Full Length Research Paper

Models of the ATM-based alternative distribution channel development

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This paper describes the economic model for bank's automated teller machine (ATM) network outsourcing services and the Economic model for the shared ATM network services. The structure of the costs has been presented; as well as the comparative analysis of these two models. This paper highlights the need for rationalization of the invested funds in ATM infrastructure development, which is especially significant for less-developed regions. Small number of users makes individual banks uninterested for the ATM network development, but shared networks are justifying the invested funds.

Key words: ATM, shared network, economic model, costs, savings.

INTRODUCTION

When banks and banking business face global market turmoil, they are not eager to invest into the business development; and therefore, they are not eager to invest into the automated teller machine (ATM) infrastructure neither (Barczak et al., 1997). In order to expand their ATM networks, banks need to invest significant amount of funds. The financial crisis shows that banks, not only are not ready to invest, but the banks have become financial institutions which need investments injections (Sufian, 2009). However, despite the problems with which the financial institutions are facing, the banks need to have continuous presence on the market and to expand that presence further and to offer more convenient service to its clients (Meuter et al., 2003). One of the important bank's links to the clients is the part of the bank' alternative distribution channels, that is, the ATM network (Cate and Franses, 2008).In order to gain benefits from the ATM network, the bank needs to build infrastructure of the ATM network continuously and to invest continuously into the ATM network management (Chebat et al., 2001). The costs of the ATM network management are numerous and therefore very complex

and they are presenting a significant investment to the bank, either if they are considered as one-time costs or monthly costs (Anderson and Ortinau, 1988).

Networks of the ATM devices are deployed by the banks only or in cooperation with processing companies. Deployment of the ATM devices requires engagement of the significant resources from the bank side, both financial as well as human resources (Becker-Olsen et al., 2006; Dietrich, 2009). Deployment and maintenance of such network is usually outsourced by the banks, in order to avoid huge computing centers and specialized experts needed for the network maintenance. Network maintenance is a comprehensive job and it can be payable only if there are many ATM devices in the network, which is not the case when speaking about small banks (Rankovic and Vaskovic, 2009). From the other side, processing companies have resources and equipment for deploying and maintenance of the ATM networks, bigger then those which are owned by the banks (Schargrodsky and Sturzenegger, 2000; Otto, 2008).

All these elements created prerequisites for relationship established between banks and processing companies, with idea that each party should do what it do best. This relationship represented common ground for the shared ATM networks enterprise (Zhao et al., 2009).

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THE MODEL

Model 1: The economic model for the bank's ATM network outsourcing services

The economic model for bank's ATM network outsourcing services is describing the level of funds, on one-time and monthly basis, which need to be invested in the ATM network infrastructure, in order to expand the network. The starting presumption of this model is that the bank is the main and only investor to the expansion of the ATM network. This model describes the structure of the costs and the cost-related activities which need to be undertaken in order to create or expand the ATM network.

The costs in the economic model for the bank's ATM network outsourcing services have been separated to the two levels: one-time costs and monthly costs.

One-time costs

One-time costs are the costs which occur once. In this model these costs are very significant because they include the purchase of the ATM, which is the largest investment needed for the expansion of the ATM network. One-time costs and their structure are presented with following equations:

$$C_{UK} = \sum_{i=1}^{m} \sum_{j=1}^{n} C_{OT} = C_S + C_{SS} + C_{PC} + C_I + C_{PIF} \quad :$$

$$C_I = [C_{SP} + C_{IPC} + C_{IC}]$$

$i = 1 - n$:- number of the ATMs on the corresponding locations
$j = 1 - m$:- number of the ATM locations
$k = 1 - t$: -number of transactions

C_{uk} – overall one-time costs

$$C_{pif} = [C_P + C_{FC}]/f \quad \text{- Crediting purchase finance model}$$

Cot- One-time infrastructure costs
Cpif- ATM purchase and financing costs
Cp- ATM purchase costs
Cs- ATM storage costs
Css- ATM site selection costs
Cpc- ATM procurement costs (Procurement department related costs)
Ci- ATM installation costs (Csp- ATM site preparation costs + Cipc- ATM site infrastructure preparation costs + Cic- ATM installation costs)
Cfc- ATM financing model costs
f- financing period

One-time costs have been classified to the two groups of costs: the one-time infrastructure costs; and the ATM purchase and financing costs.

