



# Payment Card Transaction Chain

(Final Report)



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This report was written by a Bank of Israel interdepartmental working group, headed by Noa Sheshinski  
(Head of the Payment Systems Oversight Unit—Accounting, Payment and Settlement Systems  
Department)

Working group members:

Steve Lev (Payment Systems Oversight Unit);

Boris Levit (Banking Supervision Department);

Elitzur Weiser (Legal Department);



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## **1. Executive Summary**

A payment card transaction is a complicated process, which combines numerous interconnected players and processes. It is not possible to relate to only one component without considering its effect on each of the other links in the transaction chain.

There are differences among countries in the structure, composition of players and execution process of a payment card transaction, depending on the historical background and domestic circumstances of the players (market size, number and size of the banks and the legal and technological environment). Even in this era of globalization, the functions and processes of the various participants in the chain vary between countries, a fact that makes it difficult to carry out an international comparison of payment card systems.

At the same time, it is possible to identify the development of several trends in the use of payment cards, such as increasing standardization, the consolidation of functions, the separation between management of the “scheme” (the system’s rules) and the transaction processing services, the increase in regulatory intervention, the creation of national payment councils, the strengthening of international brands (at the expense of local ones), international activity of acquirers and processors, etc.

In Israel, a model has developed according to which the Shva (the Hebrew acronym for Automated Banking Services Ltd.) company provides a large portion of the services in the payment card transaction chain, including the provision of the switch infrastructure, the management of terminals (the main infrastructure for connecting terminals at merchants with the acquirers and issuers for authorization and settling of a payment card transaction), formalization of the principles and rules for the development and use of the protocol, certification of terminals, the settlement interface, etc. Historically, this structure has answered the needs of the market, but it is not necessarily optimal, particularly during the current period when considerable technological innovation makes it possible to improve the efficiency and safety of the payment card settlement processes.

Experience worldwide indicates that there is no single “recipe” for the structure of the payments system and in particular that the creation of an additional switch will not necessarily improve the efficiency of the settlement process. There are various alternative structures of the system for the execution of a payment card transaction, some of which are substitutes for one another and others that can exist side



by side. Each of the alternatives has advantages and disadvantages in terms of stability, efficiency, survivability and competitiveness of the payment card payment system.

In order to improve the efficiency of the payment card market in Israel and to encourage competition while maintaining its stability, a number of changes are required. Following are the main ones:

- **Expansion of the activity and membership of the National Payments Council.** It is proposed that the Council, which serves as an advisory body to the Bank of Israel, be expanded to include additional relevant stakeholders, in line with the World Bank model. This will provide representation for various players and will facilitate an open discussion of the market's needs and the planning of the payments strategy.
- **Establishing a Payment Card Committee.** The committee will include relevant players and regulators in the payment card market and will constitute a platform for all the payment card market participants to discuss all the professional and technological matters regarding the manner of action and the rules for executing transactions (hereafter: the "scheme") in the domestic payment card system on the "Ashrait" switch. A subcommittee will outline the manner of action and domestic rules of activity for payment cards on the ATM switch, in a way that promotes standardization, innovation and transparency which will facilitate increased efficiency and competition while maintaining stability and safety. The committee will act in cooperation and transparency in line with a set of rules, while paying close attention to requirements of laws, regulation, and international norms.
- **Regulation of the principles and rules for developing and using the protocol** (a technological specification and message structure that is used to convey a transaction between the various links in the chain). It is recommended that the "Payment Card Committee" will be responsible for creating the principles and rules for the development and use of the protocol, in a way that will reflect the interests of the various players in the market while maintaining balance between the business needs of the participants and systemic considerations and ensuring transparency and accessibility of the protocol for all of the relevant entities.
- **Modular implementation of the protocol**, which will allow for the selection and implementation of uses (functionality) at the point of sale (POS) according to the needs of the users. while paying close attention to aspects of competition and of business continuity and which will also make it possible to implement part of the functionality at the level of a remote server (at the



issuer, acquirer or processor). This is in addition to carrying out the modifications required in the processing of a transaction in order to provide support for this modularity.

- In order to facilitate the entry of new players and the development of advanced payment methods and new routing options, the POS terminals which constitute the platform for the execution of a payment card transaction **must support a multiplicity of applications as well as contactless transactions**. This support should be conducted at the same stage as the market transfer to EMV.
- **The provision of end-to-end encryption services** by Shva should not interfere with the ability of a merchant to deal with the various aspects of a payment card transaction, whether on its own or by means of a service provider on its behalf, and should not prevent a merchant from fulfilling the requirements of the PCI standard, whether independently or by means of another certified provider of end-to-end encryption services, should it choose to do so.
- It will be made possible for licensed third-party entities to be approved by the system operator to **certify POS terminals** according to the domestic specification.
- The relevant entities should not be required to make the necessary modifications for the **execution of debit transactions on the ATM switch**. Although this alternative is technologically feasible, its contribution to competition and business continuity is negligible and uncertain and its implementation involves complex legal, technological and consumer issues.
- **Creation of a centralized interface** for the settlement of transactions on the ATM switch, which will simplify the settlement process, will reduce operating costs and will facilitate the entry of new players into the system.

The implementation of the recommendations in this report will remove the existing barriers in the market and will facilitate the entry of new players and the creation of a new market structure, which will be determined by market forces. At the same time, the stability and efficiency of the system will be maintained and its level of competition enhanced in a manner that will benefit the market and the players within it without creating a disruption or endangering their stability and efficiency.

The structure and unique activity in the domestic market created conditions under which new players have not appeared and will not appear without intervention or regulatory support of change. The proposed measures' objective is to enable the market to develop in a natural manner while removing the barriers existing within it. This should be done in a way that will facilitate the entry of new players



and the creation of a new competitive market structure, which will be determined by the needs of the participants and which at the same time, will preserve the stability and efficiency of the payments system.

The workgroup is of the opinion that in order to achieve the goals of competition, efficiency and stability, the creation of an additional switch is not sufficient. On the contrary, following the implementation of these recommendations in relation to the whole chain of payment card transaction authorization, the competitive environment of payment card use will improve such as to allow for, and support, the entry of new players. This environment will increase competition and business efficiency and will create new possibilities for transaction routing. The workgroup feels that the implementation of the recommendations will make possible the natural development of an additional switch, if some entity wishes to do so and feels that it is economically feasible.

Changing the payment credit market is a long-term process, which will require the investment of effort by all of the stakeholders. As part of the implementation of the recommendations, consideration should be given to the possible effect on the payments system in general and in particular on the existing switch.

The Bank of Israel will continue to monitor the developments in the market and the implementation of new routing possibilities. If new problems and barriers or new opportunities are identified in the future, additional measures will be considered.



## **2. Introduction**

On April 2, 2014, the Ministerial Committee on the Cost of Living, Concentration, and Encouraging Competition in the Economy decided to approach the Bank of Israel to examine several issues related to payment card transactions—one of which was the promotion of an additional switch for executing payment card transactions—among the steps to increase competition and efficiency in the payment card area.

On May 26, 2014, the interim report of the Committee to Examine Reducing the Use of Cash in the Israeli Economy (the Locker Report) was published. The Committee's goal was to reduce the shadow economy in Israel by reducing the use of cash and paper-based means of payment, and expanding the use of advanced electronic means of payment. Within this framework, the Committee indicated the need to promote an additional switch for carrying out payment card transactions.<sup>1</sup>

Due to the abovementioned points, the Bank of Israel established a workgroup to examine promoting the establishment of an additional switch for executing payment card transactions. The workgroup, headed by Payment Systems Oversight Unit Head Ms. Noa Sheshinski, is a interdepartmental workgroup set up to achieve a deep understanding of the payment card payments system in Israel, which will serve as a basis for examining the possibility of setting up an additional switch for executing payment card transactions.

The workgroup met with representatives of the various stakeholders operating throughout the domestic payment card market—banks, acquirers, issuers, manufacturers, and distributors of software and hardware for settling transactions, international payment card organizations, and others. The workgroup also examined the area in other countries, in order to learn from reforms carried out abroad, and held discussions with the Israel Antitrust Authority.

A payment card switch is a central infrastructure for the settlement system in Israel. The switch is domestic and is managed by the Shva company. Other than the switch, additional links were identified which are integral parts of the payment card transaction chain. The workgroup examined the range of

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<sup>1</sup> The Bank of Israel has already begun to implement the Locker Committee's recommendations and to promote steps to expand the distribution and use of debit cards.



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links in the transaction execution chain, in order to support the goals of increasing efficiency and competitiveness in the payment card market. The conclusions and recommendations will refer to this range.

This document comes to describe the processes, the structure, and the participants integrated throughout the process of executing a payment card transaction, whether at the POS (terminal) or at the ATM (automated teller machine), in Israel and abroad. The goal is to examine the current efficiency of the process, the structure of the transaction chain, and the existence of barriers to competition and to development of the area in accordance with needs. The team indicates and recommends the necessary changes throughout the payment card transaction chain in Israel—changes whose goal is to increase the efficiency of the market while maintaining its stability and encouraging competition.

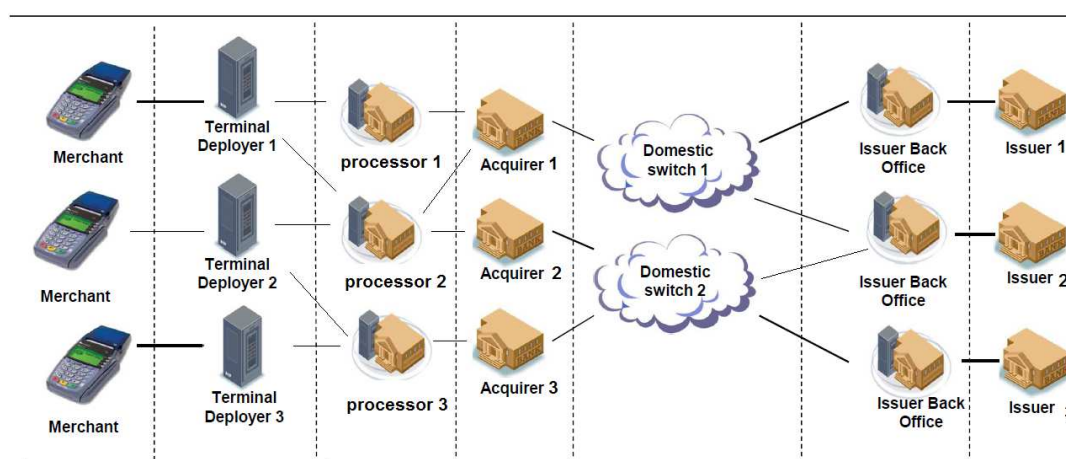
### 3. Background and structure of payment card transaction

There are various means of payment, such as cash, check, bank transfer, authorized direct debit, prepaid card, debit card, and advanced means of payment. A payment card is a means of paying for goods or services at points of sale or in remote transactions (in which the card is not presented) and for withdrawing cash from an automated teller machine (ATM).

There are three basic types of payment cards, which are differentiated by the date of debiting the account of the cardholder: **a prepaid card** for which the debit is carried out before the use of the card; **a debit card** which is debiting near the time of usage; and **a credit card** for which the debit is carried out at a later stage. With regard to credit cards, a distinction is generally made between **a deferred debit card** for which the debt balance is paid in full<sup>2</sup> on a fixed date each period, and **a revolving credit card** for which there is the possibility of deferring payment of part of the debt balance for a number of periods, while paying interest.

Payment by means of a payment card can be made in a **"card present"** format, by means of a terminal at the point of sale (POS), which is either manned or unmanned,<sup>3</sup> or in a **"card not present"** format through the Internet, via call center, etc.

#### 3.1 The players involved in a payment card transaction at a POS



<sup>2</sup> In certain markets, including Israel, a deferred debit card allows payment by the cardholder to the merchant in installments, without the payment of interest.

<sup>3</sup> Such as a self-service gas station, a drink vending machine, etc.



### **3.1.1 The cardholder (Payer)**

The cardholder is the person (or entity) who is authorized to use the payment card for payment in a transaction, based on an agreement with the issuing entity.

### **3.1.2 The merchant (Receiver of the Payment)**

The merchant is the entity that honors a payment card as a means of payment that is presented by the customer for the purpose of paying for a good and/or service.

### **3.1.3 The issuer**

The issuer is the entity that manages the account of the cardholder, including a credit line, if it exists on the payment card. The card issuer is permitted to approve or reject a transaction request and ensures that the acquirer will receive payment for the transactions carried out by the holder of the card issued by it. In general, the issuers are banks<sup>4</sup> or financial institutions.

### **3.1.4 The acquirer**

The acquirer is the entity that enables the merchant to honor payment card transactions.

The acquirer transfers the request for the approval of the debit to the issuer and ensures payment to the merchant if the request is approved.

### **3.1.5 The payment card scheme**

A payment card scheme enables the cardholder to make a payment (or withdraw cash) by means of a third party that is not the issuer. To this end, the scheme defines for its participants the rules for carrying out transactions (in particular, the technological and business arrangements, rules of settling of accounts and division of responsibility for damage). There are two main models of activity for payment card schemes:

**3.1.5.1 Four-party scheme** – In this model, there are separate players for acquiring and issuing. There is a differentiation between an issuer who has contractual relations with the cardholder and the acquirer who has contractual relations with the merchant.

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<sup>4</sup> Most of the commercial banks are members in at least one international scheme and offer cards that bear the logo of the domestic bank and of the international brand (common branding).



**3.1.5.2 Three-party scheme** – In this model the same entity serves as both the issuer and the acquirer and it has contractual relations with both the cardholder and the merchant.

Most payment card transactions worldwide are carried out on the basis of a four-party model (such as the international schemes Visa and MasterCard). Schemes that use the three-party model include Diners and American Express.

### **3.1.6 POS switch**

The infrastructure<sup>5</sup> that connects the issuers to the acquirers (or connects the processors on their behalf) for the purpose of approving and settling a transaction, sometimes also carries out the financial settling of accounts between the issuers and the acquirers. Switching services can be provided by the payment card scheme, the acquiring processor or a designated entity.

### **3.1.7 The processor**

The processor is an entity that provides service to the issuer and/or acquirer in the operational aspects of the processing of transactions in the various stages of the life cycle of the payment card transaction. The term “processing” is sometimes used in a broader sense, combining a variety of payment activities, where the dividing line between some of the activities is often blurred.<sup>6</sup> The following are some of the processing services offered by the processors to the issuers and acquirers in the activity of ATMs and payment cards:

**3.1.7.1 The Issuing processor** may provide services, such as opening and managing cardholder accounts (including monitoring of the utilization of credit lines), approval of transactions on behalf of the issuer, fraud identification and risk management, producing statements for cardholders, customer service desks, handling payment returns and collection from customers, maintenance of an accounting system, production of the payment card, personalization, creation of codes, distribution of the payment card and settlement and clearing services.

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<sup>5</sup> The payment card transaction structure can also include bilateral arrangements or entities that serve as a Gateway that connects between acquirers and issuers throughout the various networks for receiving transaction approval.

<sup>6</sup> Some of the services may be provided by the processors also to the other links in the chain (merchants or a switch).



3.1.7.2 The **acquiring processor** may provide services such as opening and managing merchant accounts on behalf of the acquirer, transfer of authorization requests to the switch (or directly to the issuer's processor), fraud identification and risk management, recording of transactions in the account of the acquirer, collection of service fees from the merchants, auxiliary services and value added services to the merchant (reconciliation services, loyalty programs, production of reports to the merchants, management of customer service desks for the merchant), operation of ATMs and terminals (including physical connection, software, maintenance and monitoring services) and settlement and clearing services.

### **3.1.8 The terminal manufacturer**

Manufacturers are entities that provide merchants (directly or by means of acquirers or processors) with terminals that facilitate the receipt of card payments. The terminals are produced according to specifications that include the functional and technological demands of the schemes and acquirers. A terminal can support working with more than one acquirer if the acquirers work on the basis of a common specification (including the structure of the message) or if the payment applications of the various acquirers have been installed on the terminal.

## **3.2 The players involved in a payment card transaction carried out through an ATM**

The division of functions between the entities involved in the execution of a transaction to withdraw cash from an ATM is similar to that in a payment card transaction, with the following modifications:

### **3.2.1 The ATM acquirer**

The entity that enables the withdrawal of cash by means of an ATM under its ownership. The service can be provided by a bank or a non-bank ATM provider.

