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Economics of savings-based finance: an interest-free model of rotating savings and credit association in Turkey

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Abstract

Purpose – The emerging markets have been witnessing a remarkable revival of rotating savings and credit associations (ROSCAs) serving as alternative informal financing and investment platforms, also known as savings-based finance (SBF) in Turkey. The purpose of this study is to present the SBF model mathematically, analyse the performance of the SBF sector and propose a new Sharīʿah-compliant SBF model for the acquisition of durables

Design/methodology/approach – The paper thoroughly reviews the concept and practice of ROSCA across the globe, mathematically models and empirically analyses the performance of Turkish SBF companies using a unique data set.

Findings – The study formulates a two-person SBF model and proposes a Mudarabah-Wakalah hybrid model with a new investment feature. It is found that the concept of ROSCA is being operationalized in 105 countries across the globe under different names with slight business model modifications. The research also reveals that the demand for financing of durables in Turkey significantly increased in recent years with the demand for housing is twice greater compared to vehicles. Most importantly, a strong significant inter- and intra-comovement is observed between these durables implying that the success of the sector in one segment has attracted the customers to other SBF products. It shows that the SBF institutions can effectively serve as the alternative financing houses for pooling savings and financing the durables, and they have strong potential to capture a larger financial market share in Turkey and even globally.

Originality/value – The study constructs mathematical models and proposes a new investment wing to an existing SBF wealth fund.

Keywords Housing, Islamic finance, Informal finance, ROSCA, SBF

Paper type Research paper

1. Introduction

Understanding savings-based finance (SBF) requires comprehending the concept of informal financing, widely known as *rotating savings and credit association* (ROSCA). It is an informal organization formed by the local community with the purpose of saving, risk-sharing and borrowing (Adams and de Sahonero, 1989, p. 219). The importance and popularity of this association can be explained by its leading role in various informal sectors' financing activities, mostly in African and Asian developing countries (Lelart, 1990; Ardener and Burman, 1995; Umuhire and Nyssens, 2013).

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1.1 The concept of rotating savings and credit association and savings-based finance

The term "rotating credit association" was first introduced and used by Geertz (1962, p. 243), who described ROSCA as follows:

> The basic principle upon which the rotating credit association is founded is everywhere the same: a lump sum fund composed of fixed contributions from each member of the association is distributed, at fixed intervals and as a whole, to each member in turn.

There is no universally recognized definition of ROSCA in the literature. Yu (2013, p. 2) defined it as "financial self-help groups that collect multiple contributions from their members across time and allocate merged funds back generally in rotation". The precise definition of ROSCA is given by Ardener (1964, p. 201): "An association formed upon a core of participants who agree to make regular contributions to a fund which is given, in whole or in part, to each contributor in rotation."

ROSCA can be formed in numerous ways. For instance, a group of 10 people meets every month and each contributes 100 Turkish lira (TL) to a pool. In the same first meeting, the collected 1,000 TL is handed over to one of the members of the group. In the following month, another member receives the same amount and it rotates until the last person gets the fund. Basically, the member who receives 1,000 TL in the first meeting becomes a debtor to all other participants until the project is over. On the other hand, the last member becomes a creditor to all others throughout the life of the project (Ardener, 1964, p. 201).

The concept of ROSCA would remain ambiguous without discussing the Japanese term *Kou*[1] for a simplified version of ROSCA and loan association and group savings, first documented back in 1275 A.D. in Japan. Surprisingly, the basic structure of the *Kou* has not significantly changed, except for a little modification introduced in modern times (Izumida, 1989, p. 2). The structure of the *Kou* contract was described in 1345 A.D. as follows (Ginkou, 1967, p. 21):

- "Members made a written contract at the first meeting and agreed to abide by the rules of the *Kou*.
- Members had the duty to pay a certain amount of money at each meeting, except at the meeting when they received the fund. If a member who had not received a fund did not fulfil all the obligations of being a *Kou* member, he or she lost the right to draw a fund. Members who had received funds and later defaulted on their obligations suffered compulsory exclusion from the group and also were punished in other ways.
- Rotation of the fund was determined by lot.
- Members who had received a fund had no right to participate in further drawing but must meet their payment obligations. To guarantee that they continued to pay into the fund, members were sometimes required to offer two cosigners who were members of the association.
- Members met two or three times a year.
- After all, members had received a fund, the *Kou* might be disbanded".

Interestingly, the modern ROSCA framework is founded on a similar *Kou* contract structure and has got familiarity and acceptance by communities across the globe by accommodating the culture and customs of the societies. Noticeably, this association mainly focuses on the micro-level of society in the form of small institutions or small informal groups to fulfil the micro needs of individuals. However, recently, a similar concept has emerged in the Turkish economy, known as SBF which primarily concentrates on demand for housing and vehicles.

1.2 Status of rotating savings and credit association and savings-based finance globally and in Turkey

We found the presence of ROSCA in 105 countries, running similar operations under different names – e.g. Azerbaijan, *lotto*; Australia, *suit clubs*; Bangladesh, *samity*; Brazil, *pandero*; Canada, *banker ladies*; China, *hui*; DR Congo, *restourne*; England, *diddlums*; Ethiopia, *equb*; Ghana, *susu*; India, *chit funds*; Japan, *kou*; Kazakhstan, *chernaya kassa*; Lebanon, *al-tawfir el medawar*; Maxico, *tanda*; Pakistan, *bisi*; Suriname, *kasmonie*; South Africa, *Stokfel*; Turkey, *Sandik*; USA, *cundina*; Zimbabwe, *chilemba* [see *Appendix* for details]. However, due to its similar concept and nature, regionally, this association is familiar as follows: Latin America, *tandas*; Middle East, *gam'eya*; Swahili-speaking East Africa, *chama*; West Africa and the Caribbean, *susu* and *tontines*. The acceptance of this informal institution in many developing countries was mainly for the heavy indebtedness and extricable difficulties in accessing the formal financing with the substantial rise in interest rates during the 1980s, which ultimately led people to rely on the alternative sector – ROSCA – to use their domestic savings to improve their micro status.

Despite having a long history of ROSCA in the world economy, the presence of SBF, an alternative form of ROSCA, is relatively new in Turkey. Though there is a record of an institution, known as *Yapı Tasarrufu*, which commenced its operation in 1951, the corporate operation vastly began by the inauguration of *Eminevim* in 1991; *DoğruEvim* was the latest addition in the list of SBF companies in 2019. By 2020, the number of SBF companies reached 39, while *Yapı Tasarrufu,* which ceased its operations. Over the past three years, the number of these institutions mushroomed and increased by three dozen. The SBF companies and their years of the foundation are shown in Table 1.

However, recent developments in regulations on SBF companies have dramatically changed the course of the SBF system in Turkey. Accordingly, the new Law acknowledges the significance of SBF and introduces it as a dynamic and promising sector in the Turkish economy.

Upon the publication of the new regulation in the Official Gazette on 7 March 2021, the Amendment of the *Law on Leasing, Factoring and Financing Companies* [No.7292] entered into force. Under this edition, the Law's name has changed to "Law on Leasing, Factoring, Financing and Savings Financing Companies". The law comprises several new clauses such as incorporation requirements; prohibited activities; mergers, transfers, divisions, liquidation; precautionary measures; savings finance agreement; savings finance activities; financial institutions association; sanctions; revocation of operating licence and liquidation and transition period (BRSA, 2021a).

Among all amendments, the requirement of having at least TRY 100m as minimum capital for incorporation has radically reduced the number of SBF companies (BRSA, 2021b) – from 40 to only 6 companies (as highlighted in Table 1 with stars).

The main objective of this study is to explain the economics of SBF, analyse the performance of SBF companies and propose a Sharīʿah-compliant *modus operandi* for fund accumulation and distribution. In doing so, we mathematically design the SBF framework (based on a two-person model) and empirically analyse the operations of SBF companies in Turkey.

The research thoroughly reviewed the concept of ROSCA, formulated the SBF model mathematically, described the current business scenarios and analysed the economic role and performance of SBF companies. Besides, it proposed a new Sharīʿah-compliant SBF model for the acquisition of durables. The findings suggest an increase in the number of SBF participants and contracts with high delivery of durable assets. Noticeably, the growing demand for housing and automobiles shared similar patterns. The remarkable

Table 1. List of SBF companies in Turkey and foundation year (as of December 2020)

No	Company	Year	No	Company	Year
1	YapιTasarrufu	1951	21	İkizlerEvim	2020
2	Eminevim ☆	1991	22	Mesken Finans	2020
3	Fuzulev ☆	1992	23	Gelecek Tasarruf	2020
4	Birevim ☆	2016	24	YeniEvim	2020
5	Hedefevim	2017	25	İhtiyaç Evim	2020
6	Finansevim	2018	26	İstekevim	2020
7	Katιlιmevim ☆	2018	27	Varlιk Evim	2020
8	Destekevim	2018	28	Pamukevim	2020
9	Tasarruf	2019	29	Önce Evim	2020
10	Birikimevim	2019	30	Sinpaş YTS ☆	2020
11	Vizyonevim	2019	31	Güvenilir Evim	2020
12	Morevim	2019	32	EzogelinEvim	2020
13	Yaşamevim	2019	33	Birlik Birikim	2020
14	Vakιfevim	2019	34	Karli Evim	2020
15	Çözüm Tasarruf	2020	35	EleleEvim	2020
16	DoğruEvim	2020	36	Hayat Tasarruf	2020
17	İmece ☆	2020	37	Benim Evim	2020
18	Değer Tasarruf	2020	38	Gerçek Evim	2020
19	FinalEvim	2020	39	Helal Evim	2020
20	İktisatEvim	2020	40	Güvence Evim	2020

Note: *Companies survived the new regulation (Law No.7292) that came into force on 07 March 2021
Source: Authors

growth of the sector can be explained by price competitiveness, product simplicity and Shariah compliance with SBF models. However, with the new regulation, the number of SBF companies drastically reduced to six only, reflecting the stringent capital and other requirements. Nevertheless, it is expected that formalizing the SBF system will strengthen the sector in Turkey.

