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REGIONAL DISPARITIES IN SLOVAKIA FROM THE POINT OF VIEW OF WAGE EVALUATION

REGIONÁLNE DISPARITY NA SLOVENSKU Z POHĽADU MZDOVÉHO OHODNOTENIA

Emília DUĽOVÁ SPIŠÁKOVÁ

Abstract
The article deals with the issue of regional disparities in Slovakia, focusing on differences in wage levels among residents in various regions. It highlights Slovakia's position in the European Union ranking of countries based on average gross monthly income and subsequently compares the situation across Slovak regions, emphasizing districts with the highest and lowest average monthly incomes in recent years. The aim of the paper is to shed light on regional wage disparities in Slovakia, with a focus on the size of the region, employment rates, and unemployment rates in each region.

Key words: average income, regions, disparities, employment, unemployment

Abstrakt
Príspevok sa zaoberá problematikou regionálnych disparít na Slovensku so zameraním na rozdiely v mzdovom ohodnotení obyvateľov žijúcich v jednotlivých regiónoch. Poukazuje na pozíciu Slovenska v rebríčku krajín Európskej únie zostaveného podľa výšky priemerného hrubého mesačného príjmu obyvateľov a následne komparuje situáciu v jednotlivých slovenských krajoch s dôrazom na okresy, ktoré vykazujú najvyššie a najnižšie priemerné mesačné príjmy za ostatné roky. Cieľom príspevku je teda poukázať na regionálne disparity na Slovensku v oblasti mzdového ohodnotenia s dôrazom na veľkosť regiónu, mieru zamestnanosti a nezamestnanosti v tom ktorom regióne.

Kľúčové slová: priemerný príjem, regióny, disparity, zamestnanosť, nezamestnanosť

Introduction

Despite significant efforts to mitigate regional disparities in Slovakia, differences between various parts of the country have not been reduced over the past two decades. These disparities manifest in multiple areas that ultimately affect the daily lives and living standards of people in the affected regions. One key indicator used to compare regions is the average gross monthly income of their residents, which significantly impacts the quality of life across Slovakia.

In recent years, real incomes have been heavily influenced by inflation, leading to a marked decline. Numerous studies have examined the effects of inflation over time. Notably, Dilber and Hatipoglu (2022) explored the relationship between inflation and income distribution using the Dumitrescu-Hurlin panel causality test with annual data from 2007 to 2019 for eight developing OECD countries. Their findings did not confirm a significant causal relationship between inflation and income distribution. Zheng (2020) found that

inflation impacts income inequality more when labor supply is flexible than when it is inelastic. Basso, Dimakou, and Pidkuyho (2023) highlighted that poorer households are more exposed to the effects of sharp inflation increases, particularly in terms of declining real incomes and living standards, compared to wealthier households. In this context, reducing income disparities between Slovakia's regions, particularly in the impoverished eastern region with many disadvantaged households (International Monetary Fund, European Dept., 2024), is crucial. Gradually narrowing income and living standard gaps is key to ensuring long-term and sustainable growth for the country.

1 Position of Slovakia in the European Union regarding average wage levels

In terms of wages, Slovakia has consistently ranked near the bottom among EU member states, which affects household consumption, savings, quality of life, and overall living standards. According to the latest Eurostat data from 2022, only Croatia, Latvia, and Greece reported lower average gross monthly incomes. In that year, Greece was the only country where the average income was below 1 500 €.

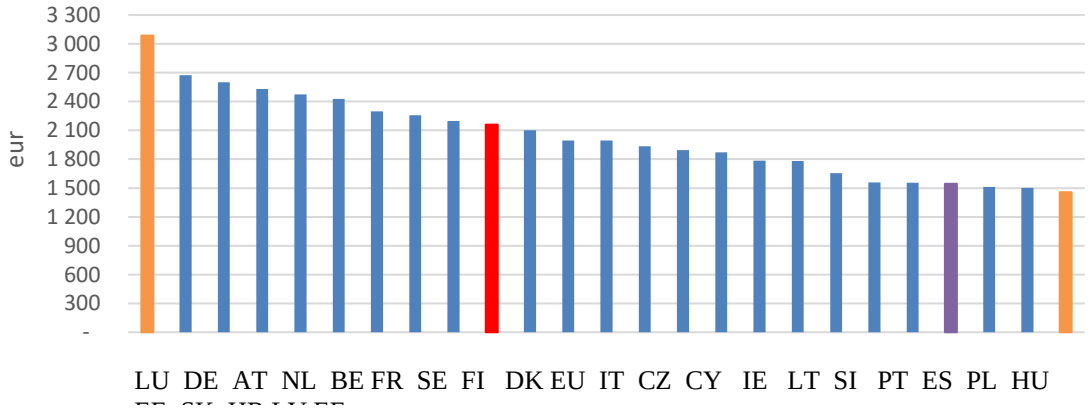

Figure 1 Average gross monthly income in the European Union in 2022

Source: Own processing based on data from Eurostat, 2024

Conversely, the highest wages were observed in Luxembourg, with an average salary of nearly 3 100 €, 400 € higher than in second-placed Germany. Northern European countries predominantly surpassed the EU average (2 160 €). Among the Visegrad Group (V4) countries, the Czech Republic reported the highest average gross monthly income in 2022 (1 996 €), followed by Poland (1 654 €) and Hungary (1 558 €).