### **3.2.2 The ATM switch**

This is the infrastructure that is used for the routing of requests for approval of a cash withdrawal from an acquirer (the ATM operator) to the bank at which the cardholder's account is held. There are cases in which the switch also carries out settlement of debit and credit transactions that are created by the withdrawal from an ATM.

One entity can fulfill a number of functions in the payment card process. For example, schemes can offer processing services in the areas of acquiring and issuing.



## 4. The life cycle of a payment card transaction

### Stages in the execution of a payment card transaction at a terminal

#### 4.1 Verification and approval

The request for approval is directed from the terminal to the acquirer (or to the acquiring processor) and from there to the issuer, generally by way of a switch.<sup>7</sup> The answer returns by the same route in the opposite direction.

This stage includes: verification of the identity of the cardholder (by means of the inputting of a secret code, a signature or some other means), checks to prevent abuse of a card (such as checks of the plausibility of card use, checks against a black list and EMV security mechanisms) and a check of the requested amount of the transaction against the balance for utilization.

Approval of the transaction is the responsibility of the card issuer and generally is provided by it. Nonetheless, the issuer can rely on other approval mechanisms, such as:

- Approval on the level of the terminal, on the basis of information saved on a smart card (such as balance for use, a meter of transactions, issuer restrictions, etc.);
- Approval on the level of the terminal on the basis of parameters and restrictions set by the issuer;<sup>8</sup>
- Approval on the level of the switch, on the basis of decision rules set by the issuer for stand-in services.<sup>9</sup>

There is also the possibility that the transaction will be carried out by the merchant without receiving approval from the issuer ("forcing a transaction"); however, in this situation the risk of the transaction will be borne by the merchant.

The request for approval and accompanying information from the issuer to the acquirer is passed through a message structure that has been determined previously and is sent by way of the communication network,<sup>10</sup> which broadcasts in real time, at fixed intervals or in batch files.

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<sup>7</sup> A transaction in which the acquirer serves also as the issuer does not in principle have to pass through a switch.

<sup>8</sup> Approval on the level of the terminal is considered to be an offline approval.

<sup>9</sup> Approval on the level of the switch is considered to be an online approval.

<sup>10</sup> Broadcasting of the transaction can be carried out on an infrastructure based on IP/TCP, dialing, wireless CDMA or landline connection.



### 4.2 Clearing

After receipt of the approval and in accordance with the rules and laws of the system, additional processing procedures take place, such as reconciliation, sorting, aggregation, consolidation and exchange of relevant information between the participating institutions. This process can be carried out differently between one brand and another and between different schemes and is dependent on whether the issuer and the acquirer maintain an account at the same financial institution or at two separate ones.

Calculation of the final positions is carried out on a multi-party net basis or bilaterally for final settlement of the balances. This calculation can be carried out by the payment card scheme or another entity which has been agreed upon by the participants.

### 4.3 Settlement

The transfer of funds from the issuer to the acquirer and from the acquirer to the merchant is carried out according to an agreement between them (the settlement agreement<sup>11</sup>), while the debiting of the cardholder is carried out according to the type of card and its conditions.

Settlement can be carried out on a net or gross basis, in real time or at fixed intervals.

There are a number of arrangements for carrying out settlement:

**4.3.1 In-house or on-us settlement:** Settlement of these instructions is handled on the internal network of the bank and in the bank's books. The accounts of the payer and the payee are debited and credited accordingly.

**4.3.2 Bilateral arrangements:** By means of bilateral arrangements, the two banks that are a party in the transaction handle the processing and the payment itself without the involvement of intermediaries.

**4.3.3 Arrangement by means of a third party (intermediary agent):** When there is an arrangement with a correspondent bank, the two sides (or one side) transfer the payment instructions to the correspondent for sorting and processing on their behalf.

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<sup>11</sup> There is a separate and independent agreement between the issuer and the acquirer and a separate and independent agreement between the acquirer and the merchant.



**4.3.4 Payment systems:** Payment systems are a formal arrangement based on legislation or private contracts with many members, accepted laws and standard processes for transferring information and funds between members. This is a system in which funds are transferred between the banks for their accounts and in the name of their customers. The participation in the system can be direct or indirect.

With regard to the finality of settlement, a payment is considered final when it is unconditional and cannot be cancelled. Every payment system determines the exact moment in which the settlement becomes final; immediately in the RTGS system or at any other time that has been agreed upon in the system's rules.

### **Stages in the execution of a cash withdrawal transaction by means of a payment card**

#### **4.4 Verification and approval**

The verification and approval stage includes a check to verify the identification of the card holder by means of inputting a PIN, checks to prevent abuse (such as EMV mechanisms, a check against a black list, etc.) and a check of the requested amount against the restrictions imposed by the issuer, including the balance for utilization. In a transaction carried out at an ATM of the bank that issued the card, the approval is given by means of the issuing bank's systems, without the involvement of a third party (on-us transactions). In transactions carried out at the ATM of a different bank, the request is sent by means of the switch to the issuing bank. A switch can also provide stand-in services on behalf of the issuer, in accordance with the definitions set by it.

If all of the checks are positive, the customer can withdraw cash from the ATM.

#### **4.5 Clearing and Settlement**

In general, transactions carried out on ATMs are reflected directly and immediately in the customer's bank account and the amount of the transaction is deducted immediately from the balance in the account.<sup>12</sup>

Mechanisms for settlement and clearing of cash withdrawal transactions between the issuers and the acquirers are similar to those that take place in transactions on a terminal.

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<sup>12</sup> The stage of settlement and clearing between the banks (apart from self-transactions) is still required.





## **5. International survey**

The payment card market is a complex one with a great deal of variation from one country to another. This variation is manifested in the processes, roles and functions in the transaction chain, where the distinction between them is not discussed in the written literature at the level needed to differentiate between them.

The terms used to describe a process, role or function vary from one place to another and do not necessarily have clear boundaries between them, even though differentiating between these terms and functions is critical in understanding the chain.

This variation is not only present in the written literature but is also an integral part of the activity and design of the various players' functions along the chain around the world.

The payment systems in general and the payment card market in particular were designed in a unique form in each country by the players participating in the system, according to the functionality required by those participants and the economic development of that country. In order to understand the structure and functionality that has developed in each country, we must understand the historical background and specific circumstances in which the players developed (such as the size of the market and the size of the banks, and the legislative, legal, and technological environment). Therefore, in order to achieve an in-depth understanding of the payment card transaction chain in a particular country, contact must be made with the various players in that country who possess information and knowledge about the transaction chain.

Even in the current era of globalization, joint processes and regulation, the achievement of harmonization between these systems and a common language is a long and complex process.

In writing this document, several countries were surveyed. The information gathered is presented below. The countries include the Netherlands and Belgium, which belong to SEPA. SEPA organizes its members into a single payment region in order to achieve harmonization in the activity of the payment systems.

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The market structure in these countries is similar to that in Israel<sup>13</sup> and in the past they have carried out reforms of the payment card system. In view of this similarity and the reforms carried out in these countries, we decided to carry out an in-depth examination of the changes carried out by these countries and the historical reasons for these changes, with the goal of learning from the experience accumulated by them, as will be described in detail below.

### US

Due to the size and structure of the market, the US cannot serve as a test case for the desired market structure in Israel. Due the size of the market, solutions exist in the US that are not relevant to a market the size of Israel's (such as bridges and regional switches).

### Belgium

The Atos Worldline Company manages the POS and ATM network and operates various systems for the various brands (Visa, MasterCard, Bancontact/Mister Cash [hereinafter, BCMC], and Maestro).

Atos Worldline is a public company that has been operating for more than 40 years in a number of locations in Europe and Asia with representation in 17 countries. The Company is supervised by the central bank and operates for profit. It supplies various services along the payment card value chain, including: settlement, switching, processing for acquirers and issuers in the ATMs and POSs, information and back office services (for the issuers and acquirers), manufacturing and distribution of terminals (POS) and certification of terminals for PCI.

### Changes in the Belgian payment card market

As in Israel, processing and routing processes were in the past controlled by a single entity – Atos Worldline (BANKSYS) which was the only processor and switch for transactions. In addition, the company was the only acquirer for the domestic Belgian brands.

In 1998, two major changes were carried out in order to increase competition and as a result the company's services were split between two new companies:

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<sup>13</sup> Size of population, number of terminals, quantity of transactions per capita, historical structure of the market, concentration in the banking system, etc.



### Stage I – Creation of the Electronic Payment Certification Institute (EPCI)

EPCI<sup>14</sup> was created in 1998 and operates as a provider of services to the managers of the card programs and acquirers who handle transactions by means of payment terminals. The Institute was founded as a non-profit organization under the control of the issuing banks in the BCMC schemes of the local debit.

Within this framework, EPCI has two main functions: management of the distribution process of specifications to terminal deployers and management of the approval process in the payment terminals.

The Institute manages the authorization process of the terminal, where the actual authorization work is carried out by external labs who have obtained the relevant approval. The certifications are carried out according to the global EMV requirements and the local specifications of the C-TAP as decided upon by the acquirers.

The creation of the EPCI and the standard protocol (CTAP) resulted in a decline in the prices charged by acquirers for terminal processing; the entry of acquirers into the market; and the entry of new terminal deployers.

### Stage II – Creation of a separate company for the management of a scheme under the BCMC domestic debit brand

In 2011, the management of the BCMC brand was transferred to a separate company with the support of the European regulator. This opened up BCMC settlement and the digital wallet to competition.

### The Netherlands

As in Israel, **Equens** is a company owned by the banks and serves as the operational platform for all of the retail payment systems, including the ACH, as a processor for the acquirers and issuers and as the operator of the payment card switch and the ATM switch.<sup>15</sup>

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<sup>14</sup> <http://www.epci.be/index-terminals.htm>

<sup>15</sup> The Company's services include, *inter alia*, end-to-end processing for the acquiring of terminals, solutions for receiving debits/credits at the terminals, ATM settlement, back office services for the merchant, end-to-end encryption services, monitoring for fraud including a black list (restricted card numbers) and a white list (risk management for active card numbers), full support services for the merchant and the supply of terminals.



The Company supports various brands and various receipt methods (including Contactless), a multiplicity of protocols, translation between one protocol and another and the unification of protocols for a uniform message that is sent to issuers.

**CCV** is a smaller private company that is supervised by the central bank and provides two main services: distribution of POS terminals and processing services of acquirers.

### **Changes in the Dutch payment card market**

The regulatory authorities in the Netherlands, led by the central bank, introduced changes into the structure of the payment card market (most of which correspond to the taskforce's recommendations) without requiring legislative measures or coercion, but rather through consensus and understanding that change is needed in the market and that a voluntary solution is in line with the changes required to increase the efficiency of the market and its level of competition. The changes carried out were as follows:

1. In the first stage, the banks stopped using a joint settlement company (Equens) in order to communicate with merchants and they had to create communication with the merchants themselves. The Equens company continues to operate only as a supplier of network services (hosting of terminals and processing of transactions) instead of maintaining direct contact with merchants.
2. It was decided to adopt a standard communication protocol for communication between merchants and the processor (C-TAP).
3. Separation of the software management activity and its transfer to a designated company (Acquiris) and the transfer of authorization of terminals to authorized third parties.

These steps facilitated the entry of new terminal deployers and the opening up of new routing possibilities.

**The Acquiris Company** – a non-profit company that was established to write, manage and update the protocol, to manage the authorization of terminals and to manage the terminals (updating of software, parameters, etc.). The company is owned by a number of entities active in the industry and its decisions are made by a general assembly made up of representatives of all the members in the Company.

Membership in the organization is open, transparent and subject to clear and nondiscriminatory rules.



### 5.1 Global trends in payment cards

As noted, an international comparison of payment card payment systems is difficult. This is because they are complex systems, whose configurations are to a large extent the result of historical developments, the legal and regulatory environment, consumer preferences, etc. Similarity between systems in one dimension can exist alongside a lack of similarity in other dimensions. However, it is possible to identify a number of common trends in the development of payment cards in various advanced economies. In what follows, we will relate to a number of these trends:

1. **Increased standardization:** While in the past, functional and technological standards were determined by each scheme separately, in recent years, there has been a trend toward coordination in the creation of accepted international standards. Following are a number of prominent examples:

#### 1.1. SEPA (Single Euro Payments Area)<sup>16</sup>

This is a project of EU and other countries whose goal is to create a joint and competitive market for electronic retail means of payment. As part of this project, legislation in the EU initiated a transition, starting in February 2014, to a uniform product for bank transfers (SEPA Credit Transfer) and instructions for the debit of an account (SEPA Direct Debit). In addition, the project dealt with specific aspects of payment card activity, such as adoption of EMV as an obligatory standard and the separation between management of the scheme and processing services. Another part of the project, which has not yet been completed, relates to the unification of the payment card market (SEPA for Cards).

#### 1.2 PCI DSS standard (Payment Card Industry Data Security Standard)<sup>17</sup>

The PCI-DSS standard was created by the five largest global credit card companies and was instituted by the Payment Card Industry Data Security Council, which is responsible for establishing rules and measures to protect payment card data. The standard provides a framework for the work process with payment card details and defines how to process and save them in order to ensure, to whatever extent possible, the security of the data.

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<sup>16</sup> For additional information see: <http://www.europeanpaymentscouncil.eu/index.cfm/about-sepa/sepa-vision-and-goals/>

<sup>17</sup> For additional information see: <https://www.pcisecuritystandards.org/>



### 1.3 EMV<sup>18</sup> (Europay, Mastercard and Visa)

EMV is a set of specifications whose goal is to provide a uniform and secure format for payment card “card present” payment transactions. The specification relates to the requirements of a payment card (a “smart” card with a chip) and of the payment card reader (a terminal or ATM). The specification defines the transaction flow process, including various mechanisms to prevent abuse.

In order to ensure that payment card transactions are carried out in accordance with the international standards accepted by the schemes (for example, PCI and EMV), there is a process to certify these standards by a body that has been authorized to do so by the institute that created the standard. These certifications relates to each link in the payment card transaction chain.<sup>19</sup>

These certifications are likely to include the following:

1. Basic certification on the level of hardware (physical) and on the level of software (kernel), which is carried out by the manufacturer.
2. End-to-end certification of the installed software at the terminal aligned with the international companies.
3. Local certification of the protocol implementation, additional technological and functionality requirements that may arise as a result of decisions by an acquirer or processor/switch to whom the terminal is connected.

### 1.4 Principles for Financial Market Infrastructures (PFMI)

In April 2012, the BIS published a report containing the Principles for Financial Market Infrastructures. The new principles established various standards and requirements that would apply to all financial infrastructures.<sup>20</sup>

2. **Steps to unify the functional requirements, which have not yet matured:** While the EMV requirements became the accepted standard for communication between a payment card and a

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<sup>18</sup> For additional information, see: : <http://www.emvco.com/>

<sup>19</sup> Terminal, payment application, host, etc.

<sup>20</sup> For further details see appendix E in the PFMI.



terminal, there has been little progress in the synchronization of communication between a terminal and the acquirer (or processor) and between acquirers and issuers. It should be noted that in certain markets, use by a dominant player in settlement and/or processing of a particular standard that is not in general use by the market has been identified as a barrier to competition.

3. **Separation between management of the scheme and processing services:**<sup>21</sup> One of the key requirements of the SEPA framework, which was also adopted as part of the European draft legislation on interchange fees, is the separation between scheme management and processing. This principle relates to operational, financial, commercial and, to whatever extent possible, legal separation. Such separation is meant to support the creation of a competitive payments market, in which issuers and acquirers have the right to choose the providers of processing, settlement and clearing services.
4. **Increased regulatory intervention in payments:** The increasing importance of payment cards in the proper functioning of the payments systems and in economic activity has constituted a catalyst for the growing regulatory and legislative involvement which has taken various forms, such as access of providers of payment service providers to the system,<sup>22</sup> arrangements between issuers (such as interchange fees), information security issues,<sup>23</sup> etc.
5. **Creation of a national payments council:**<sup>24</sup> The need for coordination between various types of players with different needs and for the strategic planning of national payment systems has in many countries led to the creation of permanent forums to discuss these issues. The World Bank has published a model<sup>25</sup> for a national payments council that defines the goals, primary tasks and methodology of such a council.
6. **The strengthening of international brands at the expense of local ones:** In view of the investment required to meet the requirements for information security and to work within the SEPA framework, many countries decided to neglect domestic payment card schemes in favor of global brands.<sup>26</sup>

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<sup>21</sup> "Card payments in Europe - a renewed focus on SEPA cards", ECB, April 2014.

