Theory of Clubs” from 1965.

“The small size of the club facilitates the prompt information about conduct of a single member to the rest. So, instead of one-shot games between two given intermediaries, the club produces multiple games between various members (...) However, as usual with sanctions in economics, the threat thereof must be credible in order to enforce cooperative behaviour. Credibility is easily achieved by imposing a sanction on a member who displayed opportunistic behaviour by exploiting the network or one of its members. In short, the future loss of business outweighs the short-term gain of non-cooperative behaviour. The permanent investment of members into their credibility forms the club’s social capital which cannot be retrieved when banned by the club; in other words, sunk costs further enhance the incentive to stay in the club since the accumulated social capital would be lost” (Müller, 2004: 18).

The latter would be a regional contract where the parties jointly agree on the terms of their relationship. Often these contracts are not formalized. Even in the absence of states and legal enforcement, empirical evidence suggests that hawala *does* work. “It is a rare phenomenon to observe a case where money or a hawaladar disappears.”<sup>52</sup> “In fact, the system is so secure that even international aid agencies and non-governmental organizations (NGOs) use the system when applicable” (Müller, 2004: 15). However, when NGOs or international aid agencies use the likes of hawala the contracts tend to be more formalized.<sup>53</sup> The regional contract between a client and a hawaladar must be designed in a way as to prohibit non-cooperative behaviour by simply making it irrational (Müller, 2004: 18). To understand why non-cooperative behaviour is not chosen more often than it is, one must look into several important factors. Firstly, outside the formal model, there might be something that makes people, in this case a client and one or several financial intermediaries, respect a certain outcome of the “game” they are indulging in. Common values like similar cultural background or religion could be critical when it comes to establishing trust amongst one another. This is outlined by Müller (2004: 16), who points out that “hawala is predominantly observed in Islamic civilizations.” Müller (2004: 16) goes on stating that “Sharia, the Islamic

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<sup>52</sup> In some rare cases hawala does *not* work. Usually this is the case when hawala is combined with some kind of physical transport of money. An example is presented in Passas (2003): “In a concrete case, a group of Syrians get together to send collectively money to their families back home.” “The amount was several million Greek drachmas (at the time the rate was about 360 GDR to USD).” “Their trust proved misplaced: They had given the same courier money before, and the money was delivered on time without problems.” “This time, however, he disappeared with the money and without a trace (personal interview with friend of victims)” (Passas, 2003: 31).

<sup>53</sup> A sample contract from Maimbo (2003) can be found in the Appendix.

law derived from the Quran, Hadith and Ijma, serves as a common base of values.”<sup>54</sup>

Secondly, a quite interesting event occurs in some countries where hawala is forbidden by law.

“Especially the transfer of money between the sender and his hawaladar seems to suffer from a considerable risk since the first intermediary could just run with the entrusted money. Due to the lack of proof, the client has no proof of the handover of the amount. Here, a very surprising phenomenon takes place. In a lot of places where hawala exists, it is banned since governments fear the loss of macroeconomic control.<sup>55</sup> The aggrieved client could then give his knowledge about the intermediaries to the authorities, thereby endangering the club. So, by banning the system, the government actually lowers the risk of non-cooperative behaviour of the first intermediary and paradoxically enforces it [the system]” (Müller, 2004: 18-19).

Similar arguments could also be found in Watson (2002), where coordinated behaviour leads to avoiding inefficiency. “Strategic uncertainty is a part of life, but there are devices in the world that help us coordinate our behaviour and avoid inefficiency.” “Institutions, rules, norms of behaviour, and, in general, culture often facilitate coordination in society” (Watson, 2002: 63). An open question remains whether these contracts are self-enforcing or externally enforced by the means of religion, or perhaps the government being the external enforcer? When it comes to contracts being externally enforced, Watson (2006) discusses how “active” the parties are in contracting; “In less active contracting, social convention and history (including prior agreement) play a greater role” (Watson, 2006: 6).

Another important part of the institutional framework of hawala is the often personal relationship between the client and the hawaladar (Müller, 2004: 16; Passas, 2003: 64). This relationship could have a great influence on the moral commitment of the contract at hand. Interviews from Passas (2003) show how, for the most part, hawaladars actually do know their customers.

“For the most part, however, the clients are known community people or are referred by a member of that community. (...). For example, an informal remitter explained how he knew each customer entering his office. After some greetings, basic information was taken from customers (sender name, address, phone number, reference to a clan in some cases, same

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<sup>54</sup> Hadith is the collection of laws and stories about Muhammed’s life and his conduct, while Ijma is the consensus of the Islamic community, the umma or the consensus of the scholars, the ulema (Müller, 2004: 16).

<sup>55</sup> More on hawala’s possible macroeconomic implications can be found in El Qorchi et al. (2003: 18-20).

information for receiver). The operator entered the information into a computer spreadsheet, which was maintained for several years. The operator indicated that he does in fact know his customers. Along these same lines, an IRS<sup>56</sup> official based in the same area commented: “They (hawaladars) basically do know who their customers are based on trust, which is how their operations work. They know who the customers are and how they came to utilize their service.” On the other hand, some hawaladars may serve a wider clientele (cross-ethnic groups) and therefore do not have the same degree of familiarity with the patron base” (Passas, 2003: 63-64).

This institutional framework might provide a sound foundation for hawala. However, with the informal nature of the system, one cannot help wondering about the security of a certain transfer.

### **4.3 The Formal Theory.**

“A player’s optimal decision depends on what he or she thinks the others will do in the game. Thus, to develop solution concepts - which are prescriptions or predictions about the outcomes of games - one must study how individual players make decisions in the presence of “strategic uncertainty” (not knowing for sure what other players will do)” (Watson, 2002: 3).

This segment will mainly use Guttman’s 1996 article “*Rational actors, tit-for-tat types, and the evolution of cooperation*” to describe a regional contract between a customer and a financial intermediary (hawaladar). Guttman’s (1996) article analyzes cooperation in the finitely repeated Prisoners’ Dilemma game. A repeated game is defined as a game in which a set of players expect to face each other in similar situations on multiple occasions (Ross, Stanford Encyclopedia of Philosophy, 2006). A motive for analyzing a finitely rather than an infinitely repeated Prisoners’ Dilemma game have been proposed, amongst others, by Kreps et al. (1982); a finite number of repetitions might allow cooperation because the players are uncertain about the payoffs or possible actions of their opponents. “Such “incomplete information” in the Prisoners’ Dilemma precludes applying the backwards-induction argument that establishes that the players must confess [defect] each period...” (Fudenberg and Maskin, 1986: 534-535). Other studies, including several by political scientist Axelrod (1984 and 1987 in Moore, 1997), have examined an infinitely repeated Prisoners’ Dilemma

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<sup>56</sup> Internal Revenue Service, US (Dictionary of Banking and Finance, 1999: 168).

game. Axelrod's work indicates that a Tit-for-Tat (TFT from now on) policy – that of being “nice” on an initial interaction with a strange individual, with whom one expects to have frequent future relations, and then by simply repeating the moves of the other player – in many cases can be the best long run strategy (Moore, 1997). It showed that reciprocal altruism, an act which benefits others, under the assumption that iteration would go on for an indefinite or unknown time and that the discount rate was low enough was a stable and robust long run solution to the Prisoners' Dilemma game. The TFT strategy will be profitable in cases where individuals expect to meet each other frequently in the future and according to Moore (1997) when these individuals deal with each other on a continual or frequent basis, they tend to follow certain unwritten rules of honest behaviour. Whether this is true or not is not an easy task to verify. However, if it is true, one could argue that a reputation<sup>57</sup> for honesty can promote exchanges<sup>58</sup> within the environment at hand. “A person meeting an individual who is well respected will feel safe that he or she will not be cheated and that the honest individual will not defect” (Moore, 1997). One must of course consider the possibility that an individual with a reputation of being honest can exploit the situation, or make a mistake. One thing that can enhance reputation in the case of hawala is religion. Or as Adam Smith is cited in Moore (1997); “one of the most significant functions of religious belief was to provide strong incentives to follow moral structures (...) religion can enhance reputation, which can be a strong force in assuring cooperation.” Here we witness, what was already touched upon in the last segment, that there is something outside the formal model that makes people respect a certain outcome of the game. In other words, to fully be able to explain why people choose to cooperate rather than defect in Guttman's (1996) article, we should perhaps add an auxiliary assumption, religion.