2 Wage Levels in Slovak Regions and Districts

The long-term development of average gross monthly income in Slovakia's regions is shown in Figure 2. The only region that consistently reported above-average values for Slovakia throughout the observed period is the highly

urbanized Bratislava Region, where income increased from 1 178 € to 2 077 €. However, this region experienced the slowest income growth compared to other regions (a rise of 76.3 percentage points between 2009 and 2023). Notably, Bratislava Region was the only region to see a decline in average income during 2010 and 2011 due to the financial and economic crisis. In 2023, the highest average incomes (Figure 3) were recorded in the Bratislava I district (2 253 €), while the lowest were observed in the Pezinok district (1 373 €). It is also worth noting that the Bratislava Region is the third most populous in Slovakia, with the highest number of employed individuals and the lowest unemployment rate, factors that clearly influence the average income of its residents (Table 1).

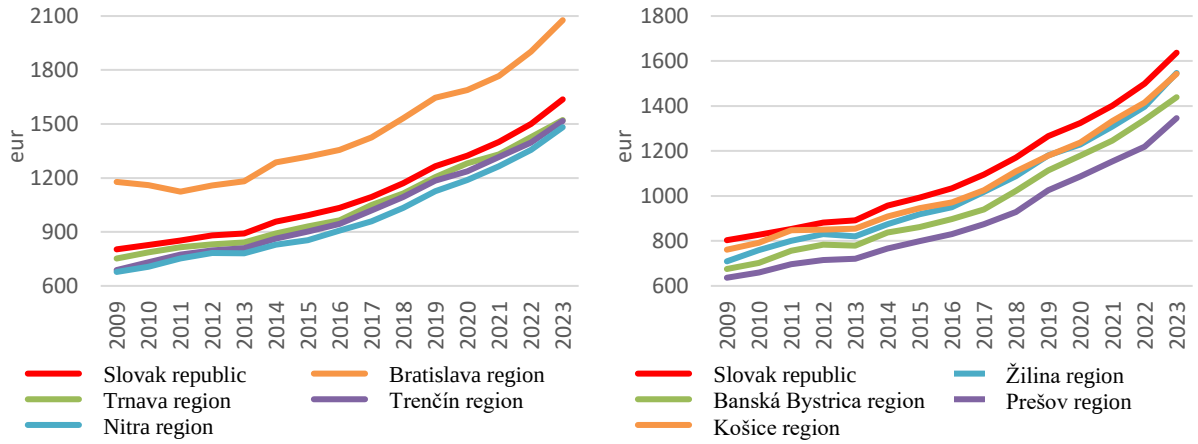

Figure 2 Development of the average gross monthly income in the regions of Slovakia

Source: Own processing based on data from SOSR, 2024

In terms of NUTS2 classification, the average gross monthly incomes in the regions of Western Slovakia ranged between 1 482 € and 1 522 € in 2023. During the observed period of 2009 - 2023, incomes increased by 102.3 percentage points in the Trnava Region, 118.7 percentage points in the Nitra Region, and 120.5 percentage points in the Trenčín Region.

In the Trnava Region, the highest earners were in the Trnava district, with an average monthly income of 1 685 €, while the lowest incomes were recorded in the Senica district at 1 368 €. This region has the smallest population among all Slovak regions, with the same employment rate as the Trenčín Region but a higher number of unemployed individuals (Table 1). Despite a slightly higher unemployment rate compared to the other two regions of Western Slovakia, gross average incomes in the Trnava Region are higher.

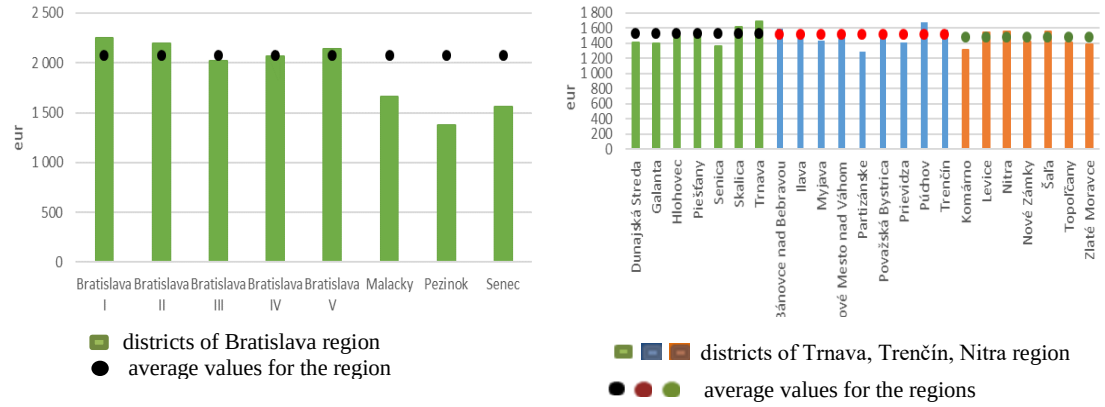

Figure 3 Average gross monthly income in the districts of the Bratislava region and Western Slovakia in 2023

Source: Own processing based on data from SOSR, 2024

In the Trenčín Region, the Púchov district has consistently reported the highest average incomes (1 682 €), while the Partizánske district shows the lowest (1 289 €). Among the regions of Western Slovakia, the Nitra Region has historically had the lowest average gross monthly incomes. In 2023, incomes ranged from 1 316 € in the Nitra district to 1 561 € in the Šaľa district.

