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Systematická analýza bankovních služeb pro studenty v České republice

A Systematic Analysis of Banking Services for Students in the Czech Republic

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The declaration

"I hereby declare that I have elaborated the entire thesis including annexes myself."

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Contents:

1 Introduction

Banking is one of the most dynamic sectors of the economy. Banks are basically business entities whose main goal is to generate profits, and to succeed in today's competitive environment, they are constantly forced to develop their product and service spectrum. Related to this is the selection of the segment that banks focus on with specific offers.

As Norazah (2016) noted, that the aim of banks should be to provide customers hassle-free banking that would allow them to access a wide range of banking functions via a wider network of automated teller machines (ATMs), mobile banking and online banking. He also mentioned that especially online banking should allow functions such as checking of account and credit card balances, transfer of funds, changing credit limits, redemption of reward points, enrolling fore-statement, etc., and that all this should be possible in the comfort of customers' homes or workplaces, 24 hours a day. And he also added that in today's world customers expect to enjoy access to trusted technology with no service breakdown during banking transactions.

Most banks have already started focusing on providing their products and services to students. They represent a high potential for banks because there is a high probability that if a student is satisfied with the offer of banking products and services, there is no reason not to continue using their services after graduation. (Lidovky, 2009) In particular, university-educated people have a significantly higher income and thus become welcome active clients of the bank. It has been also observed that current accounts also serve as a gateway to other banking products such as loans, mortgages etc. If customers are satisfied with their current account, they are likely to set up a loan or mortgage at the same bank (Smith, 2002). However, in order to maintain this new group of clients, the bank must continually improve its services and thus prevent clients from leaving to other competitors, and in the case of long-term partnerships, for example, offers more favourable conditions for obtaining a loan, mortgage or other credit products.

1.1 Aims and objectives

With all that was mentioned above, it would seem that the banking preferences of university students are a worthy area of exploration, therefore the aim of this bachelor thesis:

1) Investigate what criteria are most important for students when opening a bank account
2) Based on the result of the investigation find out which bank account in the Czech Republic is most suitable for students using multi-criteria analysis.

1.2 The structure of the dissertation

The dissertation is sectioned into five chapters.

- Literature review – aims to make the reader familiar with current literature in regard to banking services with a particular aim to students.
- Methodology - firstly research questions are introduced, then it focuses on the type of data used in this dissertation together with the used data collection method.
- Results - in this chapter, the obtained data are processed, and research questions are answered using multi-criteria analysis.
- Discussion - this chapter comments on the results of the previous chapter and also provides recommendations for students, banks and future researchers.
- Conclusion – summarize the whole dissertation, aim, objectives with research questions are once more mentioned there, also results and answers to research questions are briefly summarized there.

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2 Literature Review

The aim of this chapter is to summarize existing literature regarding to banking services for students. The literature review has been divided into four main parts. The first part describes the banking system, its functions and the forms of its organization, the second part describes banking products, their systematization and their price, the third part focuses on banking services for students and the last part presents a framework of decision criteria.

2.1 The banking system

Operation of banks and branches of foreign banks is regulated by law no. 21/92 coll., act on banks, as amended. (ČNB, 1991)

Financial institutions form together with financial markets and financial documents the basic elements of the financial system. It offers a range of transactional, mediatory and insurance services, as well as services related to investment in securities and securities trading. (Polouček et al., 2013)

Financial system also provides a variety of supporting services essential to modern living. These include “payment services” that make commerce and markets possible (such as checks, credit and debit cards, and interactive websites), “risk protection services” for those who save and venture to invest (including insurance policies and derivate contract), “liquidity services” which makes possible to convert property into immediately available spending power), and “credit services” for those who need loans to supplement their income. (Rose & Hudgins, 2013)

Under the term "bank" can be included different types of banks (with the exception Central Bank). (Mejstřík et al., 2009) Central Bank of the Czech Republic is the Czech National Bank. It was created by law no. 6/1993 coll., act on the Czech National Bank. Its main purpose is to maintain price stability in the Czech Republic through inflation targeting. If there is not prejudice to its main objective, it supports the

general economic policy of the government, which leads to sustainable economic growth. (Kalabis, 2012)

The most common types of banks are listed in table 2.1.

Tab. 2.1 Most common types of banks

Retail banks	Smaller banks serving primarily households and small businesses.
Commercial banks	Sell deposits and make loans to businesses, individuals, and institutions.
Investment banks	Help businesses work in financial markets (e.g. if business wants to go public or sell debt to investors).
Central banks	Manage the monetary system for a government.
Credit unions	Are similar to banks, but they are not-for-profit organizations owned by their customers.
Online banks	Operate entirely online – there are no physical branch locations.
Mutual banks	Similar to credit unions because they are owned by members.
Saving and loans	Attract saving deposits and make loans to individuals and families.

Source: thebalance.com

2.1.1 Characteristic of Banks

The common definition of the bank is based on the fact that banks are financial institutions whose activities are deposit taking and lending. Although it is a basic and very simplified definition, it is very clear – provides key banking activities. (Polouček, 2013)

In addition to domestic banks, the banking sector also includes foreign banks and branches of foreign banks, as well as large and small banks. The nature of the banking sector is mainly driven by domestic banks and large banks (Polouček, 1999)

Commercial banks, retail banks, saving banks and credit cooperatives are rank among deposit financial institutions. All traditionally offer a mostly interchangeable

palette of savings accounts. The character of their activities is approaching each other and also the difference between them and commercial banks is gradually wiping out – all depository institutions offer to clients a wide range of products on current accounts, as well as on saving accounts. However, individual savings banks have a number of specific features and the amount of their assets is substantially lower than the bank's assets. (Polouček et al., 2009)

2.1.2 Basic functions of banks

Banks perform a number of different functions in the market economy, their role is very diverse and, in many ways, irreplaceable. As a standard basic bank function, we can label the four following:

- financial intermediation;
- issuing of non-cash money;
- payment transactions;
- mediation of financial investment in the money and capital markets.

Financial intermediation - the bank carries out financial intermediation on a profit principle, therefore attempts to place the capital raised, where it provides the highest valuation at a given level of risk. (Revenda, 2008) The existence of financial intermediaries is generally considered to be necessary due to the importance they have in allocating resources, resp. allocation of capital. Resource allocation represents only a part of bank assets. The definition by which the bank has taken deposits and provides loans is very simplified. In bank theory, the functions of banks are divided into four categories: offer access to payment and settlement mechanism; resource allocation, resp. conversion of savings into investment; risk management; information processing and debtor monitoring. (Polouček et al., 2013)

Issuing of non-cash money – banks can only issue non-cash money i.e. money in the form of entry in current accounts. Cash money can only be issued by the Central Bank as the only institution in the state. (Revenda et al., 2008)

Payment transactions – Depending on the form of money, payment transactions can be split into cash and non-cash payments. In cash payment, cash (banknotes and coins) is transferred between the payer and the payee. In the case of non-cash payment transactions, money is transferred in the form of entry in the payer's and payee's accounts. (Mejstřík et al., 2009)

Mediation of financial investment - banks for their clients carry out the issuance of securities on the one hand, and on the other hand also their purchases or other investment business such as safekeeping and asset management and derivatives trading. (Revenda et al., 2008)

2.1.3 The banking system and its forms of organization

The state's banking system is made up of a central bank and a set of banks operating in the country, their interrelationships and their relations to the environment – the corporate sector, households, state and abroad. The function and mode of operation of the banking system are determined mainly by the economic environment of the existing country, but also by the traditions, by involving the country in international cooperation and others. (Revenda et al., 2008)

There are two hierarchical levels in the banking system of the Czech Republic. At a higher level, there the Czech National Bank, which has the character of a central and an issuing bank (and which is responsible for the banking system) and at a lower level are other banks, among which we also count branches of foreign banks operating in the Czech Republic. (Sekera, 1997)

The banking system can be arranged according to different principles. It is usually divided to:

- single-stage and double-stage banking systems;
- universal and separate banking systems.

The principle of a double-stage banking system is based on the institutional separation of the macroeconomic function provided by the central bank and the

microeconomic function that is the domain of the retail bank network. The central bank's primary objective is usually to secure currency or price stability, on the contrary, retail banks conduct their business on a profit principle. Based on this principle, modern banking systems are established in developed countries.

The principle of the single-stage system historically preceded to the two-tier system. There was no central bank, retail banks carried out all banking activities, including the issue of cash in circulation.

The principle of universal banking is based on the fact that banks can provide a whole range of banking products, meaning both traditional retail banking products (accepting deposits, providing loans, arranging payment transactions) and investment banking products (emission trades, securities transactions, asset management, mergers and acquisitions)

The principle of separate banking is based on the institutional separation of investment and retail banking. (Revenda et al., 2008)

In the Czech Republic, since January 1, 1990, a two-tier banking system has been built in which the Czech National Bank has been a central bank since 1 January 1993. The Czech National Bank is a legal person that is not registered in the Commercial Register and which exercises the supervision to the financial market.

2.2 Banking products

Banking products are subject to the banking law, which precisely define, under what conditions services and products may be offered. Small banks are usually oriented towards providing basic services, where belongs payment and credit. Large banks with a dense branch network provide a wide range of services, serving both large and small clients and their organizational structure corresponds to the diversity of their activities. (Polouček et al., 2013)

2.2.1 Characteristic of banking products

Banking belongs by the essence of its activity in the sphere of services. At present, the Bank carries out a wide range of activities that are constantly being developed and modified. Individual services offered by banks to their clients as such and usually for payment are referred to as banking products. They may differ from one another, but some of their features are common.

- Non-material character – for the value of banking products are decisive non-material factors and the following significant features: they are not storable (bank frontloading is not possible), they are abstract (invisible, and therefore high-quality advertising is important for the success of the bank), they are not patentable (cannot be protected by patents).
- Dualism - individual banking products combine the value and the factual aspects. The value aspect of the banking product represents the financial volume (e.g. volume of loans, deposits, bank transfers). The factual aspect is expressed by the number of individual products (e.g. number of credit cases, deposits, bank transfers). The distinction between these aspects is important for expressing the profitability of individual products.
- Interconnectivity and conditionality - this result from own essence of some banking products when one does not work without the other, e.g. the bank carries out non-cash payment transactions in the event that it leads current accounts to its clients. On the other hand, some of their products are consciously interconnected, e.g. automatic deposit of funds above the agreed above into more profitable forms. (Dvořák, 2005)

2.2.2 Systematization of banking products

Due to the large number and variety of banking products, their systematization is not easy.

The classical approach to the breakdown of bank products is based on the reflection of a bank's balance and divides into active, passive and neutral banking.

- Active bank transactions are reflected in the bank's balance sheet assets. The bank acts as creditor, various claims arise (lending, purchase of debt securities) or the property rights will arise in their consequences (purchase of equity securities).
- Passive bank transactions are reflected in the Bank's liabilities. The Bank creates liabilities and is in the position of the borrower. This is especially the case where the bank acquires foreign sources on a credit basis (receipt of deposits, issue of own bonds).
- Neutral bank transactions are balance-neutral, they do not appear in the bank's balance sheet, in these transactions, the bank is not in the position of the lender and the borrower.

From the classical approach of banking products deviates a modern approach, which is based on the view of the bank and increasing orientation to a client and his needs. They adapt all of their business and classify banking products in terms of the purpose of using the product by the bank's client. In this respect, banking products are divided into five basic groups:

- financially credit products (allow clients to obtain funds from the bank);
- deposit products (allow clients to deposit funds into the bank);
- payment clearing products (allow clients to make payment and clearing transactions through a bank);
- investment banking products (financial investment, fundraising through money and capital market instruments, other services related to the management and management of investment instruments, advisory services etc.);
- cash and exchange products (transactions with cash, exchange from one currency to another).

The next breakdown is based on client segmentation and the bank sets the parameters of its banking products on this basis. These are:

- retail products (a large number of transactions with relatively small amounts),
- wholesale products (associated with larger amounts). (Dvořák, 2005)

2.2.3 Price of banking products

In banking as well as in other branches of services, the price of offer products plays an important role. The price of banking products is the result of a bank's pricing policy, where we can include all bank decisions regarding the price of both current and newly introduced products. The main objective of the Bank's pricing policy is to determine the prices of banking products, which mean sufficient bank revenues, reflect the bank's costs and improve the bank's competitive position on banking products

Prices of banking products can be in different forms; the price is formed:

- interest rate (i.e. the cost of borrowing money);
- commissions, bonuses (e.g. for mediation of payment transactions, foreign exchange operations);
- direct charges (tied to a particular service the bank will perform; here is also included the risk, which the bank has in this business - fees for the sale of securities);
- indirect charges (i.e. hidden charges that the client will not know).

The price of banking products can be determined on different bases, which are:

- based on a valued volume, where the price is determined as a value unit. It can be determined in different ways, i.e. based on the actual amount of money drawn; on the basis of the agreed amount, which the client can draw; on the basis of the amount guaranteed by the bank and on the basis of turnover over a given period (e.g. monthly account management);
- based on an individual product, where the price of a product is set as a flat-rate;
- on the basis of a valuable result, the price is determined here as the function of the achieved result of the negotiated transaction (e.g. is determined as a percentage of the profit from the sale of securities);
- based on the time when the price is set as the price per unit of time.

The profit of retail banks consists of the largest part of the difference between the interest received and the interest paid. Given that credit transactions are relatively

risky and hence yields are relatively uncertain, banks are seeking to increase their share of profits by other revenues from providing other services, such as payment transactions or account maintenance fees. (Dvořák, 2005)

2.3 Types of banking services for students

The previous chapter was devoted to banking products in general. To increase competitiveness, the bank focuses its attention on young people as well. Students of secondary schools and universities, who often do not have their own permanent income, are very attractive for the banks in the long run and will benefit if they remain satisfied with the selected bank after completing their studies and become creditworthy clients of the bank.

2.3.1 Banking products

Banking products designed specifically for students are offered today by almost every bank, whether they are current accounts or study loans. With advance modern times, the products are continuously expanded, and students have the choice of their current needs and requirements. The benefits of student accounts are, that most banks include a higher interest rate, as well as the possibility of account management and account statement free of charge, and the issuing and maintenance of a payment card also free of charge. (Vysokeskoly, 2007)

Banks, however, are also trying to distinguish student accounts from current accounts otherwise, by providing a variety of advantages. Benefits may take the form of lower or equal zero fees for individual services, annual financial bonuses or other services. Frequent is, e.g. free account management, an international free credit card or ISIC student card contribution, possibility to draw overdraft, and more. (Penize, 2012)

The following paragraphs summarize basic and general information about bank products for students.