The model in Guttman's (1996) article is an extension of the Kreps et al. (1982) model which deals with the interaction of rational players in a mixed rational-TFT population. In both models we are dealing with rational actors and mechanical actors. The rational actor, R, is defined as a player who chooses a best reply to the current population mix of strategies, while the mechanical actor, TFT, is a player who plays a fixed strategy which will not necessarily be a best reply to the population mix (Guttman, 1996: 28). In the Kreps et al. (1982) model we have the following normal (strategic) form<sup>59</sup> game:

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<sup>57</sup> How a person's past actions affect future beliefs and behaviour (Watson, 2002: 211).

<sup>58</sup> Social exchange: Player's cooperation hinges on their actions being reciprocated by others (Richards, 2001: 621).

<sup>59</sup> The normal form representation of a game specifies the players in the game, the strategies available to each player and the payoff received by each player for each combination of strategies that could be chosen by the



	C	D
C	(1, 1)	(b, a)
D	(a, b)	(0, 0)

Figure 6: Payoff matrix for Prisoners' Dilemma (Guttman, 1996: 31).

The matrix illustrated above shows a one-shot Prisoners' Dilemma game. Players 1 and 2 can both choose between cooperating, C, or defecting, D. If both players choose to defect they will receive a payoff of zero each. However, if both players choose to cooperate they will receive a payoff of one each. Another possibility is when one of the players, either player 1 or 2, can choose to defect while the other player cooperates. The player that defects in this situation will be better off than the player who chose cooperation. This leaves us with the following:  $a > 1$ ,  $b < 0$  and we assume that  $a + b < 2$ , which is what the players would get if they choose joint cooperation for two rounds (Guttman, 1996: 31). In this one-shot Prisoners' Dilemma game we only have one Nash equilibrium. The Nash equilibrium is a joint defection by both players. This is a strategically stable and self-enforcing strategy, because none of the two players would want to deviate from their predicted strategy (Gibbons, 1992: 8).

The Kreps et al. (1982) model, however, looks at an iterated rather than a one-shot Prisoners' Dilemma game, where both players are assumed to be rational. One of the players suspects the other one to be a mechanical actor, a so-called TFT player. Neither players discount future payoffs. Thus, had it not been for one of the player's uncertainty about the other player's type, the usual backwards induction argument would yield the prediction that both players would defect throughout the whole game (Guttman, 1996: 30).

“The fact that R's counterpart is a TFT type gives R a strong incentive to cooperate, since consistent cooperation by R leads to the jointly cooperative outcome and gives a payoff of 1 per round to both players. Moreover, it is not rational for R to defect in round  $t$  and then cooperate in round  $t + 1$ , since this gives him a payoff for the two rounds of  $a + b$  (assuming

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players (Gibbons, 1992: 3). A convenient way of describing the aforementioned is by a matrix. The matrix is a type of mathematical object used to represent non-cooperative games, that is, players act independently, in other words, the decision making is non-cooperative. Matrices simply show the outcomes, represented in terms of the player's utility functions, for every possible combination of strategies that the players might use (Ross, Stanford Encyclopedia of Philosophy, 2006).

that TFT cooperated in round  $t$ ). (...). In fact, if R merely assigns a sufficiently large probability to the proposition that he is playing with a TFT player, it will be rational for him to cooperate” (Guttman, 1996: 31).<sup>60</sup>

The player who is suspected of being a TFT player finds it best to confirm this suspicion. The TFT player starts playing the cooperative move initially and thereafter always playing the same move as his or her counterpart did in the previous round of the game. The reason for this is to induce the counterpart to cooperate. The TFT player has the opportunity to establish a reputation for cooperation, and by doing so encourage the other player to do the same. In other words, the key to doing well in this game lies not in overcoming other players, but rather in eliciting their cooperation, assuming of course that the players actually *do* want the game to “end” with joint cooperation. There are many ways to promote cooperation. Punishing your opponent when he or she does not cooperate is one of them.

“An important feature of ongoing relationships is the development of cooperation through repeated interaction. It is well known that players may be able to enforce cooperation through strategies that involve punishment in response to deviations from cooperative play” (Bernheim and Whinston, 1998: 917).

However, in this thesis we rule out the possibility of retribution<sup>61</sup>, as this might alter the game, and we may no longer be dealing with a Prisoners’ Dilemma game.

The motive for choosing this game-theoretic model is that it will hopefully not only describe what we have already witnessed in part three of this thesis, that hawala is practiced in large parts of the worlds, but also give us an answer as to why, to explain and understand why people behave as they do.

First, we look at a situation with one-sided uncertainty. The two players (a financial intermediary, a hawaladar, and a customer) play the repeated Prisoners’ Dilemma game shown above. Player 1 (hawaladar) is rational, R, and this is common knowledge. Player 2 (customer) is also rational, however, this is *not* common knowledge, and therefore player 2 will be called MR, maybe rational. R assigns a probability  $p$  to whether player 2 is rational and probability  $1 - p$  to player 2 being a mechanical TFT player (Guttman, 1996: 31).

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<sup>60</sup> Although Guttman (1996) does not mention it in his article, one should assume that it would be rational for R to cooperate up until the very last round, and then defect.

<sup>61</sup> Here we are not talking about the kind of retribution that can take place if one player defects in round  $t$  and the other player defects in round  $t + 1$ , as to punish the first player’s deviation in round  $t$ . What we rule out is, for example, the threat of, or carrying out, a physical punishment like cutting of a finger or similar sanctions.

As shown in the aforementioned figure, the two players can either cooperate, C, or defect, D. This is initially their possible actions. When the players choose to act they will have incomplete information. This is due to the uncertainty about the payoffs, because of player 2's possible rationality. Looking at the outcomes and preferences in this game we can conclude that  $a > 1 > 0 > b$ , but if both players prefer a it would be hard to promote cooperation. Here it might be appropriate to assume that perhaps religion or a similar cultural background make the players respect a certain outcome of the game, namely getting one each, when both choose to cooperate.

Guttman's article (1996) uses the equilibrium concept of perfect Bayesian<sup>62</sup> equilibrium (PBE). Perfect Bayesian equilibrium is defined as a "set of strategies and beliefs such that, at any stage of the game, strategies are optimal given beliefs, and the beliefs are obtained from equilibrium strategies and observed actions using Bayes' rule" (Guttman, 1996: 31). A belief is a conjecture about what strategy the other player is using (Watson, 2002: 27). The beliefs represent the players' assessments about each other's types, conditional on reaching different stages in the game (Watson, 2002: 273). In connection with this, Guttman (1996) also adds a constraint to the PBE definition, something called limited history dependence.

"We require that the history of play up to stage  $t$  can have an effect on the players' actions at stage  $t$  only via one of the following routes. First, the history of play will have an impact on the players' (posterior) beliefs at  $t$  and thus in subsequent stages. Second, the number of stages left to be played in the game (and thus, for a fixed game length  $N$ , the stage number  $t$ ) can be a determinant of the players' actions at  $t$ . Third, the actions chosen at stage  $t - 1$  can directly affect actions chosen at  $t$ " (Guttman, 1996: 32).