The one-time infrastructure costs are includes:

1. ATM storage costs
2. ATM site selection costs
3. ATM procurement costs
4. ATM installation costs.

The ATM storage costs (Cs): are variable which is dependant on the duration of the period between the ATM purchase and the ATM installation. As much as this period is longer, these costs will be

higher. It is possible to keep these costs at the minimum level (Cs = 0) with appropriate coordination and organization activities in order to avoid any ATM storage (the purchased ATM device is directly transported to the installation site).

The ATM site selection costs (Css): are variable which is dependant on the following few elements:

1. The type of the ATM which needs to be installed (on-site or off-site). In case of on-site ATM installation (installation in the bank's branch), these costs are lower.
2. The geographic distance of the ATM installation site.

These costs are associated with the bank's organizational unit responsible for the ATM site selection. The site selection process can depend on various parameters:
(a) bank's business policy (to install ATM devices into the bank branches (on-site); to install ATM devices off-site; to install in-the-lobby-through-the-wall ATM devices).
(b) potential ATM site visiting frequency.

The ATM procurement costs (Cpc): are the costs which are associated to the procurement department, in relation to the ATM procurement process (negotiations with the ATM vendor, contracting, etc.).

The ATM installation costs (Ci): are structured as the sum of the following costs: the ATM site preparation costs; the ATM site infrastructure preparation costs, and the ATM installation costs.

The ATM site preparation costs (Csp): include the physical construction-structural preparation costs (wall cutting, etc). These costs are varying on the quantity of the construction work which needs to be performed in order to prepare the ATM site for the installation.

The ATM site infrastructure preparation costs (Cipc): are costs related to the providing of electricity to the ATM, providing the communication line to the ATM, providing appropriate illumination.

The ATM installation costs (Cic): relate to the costs of the actual ATM installation on site, performed by the ATM vendor [most commonly the second line maintenance (SLM) company). The result of the ATM installation process is the up and running ATM, connected to the host.

Some of these costs can be associated to the SLM activities, such as: ATM transport, ATM installation and de-installation.

Monthly costs

Monthly costs are the costs which occur on the monthly basis. Individually, these costs are not too high, but since there are many types of the monthly costs, summarized they represent significant costs.

The structure of the monthly costs is presented with the following equation:

$$C_{UM} = \sum_{i=1}^{n} T_{mt} = \sum_{i=1}^{n} T_{up} + \sum_{i=1}^{n} T_l + \sum_{i=1}^{n} T_s + \sum_{i=1}^{n} T_o$$

Cmt- Monthly costs
Cum – Overall monthly costs
Tup- Processing services costs
Tl- ATM location costs
Ts- Servicing related costs
To- Insurance related costs

$$T_{up} = C_{of} + \sum_{k=1}^{t} C_{pc}$$

Cof- ATM outsourcing services monthly fee
Cpc- ATM transaction processing fee

$$T_i = \sum_{j=1}^{m} C_{sr} + \sum_{j=1}^{m} C_{mm}$$

Csr- ATM site renting fee
Cmm- ATM site monthly maintenance fee

$$T_s = \sum_{i=1}^{n} C_{tc} + \sum_{i=1}^{n} C_{fc} + \sum_{i=1}^{n} C_{cc}$$

Ctc- ATM telecom connection cost
Ccc- ATM consumables cost
Cfc- ATM cash fill cost

$$T_o = \sum_{i=1}^{n} C_{ci} + \sum_{i=1}^{n} C_{ai}$$

Cci- ATM cash insurance
Cai- ATM insurance

The ATM site renting fee (Csr): is the fee related to the renting of the ATM site. This fee is applicable only for off-site ATM devices, when the ATMs are not installed in the bank's premises (branches, bank's business buildings). This fee for the off-site ATMs depends on the agreed paying model for the site renting. For the off-site ATMs which are in the attractive and high-frequent zone are commonly high.

The ATM site monthly maintenance fee (Cmm): is the fee associated to the first line maintenance (FLM) and second line maintenance (SLM) costs. These services are provided by the specialized companies. The companies which provide the FLM services are most commonly the CIT (Cash In Transit) companies.

The following problems which can cause the ATM downtime or incorrect performance are also covered by the FLM:

(i) Consumables related problems e.g. lack of printer paper, jammed printer paper.
(ii) Foreign objects blocking the external slots of the ATM, for example, gum, paper, incorrectly inserted cards.
(iii) Blocked cash in the cassettes/dispenser.
(iv) ATM cleanliness (card reader unable to read magnetic stripe due to accumulated dirt, monitor definition affected by dirt etc).
(v) De-synchronization of the local ATM modem which can be resolved through simple hardware restart or power down/up.