<sup>22</sup> For example, the payments directive of the EU (PSD and draft PSD2).

<sup>23</sup> For example, ECB recommendations for the security of internet payments (January 2013).

<sup>24</sup> For more details, see Appendix B – Payments councils in other countries.

<sup>25</sup> [http://siteresources.worldbank.org/FINANCIALSECTOR/Resources/Developing\\_a\\_comprehensive\\_national\\_retail\\_payments\\_strategy\\_for\\_GPW\\_10\\_20\(v1\).pdf](http://siteresources.worldbank.org/FINANCIALSECTOR/Resources/Developing_a_comprehensive_national_retail_payments_strategy_for_GPW_10_20(v1).pdf)

<sup>26</sup> "Card payments in Europe – a renewed focus on SEPA cards", ECB, April 2014.



7. **Expansion of the activity of processors and acquirers to additional markets:** The increased standardization in the world of payments, initiatives to create a common European payments market and the economies of scale that characterize this field, have led to mergers between various players and, at the same time, to the creation of international players in settlement and/or processing that operate in a number of markets.<sup>27</sup>
8. **Near Field Communication (NFC):** A standard that includes a group of **radio frequency communication protocols** based on Radio Frequency Identification (RFID) technology, which allows the transmission of radio waves to a passive electronic device for the purposes of identification, authentication and monitoring from a range of a few (about 2) centimeters. This technology is currently installed on most cellular phones and is used in a means of payment that is sometimes called an “electronic wallet”. In addition, this technology can be installed on any device that has a power source, which can be used for broadcasting (smart watches, etc.). This technology possesses advantages of convenience and speed in the execution of a transaction and the reduction in malfunctions in the Points of Sale.

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<sup>27</sup> For example, First Data (35 countries), Worldline (17 countries), Equens (8 countries), Nets (5 countries), etc.





## 6. Mapping of the payments systems in Israel

### 6.1 Legal background

Section 4(5) of the Bank of Israel Law, 5770-2010, states that one of the functions of the Bank is: “to regulate the payment and settlement system in the economy, with the goal of ensuring their efficiency and stability, including according to the Payments Systems Law, 5768–2008.”

The Payment Systems Law, 5768-2008, regulates, among other things, the following: the manner in which the Bank of Israel declares a payments system to be a designated controlled system or a controlled system; monitoring of such systems; directives regarding the finality of payments in the system; liquidation proceedings of a system participant; and miscellaneous directives.

The abovementioned laws constitute the main legislative framework for the activity and regulation of payments systems activity. There are additional laws that are related to the payment systems, including: The Payment Card Law, 5746-1986, and its derived regulations, the Banking (Licensing) Law, 5741-1981 and the Banking (Service to the Customer) Law, 5741-1981. The abovementioned Banking Law is relevant primarily in the context of the activity of a joint services company such a payments system. In addition to the aforementioned, there are directives issued by the Supervisor of Banks that apply to joint service companies whose authority is derived from the aforementioned banking legislation.

### 6.2 Players in the Israeli market

The structure of the payment card market in Israel<sup>28</sup> is unique and differs from that in most other countries. The payment card market in Israel developed as a deferred payment market, unlike the debit and credit (revolving credit) markets, and is characterized by a relatively small number of players in some of the links of the transaction chain, particularly in those sections related to the operations of issuing processing and acquiring processing.

**Issuers** – Payment cards are issued in Israel by 15 commercial banks, the Postal Bank (which partners in joint issuing) and five credit card companies: Isracard Ltd. and Poalim Express Ltd., controlled by Bank Hapoalim Ltd. (hereinafter: Isracard), Cal (Cartisei Ashrai L'Yisrael)—Israel Credit Cards Ltd. and Diners

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<sup>28</sup> See **Appendix C** – Chart of the structure of the payment card chain in Israel and **Appendix D** – Key players in the transfer of funds in Israel.

## Bank of Israel



Club Ltd, controlled by Discount Bank Ltd. and First International Bank (hereafter Cal); and Leumi Card Ltd., owned by Bank Leumi Ltd and by the Azrieli Group Ltd. The credit card companies issue non-bank cards and provide issuer-processing services for all the banks, where some of the banks have joint issuing arrangements with more than one credit card company. Issuer processing services include links to the payment card switch and to international schemes, help desk services, fraud detection, etc.

In Israel, there currently four international brands of payment cards issued (Visa, MasterCard, Diners and American Express [Amex hereafter]) and a local brand (Isracard). In general, payment cards also include the function of cash withdrawal.

Issuer/brand	Visa	MasterCard	Isracard	Amex	Diners
Isracard	X	X	X	X	
Cal	X	X			X
Leumi Card	X	X			

**Acquirers** – The credit card companies also serve as the only acquirers of payment card transactions. Banks in Israel do not engage directly in acquiring. The brands Visa, MasterCard and Isracard are open to interchange settlement (in the format of a four-party scheme) while the brands American Express, and Diners are settled by the issuer only (in the format of a three party scheme).

Acquirer/brand	Visa	MasterCard	Isracard	Amex	Diners	Union Pay
Isracard	X	X	X	X		
Cal	X	X	X		X	
Leumi Card	X	X	X			X

As part of Amendment 18 to the Banking (Licensing) Law, 5741-1981,<sup>29</sup> the Governor of the Bank of Israel was granted the power to provide an acquiring license to an entity that is not a bank or an auxiliary corporation. As of the date of this report, no licenses had been granted to an acquirer.

<sup>29</sup> [http://knesset.gov.il/laws/data/law/2314/2314\\_2.pdf](http://knesset.gov.il/laws/data/law/2314/2314_2.pdf)



**Payment Card Switch** - the Automatic Banking Services Company (herein: Shva) operates a payment card switch which is used for the gathering of transactions from the terminals and their routing for the purposes of approval and settlement.

**ATM switch** – Shva operates the ATM switch, which is used by the banks for the purpose of authorizing the withdrawal of cash by external customers.

**ATM operators** – Devices for the withdrawal of cash are operated in Israel by the commercial banks and by a number of private operators. The authorization of activities of bank customers is provided by means of an internal approval system, without using any external switch. In order to approve withdrawals using the cards of external customers, use is made of the interbank ATM switch. The private operators have hosting agreements with the banks in order to provide access to the banks' authorization interface and that of the ATM switch.

**Providers of other cash withdrawal services** – Stores and certain retail chains offer cash withdrawal services in exchange for a commission or service fee. The withdrawal transaction can be carried out as a payment card transaction or as an ATM transaction using a PIN code, according to the type of terminal, the interface and the relevant authorization switch.

**Manufacturers and distributors of POS terminals** – There are five manufacturers in the domestic market whose terminals are approved for connection to Shva. In addition, there are designated manufacturers for large systems, such as retail chains, gasoline station chains, etc. There are also about 100 distributors<sup>30</sup> of Shva's "Ashrait PC" software, which is modified according to the various business sectors and the various methods of use (such as Internet sites, computerized cash registers and vending machines). Some of the manufacturers are also distributors of the "Ashrait PC" software.

**Providers of payment gateway services** – Electronic commerce sites and other merchants interested in honoring payment cards in online transactions who do not want to create an independent system, can receive payments by means of a third-party interface known as a gateway. This solution makes it easier

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<sup>30</sup> <http://www.shva.co.il/?catid={CC10E1F0-EBAA-44B4-9053-F1833A4D5418}>



for merchants to connect with acquirers, particularly with respect to fulfilling the requirements of the PCI DSS standard, and makes it possible to benefit from accompanying value-added services.

**Aggregators** – In recent years, the use of aggregators who gather the payments and credits for other merchants whose retail activity involves the use of payment cards has become more common. The aggregation can be accomplished by means of a designated application, a virtual wallet service or the issue of some other payment vehicle (such as restaurant cards). The use of aggregators is due to the desire of merchants, especially very small ones, to expand their payment options or to acquire other services provided by the aggregator (such as information or discounting services).

**Providers of payment applications** – As the use of smartphones has increased, so has the variety of applications that enable payment to a merchant by means of payment card details stored with the application provider or a third party (such as the payment services of Apple and Google). Payment applications provide a variety of uses, such as a cellular wallet, ordering of services, etc. The trend in the use of payment applications has blurred the line between payment cards and cellular payments.

**The Postal Bank** – The Postal Bank currently markets debit payment cards that are issued by Isracard and issues identified prepaid cards in foreign currency for use abroad.

**Discounting companies** – In Israel, there is increasing use of deferred payment transactions and in particular installment transactions. The discounting companies bridge between the date of the transaction with the merchant and the date that the cardholder pays. This is done by means of a discounting service, which pays the merchant up front in exchange for a discount fee. Discounting services are currently provided by both banks and non-banks.



## **7. Characteristics of the payment card system in Israel**

In order to briefly describe the payment card system in Israel, we will outline its main characteristics, while relating to the advantages and disadvantages implicit in each one. Some of the characteristics are unique to Israel, while others are common to other countries and markets, as is described in the chapter providing an international survey.

**7.1. Access to the ATM switch** – Direct access to the ATM switch is currently available only to the banks and this is for the purpose of support for cash withdrawal activity and balance requests only.

7.1.1 Banks and operators of non-bank ATMs have the possibility of indirectly connecting to the switch, by means of a host bank.

7.1.2 There is no uniformity in the interfaces between the various banks in the clearing stage, such that each bank has its own unique characteristics, and specific adjustments are required. The lack of sufficient documentation of these differences makes it difficult to access the ATM switch.

**7.2 Settling of accounts outside the ATM switch** – The settling of accounts and transfer of funds in ATM transactions is carried out externally to the switch, which is liable to constitute a barrier to the entry of a new direct user of the switch.

**7.3 Ownership of terminals** - Most of the terminals are not owned by existing acquirers.

7.3.1 In Israel, in contrast to other countries, the leasing of terminals by acquirers is not common and most of the terminals are leased or sold to merchants by the manufacturer/distributor.

7.3.2 The ownership model that has developed in Israel makes it easier to switch acquirers. Since "Ashrait" supports all of the existing acquirers, the acquirers have no interest in providing the terminal that connects the merchant to them. In this respect, the domestic market is more efficient relative to the ownership structure in other countries.

**7.4 Technological/protocol specification** – The system operates on the basis of a common technological specification that relates to the payment application in the terminal and the message structure, which are set by Shva.



The joint protocol facilitates a high level of interoperability between terminals and acquirers, including the ability to switch between acquirers without changing terminal and also to use one terminal for working with a number of acquirers at the same time. The common standard increases the uniformity of the payment experience and results in savings to the system users (for example, in the costs of development and certification for each acquirer separately), but on the other hand does not facilitate the entry of new players and consumers. The existing local protocol is not a standard one, while in other countries a generic/standard protocol based on ISO 8583 with the addition of private fields is generally used. The Ashrait EMV protocol was developed on the basis of ISO 8583 while using private fields as accepted in the world.

**7.5 Certification of terminals** – Currently, Shva is the exclusive entity for certifying terminals. Certification requires testing the integrity of the transmission of a transaction from the terminal to Shva, in accordance with the functionality and technical requirements of the “Ashrait” specification. Receiving certification is a condition for connecting a merchant’s terminal and for the interfacing with the Shva systems.

**7.6 Provision of software** – Shva is the manufacturer of Ashrait PC, which is an off-the-shelf product for Windows-based cash register systems for the payment card module. In addition, there are specialized manufacturers for terminals and large systems.

**7.7 Functionality of the system** – the system facilitates a rich and unique functionality, which includes:

**7.7.1 Payment types** – In other countries; the type of card usually dictates the type of payment. For a deferred payment card, which is common in Israel, one can carry out a credit transaction, a deferred payment transaction in one installment and an installments transaction. This ability increases the variety of payment options available to the consumer and the merchant and encourages the use of payment cards in Israel.

**7.7.2 Risk management on the level of the terminal** – In Israel, the system carries out a number of checks at the level of the terminal (such as checking the brand, type of card, validity, limit for automatic approval and blocked files). These checks reduce the risk of fraud, particularly in off-line transaction (transactions approved on the level of the terminal) and thus contribute to the accessibility and speed of payments, alongside a high level of business continuity.



Alongside the contribution of local solutions to the quality of service and the minimization of risk for system participants, a number of concerns have been raised that these solutions increase the dependency on Shva and constitute a barrier to the entry of competitors.

Additional concerns that have been raised:

7.7.3 Due to the improvement in the speed and stability of communication, it is possible to waive the support ability in off-line transactions at the level of the terminal.

7.7.4 The requirements for risk management at the terminal stage, rather than on the level of the central server, result in development costs to the manufacturer alongside savings to the credit card company.

7.7.5 Given the access to functionality specifications, the international schemes can provide a solution to the unique products in Israel as well.

**7.8 P2PE encryption requirements of Ashrait EMV** – During the discussions of the technological committee, it was decided that the switch to Ashrait EMV would be carried out together with a solution that will enable merchants to meet the PCI-DSS standard.

**7.9 Joint management of terminals** – Shva provides processing services to all acquirers, including joint management of terminals, which includes, among other things, the creation of a direct connection between the terminal and the approval switch, the opening and mobility of terminals and acquirers and the distribution of updates.

7.9.1 Joint management of terminals allows the exploitation of economies of scale, results in savings in costs of intake and transaction processing for acquirers, makes it easier to distribute updates to terminals and reduces in scale the authorization processes required for each terminal. In addition, Shva's interface is characterized by ease and speed of mobility between acquirers, which contributes to competition in settlement and eliminates the need for several terminals.

7.9.2 The claim was made that joint management of terminals constitutes a barrier to entry of international schemes for the switching of local transactions.



7.9.3 Joint management of terminals also creates dependency on Shva as a supplier of information on transactions carried out at a terminal.

**7.10 Switch** – The switching of authorization requests is carried out exclusively by Shva. A payment card system based on a single joint switch facilitates a high level of coordination between participants, makes it easier to connect new participants (both issuers and acquirers) and results in savings due to the exploitation of economies of scale. On the other hand, dependency on a single entity is liable to create a single point of failure in the payment card payments system.

**7.11 Access to a payment card switch** – Currently, the law allows Shva to provide services only to banks and their customers.

**7.12 Usage costs** – Joint ownership of Shva by the banks and the fact that it is an essential infrastructure for all payment card users allegedly creates a potential for discrimination between users and even for the setting of an excessive price. This concern is dealt with as part of the conditions of exemption from a restrictive arrangement, which stipulates that the fees and any other revenues from use of a system for gathering and authorization will be identical for all users.

7.12.1 In this context, we note that the costs of the services constitute less than one percent of the merchant fees paid on an average transaction with a payment card. Shva collects about NIS 0.02 per transaction: 0.6965 agorot (agorot is plural of agora; 1 agora = NIS 0.01) per transaction for collection of a transaction; 1.171 agorot per transaction for a transaction authorization request; and 0.943 agorot per transaction for the settlement interface between acquirer and issuers (the full price list appears on Shva's website<sup>31</sup>).

7.12.2 It is difficult to compare the costs of switch usage between countries, in view of the differences in the basket of services on the one hand and the geographic dispersion on the other. Nonetheless, the indications in the professional literature and from conversations with entities that provide similar switching services abroad,<sup>32</sup> it appears that Shva's transaction gathering and switching costs are not excessive from an international point of view.

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<sup>31</sup> <http://www.shva.co.il/default.asp?catid=%7B80DC8F1B-757D-4276-81ED-A116D134E090%7D>

<sup>32</sup> For example, in research carried out by the Federal Reserve Bank of Kansas City, it was reported that the average network fee in a debit transaction in the US ranges from 3 to 7 cents. (F. Hayashi, "The New Debit Card





### 7.13 Approval and settlement of transactions on the internet

7.13.1 Approval of transactions: There are two models: in the on-site model, every authentication and approval process of a transaction is carried out via the merchant's website, while in the off-site model the customer is redirected to a host site where the payment transaction is carried out. Both models exist in Israel, and in both the requests are routed from the page on which the transactions details are inputted to Shva as the acquirers' processor.

7.13.2 Clearing and settlement: The settlement process is carried out in the same manner in which the physical POS settlement is carried out, i.e., by means of batch files.

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Regulations: Initial Effect on Networks and Banks", 2012). The average network fee for a transaction during the period 2011-12 stood at 5.8 percent for the acquirer and 4.4 cents for the issuer.



## 8. Analysis and Recommendations for Changes in the Payment Card Transaction Chain

The structure of the transaction execution chain used in Israel affects the ability of new players to enter into various segments of the transaction approval chain, starting from the terminal and ending with the connection to issuers. The working configuration determined for a particular segment of the chain affects the subsequent parts of the chain. The structure of the chain reduces the degrees of freedom in revising the systems and the arrangements to make technological improvements.