Further, the article assumes that the two players' beliefs evolve a specific way; as we already know, player 2 is certain that player 1 is rational. Thus, player 2's beliefs must coincide with player 1's equilibrium strategy (Guttman, 1996: 32). Player 1, on the other hand believes with a probability  $1 - p$  that player 2 is a TFT type. If this is the case, it would imply that player 2

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<sup>62</sup> "In game theory, a Bayesian game is one in which information about characteristics of the other players (i.e. payoffs) is incomplete. (...). "In a Bayesian game, the incompleteness of information means that at least one player is unsure of the type (and so the payoff function) of another player." "Such games are called *Bayesian* to account for the probabilistic analysis inherent in the game." "Players have initial beliefs about the type of each player (where a belief is a probability distribution over the possible types for a player) and can update their beliefs according to Bayes' rule as play takes place in the game, i.e. the belief a player holds about another player's type might change on the basis of the actions they have played." ([http://en.wikipedia.org/wiki/Bayes-Nash\\_equilibrium](http://en.wikipedia.org/wiki/Bayes-Nash_equilibrium)).

would never pre-empt<sup>63</sup> and that player 2 will always play player 1's move in the previous stage of the game. If player 2 plays a move that contradicts either of these two limitations, for example not defect after a defection by player 1, player 2 would reveal him- or herself as being rational and player 1 would revise the probability assigned to player 2 being rational from  $p$  to  $1$ . This also means that player 1 initially assigns a probability  $p$  to player 2 being rational, which may be revised to  $1$ , and thus assigns the same probability to actions specified by player 2's equilibrium strategies (Guttman, 1996: 32). As already mentioned earlier, player 2, being the maybe rational player, will hide his or her rationality, in equilibrium, by mimicking a TFT type of player. "Along the PBE path, if player 1 (rational) pre-empts in stage  $t$ , then player 2 (maybe rational) will switch from C to D in stage  $t + 1$ , and will not return to playing C unless player 1 returns to C" (Guttman: 1996: 32). The reason for this is that if player 2 had *not* defected at stage  $t + 1$ , player 2 would have revealed his or her rationality. This would have produced common knowledge about the rationality of both players, thus it would not be any one-sided uncertainty, the game would have ended in joint defection, and player 2 would receive a payoff of zero for the rest of the game. However, player 2 can do better than this. By continuing to defect until player 1 returns to cooperating, the worst that can happen to player 2 is joint defection until the end of the game with a payoff of zero, which is better than receiving a payoff of  $b$ , which is what player 2 would get if he or she got back to playing C before player 1 would go back to playing C, and then zero for the rest of the game (Guttman, 1996: 33). By this we can conclude that with one-sided uncertainty along the PBE path, no player would start playing C then switch to D and finally switch back to C again. In other words, a pre-emption is followed by a joint defection for the rest of the game.

"[This] implies that the PBE can take one of only three forms: (a) both players cooperating for a string of rounds and then simultaneously switching to defection until the end of the game, (b) both players cooperating for a string of rounds and then one player defecting, followed by joint defection for the rest of the game, or (c) joint defection for the entire game.

Corresponding to these three basic equilibrium structures are three strategy options: (a) to pre-empt at some specified stage, (b) to switch simultaneously with the opponent at stage  $t$ , and (c) to wait – i.e. to cooperate until pre-empted, and then to switch to D (implying joint defection for the rest of the game)" (Guttman, 1996: 34).

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<sup>63</sup> Definition of pre-emption: "A switch from C to D by one (and only one) player, either in the first round or following a round in which both players cooperated" (Guttman, 1996: 32).

Let us examine the first situation, where player 1 expects player 2, if rational, to pre-empt at stage  $t$ . Then, if player 1 wants to pre-empt, he or she must do so at stage  $t - 1$ . This results in  $t - 2$  stages of cooperation from both sides. This leaves player 1 with the following expected value of pre-empting at stage  $t - 1$  under one-sided uncertainty.

$$E(\text{pre-empt}) = (t - 2) + a$$

Player 1 will get an expected payoff of one times  $t - 2$  stages of joint cooperation, which gives us the first part on the right-hand side, plus  $a$ , which is the payoff received when defecting at stage  $t - 1$ . “In all following stages (from  $t$  to the end of the game), there will be joint defection, with a payoff of zero” (Guttman, 1996: 34).

Switching simultaneously at stage  $t$ , with his or her opponent, would give player 1 the following expected value under one-sided uncertainty.

$$E(\text{simultaneous switch}) = (t - 1) + (1 - p)a$$

This means that a simultaneous switch will give  $t - 1$  rounds of joint cooperation, each giving a payoff of 1, which is represented by the first term at the right-hand side. The second term represents the fact that player 1 assigns a  $1 - p$  probability to player 2 being of the TFT type. Since a TFT type, by definition, never would pre-empt, player 2 will cooperate at stage  $t$ , the stage that the simultaneous switch occurs. Finally, this gives player 1 an expected payoff at stage  $t$  equal to  $1 - p$  times  $a$ , because  $a$  is the payoff a player would receive if defecting assuming the other player cooperates at the same stage.

If we compare these two expected payoff values, by setting the expected payoff when pre-empting equal to the expected payoff when switching simultaneously and then solving for  $p$ , we will find a condition which tells us what player 1 should do.

$$(t - 2) + a = (t - 1) + (1 - p)a$$

$$- pa = (t - 2) + a - t + 1 - a$$

$$- pa = -1$$

$$p = \frac{1}{a}$$

This means that  $E(\text{pre-empt}) > E(\text{simultaneous switch})$  if and only if  $p > 1/a$  (Guttman, 1996: 35). Only for sufficiently small values of  $p$ , is it optimal for player 1 to switch simultaneously rather than pre-empting. However, there is also a third strategy that player 1 can choose, and that is to wait. The wait strategy has one important advantage. If player 2 is indeed a TFT type, this strategy yields joint cooperation until the end of the game. The intuition is that a TFT type, by definition, never pre-empts, leaving player 1 waiting throughout the game, only to defect at the last stage. Thus, waiting gives us the following expected value under one-sided uncertainty.

$$E(\text{wait}) = (t - 1 + b)p + (N - 1 + a)(1 - p)$$

Where  $1 \leq t < N$  is the stage at which the opponent is expected to pre-empt if he or she is indeed rational (Guttman, 1996: 35). This expected value needs some further explanation. If player 2 is a TFT type, player 1 will defect at the last stage of the game, stage  $N$ . Player 1 will receive a payoff of  $a$  at stage  $N$  and payoff of  $1$  for every stage until  $N$ . By the fact that player 2 will be a TFT type with a probability  $1 - p$ , player 1 gets an expected payoff of  $(N - 1 + a)(1 - p)$ , if player 2 is a TFT type of player. On the other hand, if it turns out that player 1's opponent is rational, player 1 will get an expected payoff of  $(t - 1 + b)p$ .

We can now illustrate the three different expected payoffs in the following figure:

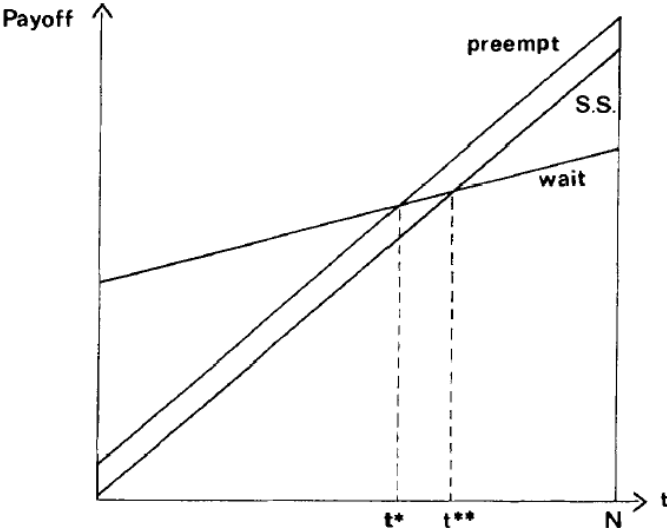


Figure 7: Illustration of expected payoffs when  $p > 1/a$  (Guttman, 1996: 36).