All issues which can be resolved without using any tools and without specialized engineering level, knowledge of ATM electronics and mechanics are presenting the FLM group of issues.

The ATM telecom connection costs (Ctc): are the costs related to the telecom line usage. The ATM telecom line can be frame-relay, GPRS or satellite based. For the on-site ATMs, located in the bank's branches, the frame-relay line is the most often solution. For

the off-site ATMs, most commonly used solutions are GPRS or satellite connection.

The ATM consumables costs (Ccc): relate to the usage of the ATM statement and ATM journal paper, printer toner. Depending on the contract, these costs can be charged as per the flat rate or depending on the monthly consumables usage.

The ATM cash insurance costs (Cci): are the costs of the cash insurance inside the ATM. These costs are not related to the costs of the cash insurance during the transport from the vault to the ATM. For these insurance the CIT Company is responsible.

The ATM insurance costs (Cai): are the costs related to the physical insurance of the ATM. Depending on the contract with the insurance company, there are two models of the ATM insurance:
(a) equal insurance conditions for all ATMs, which is most common solution; and (b) situation-based ATM insurance, which considers each ATM as separate case and evaluate insurance risks on-site. This type of insurance is used specially in high-risk countries with high criminal rate, and politically and economically unstable countries.

The ATM cash fill costs (Cfc): are the costs associated with the number of the cash replenishment on the monthly basis.

The ATM transaction processing fee (Cpc): is the cost related to the transaction processing. Usually the processing of the on-us transactions is free of charge and the processing of the off-us transactions is charged. This cost is associated to: (a) transaction routing; and (b) transaction validation and authorization (CVV validation, PVV validation, expiration date checking, limit checking, balance authorization).

Overall monthly costs

Overall monthly costs, for each month, can be calculated with the system of equations presented as follows:

$$C_{UK1} = (C_{OT} + C_{MT1}) \cdot n_{ATM1}$$
$$C_{UK2} = [C_{OT} \cdot (n_{ATM2} - n_{ATM1})] + C_{MT2} \cdot n_{ATM2}$$
.

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$$C_{UKm} = [C_{OT} \cdot (n_{ATMm} - n_{ATMm-1})] + C_{MTm} \cdot n_{ATMm}$$

C_{UKi} - overall monthly costs for month i

C_{OT} - one-time costs

C_{MTi} - monthly costs for month i

n_{ATMi} – number of the ATM devices of i-month
m – month

During the finance period, the monthly costs per ATM will contain the crediting component as well. Even C_{PIF} costs are considered as one-time costs; in this case they are presented as partly-monthly costs, during the duration of the crediting finance period. As soon as the crediting finance period expires these costs will not be shown in the overall monthly cost equation.

C_{OT} costs are real one-time costs and they are shown in each equation of the m-equation system, for example, they are recurring for all newly installed ATM devices of the m-month period.

$$\Rightarrow C_{UK} = \sum_{i=1}^{m} C_{UKi}$$

$$\Rightarrow C_{UK} = C_{OT} \cdot n_{ATM1} + C_{MT1} \cdot n_{ATM1} + C_{OT} \cdot n_{ATM2} - C_{OT} \cdot n_{ATM1} + C_{MT2} \cdot n_{ATM2} +$$

$$+ C_{OT} \cdot n_{ATM3} - C_{OT} \cdot n_{ATM2} + C_{MT3} \cdot n_{ATM3} + C_{OT} \cdot n_{ATM4} - C_{OT} \cdot n_{ATM3} + C_{MT4} \cdot n_{ATM4} + \cdots +$$

$$+ C_{OT} \cdot n_{ATMm-1} - C_{OT} \cdot n_{ATMm-2} + C_{MTm-1} \cdot n_{ATMm-1} + C_{OT} \cdot n_{ATMm} - C_{OT} \cdot n_{ATMm-1} + C_{MTm} \cdot n_{ATMm}$$

$$\Rightarrow C_{UK} = n_{ATMm} \cdot (C_{OT} + C_{MTm}) + \sum_{i=1}^{m-1} C_{MTi} \cdot n_{ATMi}$$

Model 2: The economic model for the shared ATM network services

The shared ATM network is based on the concept of spreading and expansion of these devices, by involving the third party- specialized companies (banking processors). The shared ATM network is not a substitute for the existing banking ATM network, but on the contrary, it represents the expansion of that network.