Student bank account

These accounts are designed for students of secondary and university students aged 15-30 years. Some banks distinguish between secondary, linguistic, higher education and college students, and offer slightly different conditions for each level of education; other account opening is conditional only for age and is designed for all young clients.

To create a student account, it is necessary to submit the identity card, a second identity document, and a valid study certificate. Some banks require a minimum deposit, which will usually not exceed several hundred crowns. Keeping your account, including sending statements and issuing debit cards, is often free of charge. (Měšec, 2012)

Students loans and overdrafts

The product as such can be found in the offer of several domestic banks. However, there are also non-bank companies that can also lend to students. Here, however, it is usually necessary to expect higher interest rates. On the other hand, getting a loan is quite easy.

An alternative is also the student overdraft. Nowadays, it is offered by almost any bank. The difference between the loan and the overdraft is mostly at maturity and the amount of interest rate. While student loan you take for a clearly defined period, after which its interest rate is fixed, with overdraw you only pay for the actual draw amount.

The student loan is a special purpose loan and is intended primarily to finance the costs related to the study. It can be used for example on buying scripts and textbooks, annual tuition fees, accommodation, transport to school, foreign study (Erasmus). (Studentpoint, 2018)

Saving products

Most Czech students work while studying and another important part of their income is pocket money from parents. Saved money most often provides building savings or savings accounts.

Building savings can be an interesting valorization of funds through savings. Children who have not reached the age of majority may have their contract (contractually they are represented by the legal representative) and this is one of the benefits. The money deposited on building savings is valorized at a predetermined interest rate and the substantial advantage and exclusivity of building savings is state aid. However, the list of advantages does not end, but it is worth mentioning the fact that all the revenues from the building savings (i.e. interest and state aid) are exempt from income tax.

Saved money can be used for any purpose, purposefulness only relates to cases, when a building savings loan is drawn. And this building savings loan is another benefit of building savings, because it is bearing at a very favourable interest rate, the loan can be repaid at any time prematurely or reduced by an extraordinary instalment, which it is not sanctioned for example compare to mortgage credit. (Stavebni-sporeni, 2009)

Insurance

To cover a wide range of demand services, the Bank also offers additional services, for example, various forms of insurance. Thanks to various discounts and favourable offers, students can choose from a range of insurance, especially life, accident and travel, card and personal insurance, insurance for repayment, and even insurance for mortgages.

2.3.2 Payment cards

Payment cards are a modern non-cash payment instrument, mainly used to pay for consumer spending and cash withdrawal. Payment cards can be divided according to a number of criteria, the most important of which is their division on debit and credit cards. The difference between them is that:

- debit cards are in most cases linked to a current account, but some banks also issue a debit card to a savings account. With a debit card, you can withdraw cash from an ATM or in the shops, which offer a cashback service. You can

of course also make non-cash transactions by debit card - pay for spending in shops, restaurants or the Internet;

- with a credit card, you do not draw money from your own account as in the case of a debit card but draw a loan from a bank. The cardholder can automatically draw a credit within the agreed amount. Repayment of the loan does not have to be regular, but usually, a minimum monthly instalment is set. Also, there is a time limit for interest-free settlement during which the cardholder can pay the debt without paying interest. (Penize, 2011)

Payment cards usually issue through commercial banks so-called card association. The most well-known are VISA, MasterCard, which issue bank payment cards.

Contactless cards and stickers

In contactless payments, the Czechs are at the top. According to the recently published statistics of the Visa card company (2017), Czechs in the share of contactless payments are the second country in the world with 91%. (Úšela & Chripák, 2018)

Contactless payments are made using credit and debit cards or other devices that use contactless technology. Therefore, it is not necessary to insert the card into the reader, but only place it to the proximity of the terminal. Payment is faster because there is no need to enter a PIN into a certain amount. (in the Czech Republic up to 500 CZK). Contactless technology is built into classic payment cards or as a sticker, or it can be used as a chip in a mobile phone. (AGE, 2016)

A contactless sticker is similar to contactless card, only in small dimensions. Banks offer it as an additional payment card to a debit and credit cards. The advantage of the payment stickers is the variability of its location. For example, you can place it on a mobile phone, keychain, or other item you carry. As with contactless cards, you do not need to enter a PIN for smaller amounts. Compared to classic cards, however, they have a limited option; you cannot withdraw money from ATM or pay online.

Figure 2.1 Contactless payment card

Source:(co-operative bank, 2018)

Mobile wallets and NFC

Nowadays smartphones and tablets can also replace our wallet. Mobile wallet actually combines mobile banking and credit cards together.

For use, it is necessary to have a mobile phone with NFC[1](Near Field Communication) function, which has passed Visa and MasterCard certification and has to support secure element (a chip that handles the hardware and the phone infrastructure itself). That way is a mobile phone is protected from possible attacks by hackers and prevents the loss of confidential data. Then the user will download the available payment app on Google Play for free and match it with its bank account. (Schatt, 2014)

The application gives us plenty of services. When paying, the mobile phone works just like a contactless credit card, so we can pay for it wherever there are contactless terminals that support NFC payments. All credit cards and loyalty cards can be stored in your mobile. With the application, you can view your balance and payment history without having to open Internet banking. We can quickly and safely pay on the Internet without having to rewrite credit card details. Through the mobile wallet it is

[1] NFC is a technology for fast and secure data exchange over a very short distance (10cm/few inches). (Triggs, 2018)

also possible to withdraw cash in contactless ATMs, which are constantly increasing. (ČSOB, 2018)

In the Czech Republic, this app is available for mobile phones running Android 4.4 or higher and is called Android Pay. Most banks, however, are gradually switching to the universal Google Pay system. (Cvejnová, 2018) Also from February 2019 Apple launched its Apple Pay app in the Czech Republic. Within the first wave, six Czech banks and one non-banking institution support the payment service from Apple. (Fajmon, 2019)

Cash back

This is an additional service to payment cards, which allows withdrawing cash while paying in a shop. The client's account is burdened not only with the payment for the purchase but also with the cash withdrawn. Transactions typically require a PIN code. For the client, this service brings more comfort, reducing the costs associated with withdrawing from an ATM. For merchants, this service means lowering the costs of transferring cash to the bank; in addition, for the issued cash will receive a commission. The payment card issuer usually sets a maximum daily payment limit in its terms (cash withdrawal). (Dvořák, 2005)

Online payments

Nowadays, card payments on the internet are supported by most online stores, so you can easily buy any goods. When paying online with a card, the PIN is never entered, the cardholder enters the credit card details, such as the 16-digit card number on the front of the card, card validity and CVV2, which is a three-digit number on the back of the card next to the signature strip.

Security of payments is ensured through the worldwide standardized 3D Secure Technology Protocol, which protects the users in case anyone wants to abuse data from their card. At each Internet payment in merchants secured by this protocol, the bank will send the SMS code to the client and the payment will be made only after it has been entered. Another way of confirming payments on the Internet is through banking

application from individual banks, where the client can set up a payment confirmation method (e.g. security code or fingerprint). (Česká spořitelna, 2018)

2.3.3 E-Banking

Electronic banking is a payment transaction mediated through a payment instrument on which funds are stored in electronic form as electronic money. The transfer of electronic money occurs between the payer and the payee. (Schlossberger, 2012)

Batchelor (2017) pointed out, that "customers who use e-banking tend to be more profitable, loyal, and willing to refer their bank to friends and family than do traditional banking customers. Online customers also maintain higher balances, require less customer support and have lower attrition rates than offline consumers. Online banking customers who use online bill pay and e-bill services are happier with their banks, which translates into deepened relationships."

For customers, e-banking brings a number of benefits, such as saved time spent in the bank, 24/7 access to accounts and services. As financial institutions continue to develop online banking, customers are using more services, such as bill payment across industries, money transfer and mobile e-banking using mobile phones and hand-held devices. (Batchelor, 2017)

Internet banking

Internet banking is similar to home banking using Internet communications. It is an application that does not require special hardware and the connection to the application in the bank ensures the client's PC. Internet Banking allows to transfer information about a client's account, enter payment orders, obtain information from the bank (exchange rates etc.).

In recent years, the possibilities of using Internet banking has expanded to areas such as work with user's accounts - their opening, cancellation or opening and cancellation of time deposits etc. This was made possible by the significant development

of information technologies in the field of data security. Client can choose different forms of security - from the simplest (and least secure) combination of using the access key and the password to significantly safer (though more expensive) by providing a qualified certificate on an external medium, connected only for the time necessary to perform the required operation.

Mobile banking

Mobile banking offers remote banking services through cellular communication. It is a useful tool for clients, thanks to which they have a constant overview of their finances through their smartphones. One of the possible communication forms of mobile banking is the sending of encrypted SMS messages, which allows you to enter bank orders directly from your mobile phone keyboard. That may be a disadvantage because some clients do not prefer using SMS messages. That is why banks started to offer mobile banking applications, based on the internet connection of smartphones and usage of touch screens those devices – these services are called smart banking. Mobile banking can be used e.g. to track balance and account turnover, enter orders for payment or direct debit authorization, order cash withdrawals at a branch or to find out exchange rates etc. (Polouček, 2013)

Another smart feature that these application offers are QR payments. These payments are entered using the QR[2] code, the data from it is overwritten into a payment order, which the user subsequently checks and confirms. This will save time to complete by filling in all the data needed to execute the payment order (e.g. account number, variable symbol etc.) (mBank, 2018)

2.4 Decision criteria framework

The literature survey contains a review of previous studies which have investigated choice criteria in retail banking regarding to students

[2] QR codes are square barcodes which store information in a machine-readable optic label. (Neagu, 2018)

Based on study results from Huu a Karr (2000) when from a sample of 198 undergraduate students was identified through the Analytic hierarchic process (AHP), that undergraduates highly emphasis pricing and product dimensions of bank services. Therefore, the current account price was included in the selection criteria (i.e. account management fee, ATM withdrawal fee, charges for incoming and outgoing payments), Furthermore, the fee for ATM withdrawal abroad, the price of SEPA payments, the conversion of currency when paying abroad, and the amount of interest on deposits.

Furthermore, since they are young customers who use technology extensively, the criterion is whether the bank offers the possibility to pay via mobile phone and at what level is the bank's mobile banking. As the study shows from Gerrard and Cunningham (2001), when for 184 Singaporean students, electronic services were one of the most important factors.

Also, the availability of ATMs or additional services offered by the bank may be important for students. In the study from Thwaites and Vere (1995) which was conducted in the UK, these criteria had the greatest impact on students when choosing a bank.

Khazeh and Decker (1992-93) conducted research in Maryland, the USA where, based on a survey of 209 university students, it was found that the interest rates charged on loans were one of the most important criteria for them. Therefore, the possibility of obtaining an overdraft within a current account is included in choice criteria.

Finally, it may be important for students to set up a current account with ease, as the study shows from Cicic et al. (2004), where this criterion was in the top five factors that most influenced students when choosing a bank. For this reason, the choice criteria also include whether the bank offers the possibility to set up an account via internet.

3 Methodology

The aim of the methodology is to introduce the main questions of this research, describe what type of data was used for this research, and then indicate what research method was used for data collection and finally explain how these data were analysed.

3.1 Research approaches

"Research approaches are plans and the procedures for research that span the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation. This plan involves several decisions, the overall decision involves which approach should be used to study a topic. Informing this decision should be the philosophical assumptions the researcher brings to the study; procedures of inquiry (called research design); and specific research methods of data collection, analysis, and interpretation. The selection of a research approach is also based on the nature of the research problem or issue being addressed, the researchers' personal experiences, and the audiences for the study." (Creswell, 2014, p.3)

The research should provide answers to the following two questions.

1) What criteria are most important for students when opening a bank account?

The first question should provide the data needed to process the second question.

2) Which bank account is most suitable for students, based on the importance of each criterion?

You can find selected banks in chapter 4.2 and selected criteria in chapter 4.3.

3.1.1 Qualitative research

Qualitative research is based on data that cannot be measured or counted but can be collected and interpreted through observation.

Characteristic of qualitative data:

- Open-ended questions such as 'what, how, when' and so on, so that the respondents can express themselves using their own words;
- cannot be qualified or counted no two answers or observations are exactly the same which is why they can't be counted;
- can be used to uncover people's motivations, feelings, attitudes, preferences and behaviours exactly as they choose to express them;
- benefits of quantitative data are, that it can uncover details in depth information from each respondent and that it is often relatively low cost to carry out;
- however, the disadvantages are, that only a few respondents are used and that they are unlikely to be representative of the entire target group and results can be difficult to interpret, making the results subjective.

Tab. 3.1 Types of qualitative data

Source of data	Research method	Format of data
Interview talk	Interview	Recorded speech
Reports, diaries, minutes of meetings Scripts (e.g. For political speeches or media programmes)	Documents	Printed text
Interactions between people (including naturally occurring actions, responses, language) Events (e.g. Ceremonies, rituals, performances) Artefacts, symbols, cultural objects (e.g. Paintings, advertisements)	Observation	Photographs Pictures Video recordings
Answers to open-ended questions	Questionnaires	Printed text

Source: (Denscombe, 2018)

3.1.2 Quantitative research

Quantitative research is based on numerical data which can be analysed using statistic.

Characteristic of quantitative data:

- can be counted and/or measured, it's quantifiable;
- it is based on asking closed-ended questions (e.g. by providing predefined answer options in questionnaire);
- the benefits are, that it can be representative of the target group since a larger number of respondents can be covered and that it is objective;
- however, the disadvantages are, that it doesn't uncover in-depth motivations, detailed reasons or underlying feelings and attitudes, and some quantitative research can be fairly costly to carry out.