Both figure 7 and 8 is drawn under the assumption that  $t$  is a continuous variable, when in fact it is not, meaning that all lines in both aforementioned figures should actually be dotted lines. Therefore, as a simplification, we will assume that  $t$  is continuous. Figure 7 is also drawn under the assumption that  $p > 1/a$ , and if one wish to illustrate the situation where  $p < 1/a$ , which will be done later in this thesis, all you have to do is to reverse the positions of the curves which represents  $E$  (pre-empt) and  $E$  (simultaneous switch), denoted ‘preempt’ and ‘S.S.’, respectively. All three curves in the figure are linear, which follows from

$$\partial E (\text{pre-empt}) / \partial t = 1$$

$$\partial E (\text{simultaneous switch}) / \partial t = 1$$

$$\partial E (\text{wait}) / \partial t = p$$

when assuming that  $p < 1$ , this means that the slope of  $\partial E (\text{wait}) / \partial t$  is less than unity, and if the  $E$  (wait) function is to intersect the other two functions at some time  $t$  between 1 and  $N$ , the relative positions must be as shown in the figure above (Guttman, 1996: 35). In the figure the stages denoted  $t^*$  and  $t^{**}$  are the stages at which  $E$  (wait) =  $E$  (pre-empt) and  $E$  (wait) =  $E$  (simultaneous switch), respectively.

$$E (\text{wait}) = E (\text{pre-empt})$$

$$(t - 1 + b)p + (N - 1 + a)(1 - p) = (t - 2) + a$$

$$tp - p + bp + N - Np - 1 + p + a - ap = t - 2 + a$$

$$t - tp = -p + bp + N - Np - 1 + p + a - ap + 2 - a$$

$$t(1 - p) = N(1 - p) + p(b - a) + 1$$

$$t^* = N + \frac{p(b - a) + 1}{1 - p}$$

or as in Guttman (1996): 
$$t^* = N - \frac{(a - b)p - 1}{1 - p}$$

$E(\text{wait}) = E(\text{simultaneous switch})$

$$(t-1+b)p + (N-1+a)(1-p) = (t-1) + (1-p)a$$

$$tp - p + bp + N - Np - 1 + p + a - ap = t - 1 + a - ap$$

$$t(1-p) = bp + N(1-p)$$

$$t^{**} = N + \frac{bp}{1-p}$$

The players pre-empt at stage  $t-1$ , while the simultaneous switch occurs at some stage  $t$ , and finally the wait strategy yields that an opponent, if he or she is rational, is expected to pre-empt at stage  $t$ .

“We can now note an important characteristic of the PBE under one-sided uncertainty: an equilibrium in pure strategies does not, in general, exist. To see this, suppose that Rational expects Maybe Rational (if he is rational) to switch from C to D at stage  $t$ . To begin the analysis, let  $t = N$ , and assume, as will usually be the case, that  $t^* < N$  and that  $t^{**} < N$ . Then Rational’s best response is either to pre-empt or to switch simultaneously, depending on whether  $p$  is greater than or less than  $1/a$ . In either case, Maybe Rational, expecting with certainty that Rational will defect at stage  $N-1$  (if  $p > 1/a$ ) or  $N$  (if  $p < 1/a$ ), will find it optimal to defect one stage earlier. But Rational’s best response to this is either to pre-empt or to switch simultaneously, provided again that the defection stage under consideration is still greater than  $t^* - 1$  (for a proposed pre-emption) or  $t^{**}$  (for a proposed simultaneous switch). And again, it will be optimal for Maybe Rational to pre-empt. And so it continues, until Rational expects Maybe Rational (if rational) to pre-empt at a stage at or before  $t^*$  (when  $p > 1/a$ ) or  $t^{**}$  (when  $p < 1/a$ ). If Rational expects Maybe Rational to pre-empt at such a stage, Rational’s best response is to wait – i.e., to ‘pre-empt’ only at stage  $N$ . But then Maybe Rational’s best response is to pre-empt at stage  $N-1$ . And then the cycle would repeat itself. We conclude that there is no PBE in pure strategies” (Guttman, 1996: 36-37).

This implies looking for equilibrium in mixed strategies. In order to characterize this equilibrium, Guttman (1996) notes “all equilibrium strategies have the form ‘cooperate until stage  $t$  and then defect, continuing to defect until the end of the game; if pre-empted earlier than  $t$ , then defect in the following round and do not return to cooperation until the opponent does so” (Guttman, 1996: 37). Further, all equilibrium strategies are denoted  $s_t$ , where  $t$  is



the planned round of pre-emption. This means that the ‘wait’ strategy is denoted  $s_N$ . The ‘simultaneous switch’ strategy is denoted as a pair  $(s_t, s_t)$ , where  $t$  is the stage at which the simultaneous switch occur. The TFT strategy is denoted by  $s_{N+1}$ , due to the fact that a TFT player will never pre-empt (Guttman, 1996: 37). The two players, R and MR, are in Guttman’s (1996) article viewed as being drawn from different populations. The story behind this statement is that Guttman (1996) follows another article by Harsanyi (1973)<sup>64</sup>. Regarding each of the players as being drawn from a population consisting of a variety of types, R will be playing one of the following pure strategies  $s_t$  ( $t = 1, \dots, N$ ), while MR will be playing on of the following pure strategies  $s_t$  ( $t = 1, \dots, N + 1$ ) rather than randomizing across strategies (Guttman, 1996: 37). The equilibrium mixed strategy specifies a population mixture  $(p_1, \dots, p_N)$  of the aforementioned types, where  $p_t$  is the probability that a given rational actor will play  $s_t$  (Guttman, 1996: 37).

“The expected payoff of  $s_t$ ,  $EU(s_t)$ , must be equal, in equilibrium, for all pure strategies whose population proportions  $p_t$  are positive. Given the equality of the (observed) expected payoffs, each rational actor’s choice of a specific strategy  $s_t$  is determined by an unobservable, infinitesimally small, random taste ‘disturbance’ (in Harsanyi’s terminology) from the standard (observed) payoffs” (Guttman, 1996: 37).

Thus we let  $p_t$  denote MR’s subjective probability that R will choose his or her pure strategy  $s_t$ , along the same line we let  $q_t$  denote R’s corresponding probability for MR. Player 2, maybe rational, is sure of player 1’s rationality, which gives us

$$\sum_{t=1}^N p_t = 1$$

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<sup>64</sup> The article “*Games with Randomly Disturbed Payoffs: A New Rationale for Mixed-Strategy Equilibrium Points*”, from 1973, by J. C. Harsanyi examines the hypothesis that equilibrium points in mixed strategies seems to be unstable. This is because any player can deviate without penalty from his equilibrium strategy even if he or she expects all other players to stick to theirs (Harsanyi, 1973: 1).

Player 1, rational, assigns a probability  $p$  to player 2, maybe rational, being rational, which gives us

$$\sum_{t=1}^N q_t = p$$

In Guttman's (1996) article this ends the case of one-sided uncertainty. However, he goes on to state that "with one-sided uncertainty, in any mixed strategy PBE,  $p_t$  is zero for all  $t < t^* - 1$  and  $q_t$  is zero for all  $t < t^* - 2$ " (Guttman, 1996: 37). These results, under one-sided uncertainty, will be used as a framework in the following, more relevant model; the case of two-sided uncertainty.