The remainder of the paper is organized as follows. Section 2 reviews the literature on ROSCAs. Section 3 explains the theory of ROSCA and its practice across the world. Section 4 describes the methodology of the study. Section 5 formulates and provides the SBF models. Section 6 illustrates the proposed fund accumulation and distribution framework for SBF companies in Turkey and Section 7 explains scenarios of the possible relationship among participants, contribution and fund as well as statistical scenarios of SBF companies. Finally, Section 8 concludes the study.

2. Literature review

2.1 Saving-based finance

Over the past decade, though the concept came to existence in 1990, SBF companies have been playing a significant role in the Turkish economy. There is a growing body of literature that recognizes the importance of SBF as an alternative interest-free financing model. The SBF is an arrangement by a group of people who agree that each of them contributes a specific amount of money, to be used to meet each participant's targeted amount of financing needs, based on mutual solidarity and collaboration. The model is similar to the contractual savings concept, with the main motive of matching the positive savings with the negative savings for the total targeted amount on *Wakalah* (agency) basis (Dinç *et al.*, 2019). Ergüven and Kaya (2016) defined the SBF system as a model of cooperative activity, based on the characteristics of solidarity and the joint fulfilment of common needs. Some studies simply define the system as an interest-free housing finance model (Kumbasar, 2016; Ersin and Duran, 2017). The SBF operation was inaugurated in 1991 and since then it has been evolving at a significant pace.

The economics of ROSCA or SBF has been analysed and discussed in numerous studies from different angles and different countries; most of the research conceptualized focusing on the random or non-binding ROSCA model developed by Besley *et al.* (1993). While some studies primarily describe the concept and framework of ROSCA (Ardener, 1964), others analyse locally practised versions of it, under alternative names, in different countries (Mushuku and Mayisa, 2014; Bouman and Harteveld, 1976; Gamble, 1944). However, some research studies have particularly simplified the model of ROSCA and simplified its economic theory and philosophy. Geertz (1962) analysed ROSCA institutions from across the globe, both underdeveloped or semi-developed countries, from Japan on the East (including Southeast Asia and India) to Africa on the West. Its root even proliferated into society level based on the social order: caste-based and patrilineal, in rural settings (Bouman, 1984) and cities (Adams and de Sahonero, 1989). The ROSCA has been practised in various aspects of the economy, e.g. commerce (Little, 1972), income-smoothing (Sethi, 1995) and consumption (Mayoux and Anand, 1996). From religious demography, this concept was well-known among Muslims (Bouman and Moll, 1992; Srinivasan, 1995), Christians (Mayoux and Anand, 1996), Confucians (Wu, 1974) and Hindus (Sethi, 1995).

Handa and Kirton (1999) empirically analyse the economics of "Partner" (a form of ROSCA) in Jamaica based on the theoretical framework of ROSCA and found considerable support for the ROSCA's economic theory – i.e. the sustainable nature of ROSCA is augmented significantly by providing the payments to ROSCA leader; the contractual agreement between the ROSCA leader and other members is "transaction cost minimizing – i.e. when the degree of asset specificity is higher, the contract is more flexible". Yu (2013) discusses the plausible design of ROSCAs for small business entrepreneurs by explaining its various types, e.g. random, discount bidding, premium bidding and fixed ROSCAs. He mentions that "while random and discount bidding ROSCAs improve upon autarky, premium bidding ROSCAs and some particular fixed ROSCAs can further establish efficiency despite incomplete information about investment returns".

Klonner (2006) develops a model of lending to borrowers who are considered too risky and with limited liability and examines two alternative situations considering available information. He claims that when the risk of an individual is open to the public, the competitive bidding of ROSCA is as efficient as the credit market. The finding is more strong when the same risk of the individual is publicly unknown, i.e. random or bidding ROSCA is more efficient than the credit market. On the other hand, a similar study was done by Besley *et al.* (1994), who provide a different scenario, where the credit market is more efficient for individuals than bidding ROSCA; however, in the case of the random ROSCA model, the finding supports the results of Klonner (2006) – i.e. "a random ROSCA may sometimes yield a higher level of ex-ante expected utility to prospective participants than would a credit market" (Besley *et al.*, 1994).

Anderson and Baland (2002) examine the reasons for individuals to participate in ROSCA and claim that members of this association are mostly women from Kenyan *slum* (Nairobi) who have an independent income but live in a couple. The study presumes, based on conflicting interactions within the household, the reason for women's participation in ROSCA is to secure their savings from their husbands' immediate consumption. Along with other objectives, Cope and Kurtz (1980) focus on the findings of Ardener (1964) and describe the applied observation in the study on the criteria of membership in ROSCA – i.e. the probability of one or more criteria for being a member in a rotating credit association. Biggart (2001) analyses ROSCA in Bangladesh, where there is a well-established micro-credit system developed by Grameen Bank, to detect "social structural characteristics associated with successful peer group lending arrangements". To comprehend the importance of credit institutions, he considers the utility of an economic sociology approach.

2.2 Evolution from rotating savings and credit association to savings-based finance

From the discussion above, it is conspicuous that the concept and practice of ROSCA in communities is not just a recent phenomenon; rather, it has a long history of using a method of acquiring real household assets and facilitating social constructs (e.g. marriage) by accumulating funds. Considering the practice of the method, ROSCA's evolution process can be classified into five phases (Figure 1):

(1) before the emergence of the banking system,

(2) from the emergence of the banking system to Second World War,

(3) from Second World War to the 1970s,

(4) 1970s to 1990s and

(5) 1990s to present.

According to Ardener (1964), the practice of ROSCAs was found among the small groups of people in China back in 200 BC (Mushuku and Mayisa, 2014). Afterwards, based on the oldest Japanese documents, the basic ROSCA structure is traced back to the twelfth or thirteenth century, known as the *Kou* system. Noticeably, the structure of *Kou* is reflected in the modern ROSCA system with only a slight modification (Ginkou, 1967, p. 21).

In 1775, Ketley's Building Society, a similar concept to ROSCA, was practised among the people of Birmingham in the UK, which was later named "Building-Savings Fund" (Drews, 1991). In the nineteenth century, this practice was widespread among many countries across the globe – e.g. "Oxford Provident Building Association" was established in Frankford, PA, in 1831. Afterwards, the concept became popular in British colonies, especially in Australia (1858) and South Africa (1855) (Lehmann, 1970).

After Second World War, this practice got a tremendous pace and acceptance. In this continuation, different countries of Europe began practising similar models – e.g. Austria, Bulgaria, Czechoslovakia, Greece, Holland, Romania and Switzerland. In 1951, the German Building-Savings Fund System ("Bausparkassen" or BAU) was founded by the Turkish Real Estate Loan Bank (*Turkiye Emlam Kredi Bankasi*). However, due to some legal complications as well as economic and political turmoils of the time, the system could not successfully operate (Ergüven, 2021). Despite the Turkish downturn experience, the other parts of the globe were still practising the ROSCA, a similar concept to BAU, to fulfil their needs for household real assets and facilitate social constructs.

Source: Authors

Figure 1.
Evolution of SBF

After the 1970s, the emergence and acceptance of retail financing among people got its momentum in the financial sector, which bolstered the acceptance of ROSCA across the globe, resulting in the plantation of the seed for the SBF system in the 1990s.

In the 1990s, the ROSCA sector experienced a paradigm shift through the inclusion of a cooperation system, primarily used for buying vehicles in Turkey. Afterwards, this system was named "Savings-based Finance" (called "Tassaruf Finansman" in Turkish]. Through this shift, ROSCA entered into a new era, from micro to macro demand – e.g. from household durables to real properties, by a corporation called "Eminevim" and received immediate attraction from customers, resulting in the dramatic increase in the number of SBF companies – almost 40 registered companies by the year 2020 (Table 1).

2.3 Rotating savings and credit association and savings-based finance from the Islamic perspective

Aforementioned literature mainly analyses the concept and various frameworks of ROSCA explains the socioeconomic issues and formulates its pure economic model. However, there are few studies that present the bank-based ROSCA model and scrutinize the concept from the Islamic finance perspective. Bousalam and Hamzaoui (2015) delineate a bank-based ROSCA model where the model allows the members of the association to invest their savings by using bank facilities and receive an interest-free loan without management and application fee. Furthermore, this bank-based model shows the laxity of social link among members, a core feature of ROSCA, introduces "the bank as a guarantor and withdrawing, temporarily, a deposit for default risk to estimate by means of a risk-rating matrix".