Tab. 3.2 Sources of quantitative data

Numbers	Research method
Answers to close-ended questions	Questionnaires
Content analysis of transcripts	Interviews
Measurements from experiments	Observation
Observation schedule used with events	
Official statistic (health, education, trade, etc.)	Documents
Business data (performance, employment, etc.)	
Content analysis of, for example, company reports	

Source: (Denscombe, 2010)

3.1.3 Differences between qualitative and quantitative research

As Ghauri and Grønhaug (2010) stated *"The main difference between qualitative and quantitative research is not of 'quality' but of procedure. In qualitative research, findings are not arrived at by statistic methods or other procedures of quantification. Normally, the basic distinction between quantitative and qualitative research is that*

qualitative researchers employ measurement and qualitative researchers do not." (Ghauri & Grønhaug, 2010, p.104)

Tab 3.3 The difference in emphasis in qualitative versus quantitative methods

Qualitative methods	Quantitative methods
▪ Emphasis on understanding	▪ Emphasis on testing and verification
▪ Focus on understanding from respondent's / informant's point of view	▪ Focus on facts and / or reasons for social events
▪ Interpretation and rational approach	▪ Logic and critical approach
▪ Observations and measurements in natural settings	▪ Controlled measurement
▪ Subjective 'insider view' and closeness to data	▪ Objective 'outsider view' distant from data
▪ Explorative orientation	▪ Hypothetical-deductive; focus on hypothesis testing
▪ Process oriented	▪ Result oriented
▪ Holistic perspective	▪ Particularistic and analytical
▪ Generalization by comparison of properties and contexts of individual organism	▪ Generalization by population membership

Source: (Ghauri & Grønhaug, 2010)

3.2 Gathering data

According to Quinlan (2011) *"When the researcher knows what data are required for the research project, and how that data can be gathered, the researcher designs the approach to data gathering to be used. The data gathering methods are designed in such a way as to ensure that they will yield the data required. The data gathered are the means by which the researcher establishes the thesis developed in the research, the means by which they accept or reject the hypotheses presented in the research project. They are the means by which they prove their case, the means by which they illustrate the phenomenon under investigation."* (Quinlan, 2011, p.218)

For this research, the questionnaire was used as the most appropriate means of data collection. Reason for this is, that questionnaire can be used with a large number of respondents in many locations. That helps to conduct research even on students in the

Czech Republic. Another thing is that questionnaire is designed to collect information which can be used subsequently as data for analysis, which are crucial for this research. (Denscombe, 2010) And also, the selection of data collection method for this research was based on previous researches from Mokhlis (2009), which examined the gender differences in the selection of a retail bank for undergraduate students in Malaysia, next Narteh (2010), which conducted a research on bank selection of Ghanaian students to help bank managers attract and retain customers, and finally Pass (2005), which was focused on evaluating reasons for students switching banks and selecting new banks. In all previously mentioned researches, the questionnaire was used as a main source of data collection.

Tab 3.4 Advantages and disadvantages of the questionnaire

Questionnaire	
Advantages	Disadvantages
Cost-efficient - especially online and mobile surveys have a very low cost and a generous reach (no printing cost, no need to hire surveyors).	Dishonesty - there is no guarantee that respondents will truthfully answer all questions.
Practical - they may be targeted to selected groups and managed in different ways.	Differences in understanding and interpretation - respondents may have a problem with understanding the questions that may seem clear to the creator.
Speedy results - quick and easy to collect results with online and mobile tools (depends on the scale and reach of the questionnaire).	Hard to convey feelings and emotions - questionnaire cannot fully capture emotional responses or the feelings of the respondents.
Scalability - can be gather information from a large number of respondents.	Some questions are difficult to analyse - open-ended questions cannot be quantified, it must be reviewed by a human.
Easy to analyse - online surveys have tools for analysing, interpreting and visualization of a data collected.	Lack of personalization - some respondents may miss the touch of personalization and may ignore the questionnaire.
User anonymity - respondents fill the questionnaire anonymously, which encourage them to answer questions truthfully.	Skipped questions - respondents can ignore some questions.
No pressure - respondents have plenty of time to complete the questionnaire.	Accessibility issue - respondents may be unsuitable (visual or hearing impairment, or other impediments such as illiteracy).

Source: (Debois, 2019)

3.2.1 Design of the questionnaire

Robson and McCartan (2016) stress that the questions for the questionnaire shouldn't be produced by researcher just by sitting down and trying to think of some interesting things. The most important thing for the research is to design individual questions in the way, that they would be able to provide the answer to the research question. Therefore, for this research are all the individual criteria in the questionnaire are based on theoretical underpinnings from the literature review. Selected question type in the questionnaire in this research is 'degree of agreement and disagreement: the Likert Scale'. (See Annex 1)

The questionnaire was designed as a web page and located on a host site through which can respondents access it. This type of questionnaire brings some advantages such as: web page features (buttons, icons, frames), which especially young people find attractive, you can also choose from different questionnaire styles (theme, colour) and the biggest advantage for the researcher is that the web-based questionnaire not only collects the data, but it also processes it directly, and so the researcher can easily see the results in the chart. (SmartSurvey.com)

Based on this processing, the questionnaire was distributed via the internet, and also as was already mentioned before, young people prefer this way of communication. The questionnaire was available on host site web page as well as on the Facebook group of the University to improve the response rate.

3.2.2 Sample

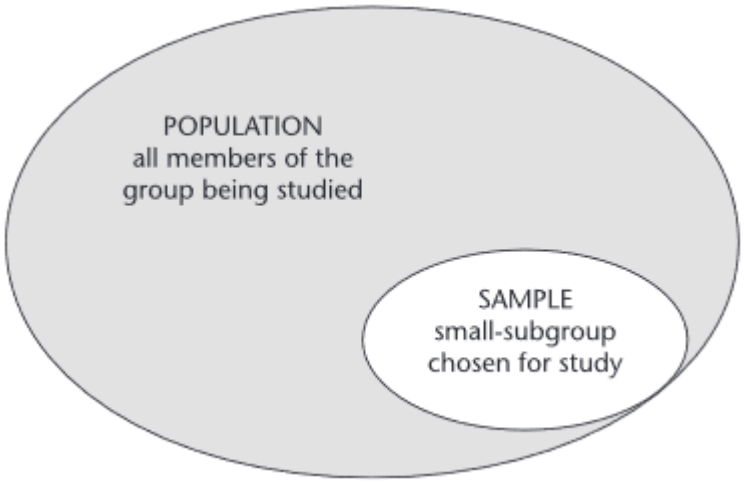
The usual problem that researchers face is that they do not have the necessary amount of time and money. Therefore, they use the sample instead of the whole population, which allows them to reduce a large amount of data, but at the cost of reducing the accuracy of research findings. (Denscombe, 2010)

This research was dealing with those problems as well. The sampling frame was composed of students of VŠB - TUO, their field of study and their year of study did not matter in their selection for this research. These elements are typical for non-

probability sampling. The non-probability sampling differs from probability sampling that it does not operate on the principle of random selection to the sample. Researchers use this sampling when they find it difficult or undesirable to choose their sample on the basis of pure chance.

As the most suitable non-probability sampling technique for this research was chosen 'the convenience sampling'. (See Annex 2)

Figure 3.1 Population and sample



Source: (Denscombe, 2010)

3.2.3 Limitations of the research

The greatest limitation of this research is clearly the size of the analysed sample of Czech students. A total of 133 respondents participated in this research, and only from Technical University of Ostrava. As a result, this may cause, that the results of this research would not be possible to generalize on the whole student population in the Czech Republic. Certainly, it would be necessary to get a larger sample of students first, and secondly to have this sample from different universities, because students with other specializations may have different preferences. The reason for this small number of respondents was, that it was not in the researcher's power to carry out such extensive research from different universities all over the Czech Republic, it was caused mainly due to lack of time and resources.

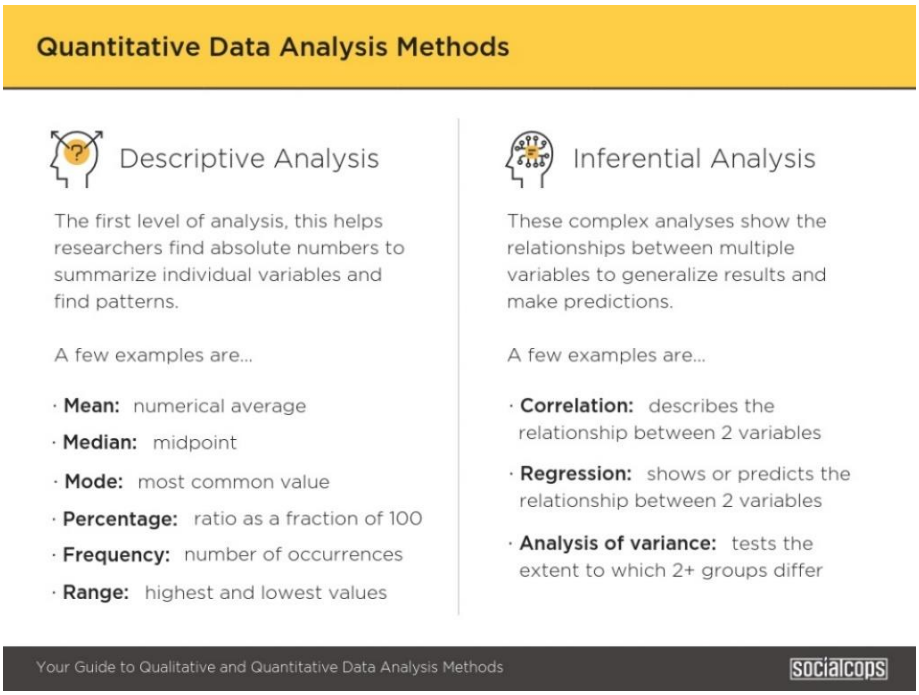
The results of this research have to be considered with previously mentioned limitation bear in mind.

3.3 Data processing

After data has been collected from the questionnaire, they have to be converted into something meaningful and readable. It is imperative that the quantitative data is in a numerical form to be analysed. To achieve this requirement, so-called data coding is used. (Bhatia, 2018) This means that code is assigned to each non-numeric answer, and each code means the number of points based on the importance of the selected answer (i.e. 'unimportant – 1'; 'less important – 2'; 'neutral - 3'; 'important - 4'; 'very important - 5').

Next step is to analyse prepared data. For analysing the quantitative data, the two analysis methods are most commonly used i.e. descriptive analysis and inferential analysis. Difference between analysis methods is shown in the figure 3.1.

Figure 3.2 Quantitative data analysis methods



Source: (Bhatia, 2018)

For this research, an inferential analysis was used to obtain results based on multi-criteria analysis as described in the following subchapters.

3.3.1 Multi-criteria decision making

When choosing products from financial institutions, it is appropriate to consider more than one decision criterion. The objective of multi-criteria evaluation of the alternatives is to find the optimal alternative, arranging these alternatives from the best to the worst and thus determining the alternatives unacceptable. The priority of multi-criteria decision making is to facilitate the work of the arbitrator in solving the problem of arranging the alternatives when using a wider set of criteria. The best option is usually the compromise option, the least distant from the ideal alternative, the ideal alternative is the one that has the best possible value in all criteria.

The general procedure for the multi-criteria evaluation includes the following steps:

- creating a set of criteria;
- determination of the weights of evaluating the criteria;
- determination of the sampling values for weighting of criteria;
- evaluation of the achieved results - this is a partial evaluation of the alternatives and their synthesis in the overall evaluation;
- risk assessment associated with the realization of alternatives;
- determining the preferential order of alternatives and selecting the best option.

3.3.2 Model of multi-criteria analysis of alternative

The objective of the multi-criteria analysis model is to select one or more alternatives of the allowable alternatives as most objectively as possible, which will then be designed for implementation. In order to maintain objectivity, different methods and procedures of alternatives analysis are used, which will be further described in the following subchapters.

The basic elements of the multi-criteria analysis model of alternatives are:

- alternatives of decision;
- criteria of decision;
- criteria matrix;
- weights of the criteria.

Alternatives are specific decision-making options, which can be realized and are not logical nonsense. Alternatives are the subject of our own decision making, alternatives are the subject of own decision-making, must be carefully selected to be achievable and to be an appropriate solution. In models of multi-criteria analysis of alternatives, the final set of m alternatives is given, which are evaluated on the basis of n criteria.

The criterion is the aspect of the evaluation of alternatives, it may be qualitative or quantitative. Qualitative only determines the order of the alternatives, telling us which alternative is better and which less, but not how much. This is done by qualitative criteria that allow the value of criteria to be determined. By nature, we can further divide the criteria into minimization and maximization. Maximizing criteria are those for which the most valuable criteria have the highest value (e.g. average wage). The opposite is the minimization criteria, where the best alternatives have the lowest values (e.g. rate of unemployment). Selection of individual criteria is important. It is necessary for the criteria to be independent, to cover all aspect of the selection and yet, there should not be a lot of them.

Criteria matrix is a matrix $Y = (y_{ij})$, whose elements y_{ij} forms the arrange of ranking *i-th* alternatives according to *j-th* criterion. The columns of this matrix form the individual criteria, the rows correspond to the evaluated alternatives. The matrix can be written in this form:

$$Y = \begin{pmatrix} y_{11} & y_{12} & \cdots & y_{1n} \\ y_{21} & y_{22} & \cdots & y_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ y_{m1} & y_{m2} & \cdots & y_{mn} \end{pmatrix}. \qquad (3.1)$$

Weights (preference) of the criteria expresses the importance of this criterion in comparison with other criteria. Determining the preference of the criteria is probably

the most difficult task, which often depends on the subjective opinion of the decision-maker. (Šubrt et al., 2011)

3.3.3 Methods of determination of criteria value

Determining criteria weights is an initial step in analysing the model of multi-criteria analysis of alternatives. Different methods, which differ from each other can be used to determine weights of the criteria. Weights numerically express the importance of individual criteria. The resulting weights can be affected by the method used, but also by the subjective decision of the evaluator. The methods described in this chapter calculate with certain preferences of criteria, respectively, they suppose that the decision maker can determine the criteria, which are more important in decision making than others. For more accuracy, it is advisable to use multiple methods, or more evaluators.