In the case of two-sided uncertainty, each player is uncertain about his opponents' rationality. Both player 1, the hawaladar, and player 2, the customer, assign a probability  $p$  to the proposition that his or her opponent is rational, and a probability  $1 - p$  to the proposition that the opponent is a TFT type.

Under the case of two-sided uncertainty, one might find it appropriate to discuss the probability  $p$ , assigned to the proposition that the opponent is rational. One might even ask the question if both players assign the same probability to this proposition. In the real world, the hawaladar might assign a larger probability to his or her client being a TFT type. The reason for this could simply be that the hawaladar's business does not necessarily depend on one specific client or customer. On the other hand, the customer may not have any other alternative, and cannot take his or her business elsewhere. If this is the case, the hawaladar might assign a lower probability  $p$  to the proposition that his or her opponent is rational. However, this modest discussion is beyond what this thesis wants to show, and will not be further looked into.

Basically, the story behind this second case is that each individual interacts with the other individual on a one-to-one basis over the course of his or her lifetime. "The interaction of each pair of players consists of playing the Prisoners' Dilemma  $N$  times, and the payoff to each player for this interaction is simply the sum of the player's payoffs for these  $N$  rounds (that is, there is no discounting)" (Guttman, 1996: 38). Guttman (1996) assumes that the probability for being rational,  $p$ , is constant over time. The justification of this assumption can be found in the following excerpt:

“[In this model] the individual’s payoff over this lifetime is the weighted average of the payoffs obtained when interacting with each of the above two types, where the weights are the proportions of each type in the population. The old generation eventually dies, and is replaced by a new generation. The proportion of rational actors  $p$  in the new generation is greater (less) than the  $p$  of the old generation if the expected payoff of the rational actors is greater (less) than that of the TFT types. Thus, eventually, an evolutionary equilibrium may be reached, in which  $p$  is constant over time” (Guttman, 1996: 38).

Some of the results already obtained under the case of one-sided uncertainty can be carried forward to the case of two-sided uncertainty. Along the PBE path, where player 1 pre-empts at stage  $t$ , and player 2 will switch from C to D at stage  $t + 1$  and not return to playing C unless player 1 returns to playing C, can also be generalized to the case of two-sided uncertainty (Guttman, 1996: 38-39). The reason for this is the same as before; if player 1 pre-empts at stage  $t$ , player 2 must defect at stage  $t + 1$ , otherwise, there will be common knowledge about both players’ rationality. Under one-sided uncertainty there will be no so-called loops, that is, one player going from C to D and then back to C. This fact, however, does not readily generalize to the case of two-side uncertainty.

“The difficulty in generalizing this result stems from the fact that if either player (under two-sided uncertainty) pre-empts, he reveals his rationality (since TFT types never pre-empt), and thus converts the game to one of one-sided uncertainty. Thus a pre-emption, followed by a return to cooperation, changes the beliefs of the other player (who did not pre-empt): he now assigns a probability of 1 to the proposition that his opponent is rational. Thus we cannot now assume (by invoking limited history dependence) that the equilibrium in the continuation of the game following a loop will be identical to that of the same continuation had no loop occurred. This implies that, while the initiator of a loop certainly sacrifices payoff over the course of the loop, he may conceivably gain in added payoff in the continuation” (Guttman, 1996: 39).

If a loop takes place in equilibrium under two-sided uncertainty, it will surely be initiated by only one of the players. The reason for this fact is that if both players had simultaneously initiated a loop, and thus revealing their rationality, the game would have continued with a payoff of zero to both. However, if only one of the players initiates a loop the game degenerates to a case of one-sided uncertainty (Guttman, 1996: 39).

There are now two cases for the PBE of the game which begins with a two-sided uncertainty. First, the game does not degenerate to a game of one-side uncertainty and no loop is generated by either player. Second, the game degenerates to a game of one-sided uncertainty by a loop being generated by precisely one of the players. The PBE in the first case contains, by definition, no loops. This means that the threefold characterization provided under the case of one-sided uncertainty can be applied for this case as well (Guttman, 1996: 39-40). The PBE path would then be characterized either by (i) both players cooperating for a string of rounds and then simultaneously switching to defection until the end of the game, (ii) both players cooperating for a string of rounds and then one player defecting, followed by joint defection for the rest of the game, or (iii) joint defection for the entire game (Guttman, 1996: 40). Each rational player has the same three basic strategy options, as before, to pre-empt, to switch simultaneously or to wait, and the expected payoffs to each of these strategies are also as before.

$$E(\text{pre-empt}) = (t - 2) + a$$

$$E(\text{simultaneous switch}) = (t - 1) + (1 - p)a$$

$$E(\text{wait}) = (t - 1 + b)p + (N - 1 + a)(1 - p)$$

The result implying that the expected payoff of the pre-empting strategy exceeds that of a simultaneous switch strategy, if and only if  $p > 1/a$ , is also valid for the case of two-sided uncertainty. “If one player expects his counterpart – if he is rational – to pre-empt in stage  $t$ , then pre-empting his counterpart in stage  $t - 1$  gives a higher equilibrium expected payoff than simultaneously switching in stage  $t$ , iff  $p > 1/a$ ” (Guttman, 1996: 40). Nevertheless, a comparison between the expected payoffs when pre-empting and waiting must be carried out. In the case of one-sided uncertainty we found out that there were generally no pure strategy equilibrium when  $p > 1/a$ , this remains true in the case of two-sided uncertainty. To see why, assume the following scenario: Player 1 expects player 2, if he or she is rational, to defect at a stage  $t$ . Player 1’s best response to this would be to pre-empt one round earlier,  $t - 1$ , or to wait. Considering figure 7, we see that pre-emption is a best response after  $t^*$ , while before  $t^*$  waiting is the optimal strategy.

“Assume momentarily that  $t > t^*$ . Then player 1’s best response is to pre-empt in the previous round. But player’s 2 best response to player 1’s pre-empting in round  $t - 1$  is to pre-empt in  $t$

- 2, if  $t - 1 > t^*$ . And so it continues, until the opponent's pre-emption is expected before  $t^*$ ; then the best response is to 'wait'. But the best response to the 'wait' strategy is to pre-empt in stage  $N - 1$ . And then the cycle repeats itself. If, initially,  $t < t^*$ , player 1's best response to an expected pre-emption by a rational opponent at  $t$  is to 'wait', but the best response to 'wait' is to pre-empt at round  $N - 1$ , and then the pre-emptions again ensue. Finally, if initially,  $t = t^*$ , player 1 will be indifferent between waiting and pre-empting, but whichever he chooses, we would enter the cycle described above" (Guttman, 1996: 40).

We must also look into the case where  $p < 1/a$ . This is the case where the simultaneous switch strategy exceeds the pre-empt strategy. As seen in the figure below, the lines denoted 'S.S.' and 'preempt' in figure 7, have now switched places and are labelled 'S.S.' and 'p-e', respectively. Since the simultaneous switch strategy exceeds the pre-empt strategy, we must compare the expected payoffs of the simultaneous switch and that of the wait strategy. As one can see from figure 8, a simultaneous switch can occur no earlier than  $t^{**}$ . This is due to the fact that the expected payoff from playing the wait strategy exceeds the simultaneous switch strategy up to this point.

$$E(\text{wait}) > E(\text{simultaneous switch}), \text{ for all } t < t^{**}$$

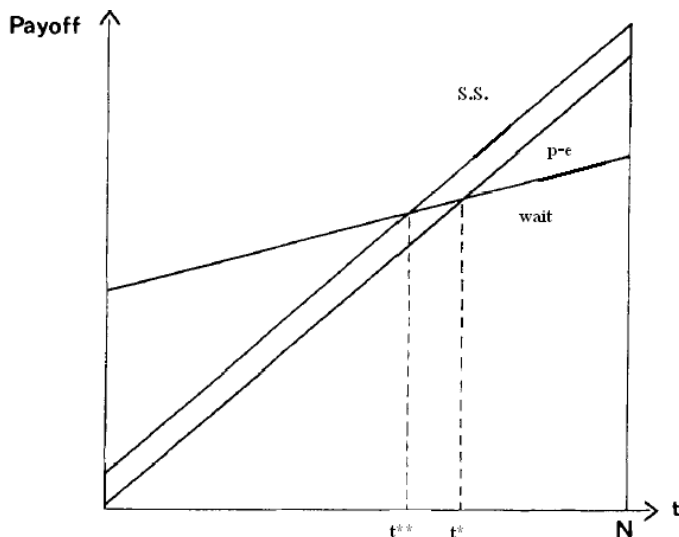


Figure 8: Illustration of expected payoffs when  $p < 1/a$ .