Another study provides an even stronger argument stating: "Why to Use ROSCAs When You Can Use Banks?" and concludes that both ROSCA and formal institutions can co-exist in the same household (Kedir *et al.*, 2011). Yakeen *et al.* (2014) went one step further suggesting "a quick Modernization and Formalization of ROSCAs by opening windows of Savings and Credit Accounts to attain the Millennium Development Goals and Eternal Bliss of the Conventional and Islamic Economists respectively". Indeed, another study in the same year by Aliero (2014) strengthens the findings of Yakeen *et al.* (2014) by claiming that most of the practices and principles of ROSCA are allowed in Shariah (i.e. Sharīʿah-compliant) except for some cases.

3. Theory and application

Before delving into the SBF model formulation and development, understanding the ROSCA model will help to build a foundation that particularly facilitates comprehending the rationale behind the proposed SBF model. In other words, the theory which has already been developed for ROSCA can be applied for developing the SBF model. In this research, we adopt the two-good model of Besley *et al.* (1993) which derives results for random ROSCA because these are the predominant types of SBF found and practised in Turkey. We first consider the economy of a group of individuals who have the desire to acquire durables during their lifespan. How long will it take for an individual to acquire an indivisible durable good (like housing) with and without being a member of SBF companies?

Precisely, suppose, N group of individuals have no opportunity to access the credit market, in other words, their credit score is insufficient to borrow money from banks. The life span of each individual is T, having a continuous inflow of exogenous income over their lifespan, $y > 0$. For avoiding any complication, assume that the individuals have no intentions of using their savings except the motive of acquiring the goods. The utility of an individual with non-durable consumption c is $\vartheta(1,c)$ if the individual owns the durable, otherwise, the utility of an individual with non-durable consumption c is $\vartheta(0,c)$. Given c, it can be defined as $\Delta\vartheta(c) \equiv \vartheta(1,c) - \vartheta(0,c)$, denoting the immediate gain in utility from owning the durable (Besley *et al.*, 1994). Now, considering the probability of owing the durable, θ, the expected utility model is:

$$\vartheta(\theta,c) = \theta\vartheta(1,c) + (1-\theta)\vartheta(0,c) \quad (1)$$

Considering the utility model of an individual, it is noteworthy to observe in which condition an individual is experiencing higher utility – i.e. utility from Autarky savings or utility from saving through random ROSCA/SBF. A significant number of theoretical studies (Besley *et al.*, 1994; Anderson and Baland, 2002; Klonner, 2003; Kedir, 2005) claim that the utility of an individual under random ROSCA savings is higher than Autarkic savings ($W_r > W_a$) [see details in Kedir (2005)].

Utility from Autarkic saving;

$$W_a = T^{*}\vartheta(1,y) - B^{*}\mu(q) \quad (2)$$

Utility from saving through random ROSCA;

$$W_r = T^{*}\vartheta(1,y) - B\mu\left[\frac{(n-1)q}{2n}\right] \quad (3)$$

Based on this basic theory, different jurisdictions have reformatted the method of ROSCA based on the customs and demands of the respected community or society. The East Asian country, such as China, are accustomed to various methods of fund allocation – i.e. throwing dice and auctioning a discount. In fact, few associations used a very complex mathematical equation to calculate the contribution and fund allocation (Ardener, 1964). For instance, the expected funds (*EF*) of contributing members who had yet to receive the funds were calculated as follows:

$$EF = F - \frac{OS + NoD \times DS}{NoC} \quad (4)$$

where *F* stands for the fund, *OS* – organizer's subscription, *NoD* – number of debtors, *DS* – debtor's subscription, *NoC* – number of creditors.

However, there were a considerable number of associations, e.g. *hui hui* association or groups who applied simple methods (Fei, 1939). Noticeably, Chinese people from West Borneo used to practise two terms of ROSCA, known as *kongsi*[2] and *hui*[3], which were mostly practised by altruistic societies as well as by secret societies for accomplishing their political agenda without mentioning the association.

In India, the ROSCA, mostly known as *kameti*, was practised among groups of women for years which is currently known as "Chit Fund Group". The fund allocation methods of the association were diversified; however, auctioning discount system was the common practice across the associations. Some associations also practised a written tender method for the allocation. In the Tambrapani area of Madras State of India, four types of Chit Fund were found which are based on different allocation methods – i.e.

(1) Simple lottery method by *Tattu Chit*;

(2) Dutch-auction method of under-bidding by Auction *Chit*;

(3) *Sahaya Chit* for helping needy relatives; and

(4) Lotter or Prize *Chit* is based on gambling (RBI, 1954).

A similar form of association is also found in the urban area of Vietnam. In Japan, as we mentioned earlier, the concept was practised among Japanese people by the name of *Kou* in 1275 A.D.; however, other types of associations are similar to some Chinese associations. In Bangladesh, despite the widespread of micro-credit institutions, ROSCA was extensively practised both in rural and urban areas under the name of Labour Associations, Cooperatives of Petty Shopkeepers and Rickshaw Cooperatives (SWAPNO, 2016).

In West Africa, the association was commonly familiar under the term "esusu" which was an ancient institution established by Yoruba people in Nigeria (Bascom, 1952). Besides, the association was also known as *adashi* (route) and meetings (do not route) among *Tiv* people in Nigeria. Interestingly, in 1951, the *Tiv* people became suspicious regarding the latter one, thinking the latter one to be used for buying *Tiv* slaves to offer a sacrifice (Green, 1947). Another practice by Chief Njoya similar to ROSCA is found in Cameroon, where fines (in cowries) were charged on defaulters and individuals who took bribes (Martin, 1951); noticeably, he would not allow and support charging interest on any loan (Ardener *et al.*, 1960). In Keta, a town of Ghana, the association was also mostly practised among women and the fund was rotated based on seniority. A similar scenario was seen in the South African type of ROSCA – *mahodisana*, the access to which was given only to women. However, there was another form of ROSCA, known as *stokfel* (also written as *stokvel*), both for men and women. These two forms of association were widely practised among the Bantu-speaking people (Kuper and Kaplan, 1944). Currently, the latter type of ROSCA is regulated under the umbrella of the National Stokvel Association of South Africa. According to recent Nedbank research:

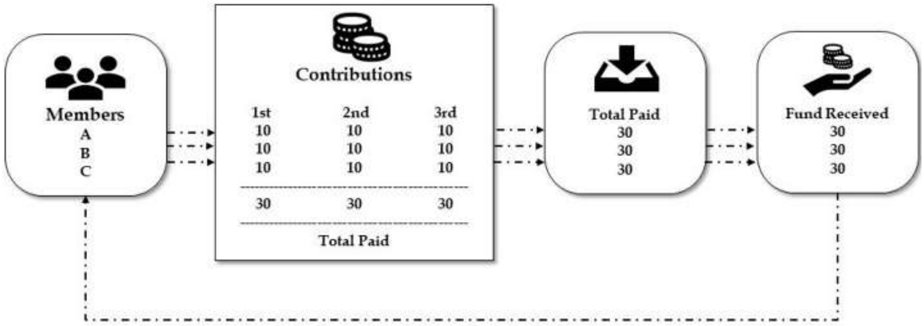
> 11 million South Africans are members of stokvels with around R44 billion saved in 820 000 stokvels in South Africa annually [. . .] 57% of stokvel users are female, with the most popular types of stokvels being grocery stokvels and burial societies. (Geldenhuys, 2019)

In the Middle Eastern countries, the association is widely known as *Gam'eya/Jam'eya*. However, in Sudan and Egypt, people, especially women, call it *sanduk* ("box") or *Qatta* ("putting down"). In this case, the members of the association intended to save a certain amount to buy gold jewellery for their daughter's wedding. Likewise, other jurisdictions also have the practice of ROSCA in their community and societies. In a nutshell, it is cumbersome to find a single country where the concept of ROSCA was not practised, some used the exact form of it, others practised the concept based on the customary need of their community and society.

3.1 Rotating savings and credit association models in practice

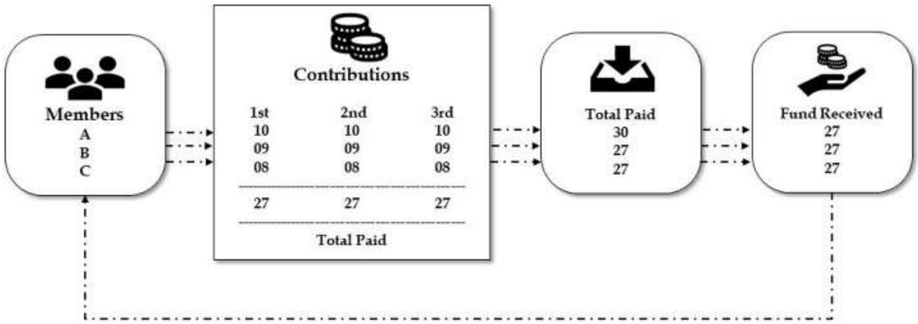
There are five scenarios that we extracted and formulated from a study which was written in the mid-twentieth century by Ardener (1964). It is conspicuous that the fundamentals of the model are the same regardless of the different size of the contribution, the number of contributors or participants, types of contributions, whether interest is paid or otherwise and whether the amount is fixed or flexible. These all linked to the basic structure of the *Kou* contract which was written in 1345 A.D. (see the "Introduction section" for details). The author illustrated the possible relationship based on some conditions that may take place between contributions and funds (See *Models A-E* in Figures 2–6). The possible conditions are listed as follows:

- "All group participants receive equal funds.
- Contributions are not all equal.
- All members pay identical contributions.