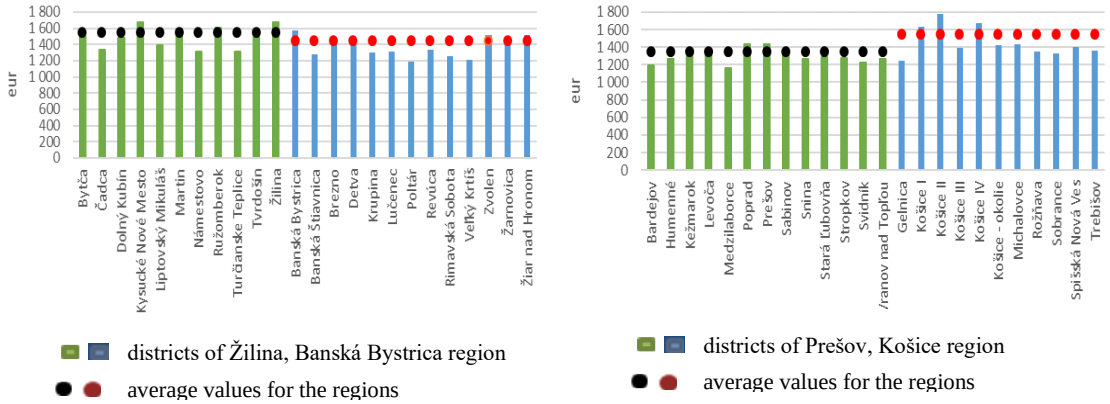

Figure 4 Average gross monthly income in the districts of Central and Eastern Slovakia in 2023

Source: Own processing based on data from SOSR (2024)

According to the latest available data, the second-highest average gross monthly income in 2023 was recorded in the Žilina Region at 1 547 €, followed closely by the Košice Region at 1 543 €. The Žilina Region achieved this position only in the most recent observed year, as it had historically ranked fourth in this indicator. As shown in Figure 4, the highest incomes in the Žilina Region in 2023 were recorded in the Kysucké Nové Mesto district, averaging 1 675 € per month. The lowest incomes were found in the Námestovo district (1 308 €) and the Turčianske Teplice district (1 313 €).

The NUTS2 classification for the Central Slovakia region also includes the Banská Bystrica Region, which, unlike the Žilina Region, ranked second to last in terms of the lowest average gross monthly incomes. In this region, incomes increased by 113.1 percentage points during the observed period, reaching 1 439 € in 2023. Among the 13 districts within this region, only four reported incomes above the regional average (Fig. 4). The highest income was recorded in the Banská Bystrica district (1 568 €), while the lowest was in the Poltár district (1 191 €). The Banská Bystrica Region was characterized by the third-highest unemployment rate and the third-lowest employment rate in Slovakia in 2023 (Tab. 1).

Table 1 Basic information about regions in Slovakia

	number of inhabitants	unemployed (in thousand)	employed (in thousand)	unemployment rate (%)	employment rate - age 20-64 (%)
Slovak republic	5 428 792	161,9	2 610,0	5,8	77,5
Bratislava region	728 370	9,2	392	2,3	85,8
Trnava region	565 573	11,6	278	4	78,6
Trenčín region	570 675	9,3	278,7	3,2	78,4
Nitra region	670 696	12,2	334,6	3,5	79,3
Žilina region	688 106	11,9	347,2	3,3	80,7
Banská Bystrica region	617 777	27,9	288,9	8,8	75,1
Prešov region	808 090	42,7	353,9	10,8	72,2
Košice region	779 505	37	336,7	9,9	71,1

Source: Own processing based on data from SOSR, 2024

The Eastern Slovakia region comprises the Košice and Prešov Regions, which are the two most populous regions in the country but also have the highest number of unemployed individuals and the highest unemployment rates in Slovakia (Table 1). In terms of income, the Prešov Region has consistently had the lowest average gross monthly income, increasing by 111 percentage points since 2009 to reach 1 346 €. In the most recent observed year, the highest incomes in the region (Figure 4) were recorded in the Poprad district (1 434 €) and the Prešov district (1 430 €). Conversely, the lowest incomes were observed in the Medzilaborce district (1 161 €) and the Bardejov district (1 196 €).

In the Košice Region, the average income has exceeded 1 000 € since 2017. Compared to 2009, its value increased by 102.7 percentage points, reaching 1 543 € per month by 2023. The gap between the districts with the highest and lowest incomes is 538 €. In 2023, the average income in the Košice II district was 1 779 €, while in the Gelnica district, it was 1 241 €.

During the observed period, the most significant wage growth occurred in the districts of Bánovce nad Bebravou and Košice III, where wages increased by more than 170 percentage points (Table 2). Conversely, districts in the Bratislava Region and some districts in the Košice Region experienced the smallest wage

increases. Despite these changes, wage disparities remain substantial and have not been reduced to the desired extent. In 2023, the gap between the district with the highest average wage, Bratislava I (2 253 € per month), and the district with the lowest average wage, Medzilaborce (1 161 € per month), was as much as 1 092 €.

Table 2 The largest and smallest changes in wage evaluation in districts in the period 2009 - 2023

District	% increase 2009 - 2023	District	% increase 2009 - 2023
Bánovce nad Bebravou	176,0	Trnava	96,0
Košice III	171,5	Sobrance	94,0
Kysucké Nové Mesto	163,4	Košice I	91,8
Tvrdošín	163,2	Hlohovec	89,6
Bardejov	156,9	Košice II	89,5
Bytča	156,2	Malacky	89,2
Skalica	143,6	Bratislava IV	87,7
Brezno	138,6	Bratislava I	74,2
Námestovo	137,9	Bratislava III	68,5
Púchov	135,7	Bratislava II	62,0

Source: Own processing based on data from SOSR, 2024

The standard of living in Slovakia has been significantly impacted in recent years by high inflation, which has also affected most European countries. This has negatively influenced real incomes, as the year-on-year increase in average monthly wages was substantially lower than the year-on-year change in prices (Table 3).