In what follows, we will describe the issues and barriers that characterize the Israeli market along the length of the transaction chain.

### 8.1 The National Council for Payments and Settlement

*The expansion of activity and participation in the National Council for Payments and Settlement. It is proposed that the Council, which serves as an advisory body to the Bank of Israel, be expanded to include stakeholders, in accordance with the World Bank model, and in a way that will provide representation to various players and that an open discussion will be held regarding the needs of the market and the planning of the payments strategy.*

**The Global trend in the creation of national payments councils for the purpose of setting strategy.** In recent years, many countries have established national payment councils. The manner in which the council is created, its members, the source of its powers, its structure, its functions and its responsibility vary from country to country but their basic formats are identical, making it possible to design a strategy and guidelines for participants in the payments systems.

**Broadly-based inclusion of players and regulators, led by the central bank.** A national payments council, in which the central bank<sup>33</sup> takes a leading role, can effectively coordinate between the various players and interests existing in the market and can facilitate discussion, coordination and long-term planning, while maintaining a strategic perspective of the local payments map and the needs of the various stakeholders. This ability is dependent on the participation of entities that can make decisions to carry out reforms, with the broad participation of a variety of stakeholders in the council and the

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<sup>33</sup> An arrangement that has been proven efficient and effective in the coordination between the diverse needs of the stakeholders.



cooperation of players and regulators in the market. The composition of the council should provide a platform for the diversity of stakeholders in Israel's payment infrastructures, i.e., commercial banks, non-bank financial institutions, international schemes, payment service providers, non-bank organizations that represent consumers and merchants, as well as the various regulators.

**Change in the paradigm for market behavior** – The creation of the aforementioned platform for discussion between players and stakeholders can lead to change not just in the structure of the technological infrastructure, but also and primarily in the behavior of the market, in the degree of transparency and in the involvement of the players. For example, switching the payment card system to the EMV standard obligates coordinated activity of various interested parties, particularly in the information and market education aspects.

**Activity of the council as an advisory body, including its representation of the diversity of players and interests.** Israel currently has a National Payments Council whose function is to assist in maintaining the efficiency and stability of the country's payments systems. The Council does not include representatives of all the stakeholders in the payments system and its regulatory activity is carried out through the rules of the RTGS (Zahav) system.

### **Recommendation: The National Payments and Settlement Council**

It is recommended that the activity and membership of the National Payments and Settlement Council be expanded and that its areas of responsibility, composition and working methods be defined. In particular, it should be separated from the RTGS (Zahav) system rules. It is recommended that the National Payments and Settlement Council operate as a permanent advisory body at the central bank, as in other countries.

It is proposed that the model published by the World Bank serve as a basis for the structure, function, composition and powers of the council, with the necessary modifications to the domestic market, and that the Council operate by means of subcommittees to deal with the various issues in the payments system.

In the opinion of the workgroup, it is very important that the National Payments and Settlement Council include representation of the diversity of players in the payments system, in addition to the representatives of the regulatory bodies.

The workgroup feels that the inclusion of a wide spectrum of stakeholders will likely contribute to the



creation of a consensus regarding the execution of reforms and the encouragement of innovation and competition in the payment environment on the national level.

### 8.2 Regulation of a “domestic scheme” for payment cards

*Creation of a payment card committee headed by the Bank of Israel. The committee is to serve as a platform for payment card market players to discuss all the professional and technological matters regarding the manner of action and the rules for executing transactions. Its subcommittee will outline the domestic rules of activity for payment cards on the ATM switch, in a way that promotes standardization, innovation and transparency which will facilitate increased efficiency and competition while maintaining stability and safety.*

**De facto existence of a “domestic informal scheme” for payment cards in Israel.** Some of the payment card arrangements in Israel are not currently determined by international schemes but rather are anchored on the domestic level in agreements between credit card companies that are subject to the approval of the Director General of the Antitrust Authority. These arrangements deal with issues such as joining the interchange arrangement, the division of responsibility for damage and dealing with payment returns, dates for money transfer, etc. Essentially, these arrangements create a de facto “domestic scheme”, which applies to all payment cards in Israel, without a formal and clear framework for managing it. The “rules of the game” for the domestic scheme are unclear and lack transparency for potential new players. Every new player is required to enter into bilateral settlement agreements with each of the domestic players, in addition to acceptance of the international scheme. This situation creates entry barriers and limits the efficiency and transparency of the payment card system.

**Lack of a formal scheme for ATMs.** In the area of ATMs, arrangements exist between the banks that are not managed within the format of a formal scheme, are not transparent and are not open to discussion between the various stakeholders with respect to safety, stability, efficiency, accessibility, rules for transaction execution and the like. The lack of a formal framework for the domestic scheme in this area of activity is reflected in, for example, the manner in which the ATM protocol is implemented.

#### **Recommendation: Formalization of the “domestic scheme” for payment cards**

It is proposed that the existing arrangements for payment cards in Israel, including ATM activity, be



formalized as part of a structured “domestic scheme”, particularly from the viewpoint of access to the system, division of responsibility, etc.

It is proposed that a permanent committee be created that will be headed by the Bank of Israel that will discuss all the professional and technological matters regarding the manner of action and the rules of transaction execution in the payment card system with regard to payment card activity on the “Ashrait” switch. Other participants should include representatives of the relevant regulators and representatives at the professional level of entities that are active in issuing and acquiring of payment cards, international schemes, and any other relevant entity. In addition, it is proposed that a subcommittee be created that will outline the local rules of activity and the rules of the “domestic scheme” for payment card activity on the ATM switch, with the participation of the representatives of the relevant regulators and the banks.

The “domestic scheme” will establish uniform rules and identical implementation requirements for all the players in the market, with cooperation and with transparency in line with the committee’s set of rules, while paying close attention to requirements of laws, regulation, and international norms. The “scheme” will deal with various aspects of payment card activity, including the rules for joining and connecting to the payment system, the execution of transactions and card usage, and in particular technological and business arrangements (activity types), rules for settlement of accounts and money transfer (settlement arrangements<sup>34</sup>) the division of responsibility for damage (failure arrangements) and the like.

### 8.3 Protocol

*The division between switching and processing services and the formulation of the principles for development and use of the protocol (technological specification and message structure used to transfer a transaction between the various entities in the chain). It is recommended that the “Payment Card Committee” be responsible for the formulation of guidelines and rules for the development and use of the protocol in a manner that will reflect the interests of the various players in the market, while*

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<sup>34</sup> As part of the scheme, an array of services and activities will be defined as possible within each infrastructure.



*balancing the business needs of the participants with systemic considerations and which will ensure the transparency and accessibility of the protocol for all of the relevant entities.*

### 8.3.1 Formulation of the guidelines and rules for the development and use of the protocol

#### **International standards contribute to efficiency and reduce barriers to entry**

Clear, common, transparent and universally accepted standards are essential to the payment card system and the reduction of barriers of entry into that system. The adoption or support of accepted international standards for communication in the various segments will assist in reducing the risk, the costs of a transaction and the costs of development and operation.

**The “Ashrait” specification is managed by Shva in a way that is not transparent and accessible to the market.** “Ashrait”, the protocol for terminals in Israel, was specified and developed by Shva, which also distributes and manages the protocol. Various professionals with whom we met expressed reservations regarding the fact that the specification is developed by Shva and that the terminals communicate via that specification exclusively through Shva and that it is not accessible, particularly for entities that potentially would compete with Shva’s services or those of the credit card companies. In addition, claims were made regarding the modification of the specification to the business needs of the credit card companies.

The protocol includes unique individual fields that were developed for the domestic market and every new player that wishes to enter the market must adjust to the unique functionality of the “Ashrait” protocol, whether or not it operates by means of “Ashrait”.

**Shva’s function in determining and managing the protocol is liable to create a conflict of interest and unfair competition with its competitors.** Although the existence of an off-the-shelf product that was developed and checked by Shva can save development and certification costs to the cash register systems,<sup>35</sup> the regulatory function of Shva in anything to do with the protocol is liable to create conflicts of interest with its activity in software development and unfair competition with competing software

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<sup>35</sup> Many software companies make use of Shaba’s payments application, while integrating it within the cash register systems that are modified to the needs of the merchant that they service; even though, the software companies have the option of developing an independent payment application.



companies. Moreover, since Shva is responsible for the authorization of the software at the terminals, its competitors are dependent on obtaining authorization from an entity that is competing with them.

**Recommendation: Formulation of principles and rules for the development and use of the protocol**

As mentioned above, there are clear advantages to having one entity determine a common language to be used by all participants. However, the formulation of principles and rules for the development and the use of the protocol in Israel and the potential conflict of interest implicit in the existing structure create a major barrier to the entry of new players into various segments of the transaction chain.

There is a worldwide trend toward structural separation between scheme management services and processing services, and between processing services and protocol management services (in the segment between the terminal and the processor/acquirer).<sup>36</sup> In various countries, processes have been carried out to separate between switching and processing services and to formulate principles and rules for the development and use of the protocol (separating between the activity of the scheme and the processing services). The players carried out these processes by means of self-regulation.

Shva currently provides a wide variety of services throughout the payment card transaction chain. We propose that a separation be made between switching and processing services and the formulation of guidelines and rules for the development and use of the protocol in the various segments of the payment card transaction chain. This separation is likely to provide issuers and acquirers with open access to services and a broad selection of options for payment card processing.

The workgroup recommends that the Payment Card Committee be responsible for the formulation of guidelines and rules for the development and use of the protocol in a manner that will reflect the interest of the players in the market, while balancing the business needs of the participants with systemic considerations (such as business continuity, minimization of the risk of fraud, information security, etc.), and that will ensure the transparency and accessibility of the protocol to all relevant entities.

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<sup>36</sup> Terminal deployment, acquiring processing, domestic switching services.



### 8.3.2 Modular implementation of the protocol

*Modular implementation of the protocol, which will facilitate the choice and implementation of functionality at the POS terminal, in accordance with the needs of the users, and the possibility of implementing part of the functionality at the level of a remote server (located with the issuer, the acquirer or the processor). This is alongside the modifications that are required in the processing of a transaction in order to support this modularity.*

**Full implementation of the protocol:** The protocol and the existing infrastructure do not enable the modular implementation of the protocol. The manufacturers are required to implement it in its entirety and to authorize any use that is supported by the protocol.

**Modular implementation of the protocol:** It is possible that a new player coming into the market will not be interested in supporting all of the uses existing in the market but rather only part of them, such as support of debit transactions only, or will want to implement some of the uses on the level of a remote server rather than on the level of the terminal. The existing specification is not modular and does not allow the disaggregation of the standard “services package” provided by the issuers and acquirers via Shva. (for example, the intake of a request for authorization by way of Shva and its transfer to the acquirer for purposes of authorization while bypassing Shva, support of online authorizations only and support of a terminal that enables the execution of debit transactions only).

#### **Recommendation: Modular implementation of the protocol**

An efficient market supports the needs of all the players in it in a way that is fair, clear and transparent and which takes risk into consideration, such that the stability of the system will not be threatened. Therefore, it is proposed that the protocol for terminals be built in a modular manner, which will enable the selection and implementation of only part of the abilities at the terminal, in accordance with the needs of the users, while giving close attention to aspects of competition and business continuity, and will also make it possible to implement part of the functionality at the level of a remote server (rather than at the level of the terminal, as is the case today. It is therefore proposed that the required modifications be made in the processing of a transaction such that this modularity will be supported. We would emphasize that each player is not obligated to support all of the message’s fields, but all the fields need to be transparent and visible.





### 8.4 Terminals

*In order to facilitate the entry of new players and the development of advanced means of payment and new routing options, terminals—which constitute the infrastructure for carrying out a payment card transaction—must support numerous applications and contactless transactions. This support should be conducted at the same stage as the market transformation through EMV.*

#### 8.4.1 Functionality requirements of terminals

##### **Multiplicity of acquirers and issuers**

**A terminal that can support a multiplicity of acquirers facilitates switching between acquirers and encourages competition.** A terminal that supports a multiplicity of acquirers and issuers encourages competition in settlement and facilitates switching between acquirers. This is in contrast to the situation in which every terminal is owned by a specific acquirer and supports working only with that acquirer. This means that the merchant must switch terminals if it switches acquirer. As of today, “Ashrait 96”, which is implemented in the terminals, supports all existing acquirers; however, it does not support the addition of new players. A new version called “Ashrait EMV”, which is currently being developed, will enable the addition of new acquirers and issuers. This adjustment is necessary but is not sufficient for the entrance of new acquirers, because in order to facilitate the activity of new acquires the businesses infrastructure must also support EMV (i.e., payment terminals that support EMV transactions).

##### **Near Field Communication (NFC)**

**NFC supports the entry of advanced means of payment and is becoming a compulsory standard in Europe.** A terminal that supports NFC and contactless transactions facilitates the introduction of advanced means of payment that cannot operate in systems that are not NFC. The MasterCard Company instructed its members in July 2014<sup>37</sup> that starting from January 2016 all new terminals to be installed in Europe must support contactless functioning. In addition, it is requiring that by 2020 all terminals in Europe will also do so.

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<sup>37</sup> <http://newsroom.mastercard.com/press-releases/mastercard-fast-tracks-mobile-payment-acceptance-europe-helping-europeans-tap-everywhere-2020>



## **Multiplicity of applications**

**The transaction-authorization request application is built such that Shva serves as the single processor for all acquirers.** Shva currently serves as the only processor for all local acquirers and all terminals are connected directly to it.

The entry of a new player as a supplier of processing services requires structural changes and in the way in which a request for transaction authorization is transmitted. In order that new players will be able to enter and provide services to acquirers, terminals must be able to broadcast the transaction approval request to the acquirer or a non-Shva processor on its behalf. Shva will still be able to continue serving as a processor for acquirers, but additional options will be developed for acquirers that wish to use them.

**Support for a multiplicity of applications will facilitate processing and dispatch of a transaction not by way of Shva.** A terminal that supports a multiplicity of applications and the implementation of advanced means of payment on the level of the hardware makes it easier to add new options for transaction authorization. It also facilitates the entry of new players who will compete with the services provided by Shva, as well as the implementation of solutions and advanced means of payment. Such a terminal is likely to reduce the dependence on Shva for transaction authorization and settlement and for the opening of new routes for the processing and routing of a transaction, although it will shift the center of gravity toward the systems of the new acquirer or processor.

To the best of our knowledge, new terminal models that today can be found in the market facilitate the support of advanced uses, including a multiplicity of applications and execution of EMV, NFC and contactless transactions.

### **Recommendation: Advanced functionality requirements for terminals**

A large part of the references for advanced functionality and the timetable for its assimilation were reflected in the "Ashrait EMV" protocol and in the plan for the switch of the payments system in Israel to the EMV standard (hereinafter, "the plan").<sup>38</sup>

<sup>38</sup> <http://www.boi.org.il/he/NewsAndPublications/PressReleases/Pages/10-02-2015-Debit.aspx>

The workgroup recommends that the entry of new players and the addition of routing options that do not currently exist be made possible and the infrastructure should support that. Therefore, the workgroup proposes that the terminals support a multiplicity of applications, which will facilitate the development of additional routing options. It is worthwhile that the broadcasting of a transaction from a terminal can be to an acquirer, to a processor on its behalf or to third parties, rather than only to Shva. The workgroups also sees importance in the development of advanced means of payment and increasing the convenience and speed of payment execution and feels that it is worthwhile to modify the payments system infrastructure in Israel to meet international standards and trends. As part of the plan, it is recommended that new terminals include support for contactless transactions (NFC contactless) according to the directives published by the MasterCard Payment Card Organization. The workgroup reinforces this recommendation and recommends that the contactless transaction support be carried out in the same stage as the market transformation through EMV in order to avoid transformation in two stages. The workgroup suggests to continue and follow the development of the technological developments in the area of contactless transactions, particularly the scope of penetration of terminals that support NFC in the coming years (until 2020). As needed, additional directives on this issue will be considered.