There are several reasons why the banks should invest in the infrastructure of the shared ATM network. The most important reasons are the following:

1. Reducing of the cost per transaction (transaction initiated in the ATM device are cheaper than those initiated at the banks premises, via teller).
2. Expanding bank's presence on the market.
3. Increasing the client's satisfaction.
4. Profit gain, based on the charges for initiation of transactions to the non-bank ATM users.
5. Reducing time needed for the turnover of funds.
6. Expanding geographical presence of the bank in the regions where the bank is not usually present.
7. Marketing advantages gained through expanded market presence.

The main reasons why processor should invest in the shared ATM network infrastructure are: (a) expanding presence on the market of the ATM devices; and (b) profit gain, based on the transactions fees initiated on ATMs devices of the shared ATM network.

Classification based on the participation in the shared network is as follows:

1. Owner of the shared ATM network – processor
2. Sponsor Bank
3. Member bank

The economic model for the shared ATM network services is describing the level of funds, on one-time and monthly basis, which need to be invested in the ATM network infrastructure, in order to expand the network. The starting presumption of this model is that the processor is the main investor to the expansion of the ATM network, as the owner of the ATM devices. This model describes the structure of the costs and the cost-related activities which need to be undertaken in order to create or expand the shared ATM network.

The processor is creating or expanding the shared ATM network, by purchasing, installing and maintaining the network infrastructure and renting these ATMs to the interested parties (banks) as a model of expansion of the ATM network.

The costs in the economic model for the shared ATM network services have been separated to the two types of costs: one-time costs and monthly costs.

One-time costs

One-time costs are costs which occur once. In this model, these costs are not complex and are not high because they including only investment for acquiring gateway opening at the international card organization (ICO). One-time costs are presented with the following equations:

Cot = Cico

Where Cot- One-time costs; Cico- ICO Acquiring Gateway opening costs.

The ICO acquiring gateway opening costs (Cico): These costs are related to the project initiation and process of designating and enabling the Acquiring Gateway. Only banks, as legal entities, can apply for the card organization membership. Processor, as a legal entity, can cooperate with card organizations, only in case if it is delegated by the bank; thus, card organization considers shared network implementation as expansion of the existing bank's ATM device network. Sponsor bank is obliged to initiate the project at card organization for the assignment of the new Acquiring Gateway. This gateway will be used for forwarding of all transactions to the card organization which are initiated on the shared network ATMs using cards which are not issued by sponsor bank or the shared network member banks. This way transactions initiated on the shared network ATMs can be clearly distinguished from the transactions initiated on the bank's ATMs, which is a prerequisite for the efficient control of the bank and processor, as well as for creation of the precise reports.

Monthly costs

Monthly costs are the costs which are occurring on the monthly basis. Individually, these costs for this model are not hot too high, and there are not many types of the monthly costs, which are included within overall monthly costs, summarized they are not

representing significant costs for the bank. The structure of the monthly costs is presented with the following equation:

$$C_{MT} = C_{OF} + C_{TC}$$

Cmt- Monthly costs
Cof- ATM outsourcing services monthly fee
Ctc- ATM transaction fee

Overall monthly costs

$$C_{um} = \sum_{i=1}^{n} C_{mt} = \sum_{i=1}^{n} T_{up}$$

Cum – Overall monthly costs
Tup- Processing services costs

$$T_{up} = C_{of} + \sum_{k=1}^{t} C_{pc}$$

Cof- ATM outsourcing services monthly fee
Cpc- ATM transaction processing fee
t- number of transactions

The ATM outsourcing services monthly fee (Cof): is the cost related to the renting of the ATM devices. This cost is associated to: the ATM renting fee.

Processor performs monitoring of the ATM devices in the shared network. The bank's resources are not involved within this process, and therefore there are no costs for the bank. When the cash replenishment for the shared ATMs is needed, the processor's monitoring center informs the bank, the bank provides funds while the processor is responsible for the cash replenishment process realization, including money transfer from the vault to the ATM,

replenishment and ATM balancing, as well as pick up of the retracted bills and retained cards and their return to the bank.