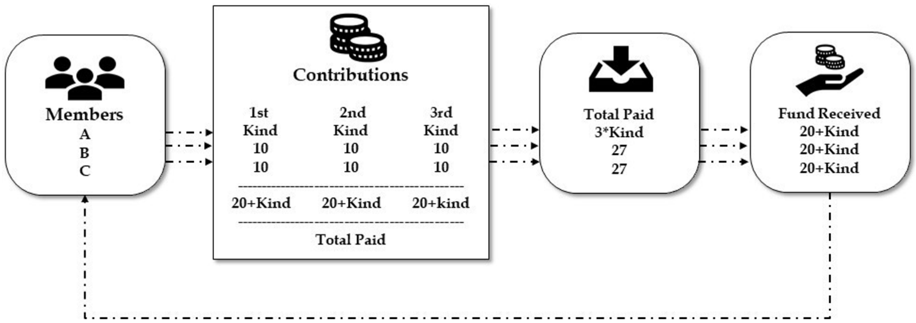
Source: Ardener (1964), Authors' formulation

Figure 2
Model A



Source: Ardener (1964), Authors' formulation

Figure 3
Model B



Source: Ardener (1964), Authors' formulation

Figure 4
Model C

- Members' contributions are not identical.
- A member's contributions remain the same throughout.
- A member's contributions may change".

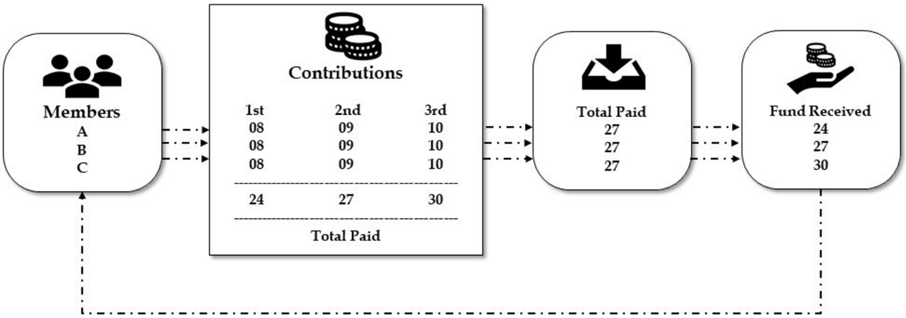


Figure 5
Model D

Source: Ardener (1964), Authors' formulation

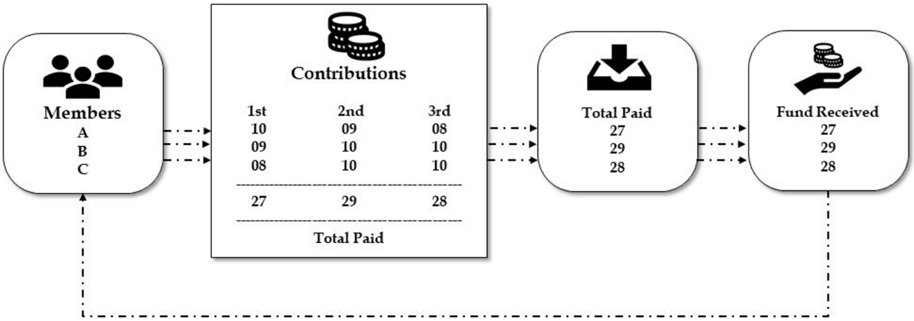


Figure 6
Model E

Source: Ardener (1964), Authors' formulation

Model A complies with the condition [1]: all the members of the pool receive equal funds, condition [3]: all the members of the pool pay the same contribution and condition [5]: the contributions of the member remain identical over the lifetime of the pool. *Models B* and *C* comply with the conditions [1], condition [4]: the contributions of participants in the pool are different and condition [5]. It is noticeable that "Kind" is only acceptable in *Model C*, which separates it from other models. *Model D* obtains the condition [2], condition [3] and condition [6]: changing pattern of participant's contribution. Finally, *Model E* complies with the condition [2], [4], [6]. Few more models could be illustrated by rearranging and altering the conditions, especially the types of contributions. However, these are the best possible relationships within the conditions that are mentioned above.

4. Methodology

This study is based on both descriptive[4] and empirical methods. The former part of the study is based on the descriptive method where it mainly discusses the theory and application of ROSCA that are widely practised across the globe. In this case, the study accessed various articles on ROSCA; interestingly, among them, some were written in the mid-century (Fei, 1939; Gamble, 1944; Bascom, 1952; Geertz, 1962; Ardener, 1964). These articles can be considered as the backbone of the study.

The latter part is based on both descriptive and empirical methods where the study formulated the model of SBF and explained the current business condition – i.e. contract size with turnover and delivery of house and vehicles as well as the number of contracts in terms of turnover and delivery of assets by the companies based on data from *Islamic Finance Report: Focus on Turkey* (Dinç *et al.*, 2019). Noticeably, the collected data covered the period from January 2019 to September 2019, which is short for analysis. For that reason, we extended the data until December 2019 by using the forecast linear formula[5]. After managing the data, the study presented the data in a line chart with an extension of the trendline up to March 2020 from January 2020, along with the R^2 value to show how closely the trendline follows the data set.

We also analysed the data based on some statistical techniques to strengthen the findings from the trendline. In this process, descriptive statistics and correlation analysis are the main techniques that we applied. In the descriptive analysis, the study mostly focused on the most prominent particulars – i.e. mean, mode, standard error, standard deviation, kurtosis, skewness, maximum, minimum and sum – to ascertain the specific understanding of the data, which ultimately support respective authority to take a sound decision. Finally, the relationship among the variables was investigated by applying the Pearson coefficient correlation technique where the level of confidence was 95%, meaning that the equation only allows 5% error. The variables are presented in Table 2.

5. Saving-based finance model

The SBF model is considered an appropriate tool for both retail and corporate finance. Through this setup, the SBF companies convert the fiscal power of participants to their financial power. This can be considered as the main difference from the banks, which have different parities on fund-demand and fund-supply sides. The SBF companies are holding the role of organizing the group of participants on their platforms and clearing the transfers between positive and negative savings. The model is mostly accepted by the participants as an alternative Islamic finance concept, where the companies operate, based on the participation finance principles, that bring strength for the companies to compete on collecting positive savings, which is the core competition area in the overall financial system. The SBF companies offer an individualized savings plan for the participants based on their personal savings capacity. The participants are simply guided by their savings plan during the whole period. The SBF company disburses the total agreed amounts to the participants within a specified period as pre-agreed in the contract (Dinç *et al.*, 2019).

Variable	description
HTS	Housing turnover (size of the contract)
VTS	Vehicles turnover (size of the contract)
HDS	Housing delivery (size of the contract)
VDS	Vehicles delivery (size of the contract)
HTN	Housing turnover (number of contracts)
VTN	Vehicles turnover (number of contracts)
HDN	Housing delivery (number of contracts)
VDN	Vehicles delivery (number of contracts)

Source: Authors

Table 2. Description of variables

Here, we describe a two-person Islamic financial trust and derive some mathematical equations. Person A finances person B; moreover, person B provides financing to person A too. However, the payments made by each party may differ in amount, frequency and time. In this financial trust, each person offers his/her payments financial utility to the other party. We define financial utility to be the amount of financing multiplied by duration (or time).

Suppose over N periods person A makes periodic payments of X amount to person B. In return, person B pays person A amount Y at the beginning of period M. This means person A provides positive financial utility to person B up to period M, person B provides utility to person A in a single lump sum amount of Y in period M. Person A continues paying amount X after period M until the last period N. This scenario is summarized in Table 3 as *Scenario 1*. An additional scenario is where there is an intermediate payment from B to A in the amount Z before the payment Y from B to A. This scenario is represented as *Scenario 2* in Table 3.

Scenario 1: Utility equivalence.

The total net utility flow from A to B until period M is given by:

$$\begin{aligned} &X \times M + X \times (M-1) + X \times (M-2) + \ldots + X \times 1 \\ &= X \times \left(\sum_{i=1}^{M} i\right) = X \times \frac{M \times (M+1)}{2} \end{aligned} \tag{5}$$

Total net utility flow from B to A is given by:

$$\begin{aligned} &Y + (Y-X) + (Y-2X) + \ldots \\ &+ (Y-(N-M-2) \times X) + (Y-(N-M-1) \times X) \\ &= \sum_{k=0}^{N-M-1} (Y - k \times X) = Y \times (N-M) - X \times \frac{(N-M-1)(N-M)}{2} \\ &= \frac{(N-M)}{2}[2Y - X(N-M-1)] \end{aligned} \tag{6}$$

Particulars	Scenario 1		Scenario 2	
Period[*]	$A \rightarrow B$	$B \rightarrow A$	$A \rightarrow B$	$B \rightarrow A$
1	X	.	X	.
2	X	.	X	.
3	X	.	X	.
...	X	.	X	.
P	X	.	X	Z
...	X	.	X	.
M	.	Y	.	Y
M + 1	X	.	X	.
...	X	.	X	.
...	X	.	X	.
N-1	X	.	X	.
N	.	.	.	.

Note: [*]Payment at the beginning of the period: Period 1 = time between 0 and 1
Source: Authors

Table 3.
Payment scenario of two-person model

If we balance the flow of utility from each partner to the other according to the ratio $\frac{a}{b}$, then we will derive a second-degree equation in M as follows:

$$\alpha M^2 + \gamma M + \beta \tag{7}$$

where α, γ, β are given by:

$$\begin{aligned} \alpha &= (\alpha X + \beta X) \\ \gamma &= \beta X - \alpha NX + 2\alpha Y - \alpha X(N-1) \\ \beta &= -2\alpha NY - \alpha NX(N-1) \end{aligned}$$

Scenario 2: Utility equivalence.