#### **8.4.2 Point-to-point encryption (P2PE) of the protocol message**

*The provision of point-to-point encryption services by Shva must be carried out in a way that will not negatively impact the ability of the merchant to deal with the various aspects of the payment card transaction, either on its own or by means of a service provider on its behalf, and will not prevent the merchant from fulfilling the requirements of the PCI standard either independently or by means of another certified provider of point-to-point encryption services, if it chooses to do so.*

**Implementation of point-to-point encryption in the “Ashrait” protocol has advantages but also involves risk and raises concerns.** The “Ashrait EMV” protocol specification dictates that certain card details be encrypted at the terminal and be opened only by Shva. This encryption requirement blocks the possibility of introducing a third party between the terminal and Shva. The implementation of the solution in this way is likely to reduce the burden for meeting the requirements of the PCI DSS standard and the quantity of databases for payment cards. Yet, at the same time, such a solution is liable to



reduce the ability of a merchant to deal with payments, whether directly or by means of a third party provider, such as a provider of gateway services. This configuration of a single player providing encryption services also raises concerns regarding the compatibility of the P2PE solution with the various types of terminals and the timetables for full support in the market, the interoperability between manufacturers and the service provider, the logistical support and the handling of loads that result from the decoding of the encryption.

### **Recommendation: Encryption of the message**

The Bank of Israel recognizes the value of the PCI-DSS standard's requirements as an important component in the protection of payment card details. The assimilation of the P2PE encryption solution at the level of the merchant is expected to reduce the potential leaking of sensitive payment card information from the merchants and as a result also to reduce the risk of payment card fraud.

Therefore, the Bank of Israel recognizes the importance of Shva's provision of P2PE encryption services and expects that Shva will provide the solution in a manner that does not harm the ability of the merchant to deal with various aspects of payment card transactions,<sup>39</sup> whether on its own or by means of a service provider on its behalf, and neither will it prevent the merchant from fulfilling the PCI requirements, whether independently or by means of another certified supplier of P2PE services, if it chooses to do so. The manner of the P2PE encryption services application will be examined by the Payment Card Committee in the future.

### **8.4.3 Certification of terminals**

*The certification of terminals according to the domestic specification should be possible also by means of certified third parties, who will be authorized for this purpose by the operator of the system.*

**Certification is a process of checking compliance with the rules of the system.** The goal of certification is to make certain that a payment card transaction is being executed according to the accepted rules and standards, which were instituted by the relevant players. Certification is a complex process that requires the investment of resources and any significant change in the software, in the terminal or in the process of executing a transaction can lead to recertification of the whole chain.

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<sup>39</sup> Reconciliation of payment cards, standing orders, security transactions, etc.



**Certification of a terminal is a means used by the operator of the system to ensure that risk has not infiltrated the system.** Certification is a tool used by the operator to verify the integrity of the terminal and whether it meets the relevant requirements. The connection of a terminal that has not undergone certification is liable to introduce risk into the system. Therefore, it is the obligation of the system operator to verify that the terminal has undergone certification, whether directly or by means of a different certifier.

**The local certification is carried out exclusively by Shva.** The time required for certification and its cost on the basic levels is a function of availability and competition between the entities that are licensed to carry out certification. In Israel, certification is carried out exclusively and without competition by Shva. While the existing model of one certifier makes it easier for manufacturers and acquirers (in contrast to the alternative in which a manufacturer certifies terminals with each acquirer and brand separately), at the same time the exclusivity of Shva as the certifier of terminals is liable to impact on the time required for certification and its cost, and there is a potential for creating “bottlenecks” in the certification process of terminals to the local specification carried out with Shva because of its being a single player. This is in spite of the fact that certification of a joint specification can be carried out by licensed certification institutes, rather than the switch itself.

### **Recommendation: Certification of a terminal**

The duration and cost of certification of terminals should be derived from the required checks and given the functionality of the terminal. The certification of terminals is not a core activity of the payments system, but the system operator must verify that the terminal is not bringing risk into the system and that it meets the certification requirements. Therefore, certification should be carried out by the entity to which the terminal is connected or by someone on its behalf and if new entities arise to whom the terminal will be connected, then the certification will be their responsibility, whether by themselves or by someone on their behalf.

Based on experience in other countries, there is a possibility of increasing the efficiency of certification processes through outsourcing to third parties. This is done by instituting a uniform certification process for terminals, which will be carried out by certified laboratories. This will ensure availability and uniform receipt and will eliminate a barrier to entry for new players.

Therefore, in order to increase the efficiency of the certification process and to open up the market to new players, it is proposed that the certification of terminals according to the domestic specification



also be carried out by licensed third parties (laboratories) that will be authorized to carry out the checks by the system operator, i.e., the entity to which the terminal is connected and be required to fulfill the standards set by the system's operator for carrying out the POS terminals certification.

## **8.5 The Switch**

*The workgroup views as advantageous the development of possibilities for new routing and market structure that differ from what currently exists by means of measures and steps (which are recommended in this report) to remove the existing barriers in the market and allow the entry of new players. The goal is not aimed at achieving some specific new equilibrium point in the market but rather to carry out those measures and steps that will remove existing barriers in the market and facilitate the entry of new players. It will also create a different market structure to be determined by market forces, while maintaining stability and efficiency.*

### **The goals of creating a switch**

A switch is a joint infrastructure for the routing of transactions between issuers and acquirers. The creation of a payment card switch is intended to achieve cost savings in the handling of a transaction for participants in the payment system and to facilitate the entry of new participants. This contrasts with the situation in which each participant is required to enter into bilateral technological arrangements and interfaces with the rest of the relevant players. At the same time, the existence of a shared link in the payments system is liable to have implications for the business continuity of the entire system and will limit technological innovation.

The workgroup looked at the potential effects of creating a new switch on the payment card market from the perspective of efficiency, economies of scale, competition, safety, business continuity and innovation, as well as examining the basic conditions for the creation of such a switch. Needless to say, there is a certain tradeoff between competition and efficiency and between competition and the systems' safety and an appropriate balance needs to be found between these considerations.

The decision of whether to create an additional switch for carrying out payment card transactions also involves economic questions regarding business feasibility, particularly the costs of modifications and



the operating expenses of various players in the market that will result from working with two or more systems simultaneously.<sup>40</sup>

### **Characteristics of the existing system's activity**

The decision of whether to create another switch requires an examination of the strengths and weaknesses of the existing system. The current structure of the switch has advantages from the perspective of efficiency and competition, which are reflected in the possibility of easy and rapid mobility between acquirers, in the stand-in services for issuers and in the exploitation of economies of scale, which achieves cost savings in the receipt and processing of transactions. The existing system currently provides a high level of system availability and significant mechanisms of business continuity. The activity of the switch is under the supervision of two units of the Bank of Israel: the Banking Supervision Department, since it is a joint services company, and by the Payment Systems Oversight Unit, since it is an operator of a controlled system in accordance with the Payments Systems Law.<sup>41</sup> The supervision contributes to the maintenance of the switch's stability, safety and efficiency.

Nonetheless, this structure also involves disadvantages, which hinder competition. This is reflected in the unique domestic specification (technological and infrastructural) that makes it difficult for new players to enter and connect to the switch and hinders a new player's activity that is not via the switch.<sup>42</sup>

A structure in which activity is concentrated in one company also makes the various players dependent on a key entity, with all of the risk involved in such a situation. The concentration of this activity may also create conflicts of interest, which are reflected in, for example, the formulation of guidelines and rules for the development and use of the protocol.

### **Economic barriers to the creation of new payment systems**

In the case of Israel, introducing an additional switch requires a major change in the structure of the network (the connection of terminals to acquirers or to the new switch) and apparently also a consensus

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<sup>40</sup> For further details, see for example:

Office of Free Trading, "UK Payment systems", July 2013

Danish Payment Council, "Report on New Payment Solutions", March 2014.

<sup>41</sup> <http://www.boi.org.il/he/NewsAndPublications/PressReleases/Pages/17-07-2013-marchot.aspx>

<sup>42</sup> For example, it is possible for an acquirer to gather transactions and/or route them independently or by way of another entity, such as the international schemes.



as to the format for transmitting messages and the division of responsibility and costs. Even if these conditions are fulfilled, there is no certainty that local acquirers will wish to route their transactions, whether some or all of them, to the new switch, in view of the prices charged by Shva and the level of service and availability that it provides. Furthermore, there are network effects, according to which the value of a new network increases with the number of its participants; if there is no entity with an economic incentive to be the first to join the new network, additional players will be hesitant. In order for the new system to have value, it must attract a significant proportion of the potential users.

### **Economies of scale**

The existence of a payments system is economically justified from the point of view of its participants if it enables the exploitation of economies of scale. A player that has already connected to a payments system has no incentive to connect to an additional system that provides identical or similar services. If the large players do not connect to an alternative payment system, a critical mass of activity that supports the existence of the new switch and price competition will not be achieved. The size of the market and the scope of domestic activity also restrict the business potential of a new system relative to larger markets abroad.

### **Costs of modification and operating costs**

The creation of a system and connecting to it involves significant costs. The requirements of a new system may be different from those of the old one. Therefore, the incentive for players in an existing system to switch to a competing system decreases as connection costs increase, to the extent that the requirements of the new system differ from those of the existing system and to the extent that its operating costs are higher. The transfer will increase the marginal cost of a transaction in the existing system; but this will not necessarily be sufficient to turn the new system into an attractive competitor.<sup>43</sup> Given the size of the domestic market, the potential savings in operating costs does not necessarily justify the creation of another system. These considerations and costs also exist regarding additional activity on the existing switch and these costs will not necessarily lead to the full realization of the potential of the additional activity and justify the risks implicit in it.

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<sup>43</sup> In the communication industry, both in Israel and worldwide, there is a trend toward consolidation of infrastructure for similar economic reasons.





### **Competition and Innovation**

A new system is likely to contribute to competition from the perspective of service and innovation. The activity of a new player will energize the market and will support the improvement of service, as well as encourage thinking out of the box and the introduction of advanced technologies. If the new system is proposed by the international schemes, which possess advanced technological infrastructures, carry out investments on a global scale in innovation and implement a diversity of products worldwide, it will be easier to assimilate innovations in the domestic payments market.<sup>44</sup>

The effect of the entry of a new player on price is unclear, because the price of switching is negligible relative to a transaction. Competition may lead to a drop in price but the absolute price is still negligible relative to the size of the average transaction.

Under the current structure of the market, additional activity on the same switch will not affect competition, since there will be one operator of the two switches.<sup>45</sup> Apart from that, the creation of an additional switch without modifying any of the other links in the chain will leave the acquirers dependent on Shva as the only processor.

### **Redundancy, survivability and business continuity**

A threat to the business continuity of local payment card activity can result from an operational disruption in any one of the links in the payment transaction chain, whether at the POS terminal or the ATM device, in the communication infrastructure and switch systems or in the issuer systems. Therefore, redundancy in the activity of the system and its continual improvement are a key component in reducing the risk of system shutdown.

The damage caused by a failure of the Shva system to support the authorization and processing of transactions is liable to be critical, since it is the only address to which authorization requests are routed from the POS terminals and at which the processing is carried out. Reducing the potential of damage is possible by means both of improvements within the existing system and dispersion of activity to additional systems.

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<sup>44</sup> This reference does not imply that it is not possible to achieve innovation in the existing system.

<sup>45</sup> Link access and governance working group report, April 2006.



Ensuring business continuity in an essential payment system usually relies on the existence of an effective framework for the management of business continuity, including operational preparedness and its practice.

In the case of two separate infrastructure systems, the question arises as to the level of substitutability between them, on the level of a specific brand or on the level of the POS, since in general, each payment system has a different function and a multiplicity of switches does not necessarily create redundancy. The level of substitutability between them is derived from the answers to a number of questions. To the extent that the answer is simple, quick and encompassing, the level of redundancy created as a result of the existence of two separate systems increases.

- The question of time – The question of time is material to the question of redundancy. The level of redundancy will increase with the speed of the transition between the systems, and if there is a significant delay then the additional system will not contribute to redundancy. The creation of real redundancy requires that both the terminals and the system of the issuers and the acquirers be connected on an ongoing basis to more than one switch (which are substitutes from the point of view of usage).<sup>46</sup>
- The question of technology and information security – To the extent that modifying the systems and the terminals to work with the alternative system is more complex technologically and from an information security point of view and to the extent that the ability to connect acquirers, terminals, issuers and other players to the system is in doubt the extent of redundancy decline.
- The legal question – Is the transition formalized and determined ahead of time or does the transaction require that contracts be written and signed, that responsibility be determined and divided and that the laws and rules of the system be accepted? The level of redundancy will be greater to the extent that the transition is formalized and determined ahead of time.
- The question of capacity – Can the alternative system support the activity of the system if it fails?

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<sup>46</sup> This situation is not common in other countries due to its low level of economic efficiency.



The survivability of the payment system will be improved to the extent that the additional switch can serve as an alternative to the existing platform in the execution of payment card transactions, since the addition of the switch by itself reduces the potential damage in a stress scenario.

If Shva's ATM switch is not available, there are alternatives for cash withdrawal—namely, the issuing bank's ATM machines or those of nonbank ATM service providers, which are directly, connected to the withdrawal authorization systems of the commercial banks.

### **The various alternatives to the switch link in the payment card transaction chain**

#### **8.5.1 A single central switch**

**A single operational infrastructure for the activity of the payments system is not unusual.** The existence of a single operational platform for the functioning of a payments system is not unusual in itself. In a similar manner, most markets rely on a single provider of RTGS services and ACH services. Other countries rely on a single provider of SWIFT transmission and the authorization and settlement of payment card transaction that are not dealt with in the local system.

**The business continuity of the payments systems relies on an effective management framework and strengthened operational preparedness.** Ensuring business continuity on the level of a critical payments system relies in general on the existence of an effective framework for the management of business continuity. This includes operational preparedness by means of an alternative remote site with identical computer systems that possess a high level of availability (Active-Active). These aspects of business continuity are regulated within the framework of Proper Conduct of Banking Business Directive 355, which applies to the Shva Company. It should be emphasized that the requirements regarding the availability of an alternative site that apply to a joint services company, which is a key factor in the financial system, are more stringent than those applying to banks and are consistent with regulations that are in place in other countries regarding such systems. Nonetheless, the reliance on a single switch may create a single failure point from the perspective of business continuity.

**The supervision and examination of Shva's risk management policy contributes to the stability of the system.** Shva is a joint services company and as such is subject to regulation and the supervision of the Bank of Israel. The supervision includes, among other things, a close examination of its risk management policy, which contributes to the stability of the system. There is an advantage in having one central



player, which is large and stable as opposed to a situation of competition in which redundancy, and the substitutability between them is not clear or certain.

**Maintaining the advantages of the existing system and dealing with its disadvantages are possible within the framework of the existing switch.** The acquirers and issuers with whom we met did not express any support for the creation of an alternative switch nor were they interested in such an endeavor, and stated that some of the advantages of the existing system would be reduced or eliminated in a situation of multiple switches. Preserving the advantages and dealing with the disadvantages mentioned above in the section “**Characteristics of the activity in the existing system**” is also possible through the introduction of changes and modifications in the existing switch without adding a new switch or changing the structure of the switch and/or the interfaces with it. These changes and modifications can include, among other things, an examination of the possibility of creating an “alternative” flow route between the terminal and the acquirer, as backup, and preparation of effective contingency plans by the acquirers for a scenario involving shutdown of Shva services as a processor or as a switch for authorizations. Major changes in the structure of the system also involve various types of risk, particularly operational risk to the system and to the players connected to it.

### 8.5.2 Activity without a switch

**A payment card system can also operate within a bilateral framework without a switch.** A switch is not an essential component in a payment card payments system. The system can be based on bilateral relations and technological interfaces, particularly in markets with a small number of players. These systems are based on mutual interfaces between the banks, issuers and acquirers.

**Inefficiency and entrance problems in bilateral activity.** Bilateral arrangements, as noted, exist in a few countries and such a market structure is not efficient. It also makes it difficult for new players to enter since they must contract with each of the other players in the market (according to conditions that are not completely clear and not necessarily equal) instead of with one single infrastructure (i.e., a payment system). Activity in bilateral arrangements will require modifications and preparations by each of the companies in order to receive transactions from the terminals and cross settlement of accounts between the various players.



### 8.5.3 Multiple switches – creation of a new switching system

#### 8.5.3.1 The creation of a new local switch in parallel to the ATM switch

This alternative involves the establishment of a corporation that will compete with Shva and will serve as a switch for ATM transactions.