Rank ordering method

This method expresses the determination of ranking by importance or preference. The individual criteria are ranked from the most important to the least important. The most important criterion is assigned as many points as the number of criteria. The least important criterion has then one point. If a situation occurs when certain criteria have the same importance, they will be ranked according to the average ranking. The weights of each criterion are then calculated using the formula:

$$w_j = \frac{v_j}{\sum_{i=1}^{n} v_i}. \qquad (3.2)$$

Where w_j denotes the relative weight of the *j-th* criterion, and n denotes the number of the criteria, v is the number of the evaluated criterion and $j = 1, 2, \ldots, n$.

Point method

For this method, the individual criteria are scored directly in points within the specified scoring scale. It is used similarly to the order method and thus the relation for the calculation of weights is the same. (Zmeškal, 2009)

Analytic Hierarchy Process

This method is used to determine criteria weights if only one expert evaluates. The principle of this method is to pairwise compare of the criteria and its write down to AHP matrix with elements a_{ij}, which is symmetrical. We can divide the weighting of the criteria into two steps. The first step in the AHP is the estimation of the pertinent data. That is the estimation of the a_{ij} values of the decision matrix. This is described in table 3.5.

Tab 3.5

Intensity of importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
3	Weak importance of one over another	Experience and judgment slightly favour one activity over another
5	Essential or strong importance	Experience and judgment strongly favour one activity over another
7	Demonstrated importance	An activity is strongly favoured, and its dominance demonstrated in practice
9	Absolute importance	The evidence favouring one activity over another is of the highest possible order of affirmation
2,4,6,8	Intermediate values between the two adjacent judgments	When compromise is needed

Ranking scale for criteria

Source: (Saaty, 2010)

Subsequently, the AHP matrix will be assembled. The s_{ii} elements on the diagonal of this matrix always have a value of 1, the elements of the right part of the matrix s_{ij} get the values from 1 to 9 according to Tab 3.5 and the elements of the lower left triangle s_{ij} are expressed by the relationship:

$$s_{ji} = \frac{1}{s_{ij}}. \tag{3.3}$$

AHP matrix has the following form:

$$S = \begin{pmatrix} 1 & s_{12} & \cdots & s_{1n} \\ 1/s_{12} & 1 & \cdots & s_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ 1/s_{1k} & 1/s_{12} & \cdots & 1 \end{pmatrix}. \tag{3.4}$$

Before calculating the weights of the individual criteria, it is necessary to verify that the assigned matrix of pairwise compare is consistent. The natural assumption for this matrix is that if the K_i criterion is s_{ij}-*times* more significant than the K_j and K_j criterion is s_{jk}-*times* more significant than K_k, where $i, j, k \in \{1, 2, \ldots, m\}$, then the K_i criterion should be s_{ik}-*times* more significant than K_k, where $s_{ik} = s_{ij}s_{jk}$.

This expresses the following definitions.

Definition 4.1: Let $P = \{p_{ij}\}$ $m, i, j=1$ is a square matrix of type $m \times m$ whose elements apply:

$$p_{ik} = p_{ij} \cdot p_{jk} \text{ for each I, j, k = 1, 2, …, m.} \tag{3.5}$$

Then we say that the matrix P is consistent.

Consistency is measured using the CR (consistency ratio), defined by Saaty (2010) as follows:

$$CR = \frac{CI}{RI}. \tag{3.6}$$

$$where\ CI = \frac{\lambda_{max} - n}{n - 1}.$$

Where *CI* denotes the consistency index, λ_{max} is the maximum custom number of the S matrix and *n* is the number of criteria. The matrix's custom number λ_{max} is determined as follows:

$$\lambda_{max} = \frac{1}{N}\sum_{i}^{N}(S \cdot \vec{w})_i / w_i. \tag{3.7}$$

The random index is determined according to the following table:

Tab. 3.6 Random index

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14
RI	0	0	0,52	0,89	1,11	1,25	1,35	1,4	1,45	1,49	1,52	1,54	1,56	1,58

Source: (Saaty, 2010)

Matrix S is sufficiently consistent if *CR <0.1*. The Matrix plugin in Excel was used to calculate consistency. (Saaty, 2010)

The least-squares logarithmic method is most often used to calculate criteria weights. It is necessary to calculate the geometric mean of the AHP matrix and thus get b_i values. For this calculation, we use the following formula:

$$b_i = \sqrt[n]{\prod\nolimits_{j=1}^{n} s_{ij.}} \tag{3.8}$$

The weights are then calculated by normalizing the *bi*:

$$v_i = \frac{b_i}{\sum_{i=1}^{n} b_i}. \tag{3.9}$$

3.3.4 Methods of multi-criteria evaluation of alternatives

The aim of the multi-criterial evaluation of the alternatives is to find the best alternative and also to determine the advantage of the individual alternatives according to the given criteria. These methods have mostly a general nature, which does not depend on the content of each alternative. The solution may be affected by several factors, such as: choice of weighting or the method used.

In this subchapter there will be described simple methods of evaluation of alternatives, those are WSM and AHP, which is among the methods based on pairwise comparison of alternatives.

Weighted sum method

In this method, the criteria matrix is transformed into the ranking matrix, which means that based on all the criteria it will be sequentially assigned the ranking to the individual alternatives. The individual evaluations of the *j-th* alternative for the *i-th* criterion can be defined as follows:

$$h_i^j = m + 1 - p_i^j. \tag{3.10}$$

Where h_i^j is the evaluation of the *j-th* alternative for *i-th* criterion, *m* denotes the number of alternatives, p_i^j characterizes the order of the *j-th* alternative for the *i-th* criterion. (Šubrt et al., 2011)

Analytic Hierarchic Process

This method is appropriate to use, when qualitative criteria prevailing in the mix set. The aggregate evaluation of the alternatives is determined as the weighted sum of the individual alternatives for the given criteria, as shown by the following relation:

$$A^j = \sum_{i=1}^{n} w_i \cdot a_i^j; \quad j = 1, 2, \ldots, m, \tag{3.11}$$

Where A^j is overall rating, or the value of the *j-th* alternative, w_i is weight of *i-th* criterion, a_j^i is an individual evaluation of the *j-th* alternative for the *i-th* criterion, *n* is the number of evaluation criteria and *m* is the number of alternatives.

Determining the individual evaluation of the alternatives for the partial criteria is similar to the AHP method of determining the scales, except that the decision alternatives are compared instead of the criteria. For each criterion, the AHP matrix is created on the principle of pairwise comparison of alternatives. Gradually, the size of the preference of each pair of alternatives is determined by assigning the number of points from the nine-step scale. The parts of the sub matrices s_{ij} then correspond to the alternative ratios between each other. (Saaty, 2010)

As was mentioned in the study from Podvezko (2011), the problem with this method arises, when there is a large number of criteria. It's because the researcher has to determine significance of a particular pair of criteria for the investigated alternative, which is a complicated problem when the number of criteria is more than ten.

4 Results

The aim of this chapter is to determine which of the Czech bank accounts best corresponds to student preferences. Firstly, the model client will be introduced as well as all chosen banks and decision criteria. In the next part, the results of the students' preferences will be presented, based on which the determined weights using the rank ordering method and the AHP method. These determined weights will be used in the next section to evaluate the alternatives using WSM and AHP.

4.1 Client profile

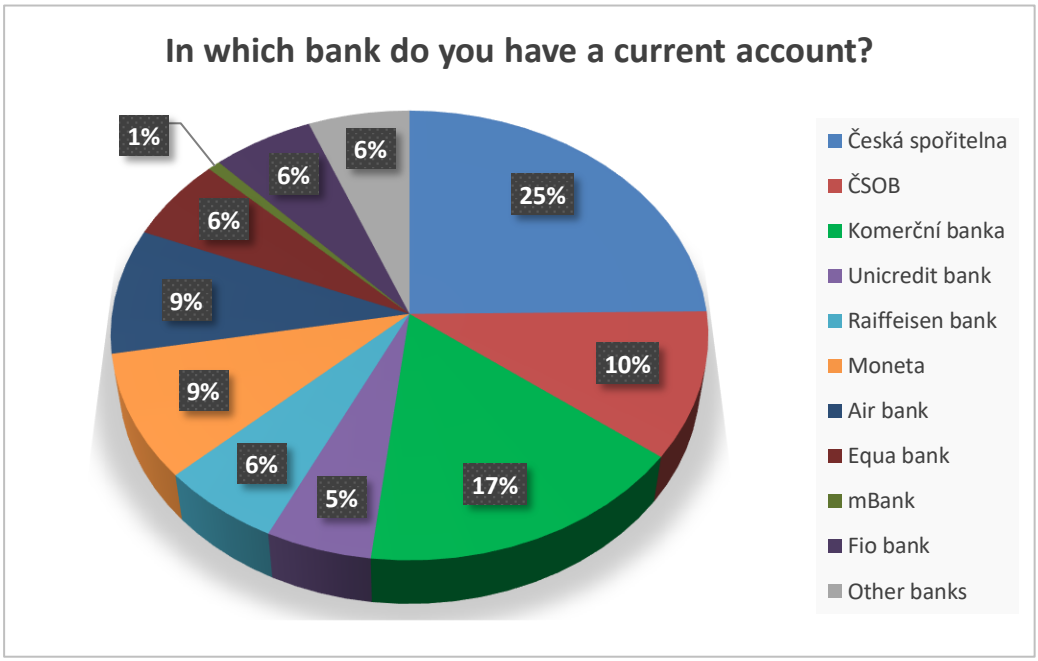
The client is a student aged 18–26, is a citizen of the Czech Republic and is interested in opening a current account with one of the Czech banks. He is unemployed, he only earns extra money within his temporary job and regularly receives pocket money from his parents, which is why its account management price (and the charges associated with its management) is important for him as well as the amount of interest on deposits. He is the owner of the smartphone Samsung Galaxy S9, from which he would like to manage all his finances, and therefore the functionality of mobile banking is important to him and also whether the bank offers the option to pay by smartphone. The client would prefer to open his bank account via internet, because there is no bank branch in his place of residence, and he would not like to travel and wait in a branch due to account opening. Furthermore, since he often withdraws cash from an ATM, he is interested in the availability of the bank's ATM. The client plans to go abroad within Erasmus program as part of his studies, and therefore the price for withdrawing from an ATM abroad is important for him as well as currency conversion (exchange rate surcharge) when paying with a payment card. Also, outgoing SEPA payments are important to him, because there he will have to pay rent and does not wish to open an account abroad. Finally, the client would like to purchase a laptop for which he currently has not enough money, and therefore he would like to be able to take an overdraft to his account.

4.2 Alternatives of solution

Possible alternatives are student current accounts provided by selected Czech banks.

In this model example, 10 Czech banks were selected. Based on the total assets and the number of clients according to the annual reports of individual banks (2018), the largest Czech banks in the Czech Republic were selected, and these are Česká spořitelna, ČSOB, Komerční banka, Unicredit bank, Raiffeisen bank, Moneta. Furthermore, representatives of the so-called young banks were included in the selection i.e. Air bank, Equa bank, mBank and also Fio bank. All mentioned Czech banks also appeared in the results of the questionnaire (see Annex 4) as you can see in Figure 4.1.

Figure 4.1 Chart of the frequency of individual banks



Individual alternatives are shown in table 4.1.

Tab. 4.1 Alternatives of solution

Alternatives	Bank name	Account name
Alternative a1	Česká spořitelna	Studentský účet
Alternative a2	ČSOB	Plus konto
Alternative a3	Komerční banka	G2.2
Alternative a4	Unicredit bank	U konto pro mladé
Alternative a5	Raiffeisen bank	eKonto Student Premium
Alternative a6	Moneta	Genius student
Alternative a7	Air bank	Malý tarif
Alternative a8	Equa bank	Běžný účet
Alternative a9	mBank	mKonto
Alternative a10	Fio bank	Fio osobní účet

4.3 Criteria of decision

Setting criteria is a key step in multi-criteria analysis. There should not be too many of them to avoid unnecessary confusion as was mentioned in subchapter 3.3.4, so the following criteria have been selected in the model example:

- Criterion c1 – Current account management price
- Criterion c2 – The amount of interest on deposits
- Criterion c3 – Functionality of mobile banking
- Criterion c4 - Support of NFC payments
- Criterion c5 –Opening a current account via internet
- Criterion c6 – Availability of the ATMs
- Criterion c7 – The price for withdrawing from an ATM abroad
- Criterion c8 – Currency conversion (exchange rate surcharge)
- Criterion c9 – SEPA payments
- Criterion c10 – Interest on overdraft

For unemployed students, the price of the current account is important. In the model example, the annual account maintenance fee was calculated. All account management costs are included, resp. account maintenance fee, ATM withdrawal fee, as well as charges for incoming and outgoing national payments. For the calculation, we assume that the client makes a monthly withdrawal from the ATM at least 1,500 CZK, he regularly receives a 3,000 CZK contribution from his parents to study and

makes on average 4,000 CZK of extra money per month with his temporary job. Its monthly expenses are about 5,000 CZK. He is using a payment card at least 5 times a month. Annually executes 40 payment orders and has 20 incoming payments per year. Out of the 40 outgoing payments, only 10 of them were made within the client's own bank. The price is among the quantitative and minimization criteria, which means that the lowest value is required, so the option with lowest account price will be rated with number 1, while the highest account price will be rated with number 9.

The opposite applies to interest on the deposit, which is among the qualitative and maximization criteria, which means that the greatest possible value is required, so the option with highest interest on deposits will be rated with number 1, while the lowest interest on deposits will be rated with number 9.

The client manages his account mainly through mobile banking, so he is keen to be fully functional and offer a wide range of features. He considers as the basic functions the overview of all cards, transaction history, the possibility to enter a standing order, direct debit order, QR payment, to modify the limits of payment cards. The advantage is the map of the bank's ATMs within the application as well as the possibility to arrange an appointment with an advisor. In addition, mobile fingerprint sign-up as well as biometric payment verification. It also takes into account the option of full-text search in the payment history. It is easier than a finding of a variable symbol of your search or another search key (account number, amount, calendar date) by in which most mobile banking can be searched. Since this is a qualitative criterion, we will set a scale in the range of 1-9, where 1 stands for mobile banking, which not only performs basic functions but also has other advanced features, while 9 stands for mobile banking with only basic functions.

Most Czech banks already enable the connection of a payment card with a mobile phone. If support of NFC payment is offered within the account, this option will be rated with number 1, however, if support of NFC is totally missing, the option will be rated with number 9.