Table 3 Comparison of the rate of increase of the average monthly wage in the rate of inflation

	increase of average monthly wage 2021	inflation rate 2021	increase of average monthly wage 2022	inflation rate 2022	increase of average monthly wage 2023	inflation rate 2023
Slovak republic	5,8	2,8	7,1	12,1	9,1	10,5
Bratislava region	4,7	2,8	7,7	12,1	9,1	10,5
Trnava region	3,9	2,8	7,3	12,1	6,6	10,5
Trenčín region	6,5	2,8	6,1	12,1	8,6	10,5
Nitra region	6,5	2,8	7,1	12,1	9,3	10,5
Žilina region	6,4	2,8	6,8	12,1	10,7	10,5
Banska Bystrica region	5,7	2,8	7,4	12,1	7,5	10,5
Prešov region	6,2	2,8	5,7	12,1	10,4	10,5
Košice region	7,7	2,8	6,2	12,1	9,0	10,5

Source: Own processing based on data from SOSR, 2024

While the inflation rate was only 2.8 % in 2021, with an average monthly wage growth of 5.8 %, in 2022, the inflation rate was 1.7 times higher than the growth in average monthly wages. The disparities were further exacerbated by the fact that wage growth in Eastern Slovakia was the slowest, particularly during such a period of high inflation.

An improvement occurred in 2023 when the inflation rate decreased to 10.5%, and the pace of wage growth increased to 9.1%. Notably, wage growth in the Prešov Region and the Žilina Region was positive, with the Žilina Region being the only one where wage growth outpaced inflation.

Conclusion

To achieve its full economic potential, Slovakia needs to reduce inequality among its regions (Hamilton et al., 2023). The aim of this paper was to highlight regional disparities in Slovakia concerning wage levels, with a focus on regional size, employment, and unemployment rates. To this end, we evaluated Slovakia's position in the European Union ranking regarding the indicator of average monthly wages and then analyzed and compared the situation across Slovak regions and districts.

The findings revealed that, despite significant efforts and societal demand to bridge the gap between the "East" and the "West," these disparities have not been sufficiently reduced. Regions with lower average wages also tend to exhibit higher unemployment rates, and in the critical year of 2022 (due to high inflation), they experienced the lowest year-on-year wage growth.

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BUILDING A STRONG BRAND WITH AI: HOW TO USE MODERN AI WIZARDS FOR SUCCESSFUL BRANDING

BUDOVANIE SILNEJ ZNAČKY S AI: AKO VYUŽIŤ MODERNÉ MÁSTROJE AI PRE ÚSPEŠNÝ BRANDING

Janka KOPČÁKOVÁ – Erik WEISS – Slávka BOCANOVÁ

Abstract
Modernisation and the ever-changing conditions in society have caused the term artificial intelligence to be used more and more frequently in society. Since the end of 2022, the term itself has begun to spread, especially among the young generation of society, which can be referred to as Generation Alpha. However, the proliferation of the platform has now reached all age groups and, for this reason, Generation Z and Generation X are also beginning to increasingly embrace the platform. In addition to the spread of AI across generations, it has also achieved widespread adoption in various sectors such as manufacturing and industry, commerce and services, finance and banking, medicine, transportation, logistics, energy, agriculture, education, etc. Based on this fact, it can be deduced that artificial intelligence has a wide range of applications. The aim of our paper was to point out and suggest the implementation of several proposals for an company that wants to build its brand and thus expand its operations. The suggestions themselves were made based on several freely available AI platforms, which shows the possibility of using AI even by companies that do not have enough financial resources that they could or would like to invest in AI platforms. However, the paper also highlights the shortcomings that can arise when using AI. This reflects the fact that although artificial intelligence is a good tool for several industries, it needs to be controlled by humans.

Key words: logo, slogan, AI

Abstrakt
Modernizácia a neustále meniace sa podmienky v spoločnosti zapríčinili čoraz častejšie skloňovanie pojmu umelá inteligencia v spoločnosti. Od konca roka 2022 sa samotný pojem začal šíriť najmä medzi mladou generáciou spoločnosti, ktorú možno označiť ako Generáciu alfa. Avšak šírenie platformy v súčasnosti oslovilo všetky vekové kategórie a z toho dôvodu sa tejto platforme začína čoraz častejšie venovať aj Generácia Z, či Generácia X. Okrem šírenia umelej inteligencie medzi jednotlivými generáciami dosiahla široký rozmach aj v rôznych odvetviach, ako napríklad vo výrobe a priemysle, obchode a službách, financiách a bankovníctve, medicíne, doprave, logistike, energetike, poľnohospodárstve, vzdelávaní a pod. Na základe tejto skutočnosti možno dedukovať, že umelá inteligencia má široké využitie. Cieľom nášho príspevku bolo poukázať a navrhnúť implementáciu viacerých návrhov pre podnik, ktorý chce budovať svoju značku a rozšíriť tak svoju prevádzku. Samotné návrhy boli uskutočňované na základe viacerých voľne dostupných platforiem umelej inteligencie, čo poukazuje na možnosť využitia umelej inteligencie aj podnikmi, ktoré nemajú dostatok finančných prostriedkov, ktoré by mohli, resp. chceli investovať do platforiem umelej inteligencie. Príspevok však poukazuje aj na nedostatky, ktoré môžu pri využívaní umelej inteligencie vzniknúť. Táto skutočnosť odráža fakt, že aj keď je umelá inteligencia dobrým pomocníkom pre viacero odvetví, je potrebná jej kontrola ľuďmi.