**The absence of an incentive in a small local market with operational complexity as opposed to the possibility of promoting innovation, redundancy and competition.** On the one hand, the introduction of an additional ATM switch may contribute to encouraging innovation and redundancy and thus will facilitate competition in switching, including the connection of additional players that are not currently connected to the existing switch. On the other hand, the domestic market is a small one, in which there are only a few players and the business feasibility of the activity of an additional ATM switch is low in the absence of an incentive to connect to it, since it will not necessarily lead to significant savings. The banks, acquirers and issuers will have to manage the requirements while facing two switches, create auxiliary systems and invest in hardware and software. Such a structure will create operational complexity and will reduce economic efficiency. If some of the players do not connect to the new switch, transactions that are carried out through an unconnected player will be routed through the two switches.

#### 8.5.3.2 Creation of a new domestic switch in parallel to the “Ashrait” switch

This alternative involves the creation of a competing company that will provide similar services to those of Shva in the areas of processing and switching of payment card transactions. The entry of such a player is likely to create competition in the market with respect to price, service, innovation and technology.

**Operational complexity and lack of interest in a solution that does not involve one switch.** There are examples of countries with more than one switch, which supports the local characteristics. However, even in such a market structure a terminal is assigned to operate through only one entity.<sup>47</sup> Acquirers and issuers will have to create technological interfaces and manage the requirements for two switches in order to create redundancy and full substitutability. This will result in operational complexity,

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<sup>47</sup> An exception in this regard is the US where each merchant has the possibility of routing **only** a debit transaction by way of at least two routes (this requirement is included in the Regulation II legislation).



additional costs and a low level of economic efficiency. The existing acquirers have not expressed any real interest in connecting to a new switch, and in any case, they will not consider the move if the new switch does not offer all services currently provided by Shva at one service point. This is even given the risks implicit in the concentration of activity. Efficient and reliable services and backup mechanisms are the parameters mentioned by the players as being more important than possible cost savings.

**Limited possibilities for using the “Ashrait” protocol.** As of today, communication with a new switch could only occur by means of a new protocol. This is because the “Ashrait” protocol only supports communication between the terminal and Shva and does not support direct communication between the terminal and an acquirer or an end point other than Shva. We would mention that the use of a protocol and a new language may reduce the advantages of the existing language and will require modifications on the infrastructure level.

**Dependency on the unique functionality and processing services provided by Shva.** The Israeli market is characterized by a unique transaction chain and functionality that are supported on the level of the protocol by the existing switch. The business feasibility of a new switch is dependent on its ability to support the unique functionality that exists in the local market and in the services and processing provided by the existing switch, either directly (modifications whose cost may be significant) or indirectly (by means of service providers). The additional switch will continue to be dependent on Shva as long as Shva serves as the only processor for the existing acquirers. The price of Shva’s processing services that will be set may be such that the addition of another switch will only add to the cost of a transaction and the activity of an additional switch will not be economically worthwhile.

### 8.5.3.3 Creation of a domestic switch for debit transactions only

This alternative involves the creation of an alternative switch that will provide switching services for debit transactions only.

**Business feasibility of switch activity for debit transactions only.** Support of payment transactions only is a less complex option and is very common in other countries. It is likely to shorten the time needed for a new player to enter the market. A debit switch is a switch for a specific type of transaction. Such a switch will not be able to support the existing variety of transactions, and therefore will not compete with Shva in activity other than debit transactions and will not improve survivability or redundancy.



Another major question—which has been answered in the negative, at least from the international perspective—is whether the activity of such a switch is economically feasible. In other words, is it worthwhile creating a new switch, with all that that involves, only for debit transactions activity, when payment card transactions are still in the stage of penetration into the Israeli market?

#### 8.5.3.4 Creation of a switch of last resort

**A switch of last resort as a means of improving business continuity and a basis for full switching activity in the future.** This alternative involves routing of a request for transaction authorization in situations in which the transaction authorization route is not available. Essentially, this is a switch of last resort for the approval of a transaction in accordance with predetermined definitions, in the case that the switch is not available. Such a solution will contribute to the business continuity of the payment card system in the event of a local failure and can serve as a basis for the introduction of full switching activity in the future. A switch of last resort does not have to support all of the functionality that currently exists in the local market and can serve as a partial solution for the basic types of transactions (debit payment and deferred payment in a single installment). In general, the international schemes serve as a switch of last resort since the issuers and acquirers are connected to them (for the purposes of carrying out tourist transactions).

**Costs of modification and setup in a solution that does not encourage competition.** This solution does not contribute to competition and requires modifications throughout the chain, which are related to the entire operation of routing a transaction through a new route (starting from the protocol and ending with modifications of the various links in the chain). Its creation and the modifications in preparation for activity with a switch of last resort will involve costs and it is unclear whether the redundancy and business continuity to be achieved will justify the investment.

**The possibility of connecting the ATM switch system to a non-bank entity as backup.** A possible solution to increase the redundancy of the ATM switch is to connect the internal ATM authorization systems of the banks to a non-bank provider, as backup in an emergency.

#### 8.5.3.5 Switching of debit transactions or of all transactions, including ATM, via the international schemes



**Using the platforms of the international schemes.** In some countries, the local acquirers and issuers make use of the services of the international payment card companies (such as Visa and MasterCard) for the purposes of authorization and settlement of transactions. In these countries, the schemes are in general, subject to the supervision of the central bank, as operators of a significant important payment system.

**Lack of business feasibility for international activity in the existing structure.** In a market in which the management of terminals is carried out by a single processor who is also the supplier of switching services, it is not economically worthwhile to introduce international schemes into this segment. If the terminals are connected to players other than Shva, it may be that the international schemes will enter into the local switching and settlement activity within a relatively short period of time.

**Continued dependency on Shva as a processor as long as there are no additional players in segments preceding the switch.** There are advantages to the switching of local transactions by means of switches belonging to the international companies from the perspective of encouraging innovation and improving the system's survivability and stability. However, this will occur only if Shva does not constitute a previous junction on the way. The international schemes do not operate in the parts of the payment card chain that precede the switch, that is, in processing services for acquirers, such as terminal management services, settlement conveyance and gathering of transaction authorization requests. Therefore, the entry of international companies into local switching activity will not eliminate the need for Shva's availability in these services, as long as there are no other players providing these services.

**Switching via the international schemes includes legal and technological modifications and will be expensive.** Switching via the international companies is not cheaper than the domestic alternative and the international companies will have to invest resources in order to provide support in Hebrew and the functionality that is provided in the local market, which will complicate their entry. The international companies will also have to make legal and technological adjustments in their framework of activity in order to carry out settlement and clearing of transactions in Israel.

**Prerequisites for the economic feasibility of the abovementioned switching.** In order for the international companies to consider the entry into activity in Israel, a number of steps must first be taken in order to achieve economic feasibility. These include: the publication of the regulator's decision as to the horizon to which he is directing the market, in order for these companies to have the security





that part of the acquirers' activity will be shifted to their switch; and the removal of structural barriers, such as collaboration with the local protocol and Shva's activity in the management of terminals in its role as the acquiring processor.

### **Recommendation: An additional switch**

After having considered the various alternatives, we realized that there are advantages and disadvantages to each of the presented switch structures, from the perspective of competition, efficiency, stability, survivability and redundancy. Some of the aspects of the presented structures even cancel out one another (there is a certain amount of tradeoff between competition, efficiency and safety of the systems). We are currently in a situation in which the market cannot change or develop on its own, due the various barriers described above.

We see the advantages of creating new routing possibilities, though we are not heading toward a specific new point of equilibrium in the market but rather we are dealing with the identified barriers to the entry of those new players within the various links of the payment transaction chain. This is accomplished by means of the steps we have recommended in this report, such as: the formulation of rules and guidelines for the protocol by a Payment Card Committee headed by the Bank of Israel; certification by additional bodies; and the strengthening of activity of the National Payments Council. In our estimation, these steps will remove the barriers to the market's development.

The goal is to enable the creation of a different market structure, though without dictating what that structure will be. Rather, this will be accomplished by removing the existing barriers in the market, which will enable the entry of new players, while maintaining stability and efficiency. We believe that as a result of these actions, the market will become more open and a new equilibrium point will be achieved, in which there will be more than one routing option.

The Bank of Israel will continue to monitor the developments in the market and the implementation of new routing possibilities. If new problems or barriers are identified in this area, additional actions will be considered.

### **8.5.4 Additional activity on the existing switch**

#### **8.5.4.1 Execution of debit transactions on the existing ATM switch**



*The relevant entities should not be required to carry out the necessary modifications that will enable the execution of debit transactions on the ATM switch. Although this alternative is technological feasible, its contribution to competition and business continuity is minor, if it exists at all, and its implementation will raise serious legal, technological and consumer-related issues.*

**Possibility of routing a transaction not via the credit card companies.** This alternative is based on the similarity between a cash withdrawal and a debit transaction at the POS, as well as on the fact that this is an active switch to which most of the domestic banks are directly connected. On the conceptual level, this configuration allows for a settlement route that circumvents the credit card companies and thus facilitates the activity of the bank as an issuer working directly with the switch and the acquirer.

**Maintaining the dependency on the availability of Shva.** Although the execution of debit transactions on the ATM switch creates an additional route for the switching of debit transactions, its contribution to competition and survivability is limited, if it exists at all. The alternative leaves intact the dependency on the services of Shva as a provider of the two operational infrastructures for handling debit card transactions.

**Implementation of the switching of debit transactions on the ATM switch in other countries.** There are some countries where the execution of a debit transaction is carried out on the ATM switch. In the US, for example, the switching of a debit transaction via the ATM networks is considered to be cheaper than routing via debit card networks,<sup>48</sup> although part of the difference in costs is the result of the difference in consumer protection.

**The alternative is technologically feasible but raises serious legal, technological and consumer-related issues.** There is a technological possibility of implementing the alternative on the existing POS terminals by means of a designated application that is separate from the “Ashrait” application, which obtains authorization for the execution of a payment via an ATM switch. However, in conversations with various entities in the market, it was claimed that this is an outdated solution and inferior from the perspective of functionality and consumer protection and requires a significant investment in initial modifications and in the ongoing operation of the alternative. **In particular, the following issues were raised:**

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<sup>48</sup> See: Debit Card Interchange Fees and Routing, Federal Reserve.  
[http://www.federalreserve.gov/aboutthefed/boardmeetings/20110629\\_REG\\_II\\_FR\\_NOTICE.FINAL\\_DRAFT.06\\_22\\_2011.pdf](http://www.federalreserve.gov/aboutthefed/boardmeetings/20110629_REG_II_FR_NOTICE.FINAL_DRAFT.06_22_2011.pdf)



- **Use of the payment card not according to its designation brings up legal and consumer questions.** The payment cards in Israel include the functions of cash withdrawal (in which the account of the cardholder is debited immediately) and payment (in which the date of payment is determined in the issuing agreement according to the type of card). It is not possible to “ride” the cash withdrawal function in order to carry out the purchases of goods or services without the prior agreement of the customer. A bankcard for cash withdrawal was not originally intended for making payments at the POS. Furthermore, the use of the cash withdrawal function for carrying out debit transactions transforms a deferred payment card into a kind of inferior integrated card (that supports debit payment in “card present” transactions only). This brings up serious consumer-related issues, particularly in the stage of the introduction of the debit card into the market. (For further details, see Section 2 of “Recommendations regarding the Encouragement of Competition in the Area of Payment Cards”<sup>49</sup>). In this context, there is a possibility in principle of limiting the use of the ATM switch to debit card transactions only.
- **Lack of information and support in execution of payment card transaction on the ATM switch.** The ATM switch does not include any of the information required to carry out payment card transactions, in accordance with the standards specified in the regulations of international organizations and the requirements of disclosure to the customer. Therefore, the need to support the execution of debit card transactions requires modifications in the structure of the message, in order for it to include information on the industry code, the name of the business, etc. Similar modifications will be needed in the banks’ systems, which are used for the authorization and settlement of ATM transactions. The ATM switch is not capable of dealing with payment returns and credit and/or cancelation transactions.
- **The lack of monitoring, support and control for transactions on the ATM switch in the current configuration.** Bank payment cards, and in particular debit cards, are issued by the credit card companies in their function as processor. The credit card companies are not connected to the ATM switch and do not have access to information on the transactions authorized at this switch for bank cards.<sup>50</sup> This reduces their ability to carry out the monitoring processes necessary to

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<sup>49</sup> <http://www.boi.org.il/he/BankingSupervision/Survey/DocLib1/paymentb.pdf>

<sup>50</sup> The banks have a direct connection to the ATM switch. They allow indirect access to the ATM switch to other players, including other banks and non-bank entities, as part of hosting agreements.



prevent abuse and to fulfill the requirements imposed by the anti-money laundering laws, as well as their ability to mediate in these transactions with respect to the cardholder (enquiries, disclosure, etc.). In this situation, the banks will have to create an independent system to handle these aspects of debit transactions conveyed via the ATM switch or to create a new designated interface with the credit card companies. It should be mentioned that a direct connection of the credit card companies to the ATM switch is liable to require a revision of Shva's operating license.

- **Revision of existing agreements.** The existing ATM switch operates under cash and netting agreements between the participating banks. The conveying of debit transactions on the switch will apparently require the examination and modification of existing agreements, including failure arrangements, as well as changes and revisions in work processes, risk management and division of functions and responsibility.
- **Costs of modification and operating costs for the support of debit transactions on the ATM switch.** Although use of the ATM switch does not involve connection costs for already-connected banks, adding activity on the existing switch requires an initial investment in technological and operational preparations for the support of debit transactions that are conveyed on the ATM switch and creates operating costs for the support of this route.
- **The existing ATM network infrastructure does not support the volume of activity that is conveyed on the "Ashrait" switch.** The capacity of the ATM network is not sufficient for the support of POS transactions. Currently, the ATM switch is intended for the authorization of cash withdrawal at ATM machines and the volume of information conveyed on it is significantly smaller than that conveyed on the "Ashrait" switch. Furthermore, the requirements for the availability of the switch and the authorization systems of the banks are lower than those required in order to support POS payment activity.
- **Change in the approach to information security.** The execution of debit card transactions by means of the ATM switch will require a major change in the approach to information security in the ATM switch.
- **The modification of the ATM switch is riskier and more complex than establishing a new and more modern switch.** The international schemes view an upgrade of the ATM switch, so that it can include debit transactions, as a complex and high-risk endeavor and therefore they do not recommend it. It was also mentioned that the creation of a new domestic switch for debit



transactions on a new modern switch platform is more stable, safer, cheaper and faster, and there are fewer operational problems than with the modification of the old ATM switch to support debit transactions.

**A lack of willingness among the issuers and acquirers to carry out the needed modifications.** Most of the issues raised here relate to aspects of consumer protection, competition and legal problems and have less to do with technological feasibility. It should be mentioned that the players with whom we met did not express interest in carrying out the modifications necessary to support this alternative.

### **Recommendation: Executing debit transactions on the existing ATM switch**

The execution of debit transactions on the ATM switch is technologically feasible; however, the examination of this alternative raised technological, legal and consumer-related issues that need to be dealt with, alongside the initial and ongoing preparedness of the banks and Shva (and perhaps also of the credit card companies). In addition, it was concluded that implementing this alternative made little or no contribution to competition and business continuity.

Certain changes and reforms are currently being implemented in the credit card system (such as the assimilation of the EMV standard and the increasing number of debit cards and their usage). These require significant technological and administrative modifications in the near future. The result of these steps together with the implementation of other recommendations in this report are likely to influence the assessment of the need to implement the option of executing debit card transactions on the ATM switch.

The workgroup attributes importance to removing barriers to the activity of players and the maintenance of stability and efficiency. Therefore, it is proposed at this stage not to require the relevant entities to carry out the necessary modifications (legal, regulatory, technological and operational) in order to allow the execution of debit transactions on the existing ATM switch.

Nevertheless, it is proposed that the Payment Card Committee that is to be established (as part of the recommendation for the formalization and definition of the rules and methods for the execution of transactions in the payment card system) will examine—after the implementation of the changes— the feasibility of executing debit transactions on the ATM switch and under what conditions.



### 8.5.4.2 The settlement interface for the ATM switch

*The creation of a new central settlement interface for transactions on the ATM switch, which will simplify the settlement process, will reduce operating costs and will make it easier for a new player to join the system.*

**Bilateral settlement of transaction that were executed on the ATM switch.** The settlement of payment transactions carried out on the payment card switch is carried out by means of Shva's settlement interface, and at the completion of the process the balance is sent for settlement in the RTGS system by means of "Masav". This is unlike the settlement of transactions executed on the ATM switch, which is currently carried out outside the switch according to bilateral arrangements between the banks.