Usually this cost is a higher than the ATM outsourcing services monthly fee of Model I, since the processor is responsible, beside the costs included within the ATM renting fee, for the cost related to:
i) ATM storage
ii) ATM site selection
iii) ATM procurement
iv) ATM installation
v) ATM site renting
vi) ATM site monthly maintenance
vii) ATM telecom connection
viii) ATM consumables
ix) ATM cash insurance
x) ATM insurance
xi) ATM cash fill cost.

The ATM transaction processing fee (Ctc): is the cost related to the transaction processing. Usually the processing of the on-us transactions is free of charge and the processing of the off-us transactions is charged. This cost is associated to: (a) transaction routing; and (b) transaction validation and authorization (CVV validation, PVV validation, expiration date checking, limit checking, balance authorization)

All transactions initiated with the sponsor/member banks cards on the shared ATMs network devices, are processed under the same conditions as transactions processed on the sponsor/member bank ATMs. All transactions initiated on the shared ATMs, using sponsor/member bank payment cards, have on-us transaction status.

Overall costs

By summarizing the overall monthly costs, we can calculate the overall costs for a period of m months. The equation which represents overall costs for m-months period is as follows:

$$\Rightarrow C_{UK} = \sum_{i=1}^{m} C_{UKi}$$

$$\Rightarrow C_{UK} = C_{OT} + C_{MT1} \cdot n_{ATM1} + C_{MT2} \cdot n_{ATM2} + \cdots + C_{MTm} \cdot n_{ATMm}$$

$$\Rightarrow C_{UK} = C_{OT} + \sum_{i=1}^{m} C_{MTi} \cdot n_{ATMi}$$

ANALYSIS OF THE SIMULATION RESULTS

During the analysis of simulated appliance of the described models, the specific scenario has been used, in order to analyze the flow of the costs function and system behavior in the specific market situation. Scenario presumes variable number of the ATM devices, with average monthly increase rate of 20.37% (increase rate varies from 0 to 100% during the period) and variable number of the ATM transactions, with monthly increase rate of 5%.

Model 1

Figure 1 shows trend of the monthly costs function, when

the Model 1 is applied has been presented. In Figure 1, the function of the monthly costs has several saddle points. Almost sinusoid shape this function owes to the continuous investments into the distribution channel development. Local minimums and maximums of this function result from the ATM purchases on monthly level. Between 13 and 14th month, the function crosses the X-axis and becomes negative. The crossing point of the function and X-axis represents the moment when the bank starts to make profit per the ATM devices on the monthly level. Number of transactions, which is increasing per 5% rate, multiplied with processing fee is giving the income per ATM, which has become equal as costs per ATM at the crossing point.
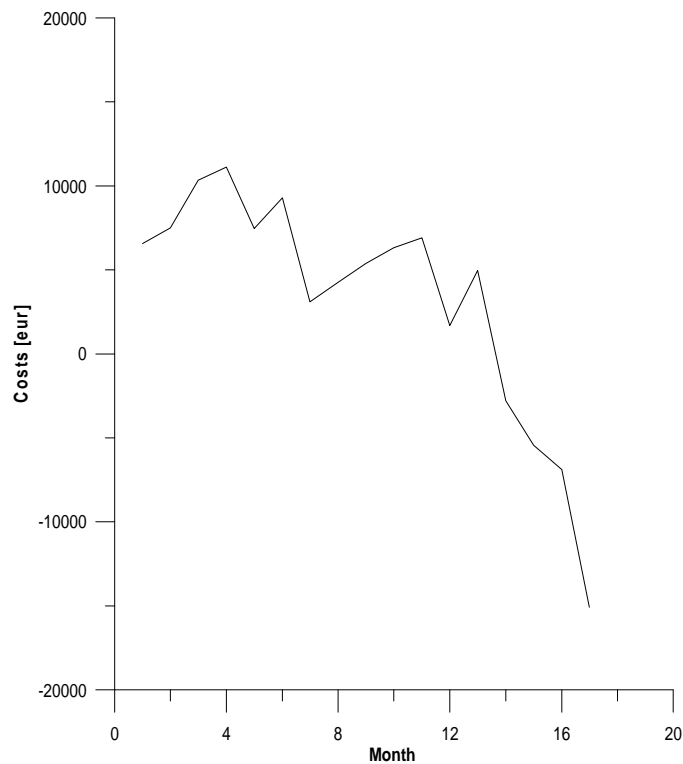
The figure of the overall costs change, when the first