Kľúčové slová: logo, slogan, AI

Introduction

The digital age is currently bringing many changes and modernisations. Artificial intelligence has laid its foundations with the British mathematician who published an article in 1950, "Computing Machinery and Intelligenc", in which he introduced the Turing test and identified hypothetical ways to determine whether a machine can think like a human (Çelik, 2018). Despite the birth of an innovative idea, artificial intelligence became limited during the 1970s and 1980s due to the inability to solve complex problems and also the financial difficulty of research related to artificial intelligence. Subsequent developments by Geoffrey Hunton and David Rumelhart through neural networks led to a renewed interest in artificial intelligence, which attempted to mimic the functioning of the human brain (Rumelhart et al., 1988), however, based on the lack of development of software and hardware, artificial intelligence was not further expanded. A breakthrough success was again achieved by artificial intelligence in 1997 when IBM's Deep Blue program defeated chess grandmaster Garry Kasparov (Brundage, 2020). Despite this success, it was just a game and the actual use of AI in everyday practice was only a future possibility. Artificial intelligence has evolved gradually and its development has been long term, but it reached its biggest breakthrough at the turn of 2022-2023. The breakthrough was made on the basis of the currently most widely used so-called ChatGPT, which was based on a language model, and which is a type of generative AI that uses deep learning. The first model is called GPT - 3.5 and allowed humans to communicate and retrieve basic information through AI. Since 2023, the development of artificial intelligence has gained rapid momentum, and artificial intelligence has begun to expand not only in people's daily lives, but also to create multimodal models or quantum computing.

Currently, artificial intelligence is still in development and it is possible to determine a prediction of its continuous progress. Currently, artificial intelligence can not only answer questions, but also create visual images, audiovisual media, etc. It is for this reason that artificial intelligence has emerged not only as an entertainment platform, but also as the future for company, which can use artificial intelligence not only for creating texts for various marketing activities or creating various visual media in brand building, but also for the broad application of optimization processes. By automating tasks, AI can perform basic administrative tasks such as order processing, invoicing, or managing e-mails, but it can also plan and optimize production, logistics, or supply chains. Through Chatbots, which can be placed by a company directly on its website where consumers make a purchase, they provide unlimited advice to individual consumers. By leveraging AI in marketing, a company can better know and segment its consumers, leading to better targeting of marketing campaigns to individual consumers. But through AI, a manager can also get various ideas for brand improvement and possible brand building.

Due to the wide scope of AI usage, in this paper we decided to focus on branding through several designs created by AI for the company we studied, which wants to expand its operations and build a new logo and slogan to go along with the new operation.

1 Literature Review - brand and branding

The brand is a strategic weapon for the company to attract its consumers. Keller (2007) states that the American Marketing Association considered a brand to be simply "a name, designation, term, symbol, design, or combination of these to uniquely identify the products and services of one or more producers and to distinguish them from competitors in the marketplace." However, a brand must be viewed from the consumer's point of view. Kicová (2016) states that "a brand can also represent a communication tool for the consumer in relation to the company in relation to its surroundings." A brand can also be defined as a tool to build identity and image for customers (Gaisler, 2016).

In professional literature, several authors define a brand by significant elements such as name, logo and symbol, representative, slogan, wordmark and packaging (Hanuláková et al., 2021). ***Brand name*** is a symbol of a company's reputation. However, the element itself is significant for the company as the logo, slogan or other brand elements may undergo rebranding, but by changing the name, the company would lose the whole identity it has been building for years. A company can build a ***logo and symbol*** most often through visualization. The logo itself should be simple, easy to remember, elegant, and economical for the company (Healey, 2008). ***The representative*** conveys symbols that support the visual connection between the logo and the brand. ***Slogan*** is characterized as a short phrase that describes the brand and promotes building consumer awareness of the brand. The best slogans often become synonymous with the brand and through the slogan, the consumer can automatically associate the brand (Hanuláková et al., 2021). ***The sound*** expresses the musical element of the brand, which can be heard by the consumer especially in the communication tools of marketing and which can be immediately associated with the brand. Companies often use not only the musicalisation of a slogan, but also well-known songs that would accurately portray their company intent and thus become an integral part of the brand for consumers (Hanuláková et al. 2021). ***Packaging*** represents several functions, besides protecting the product, it can also have the function of expressing the brand identity and thus identifying products from competitors. With unique packaging, a company can attract the attention of consumers and also build a brand image, which is an integral part (Healey, 2008; Hanuláková et al., 2021).

Brand image can be defined as the image of the brand that consumers themselves have created about the product's characteristics, as a subjective experience of the product satisfying their needs (Vysekalová, 2007). Kotler (2013) states that the basic characteristics of brand image include the expression of the product's character and the determination of the product's value by the consumer, the uniqueness of the brand identity so that it is not interchangeable with competitors, as well as the emotional and sensory charge that acts on the individual senses of consumers. A company's image can be defined as the way in which the company or its products are perceived by consumers themselves (Aaker, 2003).