The total utility flow from A to B is:

$$\begin{aligned} &X \times N + X \times (N-1) + X \times (N-2) + \ldots \\ &+\mathrm{X} \times 1 = X \times \sum_{i=1}^{N} i = X \times \frac{N(N+1)}{2} \end{aligned} \tag{8}$$

While the total utility from B to A is:

$$Z \times (N-P) + Y \times (N-M)$$

If we balance the flow of utility from each partner to the other according to the ratio $\frac{a}{b}$, then we can solve for M as follows:

$$M = \frac{\alpha YN + \alpha Z(N-P) - \beta XN(N+1)/2}{\alpha Y} \tag{9}$$

5.1 Risks in the savings-based finance system

Risk is a common factor for any system, whether it is financial or non-financial. In fact, in some cases, the risk adds additional weight to the financial system because of its nature. In the financial sector, the expectation of acquiring an asset or financial asset in the future introduces the concept of risk. Like any financial segment, SBF also experiences various risks. These risks are common and similar to any other financial segments, such as capital risk, liquidity risk, installment nonpayment risk, activity risk, operational risk, currency risk and reputational risk (Koç and Aykaç Alp, 2020).

Despite the importance of risk in the SBF system, to comply with the objective of the study, which is analyzing the economics of SBF, the paper holds the discussion on risk within a narrow spectrum. For this reason, instead of explaining the risk in detail, a list of some main risks and sub-risks relevant to SBF and their definitions are summarized in Table 4.

5.2 Appraisal from the Shariah point of view

Islamic law prohibits all forms of unlawful consumption of people's wealth, like usury (Riba) and gambling (Qimar/Maysir). It promotes social welfare and protects from all forms of injustice.

Main risk	Sub-risk	Sub-risk desc.	Definition
Financial risks	Market risks	Currency risk	Risk of a change in the exchange rate between the local currency and the foreign currency prior to the completion of a financial transaction
		Liquidity risk	Risks of not being able to meet due obligations related to cash or other financial liabilities
		Credit risk	Risks arising from receivables from delivered customers
		Installment non-payment risk	Risks arise when the cash receivables of a company are not paid by the customers
Savings finance risks	Saving acceptance risks	Lack of risk analysis during contract acceptance	Risks arising from the absence or non-implementation of saving plan acceptance principles
	Reserve risk	Incorrect provisions	Risks arising from the incorrect calculation of provisions or incompleteness
Operational risks	Technology risks	Communication network	Risks arising from incompatible or inadequate communication systems
		Information security	Risks that may arise from inadequacy of IT security system (user code, password, virus protection, etc.)
		Software	Risks arising from the inadequacy or incompatibility of computing applications (software)
	Tangible assets risks	Protection of assets	Risks arising from insufficient management of company assets, failure to protect or failure to apply capital adequacy criteria
		Infrastructure	Risks arising from lack of technical and material resources (including equipment)
Strategic risks	Reputation risk	Brand value	Risk of failure to manage negative news and gossip situations that may arise regarding the company's brand value in a timely manner
	Sales channel	Sales channel Condensation risk	Risks arise from the inadequacy or unsuitability of the company's sales network

Table 4.
Potential SBF risks

The basic SBF model is similar to the Wakalah-based Takaful system. SBF operator charges a fee for managing the platform. Each SBF participant regularly contributes a fixed amount to the common fund over the specified period and each of these participants is eligible to draw a lump sum amount in the form of a Riba-free loan. The main objective of this scheme is to facilitate the acquisition of durables using the rotating savings mechanism, hence there is no issue of Gharar (legal or contractual uncertainty). As every participant receives exactly the amount that he contributed and saved over time, there is no zero-sum game involved, hence no Qimar or Maysir. The turn of each participant to receive a lump sum amount is determined by drawing lots, which is also acceptable from the Shariah point of view. There is no penalty for early loan repayments (as practised by banking institutions) and no Gharar is involved since no exchange of assets[6].

Shaykh Al-Munajjid (2016) on the admissibility of drawing lots refers to hadith of Al-Bukhari (2593) and Muslim (2770) stating that "Aishah (r.a.) said: When the Messenger of Allah (s.a.s.) wanted to travel, he would cast lots among his wives and whichever one's name was picked, he would take her with him". Al-Hafiz Ibn Hajar (r.a.) in Fath al-Baari (1/172) explained:

> The way in which drawing lots was done was that the names would be written on things and a stranger would make the draw; the one whose name was drawn was the one who would be chosen. (Shaykh Al-Munajjid, 2016)

Moreover, the Council of Senior Scholars in its 34th session issued a fatwa on the permissibility of the so-called *Jam'iyyah Mufwazzifeen* (employees association) scheme whereby a group of employees agrees to contribute an equal amount monthly, so that each receives a lump sum on a rotating basis, which takes a form of ROSCA or SBF (Shaykh Al-Munajjid, 2009).

6. Proposed modus operandi for savings-based finance

Aforementioned sections provide the overall scenario of ROSCA along with the brief theory and its practice across the globe; alongside, the comprehensive understanding of SBF and its practised model are also explained. This section discusses some possible *modus operandi* that SBF companies may adopt. Although there might have some form of similarities in the *modus operandi*, the following scenarios will bolster the operation process and help to develop the market capitalization of this specific sector in the financial sector in Turkey. At the end of this section, we also describe the findings of the analysed data to observe the current developmental stage of the SBF sector.

Figure 7 shows an operational process that combines two models (borrowed from *Takaful*): *Wakalah* and *Mudarabah*, to run the SBF operations. For this reason, it is considered a hybrid model. In this model, the contribution or fund of certain participants or members, who have a desire of acquiring similar indivisible durable after a certain period, is accumulated; later, the pooled funds are allocated into wealth fund and investment fund based on the pre-agreement between participants and operator. The framework of this model is as follows:

The process of this *Mudarabah-Wakalah* hybrid model is as follows:

- The pool manager or operator is appointed by the participants or there is a specialized institution offering fund management services.
- Contribution by the participant to the fund for acquiring the indivisible durable(s), which could be separated into two funds – i.e. investment fund and wealth fund.
- A platform manager will receive an up-front fee for managing the wealth fund (i.e. *Wakalah* fee) and will receive a share of profit on Sharīʿah-compliant investments on a *Mudarabah* basis.
- The indivisible durable will be delivered (accrual basis) to the members or participants.

7. Sectoral performance analysis

In this section, we analyse the SBF sector from the developmental point of view focusing on actual data for 40 companies spanning from January to September 2019 and extending until

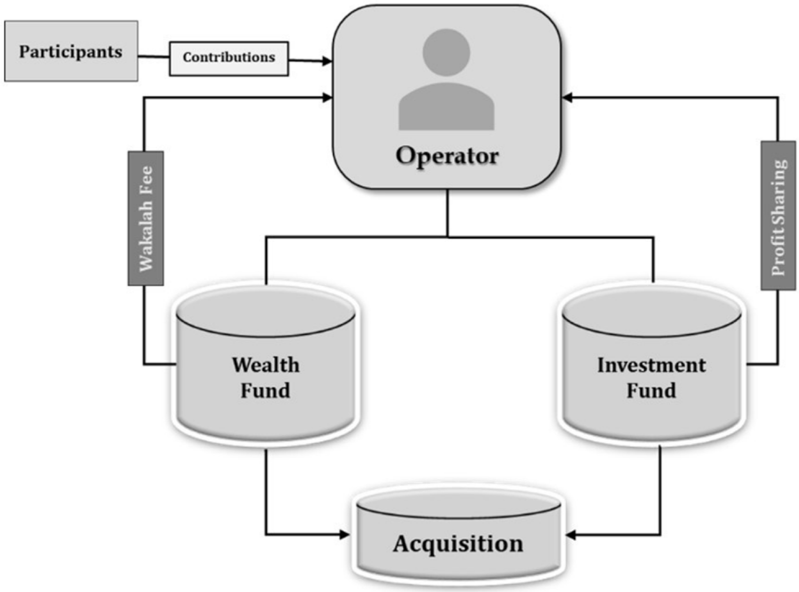


Figure 7.
Mudarabah–Wakalah hybrid model

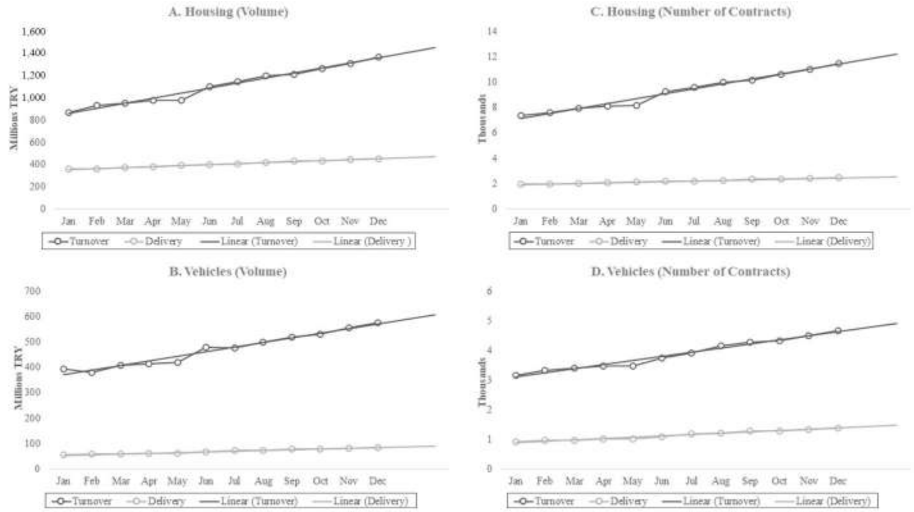
Source: Authors

December 2019 based on projections. Observing the housing and vehicles turnover and delivery based on contract size, SBF companies experienced an aggregate upward trend in both turnover and delivery. However, comparing the turnover and delivery ratio, the size of deliveries (both housing and vehicles) was lower compared to the size of turnover, i.e. the amount companies received for durables from the participants were not realized in the same year. Though from the pool's life span point of view, it is logical because the amount which was received will be matured not in the same year, but rather a certain period later, depending on the maturity of the pool (Figure 8).