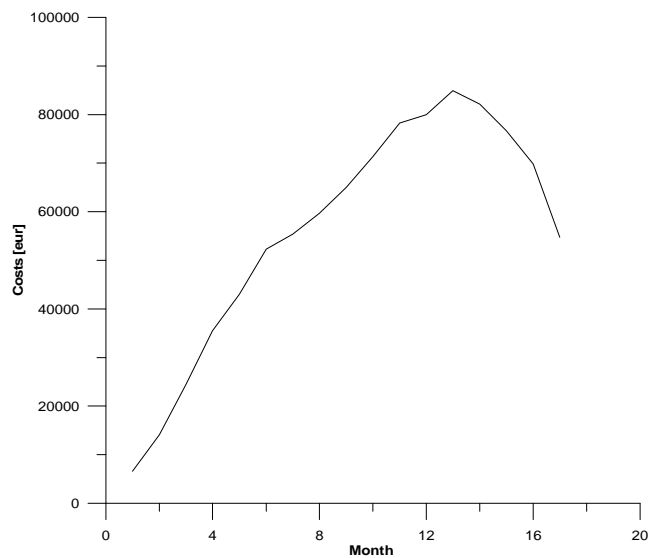**Figure 1.** Model 1 – Monthly costs.

Figure 2. Model 1: Overall costs.

model is applied, is presented in Figure 2. Analyzing the accumulated costs show that the accumulated costs function have increase trend till the specific moment and then accumulated costs are decreasing.

Until the 13th month of the period, there is increase trend of the overall costs. Number of the ATM

transactions is increasing per 5%-rate and the bank is investing in the ATM network infrastructure and therefore the costs are increasing. In the 13th month, the income per ATM became higher than the costs; this is representing the saddle point of the overall costs function. After this point, with the income increase, the
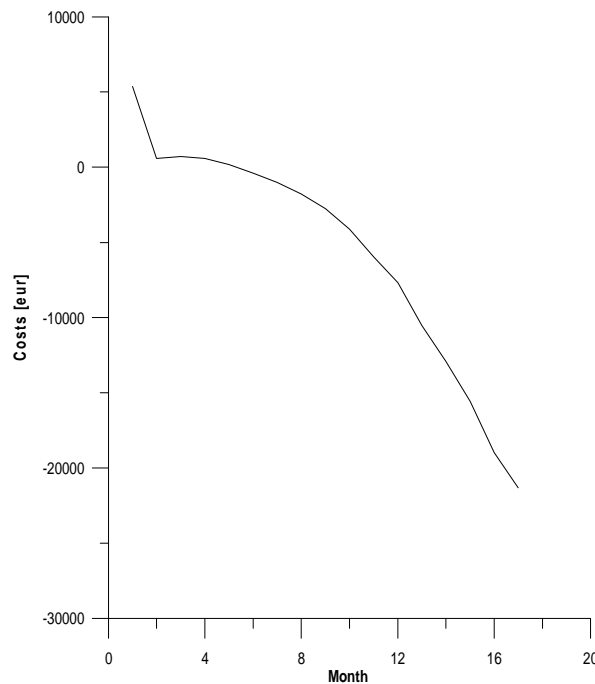
Figure 3. Model 2: Monthly costs.

overall costs function start to decrease. The function is seeking to reach X-axis and the moment of crossing the X-axis represents the complete return of the invested funds.

Model 2

Figure 3 shows trend of the monthly costs function, when the second Model II is applied. On the presented diagram (Figure 3), function of the monthly costs has two saddle points. The first saddle point is at the and of the 1st and on the beginning of the 2nd month, when the costs are decreasing, after initial investments. Between 2nd and 3rd month there is a slight increase of the costs and this is the only period when the costs are increasing and this point is the second saddle point of the cost-function. After this, the costs are decreasing, which is caused by increased number of the ATM transactions and therefore the income is increasing. Between the 4th and 5th month, the function is crossing the X-axis and becomes negative. Crossing point of the function and X-axis representing the moment when the bank starts to make profit per the ATM devices on the monthly level. Number of transactions, which is increasing per 5%-rate, multiplied with processing fee is giving the income per ATM, which has became equal as costs per ATM at the crossing point.

The figure of the overall costs change, when the second model is applied, is presented in Figure 4. Analysis the accumulated costs shows that the accumulated costs function have very slight increase trend till the specific moment and then accumulated costs are decreasing.