The same is it with the possibility to open an account via the Internet. If the bank offers this, the option will be rated with number 1, otherwise, the option will be rated with number 9.

As already mentioned, the client regularly withdraws from an ATM and therefore wants to have availability of ATMs where he can withdraw cash without fees. Most banks have their own ATMs where clients can withdraw cash for free, but they have to pay a fee for cash withdrawal from other ATMs. There are also banks that do not have their own ATMs, but if certain conditions are met, the client can withdraw cash from other ATMs without any charge (there are approximately 5,500 ATMs throughout the Czech Republic). This criterion is maximizing, so a higher value is desirable, so the option with the highest availability of ATMs will be rated with number 1, while the lowest value will be rated with number 9.

The client will travel to one of the euro area countries for 5 months as part of their studies. The prices of ATM withdrawals abroad vary depending on the amount of the fee (as with SEPA payments), by setting the exchange rate by the bank, and in some cases the banks charge an additional percentage to the rate (as well as when paying by card abroad). For the sake of comparison, let's assume that the client's monthly expenses for accommodation, meals and other services are 600 €. Of this, he will pay 400 € for the rent by transferring to the lessor's account as a SEPA payment, of the remaining 200 € will withdraw 100 € from an ATM and the remaining 100 € will be paid by a payment card. For the currency conversion was used an exchange rate of each individual banks for ATM withdrawal and VISA exchange rate for card payments on 23.3.2019. This is a minimization criterion, so the lowest value is desirable. The alternative from the lowest value will be rated with number 1, while the largest will be rated with number 9.

In addition, the client wants to purchase a laptop, but also wants to keep a financial reserve in his account, so he decides to take over a bank overdraft of 10,000 CZK from the bank to pay for the laptop, which will be paid monthly for one year. Again, this is a minimization criterion, the alternative with the smallest overpayment will be rated with number 1, while the largest overpayment will be rated with number 9. An overview of all criteria is shown in table 4.2.

Tab. 4.2 Alternatives and evaluation criteria

Criterion / alternative	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10
Account price (Year)	90 CZK	0 CZK	0 CZK	0 CZK	0 CZK	240 CZK	0 CZK	0 CZK	0 CZK	0 CZK
Interest on deposits (Year)	0 CZK	1 CZK	0 CZK	1 CZK	0 CZK	11 CZK	110 CZK	1 CZK	0 CZK	0 CZK
Mobile banking	1	5	4	5	3	1	1	2	1	7
NFC payments	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No
Opening an account via internet	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ATMs availability	1 292	856	740	5 500	5 500	650	303	5 500	5 500	5 500
Price for withdrawal abroad (month)	2 754 CZK	2 731 CZK	2 645 CZK	2 635 CZK	2 652 CZK	2 752 CZK	2 657 CZK	2 645 CZK	2 651 CZK	2 851 CZK
Currency conversion (month)	2 629 CZK	2 631 CZK	2 646 CZK	2 635 CZK	2 652 CZK	2 621 CZK	2 632 CZK	2 636 CZK	2 651 CZK	2 639 CZK
Outgoing SEPA payment (month)	10 736 CZK	10 774 CZK	10 779 CZK	10 790 CZK	10 608 CZK	10 704 CZK	10 553 CZK	10 643 CZK	10 604 CZK	10 576 CZK
Interest on overdraft (Year)	1 152 CZK	1 085 CZK	1 227 CZK	1 079 CZK	1 273 CZK	1 151 CZK	1 152 CZK	1 018 CZK	1 152 CZK	1 152 CZK

All of the above information was obtained either from the bank's online price list or through online communication with the bank's employees. A more detailed overview of all banks, including all account management fees, and other criteria can be found in the Annex 3.

It is evident from the table 4.2 that the most expensive account management is with Moneta, because the bank charges a fee of 6 CZK for each outgoing payment. Česká spořitelna charges 2 CZK per transaction for outgoing payments to another bank. Other banks offer free account maintenance.

It is obvious, that most banks do not interest deposits on current account, and the rest banks do interest deposits with a very low rate. The exception is Monet bank, which interests deposits on a student account with 1% p.a.

The most advanced mobile banking has Česká spořitelna, Moneta bank, Air bank and mBank. The worst part is the application from Fio Bank.

NFC payments are supported by all banks with the exception of Unicredit Bank, Raiffeisen Bank and Fio Bank.

The opening of a current account via the Internet is possible with all banks, with the exception of Česká spořitelna.

As for the availability of ATMs, Unicredit Bank, Raiffeisen Bank, Equa Bank, mBank and Fio Bank are the best dealers, offering free withdrawals from all ATMs. Other banks only offer free withdrawals from their ATMs and charge a fee for withdrawals from other ATMs.

The cheapest withdrawal of 100 € from an ATM abroad have Raiffeisen Bank, which offers 1 free withdrawal per month, on the contrary, the most expensive withdrawal has Fio bank, which charges 0.5% of the withdrawal amount + 80 CZK.

Payment by card is most advantageous with Moneta bank, which only has 1,65% surcharge to VISA exchange rate. The largest exchange rate surcharge has Raiffeisen bank.

From the model example, it can be seen that for SEPA the client pays the most in ČSOB, which charges a fee of 250 CZK, the same fee is charged by Unicredit bank, but thanks to a better exchange rate it is more profitable than in the mentioned ČSOB. The most advantageous SEPA payment has Raiffeisen Bank, which offers 1 free monthly payment.

The smallest paid overdraft interest is at Equa bank, while the largest overpaid is at Raiffeisen Bank.

Table 4.3 represents the criterion matrix Y in which the values of the individual criteria are shown in the given alternatives.

Tab 4.3 Criterion matrix Y

Criterion / alternative	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10
c1	5	1	1	1	1	9	1	1	1	1
c2	9	5	9	5	9	3	1	5	9	9
c3	1	5	4	5	3	1	1	2	1	7
c4	1	1	1	9	9	1	1	1	1	9
c5	9	1	1	1	1	1	1	1	1	1
c6	5	6	7	1	1	8	9	1	1	1
c7	7	5	2	1	3	7	3	2	3	9
c8	2	3	7	4	9	1	3	4	8	5
c9	6	8	8	9	3	5	1	4	3	2
c10	5	3	7	3	9	5	5	1	5	5

4.4 Determination of the criteria weights

Within this subchapter, the weighting of the individual criteria will be determined using rank ordering and AHP method. The determination of the importance of each criterion was based on the preferences of the respondents to the questionnaire presented in Annex 4. A total of 133 respondents were addressed in the questionnaire to assess the importance of the ten criteria when opening a bank account. The results of the questionnaire are shown in table. 4.4.

Tab. 4.4 Results of the questionnaire

influencing factors	Results found in %					Rank
	Very important	Important	Neutral	Less important	Unimportant	
Current account price	60,90%	30,08%	4,51%	4,51%	0,00%	1
The amount of interest on deposits	19,55%	29,32%	23,31%	18,80%	9,02%	6
Functionality of mobile banking	42,11%	28,57%	11,28%	15,04%	3,01%	3
Support of NFC payments	14,29%	17,29%	15,79%	37,59%	15,04%	8
Opening a current account via internet	15,04%	20,30%	15,79%	36,84%	12,03%	7
Availability of the ATMs	46,62%	36,09%	8,27%	5,26%	3,76%	2
The price for withdrawing from an ATM abroad	21,05%	39,10%	18,05%	18,80%	3,01%	5
Currency conversion (exchange rate surcharge)	37,59%	33,08%	12,78%	12,78%	3,76%	4
SEPA payments	9,77%	16,54%	24,06%	24,81%	24,81%	9
Interest on overdraft	12,78%	20,30%	12,78%	22,56%	31,58%	10

The table 4.4 shows that the most important for respondents is the price of the account, resp. criterion c1. Conversely, the criterion c10 is the least important, i.e. interest on overdraft.

Determination of the criteria weights using rank ordering method

The individual criteria are ranked according to their importance in the rank ordering method. Since a total of 10 criteria have been selected in the model example, the most important criterion has value 10, while the least important criterion has value 1. The weights of the individual criteria are then calculated as the ratio of the value of the criterion and the sum of the values of all the criteria, thus according to formula (3.2). The sum of all weights of the individual criteria must equal to 1.

Table 4.5 shows the rank of the criteria according to their importance and their weights:

Tab. 4.5 Determination of weights using rank ordering method

Criterion	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	Total
Rank	1	6	3	8	7	2	5	4	9	10	55
Value	10	5	8	3	4	9	6	7	2	1	55
Weight of the criterion	0,18	0,09	0,15	0,05	0,07	0,16	0,11	0,13	0,04	0,02	1

Determination of the criteria weights using AHP method

When determining weights using the AHP method, it is necessary to first sort the criteria into the table according to their significance. The rows and columns of this table form individual criteria. Subsequently, a pair of criteria is compared and the most important is determined. In addition, the AHP method determines the size of this preference, i.e. how many times one criterion is more important than the other. The sizes of these preferences are shown in the AHP nine-point scale:

- 1 – criteria i and j are equally important;
- 3 – criterion i is moderately important than criterion j;
- 5 – criterion i is strongly important that criterion j;
- 7 – criterion i is very strongly important that criterion j;
- 9 – criterion i is extremely important that criterion j;
- 2,4,6,8 – intermediate values.

Table 4.6 shows the preference sizes for each criterion.

Tab. 4.6 The preference sizes for each criterion

Criterion	c1	c6	c3	c8	c7	c2	c5	c4	c9	c10
c1		2	3	3	4	5	7	8	9	9
c6			2	2	3	4	6	7	8	8
c3				2	3	4	6	7	8	8
c8					2	3	5	6	7	7
c7						2	4	6	7	7
c2							3	4	5	5
c5								2	3	3
c4									2	3
c9										2
c10										

By adding 1 to diagonals and inverted values of preferences of individual criteria according to (3.3), an AHP matrix is created, which is shown in table 4.8.

Tab. 4.7 AHP matrix

Criterion	c1	c6	c3	c8	c7	c2	c5	c4	c9	c10
c1	1	2	3	3	4	5	7	8	9	9
c6	0,50	1	2	2	3	4	6	7	8	8
c3	0,33	0,50	1	2	3	4	6	7	8	8
c8	0,33	0,50	0,50	1	2	3	5	6	7	7
c7	0,25	0,33	0,33	0,50	1	2	4	6	7	7
c2	0,20	0,25	0,25	0,33	0,50	1	3	4	5	5
c5	0,14	0,17	0,17	0,20	0,25	0,33	1	2	3	3
c4	0,13	0,14	0,14	0,17	0,20	0,25	0,50	1	2	3
c9	0,11	0,13	0,13	0,14	0,17	0,20	0,33	0,50	1	2
c10	0,11	0,13	0,13	0,14	0,17	0,20	0,33	0,33	0,50	1

Consequently, it is necessary to verify the consistency of the matrix according to (3.6) and then calculate the geometric mean of rows of the AHP matrix according to (3.8). The final step of this method is to calculate the weights of the individual criteria using (3.9). The results of these calculations are shown in table 4.8.

Tab. 4.8 Determination of weights using AHP method

Criterion	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	Total
Geometric mean	4,181	0,953	2,528	0,381	0,51	3,027	1,414	1,933	0,28	0,234	15,4406
Weight of the criterion	0,271	0,062	0,164	0,025	0,033	0,196	0,092	0,125	0,018	0,015	1

CI	0,023
RI	1,49
CR	0,016 < 0,1

From the table 4.8 can be noted that the criterion c1 - account price has by far the highest weight, while the criterion c10 - interest on the overdraft has the lowest. Since the AHP method is among the most accurate methods for determining the weights of criteria, it will be used in the evaluation of alternatives using the WSM in subchapter 4.5 Evaluation of alternatives.

4.5 Evaluation of alternatives

The aim of this subchapter is to find the most advantageous alternative of the student account for the client through two methods of multi-criteria evaluation of alternatives. First, the alternatives will be compared by the WSM and finally by the AHP. At the end of the subchapter the results of individual methods will be compared.

WSM

The first step in the WSM method is to convert the criterion matrix Y from table 4.3 to the order matrix, which means that the order will be assigned the order within each criterion. The order matrix is shown in table 4.9

Tab. 4.9 Order matrix when applying WSM

Criterion / Alternative	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10
c1	2	1	1	1	1	3	1	1	1	1
c2	4	3	4	3	4	2	1	3	4	4
c3	1	5	4	5	3	1	1	2	1	6
c4	1	1	1	2	2	1	1	1	1	2
c5	2	1	1	1	1	1	1	1	1	1
c6	2	3	4	1	1	5	6	1	1	1
c7	5	4	2	1	3	5	3	2	3	6
c8	2	3	6	4	8	1	3	4	7	5
c9	6	7	7	8	3	5	1	4	3	2
c10	3	2	4	2	5	3	3	1	3	3

In the next step, a partial evaluation of the alternatives with respect to the individual criteria is determined, which is calculated according to (3.10). Partial evaluation of the alternatives with respect to the individual criteria is shown in the table 4.10.

Tab. 4.10 Partial evaluation of alternatives when applying WSM

Criterion / Alternative	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10
c1	9	10	10	10	10	8	10	10	10	10
c2	7	8	7	8	7	9	10	8	7	7
c3	10	6	7	6	8	10	10	9	10	5
c4	10	10	10	9	9	10	10	10	10	9
c5	9	10	10	10	10	10	10	10	10	10
c6	9	8	7	10	10	6	5	10	10	10
c7	6	7	9	10	8	6	8	9	8	5
c8	9	8	5	7	3	10	8	7	4	6
c9	5	4	4	3	8	6	10	7	8	9
c10	8	9	7	9	6	8	8	10	8	8

The next step in the WSM is to multiply the partial evaluations of the alternatives from the table 4.10 by the weights of the individual criteria that were determined by the AHP. The given weights are shown in the table 4.8.

The final evaluation of the alternatives is given by the sum of all partial evaluations multiplied by the weights. The last step is the descending order of alternatives, with the highest value option being the most preferred. The partial

evaluation of the alternatives multiplied by weights, their sum and the order of the individual alternatives are shown in table 4.11.