A similar situation is observed regarding the housing and vehicles turnover and delivery based on the number of contracts. However, it is noticeable that SBF companies experienced a drop in both sales turnover and delivery of housing and vehicles in May 2019 (Figure 8), but the following month they came back to the business track by receiving more funds. Now, looking at the trendlines shown in the figure, an upward linear trend can be observed in all eight cases – i.e. HTS, VTS, HDS, VDS, HTN, VTN, HDN and VDN – along with a high R^2 value (95% on average), denoting that the forecasted trendlines closely follow the actual data.

7.1 Descriptive analysis

Table 5 presents descriptive statistics and a correlation matrix. Mean value represents the average value of the variable under study. The housing and vehicle turnover based on the contract size and number of contracts shows the highest mean compared to their respective delivery value supporting the trends presented in Figure 8. However, the standard deviation is comparatively higher for all variables, meaning that the dispersion of data from its mean value is relatively higher for all variables.



Source: Islamic Finance Report: Focus on Turkey (Authors' computation)

Figure 8.
Housing and vehicles turnover and delivery based on contract size and number of contracts

Variable	HTS	VTS	HDS	VDS	HTN	VTN	HDN	VDN
Mean	1,107,991	470,625	404,380	67,677	9,261	3,863	2,187	1,129
Min	866,500	380,000	357,050	54,120	7,350	3,150	1,930	902
Max	1,365,454	574,157	451,274	82,490	11,464	4,653	2,442	1,377
Med	1,122,000	478,000	403,300	68,340	9,425	3,825	2,180	1,139
S.E.	47,811	19,230	9,269	2,841	408	147	50	48
StD	165,623	66,614	32,106	9,842	1,412	508	175	165
Kurt	−1.4	−1.5	−1.3	−1.6	−1.5	−1.5	−1.3	−1.6
Skew	0.1	0.1	−0.1	0.1	0.1	0.2	−0.1	0.1
Sum	13,295,888	5,647,504	4,852,563	812,124	111,131	46,359	26,241	13,545
HTS	1							
VTS	0.99	1						
HDS	0.98	0.98	1					
VDS	0.99	0.98	0.98	1				
HTN	0.99	0.99	0.98	0.99	1			
VTN	0.99	0.99	0.98	0.99	0.99	1		
HDN	0.98	0.98	0.99	0.98	0.98	0.98	1	
VDN	0.99	0.98	0.98	0.99	0.99	0.99	0.98	1

Notess: *In terms of contract size (in '000 Turkish Lira)*: *HTS* – housing turnover, *VTS* – vehicles turnover, *HDS* – housing delivery and *VDS* – vehicles delivery. *Based on a number of contracts*: *HTN* – housing turnover, *VTN* – vehicles turnover, *HDN* – housing delivery and *VDN* – vehicles delivery. *S.E.*: Standard Error, *Med*: Median, *StD*: Standard Deviation, *Kurt*: Kurtosis, *Skew*: Skewness, *Min*: Minimum and *Max*: Maximum
Source: Islamic Finance Report: Focus on Turkey (Authors' Computation)

Table 5.
Descriptive statistics and correlation matrix

As for skewness, it measures the symmetry of data. The zero skewness denotes a normal distribution of data. Unlike other variables under the study, housing delivery based on contract size (HDS) and housing delivery based on a number of contracts (HDN) both are negatively skewed. Nevertheless, skewness is close to zero in all cases. On the other hand, kurtosis explains whether the data is heavy-tailed or light-tailed compared to the normal distribution. The table shows light-tailed negative kurtosis values, i.e. the data display platykurtic distribution implying a lack of outliers in the data.

Noticeably, the housing turnover is twice greater compared to vehicle turnover considering both the size and number of contracts. It shows that Turkish customers prioritize house acquisition over the purchase of automobiles.

In addition, Table 5 shows the degree of comovement between eight variables (64 possible pairs) in terms of Pearson correlation. Interestingly, a strong positive significant correlation is seen in all pairs, especially between the pairs: HTS and HTN, VTS and VTN, HDS and HDN and VDS and VDN. These results show that a larger number of contracts is associated with an increase in the size of the contracts implying the persistent growth of the sector. The trend is expected to continue unless the sector faces competition from the banking and mortgage institutions due to new regulations, lack of innovation or other internal and external factors.

Remarkably, there is a strong correlation between two different segments (products) – housing and vehicles – in terms of turnover and delivery indicators: HTS and VTS, HDS and VDS, HTN and VTN and HDN and VDN. From this finding, it could be inferred that the success of the SBF sector in one segment has attracted customers to other SBF products. It shows that the SBF institutions can effectively serve as the alternative financing houses for pooling savings and financing the durables and they have strong potential to capture a larger financial market share in Turkey and even globally.

8. Conclusion

The study discussed a key informal financing institution, ROSCA, that has been vastly providing services and contributing to the world economic development since the first quarter of the twentieth century. The reason behind this comprehensive discussion is to strengthen the objective of the study: mathematically formulating and elucidating the economic models of SBF that are used to collect and distribute funds among members or participants. This paper describes the concept and operation of ROSCA and analyses the economic role and performance of SBF in the light of ROSCA.

In the first part of the paper, we mostly focused on the theory and application of ROSCA across the globe. In this process, various names of the association [see Table in the A.6] that have been used in different jurisdictions were provided and explained; alongside, we also investigated the root of ROSCA by going back to the twelfth century's informal financial practice. Actually, the concept of ROSCA would remain ambiguous without discussing the term *Kou*, a simplified name for ROSCA and loan association and group savings which can be traced back to 1275 A.D. introduced in Japan in the twelfth or thirteenth Century at the latest; surprisingly, the basic structure of the *Kou* has not changed, except for a little modification in the modern times (Izumida, 1989).

By the year 2020, there were as many as 40 companies offering SBF services in Turkey, mainly specializing in vehicle and house financing. However, due to tight regulations introduced in March 2021, the sector shrinked to six companies only. It is expected that these changes will strengthen the market to a greater extent by developing trust in the mind of customers and protecting the sector from mushrooming while deepening the financial inclusion and complementing the existing financial infrastructure.

In the latter part of this study, we mathematically formulated and explained the SBF model currently being practised by the SBF companies in Turkey. Alongside, the *modus operandi* and various scenarios regarding the relationship between contribution and fund are also illustrated and briefly explained in the study. At the end of this paper, the recent scenarios of the SBF companies are presented and analysed. Here, a positive growth trend for both housing and vehicles is conspicuous and correlations between the variables are significantly strong. These findings indicate potential expansion trends of this SBF sector in the entire financial sector in Turkey.

Although there are many possible reasons that can be provided for bolstering the findings of this study, we mainly focus on the durables that the SBF companies provide. Generally, acquiring a house is a common and most desirable durable for every individual in any society. An individual always desires to have his or her own house; however, not all are capable of acquiring it because of the non-inclusiveness of the current financial system. An individual needs credit for building or buying a house, but the formal financial system (interest-based) does not offer or allow everyone to receive the credit unless the individual is proven to have a healthy credit score. This is where the SBF companies play their important role, offering an interest-free platform by applying the established and well-known informal financial ROSCA concept. As long as people live, the demand for houses or vehicles will also remain alive, meaning that the growth of this kind of company seems to increase gradually in the future, assuming other external factors (e.g. COVID-19) constant.

Nevertheless, some questions may arise in the mind of readers who are concerned about Sharīʿah issues in the SBF system. For instance, how much Sharīʿah-compliant the SBF companies and their methods are? An immediate answer can be provided by mentioning a recently published article on Sharīʿah compatibility of ROSCA by Ibrahim Hussaini Aliero who claimed that most of the practices and principles of ROSCA are allowed in Shariah (Sharīʿah-compliant) except some few cases (Aliero, 2014). These findings may immediately satisfy the respective individuals; however, a comprehensive study is required to strengthen the claim and scrutinize the Sharīʿah compatibility of SBF companies and their practised methods in Turkey.

In summary, SBF s not just an innovation in the twenty-first century's financial system, but rather it is a resurrection of ROSCA in a new form. Verily, the financial crisis of 2008 provided us with enough insights into the necessity and emergence of an alternative financial system and COVID-19 just added an extra layer on top of it. Truly, this is the high and crucial period to ponder deeply on this issue, whether we will proceed with the broken system as we always do or we will accept the problems of the conventional financial system and restructure it by amending the supportive and alternative emerging financial system. In this case, SBF can be one of the essential parts for restructuring the global financial system.