Further on, there exists a pure strategy PBE where the two players cooperate up to and including stage  $N - 1$ , and then switch simultaneously, or defect if you like, at stage  $N$  (Guttman, 1996: 41). To see why the two players would indeed play such a strategy, consider

the following; player 1 expects player 2, if rational, to switch from C to D at stage N. Remembering that a simultaneous switch is always preferred to pre-empting in the case where  $p < 1/a$ , the best response of player 1 is to switch simultaneously, switch from C to D at stage N. “Thus two players, each expecting the other to switch only at stage N, would in fact play such a strategy in equilibrium” (Guttman, 1996: 41). In other words when  $p$  is “small” (in Guttman’s words), that is  $p < 1/a$ , there exists a pure strategy PBE,  $(s_N, s_N)$ , where N is the stage where the simultaneous switch occur. Guttman’s (1996) article goes on establishing that under two-sided uncertainty, the maximum number of stages in which there may be defections in PBE is invariant to the length of the game, N (Guttman, 1996: 41-42).

“There are two cases to consider, (...): (I) the game does not degenerate and no loop occurs, and (II) the game, though beginning with two-sided uncertainty, degenerates to one-sided uncertainty following a loop generated by one of the players. Consider Case II first. There would be two stages, generally early in the game, constituting the loop, in which defections would occur. (The lowest-cost loop to the initiator of the loop is one in which he switches from C to D and immediately returns to C in the following round. The cost of such a loop is  $2 - a - b$ , as compared to the payoff of cooperating over the same two rounds). After the loop, the game becomes a game of one-sided uncertainty, with the initiator of the loop taking the role of Rational and the other player taking the role of Maybe Rational. (...), the maximum number of rounds in which defections may occur in PBE, under one-sided uncertainty is invariant to N. Thus the maximum total number of rounds in which defections may occur in PBE, in Case II, is invariant to N. The corresponding maximum in Case I is  $N - t^* + 1$  when  $p > 1/a$  (...), and  $N - t^{**}$  when  $p < 1/a$  (...) – and both of these are invariant to N” (Guttman, 1996: 42).

After this set up begins the essential part, at least to this thesis, of Guttman’s (1996) article, the evolution of cooperation with rational actors. The basic idea is that rational players consider and think about the actions that the other players in the game might take. This is a wise process, forming an opinion about the other players’ behaviour before deciding one’s own strategy. However, the process of being rational is costly, and the whole purpose is to analyze the evolution of cooperation when there is a cost attached to being rational. Guttman (1996) explains why he chose the model he did with the following motivation:

“If the strategy chosen by the rational actors was a strictly better response to the population mix than alternative strategies, and if there was no costs to optimizing, it is obvious that

rational actors would usually drive mechanical types to extinction. In reality, however, optimizing *is* costly (...)" (Guttman, 1996: 28).

In respect to this thesis, the hawaladar, represented by player 1, forms an opinion about the client's behaviour. This opinion making represents a cost for the hawaladar. The optimizing costs are defined as "...costs of calculating and implementing the optimal strategy" (Guttman, 1996: 43). The costs of optimizing can be divided into fixed and variable costs. The fixed costs, denoted  $c_0$ , represent an investment made before the Prisoners' Dilemma game is reached. This means that a player's type is not a decision variable, but rather a predetermined characteristic of the game. In addition there are two types of variable costs: (a) costs of gathering information, denoted  $c_1$  and (b) costs of calculating the optimal strategy, denoted  $c_2$  (Guttman, 1996: 44). The first type of variable costs can be the likes of registration, licensing, record keeping and filing of suspicious activity reports. These are costs mainly associated with the hawaladar, but the general gathering of information may also apply to the client. In Guttman's (1996) article the first type of variable costs are independent of the length of the game, while, in contrast, the second type of variable costs directly depends on the length of the Prisoners' Dilemma game. An example of the second type could be the cost of counting to the optimal pre-emption stage. Guttman (1996) assumes that this second type of variable cost is constant per round of play, thus the cost of calculating the optimal strategy increases linearly with N (Guttman, 1996: 45).

Had there been no costs associated with optimizing, the rational actors would have driven the mechanical TFT types to extinction. The reason is that a rational actor can always play the TFT strategy. If he or she does not, it is simply because the TFT strategy gives a lower expected payoff than playing the rational strategy. "With no costs of optimizing, the rational actors have an evolutionary advantage over the TFT types" (Guttman, 1996: 48).

This thesis will now look into the evolutionary advantage (in Guttman's terminology) possessed by rational actors and make a comparison with the cost of optimizing. These will in time show that the evolutionary advantage of the rational actors decreases linearly as N, the length of the game, increases. Thus the evolutionary advantage of the rational actors must become negative for sufficiently large values of N (Guttman, 1996: 49). Both these results are obviously obtained under the assumption that optimizing is costly.

By the aforementioned establishment made by Guttman (1996), concerning the maximum number of rounds in which defections in a PBE may occur, increasing N only

enhances the number of rounds of joint cooperation in the first part of the game. However, the length, of what we may call, the end-game, in which defections may occur in equilibrium, is invariant to the length of the whole game,  $N$  (Guttman, 1996: 43). We assume that the players' beliefs at the start of the so-called end-game are the same as they were at the very beginning of the Prisoners' Dilemma game.

“(…), (i) the players' beliefs, (ii) the number of rounds remaining to be played, and (iii) the previous-stage moves (C, C) are all identical at the beginning of the end-games of two games with different lengths ( $N$ ) but whose other parameters ( $a$ ,  $b$  and  $p$ ) are the same. Therefore, the notion of limited history dependence leads us to assume that the equilibria selected in the end-games of these two games will also be equivalent. Given this assumption, the equilibrium payoff of the players in the end-game will be independent of  $N$ , (…)” (Guttman, 1996: 43).

Another important matter is, if there are optimizing costs that rational actors can avoid; that would be costs of calculating and implementing an optimal strategy. These costs must be taken into account when analyzing the behaviour of the rational actors. “In particular, if these costs (… ) exceed the benefits of playing optimally rather than simply playing ‘tit-for-tat’, then a rational player will optimize by playing tit-for-tat just as if he were a true TFT type” (Guttman, 1996: 43). This matter will reduce the evolutionary advantage of the rational actors. “(…) and even make it negative, if there are also ‘fixed’ costs of being rational that are incurred even without playing the optimal strategy” (Guttman, 1996: 44). This is very interesting concerning the overall purpose of this thesis. Again one may interpret these fixed costs as registration, licensing, record keeping and filing of suspicious activity reports. Because of these costs, the hawaladar, representing the rational actor, chooses to play the strategy of a TFT type. The client, already established as a TFT type, chooses to begin the game by cooperating. In turn, this leads to a joint cooperation in our Prisoners' Dilemma game, which is basically what we want to show. This might sound a little too simplistic, so let us now formalize the result.