#### **The difficulty for new players to enter into bilateral arrangements relative to payment system.**

The existing settlement interface in "Ashrait" reduces the disagreements between the various players and each player works with one entity rather than working with a number of players. This simplifies the settlement process, reduces operating costs and makes it easier for a new player to enter the system. In contrast, a bilateral arrangement makes it difficult for new players to enter, from both the operational and contractual viewpoints, and the arrangements are made according to the negotiating ability of the new player relative to the other players. The advantages of a settlement interface are fully exploited only if all of the players participate in it. If not, they will still have to maintain bilateral arrangements with players who do not want to connect to the interface.

**Execution of settlement and clearing is not dependent on the authorization stage.** The body that provides switching services for authorizations does not have to be the same body that carries out settlement and clearing, as in the case of the ATM switch in Israel. There are countries in which the connection between the acquirer and the issuer in the clearing segment is not through the same entity used for authorizations. In general in these cases, clearing is carried out by means of the international schemes. Nonetheless, there is an advantage for the same body to carry out this activity, since interfaces already exist between the various players and it is not necessary to introduce and operate new interfaces from scratch.



**Implementation of a system that includes a full solution as opposed to a solution that is quick and simple to implement.** The implementation of the aforementioned interface can be carried out in a similar manner to the existing implementation of the payment card switch. In other words, the interface will draw transaction data independently (directly from the ATM's or from a central point in the bank) or by means of batch files that include the transaction data from each bank. The second possibility is quicker and simpler to implement since it requires fewer modifications and changes in the software; however, the first option provides a more complete solution to the settlement process at one central point.

**Recommendation: A settlement interface for the ATM switch**

The workgroup proposes that the settlement and clearing of transactions executed in cash withdrawal devices will be carried out by means of a new central settlement interface that will operate in a similar manner to the settlement interface of the payment card switch. The interface must support all settlement processes and the settlement of accounts process on its own.

In addition, it is proposed that the existing bilateral settling of accounts mechanism between the banks be preserved, as backup to the settlement interface.



## **9. Conclusion and Recommendations**

In the Israeli payment market, Shva (Automated Bank Services Ltd.) provides a large and varied part of the services in the payment card transaction chain, including switching services, formulation of the guidelines and rules for the development and use of the protocol, certification of terminals and their ongoing management, a settlement interface and more.

Currently, a process is underway in the market to switch to the EMV standard, according to which the new system ("Ashrait EMV") is meant to provide a solution to some of the existing problems and barriers in the Shva system, such as consistency with international standards, the ability to add new issuers and acquirers and the level of support for debit transactions and NFC transactions.

The advancement and introduction of an additional switch for the execution of payment card transactions has advantages such as the following:

- Improvement of survivability – A multiplicity of switches reduces the potential damage to the availability of the payments system during an operational disruption and is likely to make it easier to recover from a disaster.
- Competition between switches – Providing the acquirer or the merchant with the ability to choose the network to which a transaction will be routed to can lead to competition that will encourage the improvement of service and innovation.

However, the aforementioned change also involves risk and not insignificant adverse effects:

- Stability – Entry of new players into the area of switching and/or processing of transactions does not currently require a license or regulatory approval. New players that do not operate in an appropriate, reliable and safe manner can expose the other participants to various types of risk, including settlement risk and operational risk, which can, under certain circumstances, lead to a domino effect and the actualization of systemic risk.
- Efficiency – Payment systems, including switching systems, are characterized by economies of scale and their operation requires significant investment and high levels of activity in order to achieve economic justification. Apart from that, working with an additional processor and/or switch requires an initial and ongoing investment by the system users. The Israeli market is small and as a result, the introduction of an additional switch and/or processor will not necessarily





lead to an improvement in the efficiency of the payment system or to a reduction in participants' costs. On the contrary, many of the processes will be duplicated and access to the system will become more complicated.

### **Creation of a new switching system**

Although as mentioned a license or regulatory approval is not needed in Israel for a switch or processor, for various reasons the conditions for the development of a competing switch or processor have not arisen and it appears that under the existing conditions a new competing switch or processor will not develop in Israel without intervention or a supporting regulatory change.

In considering the various alternatives in order to formulate our recommendations, we studied the advantages and disadvantages of each of the alternatives and the limits and risk that each of them involve, from the perspective of, among others, stability, efficiency, survivability and competitiveness of the payment card market.

In our investigation, we did not find one model that could include all of the required elements of a payment card market, a market which is two sided,<sup>51</sup> complex and characterized by economies of scale and which includes a wide variety of applications, participants and arrangements. Each of the recommendations and decisions regarding a change in the structure of the market or the introduction of a particular technological application has implications for the efficiency and stability of the payment card system.

*The workgroup sees an advantage in the development of new routing options and a market structure that differs from the existing situation by means of removing existing barriers in the market and facilitating the entry of new players and competition, while maintaining the stability and efficiency of the payment and settlement system.*<sup>52</sup>

Therefore, after examining and discussing the various alternatives and balancing the various considerations, it is proposed that the following actions be taken in order to remove the identified barriers:

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<sup>51</sup> This is a market in which- the more participants there are on one side (cardholders) the more benefit is derived by participants on the other side (merchants), and vice versa.

<sup>52</sup> The relevant regulators will oversee the implementation of the decisions and if it appears that, there is a need for their intervention, whether together or separately, they will have the option of dictating a solution.



	Subject	Recommendations
1	The National Payments and Settlement Council	<ul style="list-style-type: none"> <li>It is proposed that the activity and membership in the National Payments and Settlement Council be expanded and that the Council's responsibility, composition and work methods be formalized, though not via the RTGS system rules. The central bank will take a leading role in this process with cooperation and consent of the participants and regulators active in the market.</li> <li>As in other countries, it is proposed that the National Payments and Settlement Council operate as a permanent advisory group at the central bank.</li> <li>It is proposed that the model published by the World Bank constitute the basis for the structure, function, composition and authority of the Council; with the necessary modifications to the domestic market and that, the Council will operate through subcommittees for specific aspects of the payment system.</li> <li>It is proposed that the Council will have representatives of a variety of stakeholders in the payment system, alongside representatives of the relevant regulatory bodies.</li> </ul>
2	The Payment Card Committee	<ul style="list-style-type: none"> <li>It is proposed that a permanent committee be established which will be headed by the Bank of Israel that will discuss all the professional and technological matters regarding the manner of action and the rules of execution for transactions in the domestic payment card system on the "Ashrait" switch, particularly with regard to access to the system, division of responsibility, etc. The Committee will include representative of relevant regulators, professional representatives of entities operating in the area of payment cards, and any other relevant entity. In addition, it is proposed that a subcommittee be established to outline the rules for execution of payment cards transactions on the ATM switch.</li> </ul>
3	The "Ashrait" protocol	<ul style="list-style-type: none"> <li>It is proposed that switching and processing services be</li> </ul>



		<p>separate from the formulation of guidelines and rules for the development and use of the protocol.</p> <ul style="list-style-type: none"> <li>• The workgroup recommends that the Payment Card Committee be responsible for the formulation of guidelines and rules for the development and use of the protocol, in a manner that will reflect the interests of the various entities in the market while balancing between the business needs of the participants and systemic considerations and that will ensure transparency and accessibility of the protocol for all the relevant entities.</li> <li>• The workgroup proposes that the subcommittee be composed of relevant regulators and representatives from the industry, including banks, acquirers, issuers, the system's operator (Shva), manufacturers and other entities that make use of the protocol.</li> </ul>
4	Modular implementation of the protocol	<p>It is proposed that the protocol for the terminals be constructed in a modular manner, which will facilitate the selection and implementation of part of the functions at the terminal, in accordance with the needs of the users and the possibility of implementing part of the functionality on the level of the remote server (of the issuer, the acquirer or the processor). In order to support this modularity, it is proposed that the necessary modifications be made in the processes to support the handling of such a transaction. The degree of the modularity will be determined while paying close attention to aspects of competition and pf business continuity.</p>
5	Functionality requirements for the terminals	<p>It is important that the terminals support a multiplicity of applications and the execution of contactless transactions. Therefore, the workgroup proposes that the terminals support those abilities at the same stage with the market transformation to EMV. This will facilitate the development of advanced means of</p>



		payment and additional routing options.
6	Encryption of the message	End-to-end encryption services should be provided by Shva in a way that does not reduce the ability of the merchant to deal with various aspects of the payment card transaction, whether on its own or by means of a service provider on its behalf, and should not prevent the merchant from meeting the requirements of the PCI standard whether on its own or by means of another certified supplier of end-to-end encryption services, if the merchant chooses to do so.
7	Terminals certification	It is proposed that the certification of terminals according to the local specification also be carried out by licensed third parties, who will be certified to carry out the checks by the system operator.
8	Conveyance of debit transactions on the existing ATM switch	<ul style="list-style-type: none"> <li>At this stage, it is proposed not to require the relevant entities to carry out the necessary modifications (legal, regulatory, technological and operational) in order to execute debit transaction on the existing ATM switch.</li> <li>At the same time, it is proposed that the Payment Card Committee to be established will examine whether it is possible to execute a debit transaction on the ATM switch and under what conditions.</li> </ul>
9	Settlement interface to the ATM switch	<ul style="list-style-type: none"> <li>It is proposed that settlement and clearing of a transaction executed on the ATMs will be carried out by means of a central settlement interface to be established and that its operation will be similar to that of the settlement interface of the payment card switch.</li> <li>It is proposed that the existing bilateral settling of accounts mechanism between the banks be preserved, as backup to the settlement interface.</li> </ul>

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As part of the implementation of the recommendations, their potential effect on the payment system in general, and on Shva in particular, should be considered.

The implementation of these recommendations in the areas of processing, standardization, certification, security, and business practices requires thought, investment and efforts on the part of all the involved stakeholders.

Changes in the payment card market are long processes and the stabilization of a new market structure will take some time.

The abovementioned recommendations are meant to create an infrastructure that will allow, in coming years, the entry of new players and encourage competition in the various links of the payment card transaction chain. They will support greater stability and safety in the payment card system.

The Bank of Israel will continue to monitor the developments in the market and the implementation of the new routing options, and if new problems or barriers arise then additional measures will be considered.



## Appendix A – Definitions<sup>53</sup>

<b>Acquirer</b>	The entity that contracts with a merchant and an issuer and which enables the merchant to receive payments from cardholders by way of the issuer. The acquirer is responsible for ensuring and transferring the payment to the merchant.
<b>ATM</b>	Automated Teller Machine—an electronic device that enables authorized users, by means of a payment card, to withdraw cash from a checking account and/or to receive additional services such as checking their bank balance and transferring or depositing funds.
<b>Authorization</b>	The receipt of a commitment by the issuer to execute the payment.
<b>Bank card</b>	Cards that are intended for the customers of the banks with which the credit card companies have distribution and joint issuing agreements.
<b>Bilateral netting</b>	An agreement between two sides to offset their mutual liabilities.
<b>Card scheme</b>	This is a technical and commercial arrangement determined for one or more brands of card that provide the organizational, legal and operational framework necessary for the functionality of the services stated by these brands.
<b>Clearing</b>	The process of transferring, reconciling and in some cases authorizing the transactions prior to their being settled. This can include netting of transactions and the determination of final positions for settlement.
<b>Communication protocol</b>	A set of rules in a predefined format for the exchange of information between two sides (such as card-terminal, terminal-acquirer or acquirer-issuer).
<b>Credit card</b>	A card that includes a credit line and allows the holder to make purchases and/or withdrawals of cash up to a predetermined limit.  The credit can be fully settled at the end of a defined period or can be settled in installments, with the balance bearing additional interest.

<sup>53</sup> The definitions appearing in this chapter are those, which are accepted worldwide. They may differ from those in the Payment Card Law.



<b>Debit card</b>	A debit card connected to the account of the cardholder and which debits his account for each transaction near to the time it is executed.
<b>Distributor</b>	In Israel, these are companies that market the Ashrait PC software.
<b>EMV</b>	Europay Mastercard and Visa—A set of specifications developed by the EMVco consortium with the goal of providing a uniform and secure format for electronic payment transactions with payment cards in which the card is presented to the merchant.
<b>Issuer</b>	A financial institution that provides its customers with payment cards approves payment transactions or cash withdrawals and guarantees the payment to the acquirer for the authorized transactions.
<b>Kernel</b>	The basic layer of the POS operating system. The kernel provides the basic services of the operating system and facilitates the interaction between hardware, software and memory management.
<b>Manufacturer</b>	A company that supplies end-use equipment for the settlement of transactions at the POS, including hardware and software components according to the accepted specifications in the market.
<b>Netting</b>	An arrangement whereby the liabilities or assets of a participant with respect to the other participants will be the value of his liabilities or assets less the liabilities or assets of every other participant with respect to him.
<b>Non-bank card</b>	These cards are issued directly to customers by the credit card companies, not by way of the banks, primarily by way of the loyalty clubs administered jointly with consumer organizations or retail chains.
<b>Payment card</b>	A means of payment where information on the payer's account is contained in the card's magnetic strip and/or chip and the information is available by means of the appropriate device or interface of the payment receiver. Cards issued by merchants that are used for a limited number of points of sale are not included in this definition.
<b>Payment gateway</b>	An entity that serves as a provider of access for the conveyance of a transaction between the merchant and the acquirer or the acquirer's processor.



<b>PCI-DSS</b>	Payment Card Industry-Data Security Standard—An international standard for the security of payment card information. The standard relates to all the entities involved in the processing of a card transaction.
<b>PIN</b>	Personal Identification Number – a personal and confidential numeric code that is used for the verification of the cardholder's identity.
<b>POS terminal</b>	Point of sale terminal—A device that can read the information on a card and process a request for the execution of a payment card transaction by a merchant.
<b>Processor</b>	An entity that carries out the technical processing of a transaction for an acquirer and/or issuer.
<b>Settlement</b>	The transfer of funds between two sides in order to eliminate a liability between them.
<b>Switch</b>	An entity that is used for the routing of messages related to authorization and verification between the participating institutions (acquirers and issuers) and which can create and distribute settlement and clearing files.





### Appendix B – Payment Councils

#### EU

The European Payments Council (EPC)<sup>54</sup> – This coordinating body sets the policy and standardization for the European banking industry in connection with payments. The body was established by the European banking industry in 2002 following a call for action by the regulator. Its goal is to support and promote the SEPA although it is not responsible for SEPA's overall management.

The members of the EPC represent banks, banking communities and payments institutions.

#### Denmark

In 2012, the central bank founded the Danish Payments Council as a forum for cooperation between Danish retail payment infrastructure. The forum includes representatives of a range of stakeholders in the Danish payment infrastructures.

These stakeholders include representatives of the Danish Chamber of Commerce, the Confederation of Danish Industry, the Ministry of Business and Growth, the Danish Bankers Association, the Danish Consumer Agency, the Danish Federation of Small and Medium-Sized Enterprises and NETS.

The Forum can establish subcommittees and workgroups to deal with specific issues.

#### Belgium

On May 12<sup>th</sup>, 2006, the Steering Committee on the Future of Means of Payment<sup>55</sup> was established at the central bank. Its goal is to work together with the economic groups that are involved in promoting the SEPA in Belgium, such that SEPA will have a significant influence on the development of means of payment.

The Chairman of the Committee is the governor of the central bank and members include federal ministers, the Belgium Finance Federation, BANKSYS, the Belgian Post Office, consumers, SME companies and merchants.

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<sup>54</sup> <http://www.europeanpaymentscouncil.eu/index.cfm/about-epc/the-european-payments-council/>

<sup>55</sup> [http://www.nbb.be/pub/09\\_00\\_00\\_00\\_00/09\\_01\\_06\\_00\\_00.htm?l=en](http://www.nbb.be/pub/09_00_00_00_00/09_01_06_00_00.htm?l=en)

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The Committee supports and coordinates the implementation of SEPA in Belgium. The banking sector takes a leading role in the transition to SEPA in Belgium; and it is coordinated on the level of the community in order to take into account all the layers in the economy that are involved in the change and in the future of means of payment.

### UK

The UK Payment Council<sup>56</sup> was established in 2007. Membership is voluntary and the organization is managed in accordance with a number of laws and by a board of directors.

The Council's board of directors is composed of 16 directors (four of them and the chairman are independent) who are appointed by the banks.

The Council works with a number of payments "schemes" for the benefit of the payment industry in the UK, such as BACS, CHAPS, FASTER Payments, LINK, and the Cheque and Credit Clearing Company.

Each of the Council's participants signs a contract that includes, among other things, the obligation to report to the Council on various activities.