Until 5th month of the period there is very slight increase trend of the overall costs. Number of the ATM transactions is increasing per 5%-rate and the bank is investing in the ATM network infrastructure and therefore the costs are increasing. In 5th month the income per ATM became higher than the costs. This is representing the saddle point of the overall costs function. After this point, with the income increase, the overall costs function start to decrease. The function is seeking to reach X-axis and in 10 month the function is crossing the X-axis, which is representing the complete return of the invested funds.

The ATM shared network implementation potentials in the less-developed regions

The ATM services offer in undeveloped regions, compared to services in the developed countries, is often very modest and limited. In the less-developed ATM markets average number of the transactions offered on ATMs is 2 (cash withdrawal and balance inquiry). In the developed countries, with the highly-developed ATM markets, numbers of services varies from 5 to over 30.

The ATMs, and therefore, the ATM transactions are concentrated in the large cities and in the developed regions. The alternative distribution channels of the banking products, such as ATM networks are missing in
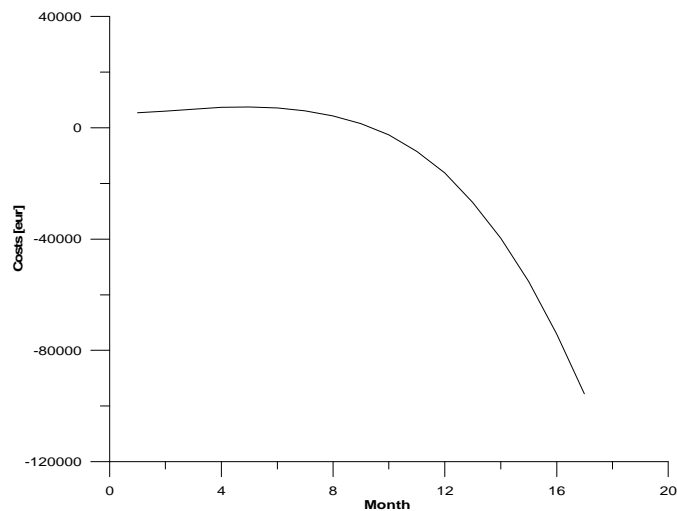
Figure 4. Model 2: Overall costs.

the undeveloped areas. In order to use the banking services and products, citizens of these regions are forced to look for these services and products outside of their municipality. This makes these services and products very inconvenient to use. Inconvenient services and products are harming the banks reputation on long-term basis.

Global market turmoil is forcing banks to provide convenient and secure services to its customers, to attract new customers and to maintain the current customer base, and all of that, with minimal investments.

By making its services and products available to potential customers in the less-developed or rural regions, the bank is developing foundations to create loyal-customer base and organic income, with constantly increasing trend.

The main problems which concern the bank to make a decision and to invest into these regions are:

1. High initial investments
2. High monthly costs (especially maintenance costs for the distant ATM devices)
3. Market research

The analysis of the economic model of the shared ATM showed that this concept is able to resolve and overcome the existing problems and concerns. The shared network is having low initial costs, since the only bank's cost is related to the Acquiring Gateway obtaining process, which is one-time cost and relatively low, when compared to the investments into the infrastructure (ATM purchasing, ATM location management, etc).

The monthly costs of the shared ATM network are lower than costs when Model 1 is used, since the only costs which are associated to the shared network on monthly basis are ATM renting and ATM transaction processing costs. Thus, it is more convenient and more cost-effective Model 2 for bank to use it as a model for the ATM network development and expansion. Beside this, pure economic advantages of the Model 2 appliance, there are numerous advantages in the market research area.

Since the shared ATM network concept is based, from the bank's perspective, on the ATM renting, the bank is able to choose more convenient scheme for the ATM renting, depending on the shared ATM network statistics and the desired market segmentation. Flexibility of the ATM network selection provides the bank more maneuver space to deal with raising business costs.

The shared ATM network allows to the banks to choose which ATM they want to rent and therefore to create their own network, based on the existing experiences and the ATM network performances. Selective renting is providing to the bank participation only in the part of the shared ATM network.

Value-added services

Beside the economical, direct and indirect, benefits from the shared ATM network implementation, the added values which can be created by implementation of this concept are numerous. Some of the value-added services and corresponding benefits that will follow which can be gained by implementation of the shared ATM network are:

1. New ATM services.
2. The efficient allocation of the resources (accounting department, the alternative distribution channel department, procurement department).
3. Extended presence on the market.