We analyze a game that will not degenerate to a game of one-sided uncertainty. This means that immediately after one player pre-empt or both players choose to switch simultaneously, the subsequent equilibrium will be joint defection for the remainder of the game (Guttman, 1996: 45). The second type of variable cost,  $c_2$ , will be incurred to the rational player's payoff only as long as he or she cooperates. “In particular, the payoff of 1 in the CC cell of Fig. 1 [Fig. 9 in this thesis] should now be interpreted as the player's payoff *net*



of  $c_2$ , and the (negative) payoff of  $b$  [in the CD cell], (...), should be interpreted as including this cost" (Guttman, 1996: 45). This gives us the following matrix for a rational actor.

	C	D
C	(1, 1)	(b, a)
D	(a, b)	(0, 0)

Figure 9: The rational type's payoff matrix (Guttman, 1996: 31).

In order to obtain the corresponding outcomes in the TFT type's payoff matrix, the second variable cost,  $c_2$ , must be added to the same payoffs, one and  $b$ . This is due to the fact that the TFT type, being a mechanical actor, does not incur any optimizing costs to his or her strategy (Guttman, 1996: 45).

	C	D
C	(1, 1 + c2)	(b, a)
D	(a, b + c2)	(0, 0)

Figure 10: The TFT type's payoff matrix.

First we consider the case where  $p > 1/a$ , and let  $T$  denote the last round in which  $p_t > 0$  in the mixed strategy PBE (Guttman, 1996: 46). The expected payoff of the rational actors will then be

$$EU(s_T) = \sum_{\tau=1}^{T-1} p_{\tau} (\tau - 1 + b) + p_T (T - 1) + (1 - p)(T - 1 + a) - c_0 - c_1$$

Where  $p_T$  is the probability that a given rational actor plays the pure strategy  $s_T$ .

The expected payoff of the TFT types will be:

$$EU(TFT) =$$

$$\sum_{\tau=1}^{T-1} p_{\tau}[(\tau-1)(1+c_2) + b + c_2] + p_T[(T-1)(1+c_2) + b + c_2] + (1-p)N(1+c_2)$$

$$\Delta EU = EU(s_T) - EU(TFT)$$

= The difference in expected payoff of the rational and the TFT types.

$$\Delta EU = - \sum_{\tau=1}^{T-1} p_{\tau} \tau c_2 - p_T(b + c_2 T) + (1-p)[a - 1 + T - N(1+c_2)] - c_0 - c_1$$

This gives the evolutionary advantage of the rational actors when  $p > 1/a$ . This advantage will be positive when there are no costs of optimizing for the rational actors.

“(…), assume momentarily that  $T = N$ . In other words, assume that the ‘wait’ strategy,  $s_N$ , is played with positive probability. Then, given that  $a > 1$ ,  $b < 0$ , and  $c_0 = c_1 = c_2 = 0$ , the r.h.s. (…) is clearly positive” (Guttman, 1996: 46).

Let us now see how this evolutionary advantage of the rational actors evolves as  $N$  increases. In doing so, Guttman’s (1996) article assumes that the equilibrium selected in the so-called end game does not vary as  $N$  varies, provided that the other parameters ( $a$ ,  $b$  and  $p$ ) are constant. “Thus the only term (other than  $N$  itself) that varies with  $N$ , (…), is  $T$ .” “Since the length of the end-game is constant as  $N$  varies (…),  $T$  increases directly with  $N$  - i.e.,  $\Delta T / \Delta N = 1$ ” (Guttman, 1996: 46). We obtain the following expression.

$$\frac{\Delta(\Delta EU)}{\Delta N} = -c_2[p_T + (1-p)] < 0,$$

where we assume that  $c_2 > 0$ . This being the case, we confirm that the evolutionary advantage of the rational actors decreases linearly with  $N$ . It must even become negative for sufficiently large values of  $N$  (Guttman, 1996: 46).

Let us now consider the other, alternative, case where  $p < 1/a$ . As already indicated we have a pure strategy PBE where the two players cooperate up to and including stage  $N - 1$ , and then switch simultaneously at stage  $N$ . Guttman (1996), in his model, introduces a new parameter,  $K$ , which is defined as the “number of rounds before round  $N$  at which the rational actors simultaneously switch from  $C$  to  $D$ ” (Guttman, 1996: 47). We now obtain the following expected payoff of the rational actors

$$EU(R) = N - K - 1 + a(1 - p) - c_0 - c_1$$

The rational actors will get an expected payoff of  $N - K - 1$  times one, plus a payoff of  $a$  with the probability  $1 - p$  and minus the fixed costs and costs of gathering information, the first variable cost.

The expected payoff of the TFT types will be

$$EU(TFT) = [(N - K - 1)(1 + c_2) + b + c_2]p + N(1 + c_2)(1 - p)$$

A TFT type will get an expected payoff of  $N - K - 1$  times one plus  $c_2$ , plus  $b$  plus  $c_2$ , all this with the probability  $p$ . Or he or she will get  $N$  times one plus  $c_2$ , with probability  $1 - p$ . To follow up in the same manner as we did in the case where  $p > 1/a$ , we must consider the difference in expected payoff values. Subtracting  $EU(TFT)$  from  $EU(R)$  gives us the following expression.

$$\Delta EU = EU(R) - EU(TFT)$$

$$\Delta EU = -Nc_2 - (K + 1)[(1 - p)(1 + c_2)] + a(1 - p) - (b + c_2)p - c_0 - c_1$$

Here we see that the right hand side of the expression above decreases as  $K$ , the number of rounds before round  $N$  at which the rational actors simultaneously switch from  $C$  to  $D$ , increases.

$$\frac{\Delta(\Delta EU)}{\Delta K} = -[(1 - p)(1 + c_2)]$$

Let us again see how  $\Delta EU$  varies with  $N$ . Remember that  $K$  is invariant to  $N$ , by the assumption already established; the equilibrium selected in the so-called end game is invariant to the length of the game,  $N$  (Guttman, 1996: 43).

$$\frac{\Delta(\Delta EU)}{\Delta N} = -c_2 < 0$$

Again we find that the evolutionary advantage of the rational actors is decreasing linearly with  $N$ . “If  $c_2 > 0$ , this evolutionary advantage decreases linearly as  $N$  increases, and thus must become negative for sufficiently large  $N$ ” (Guttman, 1996: 48). This result from Guttman’s (1996) article is based on the assumption that the rational actors continue to choose an optimizing PBE strategy, despite the costs of optimizing (Guttman, 1996: 48). However, if playing an optimizing PBE strategy would get too costly, in comparison with a simple TFT strategy, for the rational actors, one would presume that they would simply play a TFT strategy instead.

When taking an evolutionary perspective into account, this thesis has showed that, in the presence of optimizing costs, the TFT types will survive in competition with the rational actors, conditioned on the number of rounds in the Prisoners’ Dilemma game,  $N$ , being sufficiently large. The result implies that playing the TFT strategy will dominate the rational strategy in the long run.

### **Concluding Remarks.**

This thesis has explored what informal value transfer systems are, how they work, both in theory and in practice, and their scope both past and present. The thesis has also provided a theory describing how these informal value transfer systems could work, regardless of their informal nature. The theory describes the evolution of cooperation when there are positive costs of optimizing. The main result is that, in the presence of optimizing costs, the TFT types will survive in competition with the rational actors, conditioned on the number of rounds in the Prisoners' Dilemma game,  $N$ , being sufficiently large. The result is based on the assumption that being rational is costly, while, on the other hand, being a TFT type entails no cost.

Guttman (1996) discusses an especially interesting implication of the theory presented above, which may be helpful explaining why informal value transfer systems have their origin in developing economies.