Tab. 4.11 Evaluation of alternatives using WSM

Alternative / criterion	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	Sum	Rank
a1 - Česká spořitelna	2,437	0,432	1,637	0,247	0,298	1,764	0,55	1,127	0,091	0,121	8,7026	3.
a2 - ČSOB	2,708	0,494	0,982	0,247	0,331	1,568	0,641	1,001	0,072	0,136	8,18079	7.
a3 - Komerční banka	2,708	0,432	1,146	0,247	0,331	1,372	0,824	0,626	0,072	0,106	7,86415	10.
a4 - Unicredit bank	2,708	0,494	0,982	0,222	0,331	1,96	0,916	0,876	0,054	0,136	8,67963	4.
a5 - Raiffeisen bank	2,708	0,432	1,31	0,222	0,331	1,96	0,733	0,376	0,145	0,091	8,30657	6.
a6 - Moneta	2,166	0,556	1,637	0,247	0,331	1,176	0,55	1,252	0,109	0,121	8,14355	8.
a7 - Air bank	2,708	0,617	1,637	0,247	0,331	0,98	0,733	1,001	0,181	0,121	8,55611	5.
a8 - Equa bank	2,708	0,494	1,473	0,247	0,331	1,96	0,824	0,876	0,127	0,151	9,19139	1.
a9 - mBank	2,708	0,432	1,637	0,247	0,331	1,96	0,733	0,501	0,145	0,121	8,81409	2.
a10 - Fio bank	2,708	0,432	0,819	0,222	0,331	1,96	0,458	0,751	0,163	0,121	7,96458	9.

The table 4.11 shows that the most advantageous alternative according to the WSM is the Equa bank account, mBank ranked as the second and Česká spořitelna as the third. On the contrary, Komerční banka has placed in the last place.

AHP

The AHP method of multi-criteria evaluation of alternatives has a similar procedure to that of the AHP method of determining the weight of criteria described in subchapter 3.3.3. However, unlike the AHP method of determining the weighting of criteria, the criteria are not compared, but alternatives of decision making. Within this method, AHP matrices are created, which compare the alternatives with respect to the given criteria. All these matrices and their associated tables are listed in Annex 6.

In table 4.12, the alternatives are compared according to criterion c1 - account price. Differences in significance between alternative values within the first criterion are recorded in the AHP matrix. Since the criterion c1 is the minimization criterion, the most significant alternative is the one with the smallest value. Using a nine-point scale to assess the preferences between the different alternatives, then a pairwise evaluation of the alternatives takes place. Table 4.13 shows the geometric means of the individual alternatives calculated according to (3.8) and partial evaluation of the alternatives within the given criterion, which was determined according to (3.9). The consistency of the matrix is verified by (3.6), the resulting CR coefficient is recorded in the table below.

Tab. 4.12 AHP matrix for determining partial evaluation of alternatives with respect to criterion c1

	a2	a3	a4	a5	a7	a8	a9	a10	a1	a6
a2	1	1	1	1	1	1	1	1	5	9
a3	1	1	1	1	1	1	1	1	5	9
a4	1	1	1	1	1	1	1	1	5	9
a5	1	1	1	1	1	1	1	1	5	9
a7	1	1	1	1	1	1	1	1	5	9
a8	1	1	1	1	1	1	1	1	5	9
a9	1	1	1	1	1	1	1	1	5	9
a10	1	1	1	1	1	1	1	1	5	9
a1	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	1	5
a6	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,20	1

Tab 4.13 Partial evaluation of alternatives with respect to criterion c1 in the application of AHP method

Criterion	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	Total
Geometric mean	0,324	1,463	1,463	1,463	1,463	0,146	1,463	1,463	1,463	1,463	12,1758
Weight of the criterion	0,027	0,12	0,12	0,12	0,12	0,012	0,12	0,12	0,12	0,12	1

CI	0,0101
RI	1,49
CR	0,00675<0

A similar procedure is applied to all criteria, thus a total of 10 matrices will be created. The remaining 10 matrices for criteria c2, c3, c4, c5, c6, c7, c8, c9, and c10 and the associated tables are given in Annex 6.

The next step of the AHP method is to calculate the summary evaluation of alternatives according to (3.11). Finally, the individual alternatives are ranked according to the summary evaluation, the most preferred alternative being the one whose summary evaluation of the alternatives reaches the highest value. Table 4.14 shows the summary evaluation and order of individual alternatives.

Tab. 4.14 Evaluation of alternatives using AHP

Alternative	Summary evaluation	Rank
a1 - Česká spořitelna	0,077967198	9.
a2 - ČSOB	0,086149004	7.
a3 - Komerční banka	0,076364995	10.
a4 - Unicredit bank	0,119817491	2.
a5 - Raiffeisen bank	0,097549857	5.
a6 - Moneta	0,092292584	6.
a7 - Air bank	0,119787599	3.
a8 - Equa bank	0,128751047	1.
a9 - mBank	0,117128163	4.
a10 - Fio bank	0,084192063	8.

The table 4.15 shows that the best alternative within the AHP method is the Equa bank account, the second-best option is the Unicredit Bank account and Air Bank placed third. Komerční banka has placed in the last place.

4.6 Summary evaluation of alternatives

As two methods of multi-criteria analysis were used in the evaluation of alternatives, it is necessary to compare the results of individual methods. For each alternative, the average order of the variation will be determined using the arithmetic mean, and then the alternatives will be ranked according to the established average order, with the smallest value being the best alternative. The order of the alternatives, the average order of the alternatives and the overall order of the alternatives are shown in table 4.15.

Tab. 4.15 Overall evaluation of the order of alternatives

Alternative	WSM	AHP	Average	Overall ranking
a1 - Česká spořitelna	3.	9.	6	6.
a2 - ČSOB	7.	7.	7	7.-8.
a3 - Komerční banka	10.	10.	10	10.
a4 - Unicredit bank	4.	2.	3	2.-3.
a5 - Raiffeisen bank	6.	5.	5,5	5.
a6 - Moneta	8.	6.	7	7.-8.
a7 - Air bank	5.	3.	4	4.
a8 - Equa bank	1.	1.	1	1.
a9 - mBank	2.	4.	3	2.-3.
a10 - Fio bank	9.	8.	8,5	9.

Table 4.15 shows that Equa Bank is the best alternative in the overall ranking, mBank is the second and third place in the ranking with Unicredit Bank and Komerční banka ended in the last place.

5 Discussion

The offer of student accounts is currently very extensive. Therefore, it can sometimes be difficult for a student to understand what each bank offers. The purpose of this dissertation is through the model client to provide students with an overview of what bank accounts are best suited to their preferences. Of course, each client is original and has specific service requirements and their usage, so the results of this dissertation, which focuses on the overall student population, may not necessarily suit each individual student. It would be a good idea to create a custom model for each student before choosing the bank and the student account, which would be as accurate as possible for their needs. When the fees and other data are finally added to the model, the most advantageous account can be determined from a financial point of view. All results are described in the following subchapter.

5.1 Findings

The first research question was focused on decision criteria and their importance for students when opening student bank account. Based on the students' response from the questionnaire, it was found that the current account price had the biggest impact on them, where (60.90%) respondents voted that this criterion was very important to them and (0%) voted that it was unimportant for them. The second most important criterion for students was the availability of ATMs, where they can withdraw money for free and the third most important criterion was the functionality of mobile banking. Conversely, the least important for students was the overdraft interest. The effect on the outcome of this criterion may be due to the fact that there are no tuition fees for studying at Czech universities.

Depending on the first research question, the second research question dealt with which of the Czech student accounts best suits students' preferences. From the aggregate results, it was found that the current account from Equa bank corresponds most to the given preferences, in which the student does not pay anything for account management, in addition, it offers withdrawals from all ATMs free of charge and has one of the most advanced mobile banking. The second and third best alternative were

student accounts from mBank and Unicredit Bank. Certainly, the worst student bank account is provided by Komerční banka, which despite having free account management, has one of the least advanced mobile banking and high fees compared to other banks in the Czech Republic.

5.2 Recommendations

Based on the above findings, several recommendations could be made.

The first recommendation is for students. The best account that meets the preference is a current account from Equa bank. Therefore, students should consider opening this current account. Especially the students who have the bank account with Komerční banka, because it can be seen from Figure 4.1 that (17%) of the respondents have the account set up at this bank, which is the second most widely used bank account after Česká spořitelna.

The second recommendation is focused on banks, especially those that ended up on the last ranks. Based on student preference results, they should focus on providing students with a free current account maintenance, high-quality mobile banking, and minimizing any fees associated with using this account. The main reason why they should focus on this is first, it can help to attract new clients and secondly to keep their existing clients because if they are dissatisfied with the services provided, there is a high probability that they will go to a competing bank. This could be a loss for the bank in the long run, because at this point in time when the student starts working and shift from his student account to classic bank account, he becomes profitable for the bank.

The last recommendation is for future researchers who should explore the fidelity of a student when shifting from a student account to a classic current account and what factors play the greatest role in doing so. Clearly, future research should be conducted on a larger sample of students, to ensure its better relevance.

6 Conclusion

Banking is a constantly evolving field and also a field that is part of everyday life today. With the development of banking, banking products are also developing. Banking institutions on the market present a large number of these banking products, where the most basic one, we can consider a current bank account. Among these bank accounts are also included accounts that are offered directly to students by the banking institutions - that is, the student's bank accounts, which this dissertation thesis dealt with.

The aim of this dissertation was to investigate which criteria have the greatest influence on students when setting up a current account and to find out which Czech bank account best suits the student's preferences based on the results.

This dissertation was divided into 3 main parts, i.e. literature review, methodology, and results. In the literature review, the reader is introduced to the term banking system that describes banks and their importance and role in the market economy. Then this section focuses on banking products, their systematization and their price. The penultimate part is focused on banking services for students and in the last part there is a framework of decision criteria that refers to previous researches.

In the methodology section, research questions that this dissertation deals with are first introduced. Furthermore, the differences between qualitative and quantitative data were described, based on which quantitative data were selected as the most suitable for this research. Then, based on previous studies, a questionnaire was chosen as the most adequate method of collecting data for this dissertation. Finally, it was stated that multi-criterial analysis was used as a means of analysing the data obtained.

In the last part of the results, a model client was created, which is used for calculation purposes. Then, alternatives were selected based on the total assets and the number of clients of individual banks. In addition, individual criteria were presented for which individual weights were determined using methods of determination of criteria. The results showed that the price of the account, the availability of the ATM and the functionality of the mobile banking are the most important for the students. Conversely, the least important was the overdraft. Based on these findings, a bank account was

determined using WSM and AHP that best matches the given preferences, which was a current account from Equa bank.

Finally, it is worth to emphasize again that this research was undertaken on a relatively small sample. Therefore, the results of this research have to be considered with previously mentioned limitations bear in mind.

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List of Abbreviations

AHP – Analytical Hierarchy Process

APR – Annual percentage rate

MCDM – Multi Criteria Decision Making

VŠB–TUO – Vysoká škola báňská – Technical University of Ostrava

WSM – Weighted Sum Method

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Ostrava dated 18.4.2019

Jan Poremski

.....

Student's name and surname

List of Annexes

Annexes

Annex 1: Types of question in questionnaire

Figure 1/2

Example: Nine types of question that can be used in a questionnaire

1 A statement
Example:
What do you think about the UK's membership of the European Union?

_____
_____
_____

2 A list
Example:
Please list the issues you feel are most important in relation to the UK's membership of the European Union:

_____
_____
_____
_____

3 A 'yes/no' answer
Example:
Have you travelled from the UK to another European Union country in the past 12 months? Yes/No

4 Agree/disagree with a statement
Example:
Would you agree or disagree with the following statement?
European unity carries economic advantages which outweigh the political disadvantages. Agree/Disagree

5 Choose from a list of options
Example:
Which ONE of the following list of European countries do you feel has the strongest economy?

Spain	UK	Belgium	Netherlands
Ireland	France	Germany	Italy

6 Rank order
Example:
From the following list of European countries choose the THREE which you feel have the strongest economies and put them in rank order: 1 = strongest, 2 = second strongest, 3 = third strongest.

Spain	UK	Belgium	Netherlands
Ireland	France	Germany	Italy

7 Degree of agreement and disagreement: *the Likert Scale*

Example:

Membership of the European Union is a good thing for the UK.

Strongly agree | Agree | Neutral | Disagree | Strongly disagree

8 Rate items

Example:

How significant would you rate the following factors in affecting further European integration?