For the sake of uniqueness and true identity of the company, it is necessary to create a unique brand image, but nowadays there are a lot of companies on the market and for this reason it is difficult for a company to set such parameters that would differentiate it from the competition. However, the digitalization of today's time offers unique solutions for companies where a top manager can design a unique brand for the company through his critical thinking. Among the digital tools that can make multiple suggestions to the company is artificial intelligence, which is now increasingly being used in the company environment. The actual study will be conducted on a company that wants to build and expand its brand and newly establish operations. Based on the artificial intelligence, a logo and a slogan will be designed for the company, which is classified as a canteen and offers 3 types of food to its consumers on a daily basis. However, through AI, a new brand image of the new establishment will also be designed for the company, through which the brand should become unique and non-identical.

2 Results - logo, slogan and brand design through AI in practice

The very abbreviation of the company's name was meant to convey the main purpose of the company, which was to represent a public canteen. The company's intention to offer ready-made meals has been recorded since its inception. This fact is also known from the company's SK NACE classification, which it reports in its accounts as 56101 Canteens, and the SK NACE classification, which it reports according to the Statistical Office of the Slovak Republic, as 56109 Other catering.

However, the company is now looking to expand its operations and build its brand. In order to make the operation itself identical, the company wants to use basic characteristics such as freshness as well as symbols to represent the main idea of the operation 'chef's hat and cutlery'. At present, the newly built outlet does not have any logo, slogan or branding. Since the decision to create a new establishment is being taken, the company wants to be innovative and wants to apply a new logo and slogan that best describes its intention when building the new establishment.

As the company is currently in the process of deciding on the opening of a new location that would reflect its identity, we decided to use artificial intelligence (AI) to create and design the name of the location. We made the actual name of the establishment through the AI generator "ChatGTP". As the question itself, we entered: "Help us create 5. attractive one-word names of the establishment for a company that offers tasty, fresh and predatory food in Prešov. The artificial intelligence tool then created the following suggestions:

- Fresh,
- Vitallis,
- Green,
- Štavík,
- Bistrova (https://chatgpt.com/).

On the basis of these proposals, we opted for the second option, as it more closely described the possible intention of the operation.

Since the company does not even have a logo for the new operation, we decided to design a possible logo that would ensure the identity of the newly established operation and interpret its main company activity. The rapid digitalization and the increasing use of artificial intelligence in everyday life led us to the decision to design a slogan through artificial intelligence (AI) that would allow consumers to better remember the company's actual operation.

We used the "logoai.com" platform to design the company logo, which suggested the following logos (Figure 1).

Figure 1 Proposed logo for the operation

Source: own processing by https://www.logoai.com/

The artificial intelligence asked us for basic information such as the company name, the colours preferred by the company in the logo and the industry in which the establishment operates (Figure 2 – 3).