“The theory implies that increases in geographical mobility, by decreasing the number of interactions in PD-type encounters between individuals, will increase the relative evolutionary advantage of the rational actors and thus decrease the degree of voluntary cooperation. Since economic development is generally accompanied by an increase in such mobility, we would therefore expect a decrease in voluntary cooperation over time in developing economies” (Guttman, 1996: 51).

As economies evolve and get more sophisticated, the motivation for practicing the likes of, for instance, hawala may be vanishing. However, this is only one side of the story. Some informal value transfer systems have proved to survive despite of economic development. Another fact is that IVTS are highly adapted for changes, such as economic crisis, turmoil and war. Nevertheless, Guttman's (1996) implication is fascinating in many aspects. An article presented at the Bangladesh Economic Association and International Economic Association Conference in 1998 (Yunus, 1998) on the topic of creating a poverty-free world, touches upon an important critique on economic theory dealing with the topic of interest. The article talks about how the majority of people in third world countries often make a living through self-employment, and because certain economic theories have no room for self-employment, it is placed in the category of the so-called “informal sector.” “Just because it [economic theory] does not have analytical tools to cope with this situation it concluded that this is not a desirable situation; this is a symptom of primitiveness of an economy” (Yunus, 1998).

However controversial this might sound, the article goes on to state that the “informal sector” is the creation of the people, and not of any economic theory. The “informal sector” is further the people’s own effort of creating a livelihood (Yunus, 1998). For the sake of the argument assume that IVTS are a part of the so-called “informal sector.” This would imply that IVTS might be a creation of the people and thus not of any economic theory, and could possibly be an explanation as to why there is no economic theory *fully* portraying informal value transfer systems.

Guttman’s (1996) theory on cooperation in the Prisoners’ Dilemma game is far from the only one on this subject matter. Some theories (Richards, 2001; Axelrod, 1984 and 1987 in Moore, 1997) use a model of an indefinitely repeated Prisoners’ Dilemma. These theories show that if the discount rate<sup>65</sup> is low enough and the probability of meeting the same individual one dealt with at the first encounter is high enough, choosing to cooperate on the first iteration and following the TFT strategy will generate equilibrium and, typically, the best outcome. Particularly Richards (2001) shows that if the game is repeated indefinitely, with discounting or with a constant probability of another round, the mutual gains of cooperation can be sustained by the use of conditionally cooperative strategies, in which players’ cooperation hinges on their actions being reciprocated by other players (Richards, 2001: 621).

Other theories follow in Guttman’s (1996) footsteps by showing cooperation in short horizon repeated games. Conlon (2003) is one example. He presents a finitely repeated Prisoners’ Dilemma model, where it can take an extremely long time before the players learn the Nash equilibrium of the game, which is to always defect (Conlon, 2003: 36). The players may start off by playing the cooperative strategy, however, if their opponents turn out to be non-cooperative, the players will eventually learn this and cooperation breaks down. “(...), if cooperation lasts through most of the game, then it becomes likely that one’s opponent is a relatively cooperative grim type.” “It is therefore rational to cooperate through period  $T - 1$ , so the backwards induction unravelling never gets started” (Conlon, 2003: 42).

Telser (1980) examines the topic of self-enforcing agreements. The article comes to a somewhat different conclusion than the article by Guttman (1996). In Guttman’s article the length of the game,  $N$ , is known to both players. “Both players know when the game will end, (...)” (Guttman, 1996: 30). In contrast, Telser’s (1980) article concludes that “self-enforcing agreements are not feasible if the sequence of occasions for transactions has a definite known

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<sup>65</sup> The discount rate is normally a number between zero and one. It is a multiplicative number used to deflate a certain payoff received tomorrow so that it is comparable with a certain payoff received today (Watson, 2002: 183).

last element (Telser, 1980: 44). The article goes on stating that although the game will end sooner or later, this must be uncertain in order to sustain a self-enforcing agreement (Telser, 1980: 44).

Although some theories say that cooperation is only possible in repeated Prisoners' Dilemma games where the expected number of repetitions is indeterminate, while others state that cooperation is possible in a finite repeated Prisoners' Dilemma game, what is common, and what is most important, for all these theories are that cooperation can be accomplished in a repeated Prisoners' Dilemma game.<sup>66</sup>

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<sup>66</sup> Given, of course, certain stated assumptions.

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## **Appendix.**

A.1. A Sample Contract from Maimbo (2003, 32-33).

### **Agreement between Ismail Zaman Relief Fund Afghanistan And Hassan Radwan Money Exchange<sup>18</sup>**

This contract is drawn up between Ismail Zaman Relief Fund and Hassan Radwan Money Exchange desiring to set forth the following understanding that will govern supplying of US\$, Pakistan rupees and afghanis to Ismail Zaman Relief Fund. As crossing the border is still an unresolved issue, it was agreed through both sides that the payment will be done in Pershwar office based on electronic communication system, that is fax plus password file for confirmation

#### **Responsibilities of Hassan Radwan Money Exchange**

1. To provide Ismail Zaman Relief Fund offices with afghanis, Pakistani rupees and USD in 6 hours from Kabul and within 12 hours for the respected provinces after requisition through Ismail Zaman Relief Fund as:
  - For Kabul office: a) by faxing through Ismail Zaman Relief Fund, with commission of 0.65 percent.
  - For Ghazni office: a) by faxing through Ismail Zaman Relief Fund, with commission of 2.0 percent
  - For Logar office: a) by faxing through Ismail Zaman Relief Fund, with commission of 1.0 percent
  - For Gardez office: a) by faxing through Ismail Zaman Relief Fund, with commission of 2.0 percent
2. To provide Ismail Zaman Relief Fund with exchange rate of afghanis/Pakistan rupees equal or higher than the Money Changers in the open currency exchange market. Hassan Radwan will be requested to observe collection of exchange rate quotations through Ismail Zaman Relief Fund key staff.
3. To inform Ismail Zaman Relief Fund about any problem, which may cause delay in, the cash being delivered beyond 24 hours of the time of requisition.
4. In the case of cash being provided late (i.e., more than 24 hours after being requested despite Hassan Radwan signing that he will provide the money), than, the exchange rate offered will be revised again (at the time of delivery). If the second exchange rate is unfavorable to Ismail Zaman Relief Fund, then Hassan Radwan should agree to provide at the original agreed rate.
5. The bank notes that are provided must be legal tender and must not be damaged.

6. Invalid/damaged notes of all types of currencies should be changed with newer ones.
7. In case Hassan Radwan can not provide the amount Ismail Zaman Relief Fund wants, he should submit something in writing to care stating his excuse based on which Ismail Zaman Relief Fund can ask the second money dealer to provide the needed amount onwards.

#### **Responsibilities for Ismail Zaman Relief Fund**

1. To request money from Hassan Radwan 6 hours in advance for Kabul and 12 hours in advance for different provinces of the time being required informing Hassan Radwan of the exchange rate to be used.
2. Reimbursement of the same amount plus commission charge as mentioned in the first item of Hassan Radwan's responsibilities.
3. IF the money paid to Ismail Zaman Relief Fund is in Rupees and Afghanis, then the refund will be in Pakistani rupees and if the money paid to Ismail Zaman Relief Fund is in USD, then the refund will be in USD.
4. Ismail Zaman Relief Fund faxes the receipt documents to its main office in Peshawar and it bears the fax charge too.
5. Ismail Zaman Relief Fund will undertake to count the money it received as quickly as possible.

#### **General**

This contract will remain valid for three months effective from signing date onward. If either party wishes to change the contract, then, they must inform each other in written notice at least three weeks in advance by either side. This contract will be extended with the same terms and conditions when both sides agree after the validation of the contract.

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**For Ismail Zaman Relief Fund Afghanistan**

**Name:**

**Title:**

**Date:**

**For Hassan Radwan**

**Name:**

**Title:**

**Date:**

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