	Not significant						Very significant
political sovereignty	1	2	3	4	5	6	7
national identities	1	2	3	4	5	6	7
past history	1	2	3	4	5	6	7
religiousdifferences	1	2	3	4	5	6	7
language barriers	1	2	3	4	5	6	7

9 Feelings about a topic: *the semantic differential*

Example:

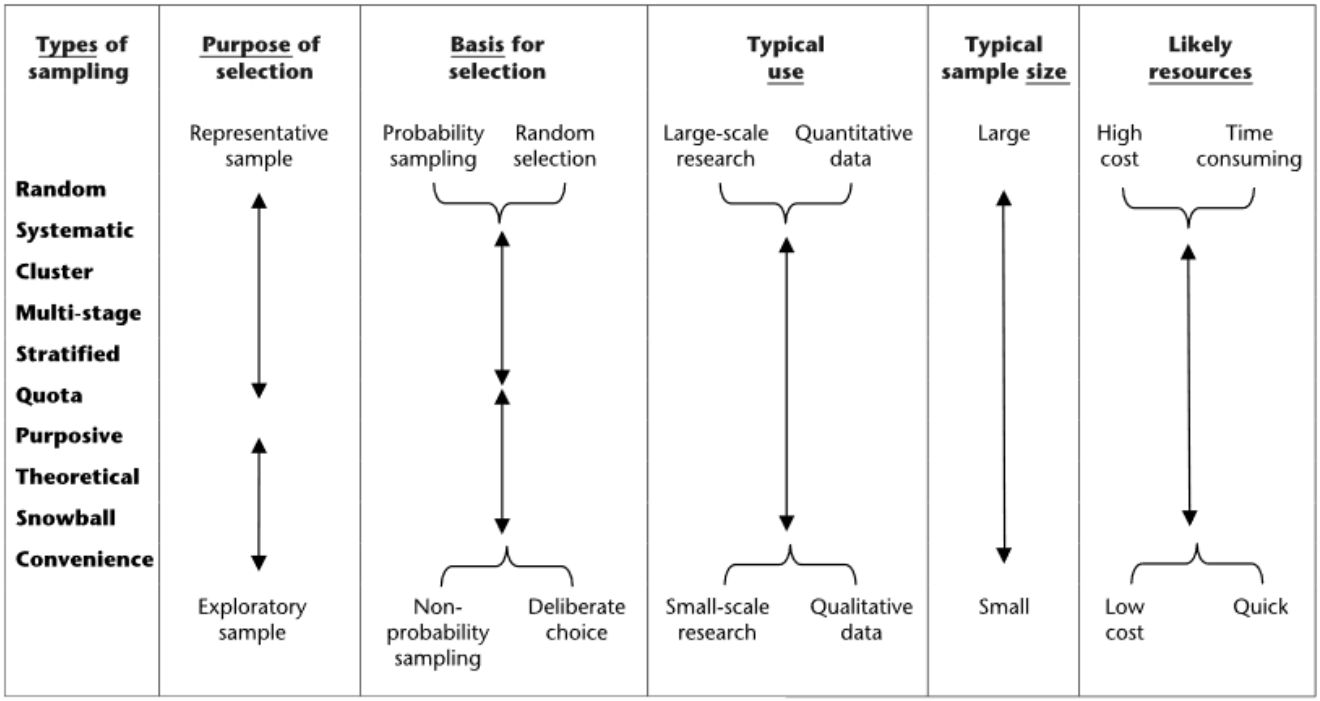
Progress towards European unity is:

Important	1	2	3	4	5	Unimportant
Difficult	1	2	3	4	5	Easy
Risky	1	2	3	4	5	Safe
Unlikely	1	2	3	4	5	Likely
Boring	1	2	3	4	5	Interesting

Figure 2/2

Source: Denscombe

Annex 2: Sampling techniques



Source: Denscombe

Annex 3: Overview of the bank and their products

Tab. 1/4

Bank / criterion	Account price	Interest on deposits	NFC payments	Opening account via internet
Česká spořitelna Studentský účet	Free under 26 years fee 2 CZK for payment made to another bank	0,00% p.a.	Yes	No
ČSOB Plus konto	Free under 26 years	0,01% p.a.	Yes	Yes
Komerční banka G2.2	Free under 26 years	0,00% p.a.	Yes	Yes
Unicredit bank U konto pro mladé	Free under 26 years	0,01% p.a.	No	Yes
Raiffeisen bank eKonto Student Premium	Free under 26 years At least 3 transactions per month otherwise 49 CZK	0,00% p.a.	No	Yes
Moneta Genius student	Free under 26 years fee 6 CZK for outgoing payment	0,1% p.a.	Yes	Yes
Air bank Malý tarif	Free	1% p.a. - condition 5 times a month to pay by card otherwise 0% p.a.	Yes	Yes
Equa bank Běžný účet	Free	0,01% p.a.	Yes	Yes
mBank mKonto	Free under condition turnover 1500 CZK free / otherwise 29 CZK ATM withdrawal> 1500 CZK free / otherwise 29 CZK	0,00% p.a.	Yes	Yes
Fio bank Fio osobní účet	Free	0,00% p.a.	No	Yes

Tab. 2/4

Bank / criterion	ATMs availability	Price for withdrawal abroad
Česká spořitelna Studentský účet	1292 ATMs 40 CZK for withdrawals from other ATMs	5 CZK - at Erste Group 125 CZK - other
ČSOB Plus konto	856 ATMs 40 CZK for withdrawals from other ATMs	100 CZK
Komerční banka G2.2	740 ATMs 39 CZK for withdrawals from other ATMs	1 per month free of charge otherwise 99 CZK
Unicredit bank U konto pro mladé	278 ATMs Withdrawals from other ATMs for free	free withdrawals
Raiffeisen bank eKonto Student Premium	148 ATMs Withdrawals from other ATMs for free	free withdrawals
Moneta Genius student	650 ATMs 59 CZK for withdrawals from other ATMs	0,5% min. 100 CZK
Air bank Malý tarif	303 ATMs 25 CZK for withdrawals from other ATMs	25 CZK - in the EU 100 CZK - outside EU
Equa bank Běžný účet	3 withdrawals from all ATMs in the Czech Republic free of charge 29 CZK- 4th and every other cash withdrawal	9 CZK abroad
mBank mKonto	For all ATMs in the Czech Republic withdrawal of 1 500 CZK and more / free up to 1 499,99 CZK / 29 CZK	withdrawal of 1 500 CZK and more / free up to 1 499,99 CZK / 29 CZK
Fio bank Fio osobní účet	172 ATMs withdrawal from other ATMs free of charge (condition - sum of charged transactions> 4000 CZK) otherwise 30 CZK	0,50 % + 80 CZK

Tab. 3/4

Bank / criterion	Currency conversation	Outgoing SEPA payment	Overdraft (interest in % p.a.)
Česká spořitelna Studentský účet	1,96%	220 CZK	Yes (min - 5 000 CZK; max 25 000 CZK) (20,63% ARP)
ČSOB Plus konto	2,03%	250 CZK	Yes (min - not specified; max 20 000 CZK) (19,45% ARP)
Komerční banka G2.2	2,63%	195 CZK	Yes (min - 2 000 CZK; max - 60 000 CZK) (21,93% ARP)
Unicredit bank U konto pro mladé	2,18%	250 CZK	Yes (min - 5 000 CZK; max - 150 000 CZK) (19,36% ARP)
Raiffeisen bank eKonto Student Premium	2,85%	1. payment monthly for free then 200 CZK	Yes (min - 5 000 CZK; max 150 000 CZK) (22,72% ARP)
Moneta Genius student	1,65%	220 CZK	Yes (min - 2 000 CZK; max 10 000 CZK) (20,60 ARP)
Air bank Malý tarif	2,07%	25 CZK	Yes (min - 5 000 CZK; max 50 000 CZK) (20,62% ARP)
Equa bank Běžný účet	2,24%	99 CZK	Yes (min - 5 000 CZK; max 100 000 CZK) (18,28% ARP)
mBank mKonto	2,83%	0 CZK	Yes (min - 5 000 CZK; max 300 000 CZK) (20,63% ARP)
Fio bank Fio osobní účet	2,35%	20 CZK	Yes (min - 5 000 CZK; max 3 000 000 CZK) (20,63% ARP)

Tab. 4/4

Banka / criterion	Mobile banking
Česká spořitelna Studentský účet	Biometric authentication of payment and login into the application Full text search in payment history Map of ATM and branch offices Push notifications Ticket of exchange rates Temporary card block + (can also block card permanently) Uploading documents (receipts, invoices, etc.) Paying debt via mobile, also despite Messenger, WhatsApp Online arrangement of other services (credit, overdraft, credit card)
ČSOB Plus konto	Biometric authentication of payment and login into the application Map of ATM and branch offices Ticket of exchange rates Temporary card block Paying your debt by mobile Online arrangement of other services (credit, overdraft, credit card)
Komerční banka G2.2	Biometric authentication of payment and login into the application Map of ATM and branch offices Push notifications Arranging a meeting with an advisor Online arrangement of other services (credit, overdraft, credit card)
Unicredit bank U konto pro mladé	Biometric authentication of payment and login into the application Map of ATM and branch offices Ticket of exchange rates Paying your debt by mobile, also despite Messenger, WhatsApp Online arrangement of other services (credit, overdraft, credit card)
Raiffeisen bank eKonto Student Premium	Biometric authentication of payment and login into the application Map of ATM and branch offices Push notifications Ticket of exchange rates Temporary card block + (can also block card permanently) Paying debt via mobile Online arrangement of other services (credit, overdraft, credit card)

Moneta Genius student	Biometric authentication of payment and login into the application Map of ATM and branch offices Virtual Currency Exchange Push notifications Arranging a meeting with an advisor Ticket of exchange rates Temporary card block Paying debt via mobile Online arrangement of other services (credit, overdraft, credit card)
Air bank Malý tarif	Biometric authentication of payment and login into the application Map of ATM and branch offices Push notifications Ticket of exchange rates Temporary card block + (can also block card permanently) Uploading documents (receipts, invoices, etc.) Paying debt via mobile Online arrangement of other services (credit, overdraft, credit card)
Equa bank Běžný účet	Biometric authentication of payment and login into the application Map of ATM and branch offices Full text search in payment history Arranging a meeting with an advisor Temporary card block + (can also block card permanently) Online arrangement of other services (credit, overdraft, credit card)
mBank mKonto	Biometric authentication of payment and login into the application Full text search in payment history Map of ATM and branch offices Push notifications Arranging a meeting with an advisor Only permanent card block Paying debt via mobile Online arrangement of other services (credit, overdraft, credit card)
Fio bank Fio osobní účet	Biometric authentication of payment and login into the application Full text search in payment history Map of ATM and branch offices Temporary card block + (can also block card permanently)

Annex 4: Translated questionnaire

Questionnaire: Consumer's criteria for bank selection and their significance

Dear respondent, I would like to ask you to fill out this short questionnaire, which will serve me to elaborate my bachelor thesis. My name is Jan Poremski and I am a student of the 3rd year of Finance at the Faculty of Economics, VŠB-Technical University in Ostrava. The aim of my bachelor thesis is to assess the influence of factors on the current account selection and to make comparisons within the Czech Republic. The questionnaire and all the data found are anonymous. Please select your answers correctly.

Please rate the importance of the criteria listed below, which you take into account when selecting a current account, or please indicate whether you are interested in the data in selecting a current account with each bank. Thank you for your willingness, cooperation and the time you spent filling this questionnaire.

Are you a student? *

(If you are not a student, please do not continue)

- ○ Yes
- ○ No

What is your gender? *

- ○ Male
- ○ Female

1. **When choosing a current account, is its price important for you?** *

   Current account price = account management fee, cash withdrawal fee, incoming and outgoing charges.

- ○ Unimportant

- ◯ Less important
- ◯ Neutral
- ◯ Important
- ◯ Very important

2. **When choosing a current account, is the possibility to open an account via internet important for you?** *

- ◯ Unimportant
- ◯ Less important
- ◯ Neutral
- ◯ Important
- ◯ Very Important

3. **When choosing a current account, is ATMs availability important to you?** *

- ◯ Unimportant
- ◯ Less important
- ◯ Neutral
- ◯ Important
- ◯ Very Important

4. **When choosing a current account, is it significant prize for withdrawing from an ATM abroad for you?** *

- ◯ Unimportant
- ◯ Less important
- ◯ Neutral
- ◯ Important
- ◯ Very Important

5. **Do you consider the functionality and security of mobile banking when choosing a current account?** *

The functionality of mobile banking is whether the application offers a wide range of features. E.g..: authorization of a transaction using fingerprint, an overview of all cards, arranging a meeting with a banker, etc.

- ◯ Unimportant
- ◯ Less important
- ◯ Neutral
- ◯ Important
- ◯ Very Important

6. **When choosing a current account, is it important for you whether the bank offers the opportunity to pay by mobile phone?** *

Mobile payment (so called. NFC payment) in the Czech Republic are running through Google pay and Apple pay.

- ◯ Unimportant
- ◯ Less important
- ◯ Neutral
- ◯ Important
- ◯ Very Important

7. **When choosing a current account, is it important for you the option to get an overdraft to your current account? (and its interest rate)?** *

- ◯ Unimportant
- ◯ Less important
- ◯ Neutral
- ◯ Important
- ◯ Very Important

8. **When choosing a current account, is it important to you the amount of interest on deposits?** *

- ◯ Unimportant
- ◯ Less important

- ◯ Neutral
- ◯ Important
- ◯ Very Important

9. **When choosing a current account, is it significant for you price of SEPA payments?** *

SEPA payments are incoming and outgoing payments in euro within the European Union. + (Switzerland, Norway, Liechtenstein, Monaco, Iceland).

- ◯ Unimportant
- ◯ Less important
- ◯ Neutral
- ◯ Important
- ◯ Very Important

10. When choosing a current account, is currency conversion (exchange rate surcharge) important for you when paying abroad? *

- ◯ Unimportant
- ◯ Less important
- ◯ Neutral
- ◯ Important
- ◯ Very Important

Please indicate with which bank you have a current account.

Important! If you have a current account opened in more than one bank, specify only the bank whose account you use more often. *****

Annex 5: Original questionnaire

Dotazník: Spotřebitelská kritéria výběru běžných účtů a jejich důležitost

Vážený respondente, dovoluji si Vás požádat o vyplnění tohoto krátkého dotazníku, který mi poslouží ke zpracování mé bakalářské práce. Jmenuji se Jan Poremski a jsem studentem 3. ročníku oboru Finance na Ekonomické fakultě VŠB –TU v Ostravě. Cílem mé bakalářské práce je posoudit vliv faktorů na výběr běžného účtu a provést srovnání v rámci České republiky. Dotazník a všechna zjištěná data jsou anonymní. Vybrané odpovědi prosím pravdivě označte.

Ohodnoťte, prosím, důležitost níže uvedených kritérií, které zohledňujete při výběru běžného účtu, resp. uveďte, zda se o dané údaje při výběru běžného účtu u jednotlivých bank zajímáte. Děkuji Vám za ochotu, spolupráci a čas, který jste věnovali vyplňování tohoto dotazníku.

Jste studentem?

(V případě, že nejste studentem, prosím, nepokračujte) *****

- ◯ Ano
- ◯ Ne

Jaké je Vaše pohlaví? *

- ◯ Muž
- ◯ Žena

1. Je pro Vás při výběru běžného účtu významná jeho cena?

Cena běžného účtu = poplatek za vedení účtu, poplatek za výběr z bankomatu, poplatky za příchozí a odchozí platby *****

- ◯ Vůbec ne
- ◯ Spíše ne
- ◯ Neutrální

- ◯ Spíše ano
- ◯ Rozhodně ano

2. Je pro Vás při výběru běžného účtu důležité, zda daná banka nabízí možnost založit si účet online? *

- ◯ Vůbec ne
- ◯ Spíše ne
- ◯ Neutrální
- ◯ Spíše ano
- ◯ Rozhodně ano

3. Je pro Vás při výběru běžného účtu důležitá dostupnost bankomatů dané banky? *

- ◯ Vůbec ne
- ◯ Spíše ne
- ◯ Neutrální
- ◯ Spíše ano
- ◯ Rozhodně ano

4. Je pro Vás významná cena výběru z bankomatu v zahraničí? *

- ◯ Vůbec ne
- ◯ Spíše ne
- ◯ Neutrální
- ◯ Spíše ano
- ◯ Rozhodně ano

5. Zohledňujete pří výběru běžného účtu funkčnost mobilního bankovnictví?

Funkčností mobilního bankovnictví se rozumí to, zda aplikace nabízí širokou škálu funkcí.