Notes

1. Pronounced as' Ko-u'.
2. Trocki (2007) defines *Kongsi* as' a generic Chinese term for a range of social and economic configurations that includes everything from business partnerships to clan and regional associations to secret triad societies'.
3. According to Heidhues (1993)," Chinese in Southeast Asia made no distinction between *kongsi* and *hui*".
4. The study critically analyses the prior literature on ROSCA leading to synthesizing a model capable of capturing the current practices of this form of financing.

5. Using [FORECAST.LINEAR] formula in Microsoft Excel.
6. A thorough Shariah discussion on SBF can be found in the comprehensive study of Aliero (2014).

References

Adams, D.W. and de Sahonero, M.L.C. (1989), "Rotating savings and credit associations in Bolivia/les institutions informelles de credit en Bolivie (RoSCAS)", *Savings and Development*, Vol. 13 No. 3, pp. 219-236, available at: www.jstor.org/stable/25830191

Aliero, I.H. (2014), "An analytical review on the concept, financial practices and Shari'ah compatibility of rotating savings and credit associations (RoSCAs)", *Journal of Islamic Economics, Banking and Finance*, Vol. 113 No. 3580, pp. 1-14.

Anderson, S. and Baland, J.-M. (2002), "The economics of RoSCAs and intrahousehold resource allocation", *The Quarterly Journal of Economics*, Vol. 117 No. 3, pp. 963-995.

Ardener, S. (1964), "The comparative study of rotating credit associations", *The Journal of the Royal Anthropological Institute of Great Britain and Ireland*, Vol. 94 No. 2, pp. 201-229.

Ardener, S. and Burman, S. (1995), "Money-go-rounds: the importance of rotating savings and credit associations for women", *American Ethnologist*, Vol. 24 No. 3, pp. 673-674.

Ardener, E., Ardener, S. and Warmington, W.A. (1960), "Platation and village in the Cameroons", Oxford University Press, London.

Bascom, W.R. (1952), "The ESUSU: a credit institution of the Yoruba", *The Journal of the Royal Anthropological Institute of Great Britain and Ireland*, Vol. 82 No. 1, pp. 63-69.

Besley, T., Coate, S. and Loury, G. (1993), "The economics of rotating savings and credit associations", *The American Economic Review*, Vol. 83 No. 4, pp. 792-810, available at: www.jstor.org/stable/2117579

Besley, T., Coate, S. and Loury, G. (1994), "Rotating savings and credit associations, credit markets and efficiency", *The Review of Economic Studies*, Vol. 61 No. 4, pp. 701-719.

Biggart, N.W. (2001), "Banking on each other: the situational logic of rotating savings and credit associations", *Advances in Qualitative Organization Research*, Vol. 3 No. 1, pp. 129-152.

Bouman, F.J. (1984), "Informal saving and credit arrangements in developing countries: Observation from Sri Lanka", *in 'Undermining Rural Development with Cheap Credit'*, Westview Press, pp. 232-247.

Bouman, F.J. and Harteveld, K. (1976), "The Djanggi, a traditional form of saving and credit in West Cameroon", *Sociologia Ruralis*, Vol. 16 No. 1, pp. 103-119.

Bouman, F.J. and Moll, H.A. (1992), "Informal finance in Indonesia", *in 'Informal Finance in Low-Income Countries'*, Westview Press, pp. 209-224.

Bousalam, I. and Hamzaoui, M. (2015), *'Bank-Based Investing RoSCA for Islamic Finance: A New Alternative to Drain Households Savings and Reduce Financial Exclusion', ASERS Publishing*, Craiova, Romania.

BRSA (2021a), "Basin açiklamasi", available at: www.bddk.org.tr/Duyuru/EkGetir/847?ekId=775 (accessed 10 August 2021).

BRSA (2021b), "Şirket unvani", available at: www.bddk.org.tr/Duyuru/EkGetir/847?ekId=776 (accessed 10 August 2021).

Cope, T. and Kurtz, D.V. (1980), "Default and the Tanda: a model regarding recruitment for rotating credit associations", *Ethnology*, Vol. 19 No. 2, pp. 213-231.

Dinç, Y., Nagayev, R., Jahangir, S.M.R. and Ahmed, A. (2019), 'Islamic finance report: Focus on Turkey 2019', WPC Matbaacılık San. Tic. A.Ş.

Drews, G. (1991), *Der Bauspar-Ratgeber*, Wilhelm Heyne Verlag, München, Germany.

Ergüven, M. (2021), "A comparative study on saving-based finance system and building-savings fund system, beta basim yayim dagitim A.S., Istanbul, Turkey", Publication No: 4171.

Ergüven, M. and Kaya, F. (2016), "Konut finansmaninda elbirliği sistemi: Müşterilerin elbirliği sistemi tercih nedenleri üzerine bir araştirma", *Kastamonu Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, Vol. 13 No. 3, pp. 24-39.

Ersin, I. and Duran, S. (2017), "Faizsiz finans döngüsünü oluşturma aç is indan adil ekonomik düzen söyleminin kredileşme ilkeleri ve uygulanabilirliğinin değerlendirilmesi", *Electronic Turkish Studies*, Vol. 12 No. 8, pp. 109-132.

Fei, H. (1939), *Peasant Life in China: A Field Study of Country Life in the Yangtze Valley*, Routledge and K. Paul.

Gamble, S.D. (1944), "A chinese mutual savings society", *The Far Eastern Quarterly*, Vol. 4 No. 1, pp. 41-52.

Geertz, C. (1962), "The rotating credit association: a 'Middle rung' in development", *Economic Development and Cultural Change*, Vol. 10 No. 3, pp. 241-263.

Geldenhuys, J. (2019), "South African stokvels – membership increases year on year", available at: www.moonstone.co.za/south-african-stokvels-membership-increases-year-on-year/ (accessed 7 May 2020).

Ginkou, N.S. (1967), *'Nippon Sogo Ginkou Nenshi Hensasitu', (Editorial Team for the History of Nippon Sogo Bank)*, History of Nippon Sougo Ginkou (in Japanese).

Green, M.M. (1947), *Ibo Village Affairs: Chiefly with Reference to the Village of Umueke Agbaja*, Sidgwick and Jackson.

Handa, S. and Kirton, C. (1999), "The economics of rotating savings and credit associations: evidence from the Jamaican 'Partner", *Journal of Development Economics*, Vol. 60 No. 1, pp. 173-194.

Heidhues, M.S. (1993), "Chinese organizations in West Borneo and Bangka: Kogsis and Hui", in Ownby, D. and Heidhues, M.S. (Eds), *Secret Societies Reconsidered: Perspectives on the Social History of Early Modern South China and Southeast Asia*, Armonk, ISBN 1-56324-198-6, pp. 68-88.

Izumida, Y. (1989), *Kou in Japan: A Precursor of Modern Finance*, Center for Development Information and Evaluation.

Kedir, A.M. (2005), "The economics of rotating savings and credit association: evidence from Ethiopia", *in 'International Conference on African Development Archives'*, Center for African Development Policy Research.

Kedir, A.M., Disney, R.F. and Dasgupta, I. (2011), "Why use RoSCAs when you can use banks? Theory and evidence from Ethiopia", *in 'Third International Conference on Development Studies in Ethiopia*, June 18-19, 2005, Addis Ababa, Ethiopia'.

Klonner, S. (2003), "Rotating savings and credit associations when participants are risk averse", *International Economic Review*, Vol. 44 No. 3, pp. 979-1005.

Klonner, S. (2006), "Risky loans and the emergence of rotating savings and credit associations, technical report", Working Paper.

Koç, I. and Aykaç Alp, E. (2020), "Konut finansmaninda yapi tasarrufu yöntemi, risk modelleri ve vasicek kisa vadeli faiz orani modeli ile ampirik bir uygulama", *İstanbul Ticaret Üniversitesi Sosyal Bilimler Dergisi*, pp. 310-334.Prof. Dr.Sabri Orman Özel Sayısı.

Kumbasar, M. (2016), "Ev sahibi olmak ve eminevim örneği", *Kafkas Üniversitesi İlahiyat Fakültesi Dergisi*, Vol. 3 No. 19190.

Kuper, H. and Kaplan, S. (1944), "Voluntary associations in an urban township", *African Studies*, Vol. 3 No. 4, pp. 178-186.

Lehmann, W. (1970), *Die Bausparkasse*, Fritz Knap Verlag, Frankfurt, Germany.

Lelart, M. (1990), *La Tontine Pratique Informelle D'épargne et de Crédit Dans Les Pays en Voie de Développement*, John Libbey Eurotext.

Little, K. (1972), "Voluntary associations and social mobility among west african women", *Canadian Journal of African Studies/Revue Canadienne Des* Études Africaines, Vol. 6 No. 2, pp. 275-288.

Martin, H. (1951), "Histoire et Coutumes des Bamoun: Rédigées sous la direction du Sultan Njoyan [History and customs of the Bamoun: compiled under the direction of Sultan Njoya]", French Institute of Black Africa, Central Cameroon, No. 5, pp. 1-36.

Mayoux, L. and Anand, S. (1996), "Gender inequiality, ROSCAs, and sectoral employment strategies: Questions from the South Indian silk industry", in Ardener S. and Burman S. (Esa), (Eds), *'Money–Go–Rounds: The Importance of Rotating Savings and Credit Associations for Women'*, Oxford: Berg.