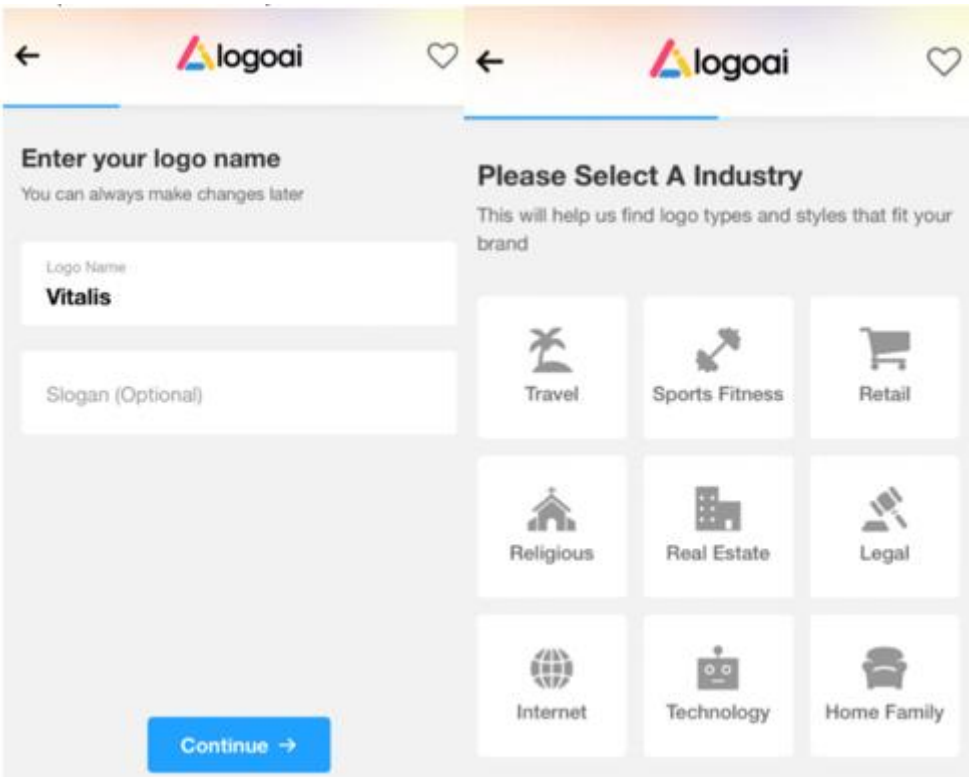

Figure 2 Creating a logo design 1

Source: own processing by https://www.logoai.com

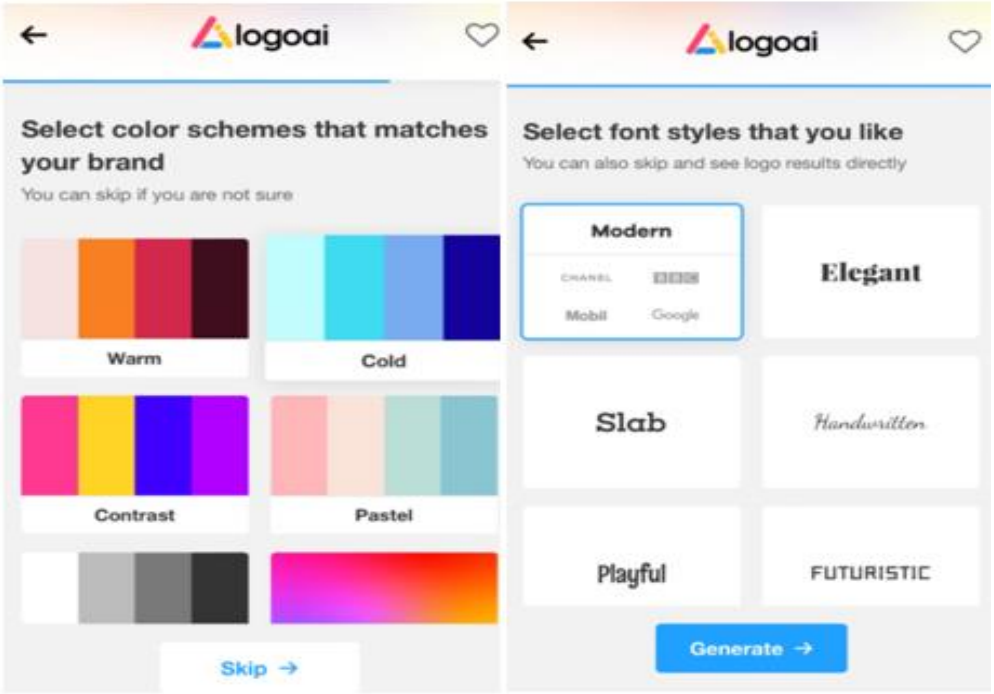

Figure 3 Creating a logo design 2

Source: own processing by https://www.logoai.com

In order to better classify and specialize the operation, we also used the possibility of entering symbols through this generator, where we included the keywords "chef's hat, fork, knife". The AI generator generated subsequent symbols, from which we chose two (Figure 4).

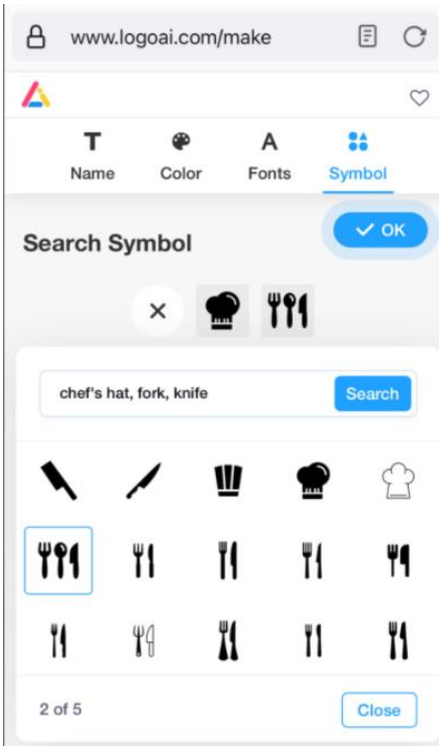

Figure 4 Logo extension with symbols

Source: own processing by https://www.logoai.com/

Again, the AI suggested several types of logo, but then only one was chosen to show a modern style that also reflects the main industry in which the establishment operates (Figure 5). The black colour of the base is intended to represent luxury to consumers and the colour shades of the name itself are intended to evoke the special requirements of all consumers segmented into demographic segments according to gender.

Figure 5 Logo design in modern style with symbols

Source: processing by https://www.logoai.com

Also, the monitored company does not have a slogan, which was the subject of the use of artificial intelligence through the free generator "aftership.com" to create slogans.

The description of the establishment was realized based on the description, "Our establishment offers fresh and traditional food every day 3 types, which are meat dishes, vegetarian dishes and split meals. The meals are made with fresh ingredients." Based on this description, the artificial intelligence couldn't generate the tagline itself and asked us for keywords among which we included "meals and freshness".

Subsequently, artificial intelligence suggested a number of slogans to us:

- Dishes full of freshness and tradition every day.
- Discover a new dimension of freshness in our dishes.
- Let yourself be carried away by fresh delicacies every day.
- We guarantee freshness, taste and satisfaction in every meal.
- Meals made with fresh ingredients for you right down to the last bite
    - (https://www.aftership.com/sk/tools/slogan-generator).

In our opinion, it would be most appropriate to use the slogan "Get carried away by fresh delicacies every day", as it points to a close relationship with consumers.

Since the current era offers several artificial intelligence tools, we decided to carry out the design of the slogan also through the tool "ChatGTP". As a command we entered: "Create me 5 slogans for: Our company offers fresh and traditional food every day 3 types that represent meat dishes, vegetarian dishes and split meals. The meals are made with fresh ingredients." implying that the command for creating slogans was the same as that for using the "aftership.com" tool. Artificial intelligence suggested the following slogans:

- Every day a different taste, always fresh and traditional!
- Three flavours to choose from, one place to experience!
- Fresh ingredients, traditional taste, varied options.
- Take your pick - meat, vegetarian or cannon: always fresh, always tasty!
- Something for everyone: dishes made with love, prepared with fresh ingredients. (https://chatgpt.com/c/673248aa-8ac0-800b-a044-8d51a2b965ce).