Např.: autorizaci transakcí pomocí otisku prstu, přehled všech karet, sjednání schůzky s bankéřem atd. *****

- ◯ Vůbec ne
- ◯ Spíše ne
- ◯ Neutrální
- ◯ Spíše ano
- ◯ Rozhodně ano

6. Je pro Vás důležité při zakládání běžného účtu, zda daná banka nabízí možnost platit mobilním telefonem?

Platby mobilním telefonem (tzv. NFC platby) v ČR probíhají skrze aplikace Google Pay a nově i Apple Pay. *****

- ◯ Vůbec ne
- ◯ Spíše ne
- ◯ Neutrální
- ◯ Spíše ano
- ◯ Rozhodně ano

7. Je pro Vás důležitá možnost, dostat k běžnému účtu kontokorent (a výše jeho úročení)? *

- ◯ Vůbec ne
- ◯ Spíše ne
- ◯ Neutrální
- ◯ Spíše ano
- ◯ Rozhodně ano

8**. Je pro Vás významné výše úročení běžného účtu?** *

- ◯ Vůbec ne
- ◯ Spíše ne

- ◯ Neutrální
- ◯ Spíše ano
- ◯ Rozhodně ano

9. Je pro Vás významná cena SEPA platby?

SEPA platby jsou příchozí a odchozí platby v eurech v rámci Evropské unie + (Švýcarsko, Norsko, Lichtenštejnsko, Monako, Island). *

- ◯ Vůbec ne
- ◯ Spíše ne
- ◯ Neutrální
- ◯ Spíše ano
- ◯ Rozhodně ano

10. Je pro Vás důležitá konverze měny (kurzová přirážka) při platbě v zahraničí? *

- ◯ Vůbec ne
- ◯ Spíše ne
- ◯ Neutrální
- ◯ Spíše ano
- ◯ Rozhodně ano

Uveďte, prosím, u jaké banky máte zřízen běžný účet.

DŮLEŽITÉ! V případě, že máte běžný účet zřízen u více bank, uveďte pouze tu banku, jejíž účet využíváte častěji. *

Annex 6 - AHP method of multi-criteria evaluation of alternatives

AHP matrix for determining partial evaluation of alternatives with respect to criterion c2

	a7	a6	a2	a4	a8	a1	a3	a5	a9	a10
a7	1	3	5	5	5	9	9	9	9	9
a6	0,33	1	3	3	3	7	7	7	7	7
a2	0,20	0,33	1	1	1	5	5	5	5	5
a4	0,20	0,33	1	1	1	5	5	5	5	5
a8	0,20	0,33	1	1	1	5	5	5	5	5
a1	0,11	0,14	0,20	0,20	0,20	1	1	1	1	1
a3	0,11	0,14	0,20	0,20	0,20	1	1	1	1	1
a5	0,11	0,14	0,20	0,20	0,20	1	1	1	1	1
a9	0,11	0,14	0,20	0,20	0,20	1	1	1	1	1
a10	0,11	0,14	0,20	0,20	0,20	1	1	1	1	1

Partial evaluation of alternatives with respect to criterion c2 in the application of AHP method

Criterion	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	Total
Geometric mean	0,407	1,704	0,407	1,704	0,407	3,293	5,427	1,704	0,407	0,407	15,8633
Weight of the criterion	0,026	0,107	0,026	0,107	0,026	0,208	0,342	0,107	0,026	0,026	1

CI	0,0414
RI	1,49
CR	0,02775 < 0,1

AHP matrix for determining partial evaluation of alternatives with respect to criterion c3

	a1	a6	a7	a9	a8	a5	a3	a2	a4	a10
a1	1	1	1	1	2	3	4	5	5	7
a6	1	1	1	1	2	3	4	5	5	7
a7	1	1	1	1	2	3	4	5	5	7
a9	1	1	1	1	2	3	4	5	5	7
a8	0,50	0,50	0,50	0,50	1	2	3	4	4	6
a5	0,33	0,33	0,33	0,33	0,50	1	2	3	3	5
a3	0,25	0,25	0,25	0,25	0,33	0,50	1	2	2	4
a2	0,20	0,20	0,20	0,20	0,25	0,33	0,50	1	1	3
a4	0,20	0,20	0,20	0,20	0,25	0,33	0,50	1	1	3
a10	0,14	0,14	0,14	0,14	0,17	0,20	0,25	0,33	0,33	1

Partial evaluation of alternatives with respect to criterion c3 in the application of AHP method

Criterion	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	Total
Geometric mean	2,303	0,426	0,633	0,426	0,939	2,303	2,303	1,431	2,303	0,227	13,2947
Weight of the criterion	0,173	0,032	0,048	0,032	0,071	0,173	0,173	0,108	0,173	0,017	1

CI	0,026
RI	1,49
CR	0,01745 < 0,1

AHP matrix for determining partial evaluation of alternatives with respect to criterion c4

	a1	a2	a3	a6	a7	a8	a9	a4	a5	a10
a1	1	1	1	1	1	1	1	9	9	9
a2	1	1	1	1	1	1	1	9	9	9
a3	1	1	1	1	1	1	1	9	9	9
a6	1	1	1	1	1	1	1	9	9	9
a7	1	1	1	1	1	1	1	9	9	9
a8	1	1	1	1	1	1	1	9	9	9
a9	1	1	1	1	1	1	1	9	9	9
a4	0,11	0,11	0,11	0,11	0,11	0,11	0,11	1	1	1
a5	0,11	0,11	0,11	0,11	0,11	0,11	0,11	1	1	1
a10	0,11	0,11	0,11	0,11	0,11	0,11	0,11	1	1	1

Partial evaluation of alternatives with respect to criterion c4 in the application of AHP method

Criterion	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	Total
Geometric mean	1,933	1,933	1,933	0,213	0,213	1,933	1,933	1,933	1,933	0,213	14,1722
Weight of the criterion	0,136	0,136	0,136	0,015	0,015	0,136	0,136	0,136	0,136	0,015	1

CI	0
RI	1,49
CR	0 < 0,1

AHP matrix for determining partial evaluation of alternatives with respect to criterion c5

	a2	a3	a4	a5	a6	a7	a8	a9	a10	a1
a2	1	1	1	1		1	1	1	1	9
a3	1	1	1	1	1	1	1	1	1	9
a4	1	1	1	1	1	1	1	1	1	9
a5	1	1	1	1	1	1	1	1	1	9
a6	1	1	1	1	1	1	1	1	1	9
a7	1	1	1	1	1	1	1	1	1	9
a8	1	1	1	1	1	1	1	1	1	9
a9	1	1	1	1	1	1	1	1	1	9
a10	1	1	1	1	1	1	1	1	1	9
a1	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	1

Partial evaluation of alternatives with respect to criterion c5 in the application of AHP method

Criterion	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	Total
Geometric mean	0,137	1,277	1,246	1,246	1,246	1,246	1,246	1,246	1,246	1,246	11,3795
Weight of the criterion	0,012	0,112	0,109	0,109	0,109	0,109	0,109	0,109	0,109	0,109	1

CI	0
RI	1,49
CR	0 < 0,1

AHP matrix for determining partial evaluation of alternatives with respect to criterion c6

	a4	a5	a8	a9	a10	a1	a2	a3	a6	a7
a4	1	1	1	1	1	5	6	7	8	9
a5	1	1	1	1	1	5	6	7	8	9
a8	1	1	1	1	1	5	6	7	8	9
a9	1	1	1	1	1	5	6	7	8	9
a10	1	1	1	1	1	5	6	7	8	9
a1	0,20	0,20	0,20	0,20	0,20	1	2	3	4	5
a2	0,17	0,17	0,17	0,17	0,17	0,50	1	2	3	4
a3	0,14	0,14	0,14	0,14	0,14	0,33	0,50	1	2	3
a6	0,13	0,13	0,13	0,13	0,13	0,25	0,33	0,50	1	2
a7	0,11	0,11	0,11	0,11	0,11	0,20	0,25	0,33	0,50	1

Partial evaluation of alternatives with respect to criterion c6 in the application of AHP method

Criterion	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	Total
Geometric mean	0,722	0,529	0,374	2,618	2,618	0,281	0,205	2,618	2,618	2,618	15,2
Weight of the criterion	0,047	0,035	0,025	0,172	0,172	0,018	0,014	0,172	0,172	0,172	1

CI	0,0372
RI	1,49
CR	0,02494 < 0,1

AHP matrix for determining partial evaluation of alternatives with respect to criterion c7

	a4	a3	a8	a5	a7	a9	a2	a1	a6	a10
a4	1	2	2	3	3	3	5	7	7	9
a3	0,50	1	1	2	2	2	4	6	6	8
a8	0,50	1	1	2	2	2	4	6	6	8
a5	0,33	0,50	0,50	1	1	1	3	5	5	7
a7	0,33	0,50	0,50	1	1	1	3	5	5	7
a9	0,33	0,50	0,50	1	1	1	3	5	5	7
a2	0,20	0,25	0,25	0,33	0,33	0,33	1	3	3	5
a1	0,14	0,17	0,17	0,20	0,20	0,20	0,33	1	1	3
a6	0,14	0,14	0,14	0,20	0,20	0,20	0,33	1	1	3
a10	0,11	0,13	0,13	0,14	0,14	0,14	0,20	0,33	0,33	1

Partial evaluation of alternatives with respect to criterion c7 in the application of AHP method

Criterion	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	Total
Geometric mean	0,355	0,677	2,325	3,449	1,458	0,342	1,458	2,325	1,458	0,202	14,0468
Weight of the criterion	0,025	0,048	0,165	0,246	0,104	0,024	0,104	0,165	0,104	0,014	1

CI	0,0463
RI	1,49
CR	0,03108< 0,1

AHP matrix for determining partial evaluation of alternatives with respect to criterion c8

	a6	a1	a2	a7	a4	a8	a10	a3	a9	a5
a6	1	2	3	3	4	4	5	7	8	9
a1	0,50	1	2	2	3	3	4	6	7	8
a2	0,33	0,50	1	1	2	2	3	5	6	7
a7	0,33	0,50	1	1	2	2	3	5	6	7
a4	0,25	0,33	0,50	0,50	1	1	2	4	5	6
a8	0,25	0,33	0,50	0,50	1	1	2	4	5	6
a10	0,20	0,25	0,33	0,33	0,50	0,50	1	3	4	5
a3	0,14	0,14	0,20	0,20	0,25	0,25	0,33	1	2	3
a9	0,13	0,14	0,17	0,17	0,20	0,20	0,25	0,50	1	2
a5	0,11	0,13	0,14	0,14	0,17	0,17	0,20	0,33	0,50	1

Partial evaluation of alternatives with respect to criterion c8 in the application of AHP method

Criterion	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	Total
Geometric mean	2,744	1,828	0,397	1,173	0,22	3,855	1,828	1,173	0,297	0,778	14,2935
Weight of the criterion	0,192	0,128	0,028	0,082	0,015	0,27	0,128	0,082	0,021	0,054	1

CI	0,051
RI	1,49
CR	0,03421 < 0,1

AHP matrix for determining partial evaluation of alternatives with respect to criterion c9

	a7	a10	a5	a9	a8	a6	a1	a2	a3	a4
a2	1	2	3	3	4	5	6	8	8	9
a3	0,50	1	2	2	3	4	5	7	7	8
a4	0,33	0,50	1	1	2	3	4	6	6	7
a5	0,33	0,50	1,00	1	2	3	4	6	6	7
a7	0,25	0,33	0,5	0,50	1	2	3	5	5	6
a8	0,20	0,25	0,33	0,33	0,50	1	2	4	4	5
a9	0,17	0,25	0,25	0,25	0,33	0,5	1	3	3	4
a10	0,13	0,14	0,17	0,17	0,20	0,25	0,33	1	1	2
a1	0,13	0,14	0,17	0,17	0,2	0,25	0,33	1	1	2
a6	0,11	0,13	0,14	0,14	0,17	0,20	0,25	0,50	0,50	1

Partial evaluation of alternatives with respect to criterion c9 in the application of AHP method

Criterion	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	Total
Geometric mean	0,334	4,069	2,933	1,995	1,995	0,239	1,339	0,92	0,66	0,334	14,818
Weight of the criterion	0,023	0,275	0,198	0,135	0,135	0,016	0,09	0,062	0,045	0,023	1

CI	0,0538
RI	1,49
CR	0,03612 < 0,1

AHP matrix for determining partial evaluation of alternatives with respect to criterion c10

	a8	a2	a4	a1	a6	a7	a9	a10	a3	a5
a8	1	3	3	5	5	5	5	5	7	9
a2	0,33	1	1	3	3	3	3	3	5	7
a4	0,33	1	1	3	3	3	3	3	5	7
a1	0,20	0,33	0,33	1	1	1	1	1	3	5
a6	0,20	0,33	0,33	1	1	1	1	1	3	5
a7	0,20	0,33	0,33	1	1	1	1	1	3	5
a9	0,20	0,33	0,33	1	1	1	1	1	3	5
a10	0,20	0,33	0,33	1	1	1	1	1	3	5
a3	0,14	0,20	0,20	0,33	0,33	0,33	0,33	0,33	1	3
a5	0,11	0,14	0,14	0,20	0,20	0,20	0,20	0,20	0,33	1

Partial evaluation of alternatives with respect to criterion c10 in the application of AHP method

Criterion	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	Total
Geometric mean	0,894	2,212	0,382	2,212	0,217	0,894	0,894	4,215	0,894	0,894	13,709
Weight of the criterion	0,065	0,161	0,028	0,161	0,016	0,065	0,065	0,307	0,065	0,065	1

CI	0,0453
RI	1,49
CR	0,03043 < 0,1