Mushuku, A. and Mayisa, J. (2014), "Unlocking the door from poverty through rotating savings and credit associations: a study of group based savings in ward 14 of Gutu district, Zimbabwe", *Bangladesh e-Journal of Sociology*, Vol. 11 No. 2, pp. 118-131.

RBI (1954), "All–India rural credit survey: Report", 2 edn, *Committee of Direction of the All-India Rural Credit Survey*, Reserve Bank of India.

Sethi, M. (1995), "Women's ROSCAs in contemporary Indian society", in S. Ardener and S. Burman, eds, *'Money-Go-Rounds: The Importance of Rotating Savings and Credit Associations for Women'*, Oxford: Berg, pp. 168-178.

Shaykh Al-Munajjid, M.S. (2009), "Hukmu al-ishtiraki fi-l-jamíyyati allatiy yajriyha al-muwazzifoon (Ruling on participating in employees' association)", available at: https://islamqa.info/ar/130147 (accessed 10 July 2021).

Shaykh Al-Munajjid, M.S. (2016), "How did the prophet (blessings and peace of Allah be upon him) cast lots among his wives when he wanted to travel?", available at: https://islamqa.info/en/235828 (accessed 10 July 2021).

Srinivasan, S. (1995), "ROSCAs among South Asians in Oxford", in Ardener S. and Burman S., (Eds), '*Money-Go-Rounds: The Importance of Rotating Savings and Credit Associations for Women'*, Oxford: Berg., pp. 199-208.

SWAPNO (2016), "Giving credit to savings – How rotating the money can empower poor women", available at: http://swapno-bd.org/beta/wp-content/uploads/2016/10/ROSCA-in-SWAPNO.pdf

Trocki, C.A. (2007), *Prince of Pirates: The Temenggongs and the Development of Johor and Singapore*, 1784-1885, NUS Press.

Umuhire, P.-G. and Nyssens, M. (2013), "Informal and formal microfinance in urban Sub-Saharan african markets: the case of micro-entrepreneurs in Ouagadougou, Burkina Faso", *Securing Livelihoods: Informal Economy Practices and Institutions*, pp. 147-166.

Wu, D.Y. (1974), "To kill three birds with one stone: the rotating credit associations of the Papua New Guinea Chinese", *American Ethnologist*, Vol. 1 No. 3, pp. 565-584.

Yakeen, M.A.A., Gatawa, N.M. and Na-Allah, A. (2014), "Modernizability and formalizability of rotating savings and credit associations through Islamic banks", *International Journal of Humanities and Management Sciences*, Vol. 2 No. 3.

Yu, N.N. (2013), "On designs of rotating savings and credit associations", available at SSRN 2201436.

Appendix. Additional information

Country	Name
Azerbaijan	Lotto
Afghanistan	Kesht
Algeria	Gam'eya
Angola	Temo
Antigua and Barbuda	Box hand
Australia	Suit Clubs
Bahamas	Esu
Bangladesh	Samity
Barbados	Meetings
Belize	Syndicate, Tanda
Benin	Ndjonu, Asusu, Yissirou, Ndjonu, Tontine
Bolivia	Pasanakus
Botswana	Motshelo, Beer Parties
Brazil	Consorcio, Pandero, Syndicates
Brunei	Kongsi
Burkina Faso	Pari, Tontine, Tibissiligbi, Pari, Song-taaba
Burundi	Upato (in Kiswahili)
Cameroon	Djanggis, Ngwa, Njangi, Jangi, Ujangi, Djana, Mandjon, Djapa, Tontine, Njanggi, Ntchwa
Canada	Banker Ladies
Central African Republic	Farie
Chad	Paarés, Pare
China	Lun-hui, Yao-hui, Piao-hui, Hui, Ho-hui, Foei-Tsjing
Cambodia	Tontine
Curacao	Sam, Hunga sam
Dominican Republic	San
DR Congo	Likelemba, Ristourne
Egypt	Gam'eya, Jam'iyya, Qatta, Sanduk
England	Diddlums, Djiji, Knick-knack clubs, Susu, Nanamei akpee, Onitsha, Nnoboa
Eritrea	Equub
Ethiopia	Equb
Gabon	Bandoi
Gambia	Asusu, Osusu, Susu, Esusu, Compin
Ghana	Susu, Eso dzodzo
Granada	Susu
Guatemala	Cuchubal, Cuchuval
Guyana	Box hand, Throw a box, Boxi money
Haiti	Sol
Hong Kong	Chinese types and Chit clubs
India	Kameti, Kuri, Chitty, Chit funds, Vishi, Bishi, Nidhi, Committee
Indonesia	Arisan, Paketan Daging, Paketan Kawinan, Mapalus, Bajulo julo, Jula-jula, Mengandelek
Iran	Ghor'e-keshi khanevadegi
Ivory Coast	Diaou Monai, Safina mam, Wari monai, Tonton, Tontine, Moni, Diaou Moni, War Moni, Djigi Moni, Safina, Akpole wule, Susu, Aposumbo, Kukule, A tche le sezu, Komite, N'detie, M'bgli sika, Monu, mone
Jamaica	Partner, Padner, (Throw a) Box, Susu

(*continued*)

Table A1. Names of associations in different countries

Country	Name
Japan	Kou, Tanomoshiko, Mujin, Donen ko, Kate, Ke, Miyin, Musin, Tanamoshi
Kazakhstan	Chernaya Kassa
Kenya	Mabati, Nyakinyua, Itega, Mkutano ya wanwake, Mkutano ya wazee
Korea	Wichin gye, Keyes, Kyes, Mujin, Ke
Lebanon	Al-tawfir el medawar
Liberia	Esusu, Esusu, susu, sau
Libya	Gam'eya
Madagascar	Fokontani
Malawi	Chiperegani, Chilimba
Malaysia	Paluwagan, Kutu, Kootu, Kongsi, Tontine, Hui, Main, Kut
Mali	Pari
Mauritius	Cheet, Pool, Cycle, Sheet
Mexico	Cundinas, Tanda, Mutualista
Morocco	Gam'eya, Daret, Jamaaia
Mozambique	Upato, Xitique
Myanmar	Suu Nagwe
Namibia	Stokvel, Rotating Savings Club
Nepal	Dhukuti, Dhikuti, Dhikur
Niger	Fayendi, Adasse, Tomtine, Asusu
Nigeria	Ofa, Esusu, Osusu, Enusu, Ajo (Yoruba), Cha (Ibo), Oha, Oja, Adashi (Haussa, Tiv), Bam (Tiv), Isusu (Ot), Utu (Ibo), Dashi (Nupe), Efe (Ibibios), Oku (Kalabari Ijawas), Mitiri, Compiri, Club (Ibo)
Pakistan	Ballot Committees, Committee, Bisi, Kistuna
Palestine	Jameye Hayriyeh
Panama	Pandero
Papua New Guinea	Akpee, Kampani, Mekim sande, Pati, Sundaying, Hui, Sande
Peru	Juntas, Quiniela, Panderos
Philippines	Paluwagan, Turnohan
Republic of the Congo	Temo, Kitemo, Ikilemba, Kikedimba, Kikirimbahu, Likilimba, Efongo Eambongo, Otabaka, Ekori, Otabi
Romania	Ţigănesc, Roata
Russia	Chernaya Kassa
Saint Vincent	Susu
Scotland	Menages
Senegal	Tontine, Nath
Sierra Leone	Charity, Esusu, Asusu
Singapore	Kootu, Paluwagan, Tontine, Shaloongo, Aiuto
Somalia	Hagbad/Ayuuto/Hamamei
South Africa	Gooi-gooi, Kuholisana, Chita, Chitu, Stokfel, Stockfair, Mahodisana, Motshelo, Umangelo
South Korea	Kye
Sri Lanka	Chit Funds, Cheetu/Sheetu, Sittu Danawa, Situ Mudal, Sittu Wendesiya, Seettuva
Sudan	Mahodisana, Stokfel, Sandukem qattu, Qatta, Sanduk, Sandook Box
Suriname	Kasmonie
Swaziland	Stokfel
Syria	Jameye Hayriyeh
Taiwan	Huis
Tanzania	Tanzanite, Upato, Fongongo
Thailand	Len Share, Bia Huey, Chaer, Hui, Hue, Pia Huey, Len Chaer
Tobago	Susu
Togo	Tontin, Abo'o, Soo, Tonton, Sodzodzo, Sodyodyo
Trinidad and Tobago	(E)susu, Sou sou, Hui, Chitty

Table A1.

(*continued*)

Country	Name
Tunisia	Noufi, Sanduk
Turkey	Sandιk, Gün
Turkestan	Çay oynaş
Turkmenistan	Chernaya Kassa
Uganda	Cheetu, Chilemba, Kiremba, Upato, Kwegatta
USA	Cooperative/Susu/Cundina
Vietnam	Hui, Hui Thao, Hui hue hong, Hui bac (ho), Yi hui
West Indies	Partnerhand, Susu
Western Samoa	Pelagolagomai
Yemen	Jamayh, Hacba
Zaire	Temo, Ikelemba, Osassa, Bandoi, Kitemo, Kitwadi, Adashi, Tontine, Bandal
Zambia	Cheetu, Icilimba, Upato, Chilenba
Zimbabwe	Chilemba, Stockfair, Kutunderrera
Latin America	Tandas
Middle East	Gam'eya
Swahili – speaking East Africa	Chama
West Africa and the Caribbean	Susu
West Africa	Tontines

Table A1.

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