The Council can make decisions that obligate the companies to implement its strategy (subject to the right of the schemes and their members to submit a request for exemption).

The Council has strategic relationships with other bodies in the industry, including Visa, Mastercard, EPC, SWITCH, the Chamber of Commerce, the Financial Conduct Authority and others.

### The Netherlands

The National Forum on the Payment System<sup>57</sup> was established in 2002 by the Minister of Finance and is also known as the MOB.

The Forum meets twice annually and represents the suppliers and users of the payment system.

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<sup>56</sup> <http://www.paymentscouncil.org.uk>

<sup>57</sup> <http://www.dnb.nl/en/payments/mob/index.jsp>



The participants in the Forum were defined by the Minister of Finance and include, among others: the pensioner's organization, the Danish payments association, the Dutch Consumers' Association, system users, an SME organization and the banking association.

The Forum establishes a number of workgroups in preparation for the Forum's meetings. Each group includes 8-12 members, one of whom serves as chairperson. The workgroups discuss issues such as social efficiency, statistics, accessibility and safety.

### Israel<sup>58</sup>

In 2009, the National Payments and Settlement Council was established, in accordance with the rules of the RTGS system.

The members of the Council include representatives of various bodies operating in the payments system in Israel, including representatives of the Bank of Israel, the banks and the payment systems.

In addition, there are representatives of stakeholders (such as the Israel Securities Authority, provident funds, insurance companies, pension funds and credit card companies).

### **Survey and Recommendations of the World Bank for 2010**<sup>59</sup>

The objective of the National Payments Council is to support the achievement of safe and efficient payment and securities systems in the state. The Council can also serve as a forum for cooperation in order to maintain an organized set of rules for regional and international payment systems.

A Council led by the central bank and that includes all of the relevant institutions involved in the payments market has proven to be an effective arrangement for the coordination between a variety of stakeholders in the reform of payments.

The survey revealed that 49 councils have been set up in order to encourage cooperation between stakeholders. The EU and Sub-Saharan Africa (SSA) have the highest percentage of councils.

**A formal National Payments Council is in place**

<sup>58</sup> <http://www.boi.org.il/he/PaymentSystem/PaymentAndClearingSystem/Pages/Default.aspx>

<sup>59</sup> [http://siteresources.worldbank.org/FINANCIALSECTOR/Resources/Retail\\_Payments\\_Strategy\\_June2013.pdf](http://siteresources.worldbank.org/FINANCIALSECTOR/Resources/Retail_Payments_Strategy_June2013.pdf)



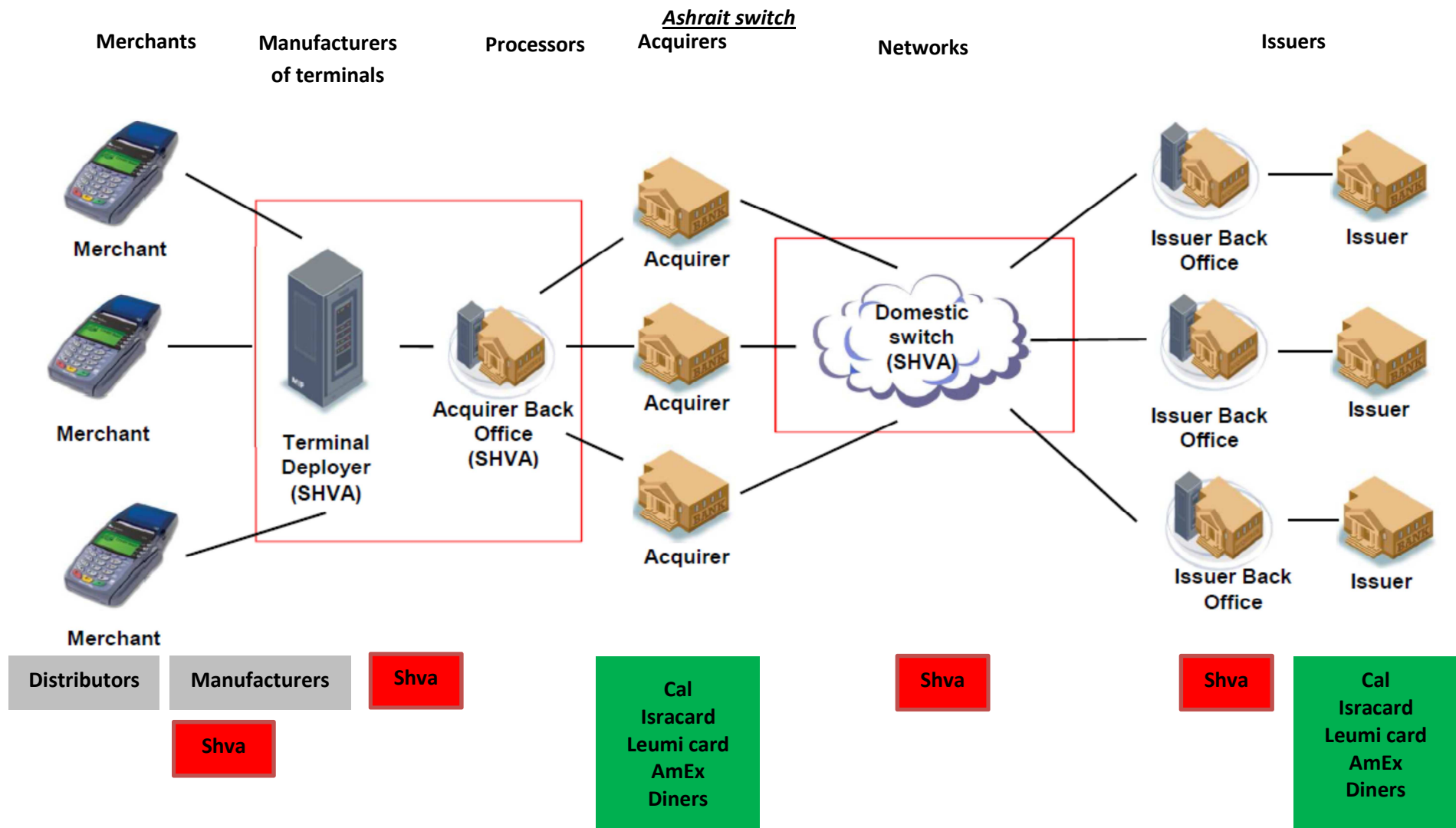
		#	%
	Worldwide total (124)	49	40%
	<b>By income</b>		
Israel	High income (45)	18	40%
	Upper-middle income (32)	13	41%
	Lower-middle income (30)	11	37%
	Low income (17)	7	41%
	<b>By region</b>		
	East Asia and Pacific (10)	2	20%
	Europe and Central Asia (15)	5	33%
	Latin America & Caribbean	7	39%
	Middle East & North Africa	2	17%
	South Asia (4)	2	50%
	Sub-Saharan Africa (24)	15	63%
	Euro area (16)	8	50%
	Other EU members (11)	6	55%
Israel	Other developed countries	2	14%
	<b>By population size</b>		
	>30 million (35)	12	34%
Israel	>5 million, <30 million (47)	20	43%
	5 million or less (42)	17	40%

The World Bank has published a report entitled “Developing a Comprehensive National Retail Payments Strategy”<sup>60</sup> which contains a model for a national payments council. The model describes in detail the main tasks, methodology, membership and organizational structure of a council.

<sup>60</sup>[http://siteresources.worldbank.org/FINANCIALSECTOR/Resources/282044-1323805522895/Developing\\_a\\_comprehensive\\_national\\_retail\\_payments\\_strategy\\_consultative\\_report\(8-8\).pdf](http://siteresources.worldbank.org/FINANCIALSECTOR/Resources/282044-1323805522895/Developing_a_comprehensive_national_retail_payments_strategy_consultative_report(8-8).pdf)



# Appendix C—Structure of Payment Card Transaction Chain in Israel



**Shva's functions:** Switch, Processor, Regulation of principles and rules, Manufacturer, Certifying entity, Settlement transfer management, Aggregator, Settlement interface, managing loyaltyclubs.

**Banks**

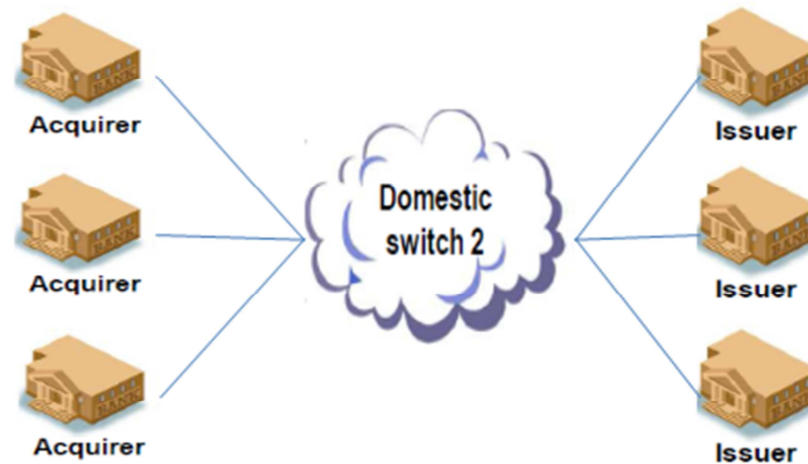


## ATM switch

Shva

Regulation of principles and rules for development and use of the protocol, communication

Shva's functions: Switch, regulation of principles and rules for development and use of the protocol, Processing services and Stand In services for issuers.



Bank Leumi

Bank Hapoalim

Discount Bank

Bank of Jerusalem

Mizrahi Bank

First Int'l Bank

Shva

Bank Leumi

Bank Hapoalim

Discount Bank

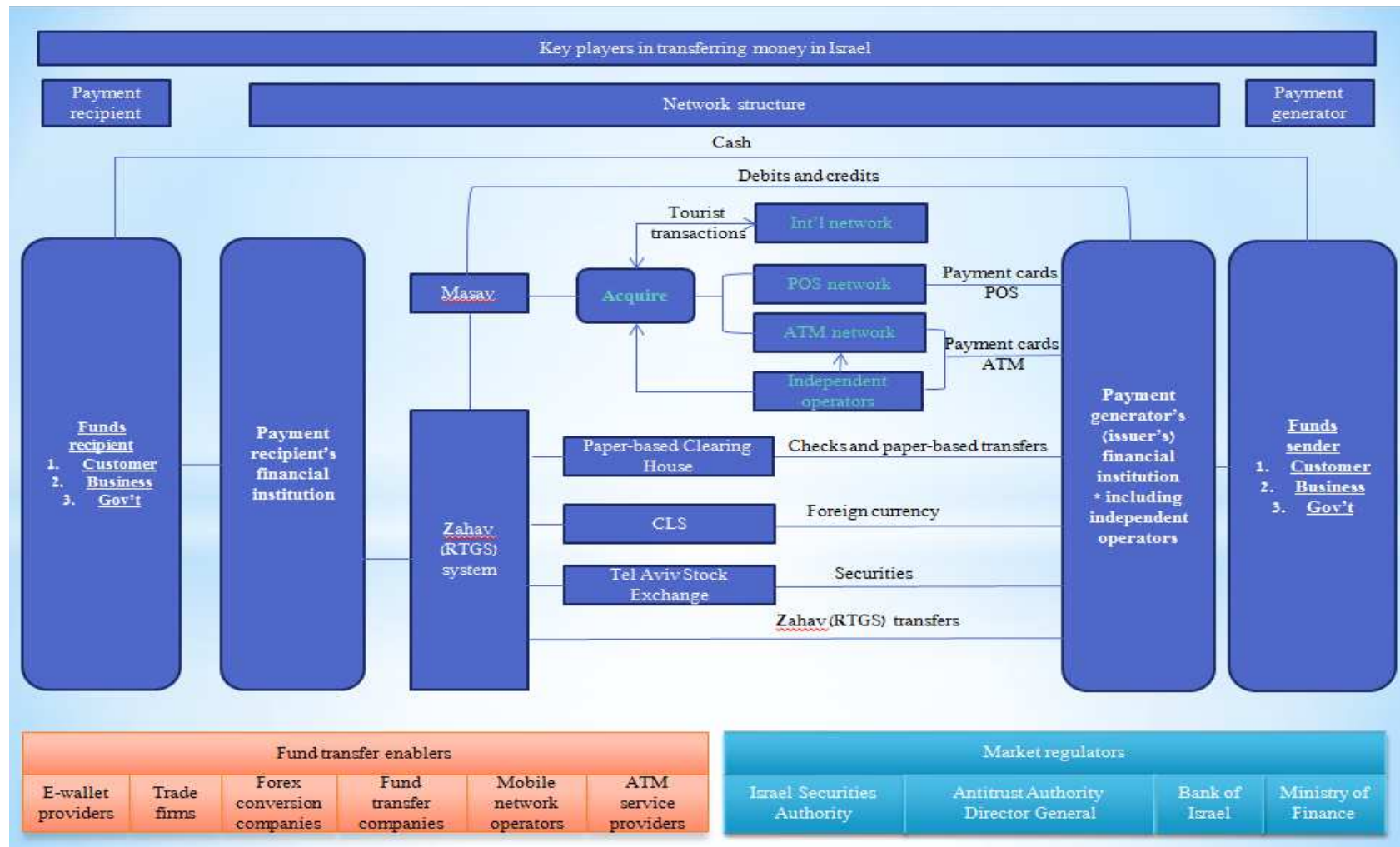
Bank of Jerusalem

Mizrahi Bank

First Int'l Bank



## Appendix D—Key players in transferring money in Israel





## Appendix E—Main points of PFMI regarding market structure and its openness to competition

In April 2012, the BIS published a report on “Principles for Financial Market Infrastructures” (hereinafter, “the new principles”). The report sets 24 international principles that are to apply to all financial infrastructures, including Payment System, Central Securities Depository, Securities Settlement System, Central Counterparty, and Trade Repository. These principles combined, expanded, and strengthened the previous principles.

The new principles establish standards and requirements in various areas, and among other things they refer to the connection and interdependencies between payment systems, which can lead to the wide spread of risks.

The Bank of Israel decided, as part of its function to regulate the payment and settlement systems in the economy, to adopt and apply the new principles on payment systems that were declared “controlled” and “designated controlled” systems, in accordance with the Payment Systems Law, 5758-2008, with the goal of ensuring their efficiency and stability.<sup>61</sup>

Among other issues that the Principles for Financial Market Infrastructures deal with, the principles present various viewpoints to take into account when establishing a market’s structure and its openness to competition, such as:

**Efficiency:** Competition can act as an important mechanism to promote efficiency. Where there is effective competition and participants have a real choice between financial market infrastructures, competition can help ensure that the financial market infrastructures operate efficiently. However, financial market infrastructures need to take care to comply with appropriate standards of safety and security, as defined in the principles.

**General business risk:** General business risk refers to a possible deterioration in the financial situation (as a commercial organization) of a financial market infrastructure due to a decline in revenue or an

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<sup>61</sup> For further details regarding the declaration, see

<http://www.boi.org.il/en/PaymentSystem/LawsAndRegulations/Announcements%20Document/>





increase in costs. Such a deterioration can be caused by negative reputation effects, by failed execution of business strategy or an ineffective response to competition.

**Achieving goals of public policy:** Factors such as economies of scale, barriers to market entry, or even legal authorities may limit competition and grant market power to a financial market infrastructure, which is liable to lead to a decline in service levels, to an increase in prices, or to under-investment in risk management systems. With that, extra caution is warranted here, since excess competition between financial market infrastructures is liable to lead to a lowering of risk-management standards due to competitive reasons. Participation requirements for a financial market infrastructure can be justified from the aspect of security and efficiency of a financial market infrastructure and the market it serves, if: they are aligned with specific risks of the financial market infrastructure, they are set in a manner that is in line with those risks, they are transparent to the public, they are objective and do not discriminate in a manner that is unnecessary nor cause competitive deviations. In order to help balance between an open approach and risk, a financial market infrastructure needs to manage the risks related to its participants through risk management controls, risk sharing agreements, and other operational arrangements whose impact on access and competition is reduced as much as possible under the given conditions.

**Requirements of access and participation:** Fair and open access to a financial market infrastructure's services encourages competition between market participants and advances payments, settlement and clearing in an effective and low cost manner. As a financial market infrastructure usually takes advantage of economies of scale, in most cases there is only one financial market infrastructure, or a small number of financial market infrastructures, in a specific market. As a result, the participation in a financial market infrastructure is likely to impact markedly on the competitive balance between market participants.