Since the offer of the ATM services on the undeveloped markets is very modest and the introduction of the new services is very expensive, the bank's does not have interest to initiate implementation of the new ATM services. On the other hand, processor needs to attract the potential shared ATM network members, and therefore wants and has capacities and resources to develop and introduce the new ATM services. The additional services will be provided to the bank on the shared network ATM devices free of charge and only on the account of membership. Additional services, which can be provided to the bank and to the banks' cardholders free-of-charge on the shared network ATMs are:

(a) Bill payment
(b) ATM mobile top-up (with multiple choice for the mobile operator)
(c) Paying taxes
(d) Reservation and purchase of the tickets (for theatre, for the football game, etc.)

Beside the additional transaction types, more banking products can be offered through the ATM network, such as loan (loan application on the ATM device), installment payment, interactive communication with the operator (emergency codes, etc).

The shared ATM network implementation is allowing to the bank the better and more efficient resource allocation. Advantages are numerous for following departments:

1. Accounting department, which work will be simplified, due to simple cost structure.
2. Alternative Distribution Channels Department, which be able to re-allocate resources, which were responsible for the ATM network monitoring, ATM network maintenance, ATM site selection, ATM site preparation, the ATM storage and to reduce costs significantly.
3. Procurement Department, which will be able to re-allocate resources responsible for the ATM vendor selection, the ATM contractual and purchasing related tasks and therefore to reduce costs significantly.

Through membership on the shared ATM network, the bank is extending its presence on the market. The bank is able to spread its influence completely focused, based on the market research and on the desired market segmentation.

Conclusion

Based on the simulation costs analysis, when scenario 1 is applied and the number of the ATMs is changing, as per the monthly growth rate of 20.37% and constant number of transactions, it can be concluded that the appliance of the Model 2: economic model for the shared

ATM network services is much more cost-effective for the bank than Model 1. The main reason why the Model 2 monthly costs are lower is that the bank has only ATM renting costs and transaction processing costs. As a result of the lower monthly costs, the Model 2 accumulated costs are also lower. Appliance of the Model 2 can bring significant savings both on monthly and accumulated basis. As much as period of simulation is longer, the level of monthly and accumulated savings is higher.

The main reason of the constant, almost linear, growth of the costs, in both models, is the continuous investment into the network, with the constant level of transactions. Since the ATM transaction number is constant, incomes per ATM are constant too. In the Scenario 1 of the cost simulation, the average number of the ATM transactions per month projected on the global level has been used.

If the bank, based on the market researches, determines that the number of transactions for the projected period will be constant, within the average number of transactions, it should use Model 2 as a model for the ATM network development and expansion.

Based on the simulation costs analysis, when Scenario 2 is applied, when the number of the ATMs is changing, as per the monthly growth rate of 20.37% and number of transactions has monthly growth rate of 5%, it can be concluded that the appliance of the Model 2: economic model for the shared ATM network services is much more cost-effective for the bank than Model 1.

If the bank, based on the market researches, determines that the number of transactions in the projected period will grow 5% per month, choice of both Model 1 and Model 2 is acceptable for the bank, since the level of accumulated savings is relatively low. Advantage of the Model 2 is that the investment will be returned sooner that if Model I is applied, because of high initial investments.

By the shared ATM network implementation the bank is able to gain numerous value-added services, such as additional ATM services, additional ATM transaction types free-of-charge, and is able to carry out the organizational changes focused on the cost reduction.

It is important to emphasize that usage of the shared ATM networks is having wider social-usability justification. Usage of the shared networks, the same communication channels are used and installed devices are used by more-than-one banking institutions and therefore overall business costs are decreasing and clime of the social responsibility has been produced against the common funds. Individual deployment of the ATM devices by the banks is causing insufficient usage of the invested funds. This is especially relevant to the rural areas and undeveloped parts of the regions, where we can make close services to all users by implementing the concept of the shared networks. The main characteristic of these regions is that the banks do not have interest to develop the ATM networks independently because the

number of users is small. This means that the only way to cover these regions with self-service services on the ATM devices is development and deployment of the shared networks, where sum of the overall users of all banks, members of the shared networks is potentially enough to make the business cost-effective and justified.

Implementation of the shared ATM network in the less-developed regions is helping in overall development of these regions. These regions are gaining benefits from:

1. Higher availability of the banking services and products.
2. Incomes from ATM sites renting.
3. Employment of the local stuff for the ATM site infrastructure preparation and ATM site location maintenance.
4. Raising the technical-technological level of the region.
5. Raising the technical-education level of the region.

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