From the previous slogans, it can be concluded that the two AI tools were most consistent in the first slogan as they mainly used words like fresh and traditional in the slogans. Similarly, the third slogan was also evaluated in the same way, where in the first case the AI tool "aftership.com" mainly generated from the words fresh delicacies, thus also used more specific description, but the tool "chatgpt.com" generated the words "fresh ingredients". However, in the fourth case, the 'chatgpt.com' tool itself misidentified the term itself and did not

use the term split diet, which evokes the consumers' own eating style, but deduced with only the word “split”, which sounds nonsensical in the slogan itself and does not give meaning to the slogan itself.

Based on these suggestions, we would recommend choosing in particular from the first slogans offered, namely "Every day a different taste, always fresh and traditional!" in the case of the generator "chatgpt.com" or "Meals full of freshness and tradition every day." when using the "aftership.com" generator. We would recommend these slogans especially based on the fact that both generators focused on the consumer right from the start when creating the slogan by using the words freshness and tradition, which can lead to attracting consumers through freshness and tradition.

For the purpose of the overall branding of the new operation, we also designed an image to evoke the identity of the operation through the company's "chatgpt.com" tool. Through this tool, an image was also designed that had: "create an image as a logo for the Vitalis operation in the city of Prešov, which offers ready meals". The artificial intelligence initially noticed that there was an error while generating the answer and asked us if we wanted to generate the image again. On subsequent tag generation, the AI generator offered us the following Figure 6.

Figure 6 Brand image created through AI

Source: processing by https://www. chatgpt.com

Figure 6 represented the basic information, but in order to give more identity to the establishment, we asked the same AI generator to enhance the image to capture basic elements such as cutlery and a chef's hat that indicate the identity of the establishment. Subsequently, we entered into the generator: "Create an image as a logo for the Vitalis operation in the city of Prešov, which offers ready-made meals." Use a chef's hat and cutlery (knife and fork) in the logo." The artificial

intelligence generator also included the symbols that specify the type of operation in the brand (Figure 7).

Figure 7 Brand image created through AI with symbols

Source: processing by https://www. chatgpt.com

Figure 7 presented the basic information and symbols, however, in order to give the establishment even more identity, we asked the same AI generator to improve the image, which would capture basic elements such as cutlery and a chef's hat, which indicate the identity of the establishment, but also the use of fresh colors, which would consumers evoked the freshness of the ingredients. Subsequently, we entered into the generator: "Create an image as a logo for the Vitalis operation in the city of Prešov, which offers ready-made meals." Use a chef's hat and cutlery (knife and fork) in the logo, with fresh colors." (Figure 8).

Figure 8 Brand image created through AI with fresh colors

Source: processing by https://www. chatgpt.com

The last proposal can evoke not only the fresh colors of the raw materials but also the main identity of the establishment through symbols. The brand itself, or figure 8 can be used at the entrance to the establishment on the door, but also as a sign on the menu itself or the daily lunch menu.

Conclusion

Artificial intelligence is a powerful tool for companies. Thanks to different artificial intelligence platforms, the post proposed several options for a company that wants to expand and thus create a new operation that should be unique for consumers. Based on this, he wants to build a brand and create creative brand elements such as a logo, slogan and image. By analyzing customer preferences and behavior in real time, AI enables managers to flexibly respond to changes quickly and accurately. This approach contributes to the long-term building of a brand that remains relevant and memorable. Thus, AI has the potential to become a key element not only in marketing, but also in the overall strategy of company development.

Artificial intelligence has brought several advantages in the research itself. One of them, in addition to creative designs, can also include saving time, because in the past the logo could represent a lengthy process for companies. Artificial intelligence tools ensure that the company also reduces the cost of brand design, which the company can already invest in various marketing campaigns. However, the post also pointed out the negatives of artificial intelligence, when I can't exactly define the names, which leads to the realization that despite the flexibility and creativity of the designs, artificial intelligence needs to be controlled by the human factor.

The advantages and disadvantages that artificial intelligence brings to society are widely used, but it is necessary to keep in mind that artificial intelligence can only be used as a supporting tool for expanding the creativity of employees, managers, students, etc. However, it is not possible for artificial intelligence to work on its own yet. Effective designs can be achieved by combining artificial intelligence and human reason.

Slovak computer scientist, software developer, and popularist in the field of artificial intelligence said: "Artificial intelligence will not replace you. But you will be replaced by the people who will use it. So enjoy it yourself and you'll be fine." With this quote, it is possible to understand the imperfection of artificial intelligence, but the necessity of education and cooperation in the field of artificial intelligence tools, which has currently reached the whole world.

Acknowledgement

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HUMAN POTENTIAL FROM THE POINT OF VIEW OF ENDOGENOUS FACTORS OF REGIONAL DEVELOPMENT IN THE SLOVAK REPUBLIC

ĽUDSKÝ POTENCIÁL Z HĽADISKA ENDOGÉNNYCH FAKTOROV REGIONÁLNEHO ROZVOJA V SLOVENSKEJ REPUBLIKE

Erika KURIMSKÁ PAJERSKÁ

Abstract
Current regional policy is focused on the key importance of human resources for regional development. Internal resources (endogenous), the position and application of actors in the region, or activity directed "from below" are the most important for the development of the region. The main goal of the contribution is to analyse and point out the development trends of selected quantitative and qualitative indicators describing the demographic structure in individual regions (NUTS 3) of the Slovak Republic. The contribution focuses its attention on the evaluation of the quality of human potential in the context of the different development of regions in the Slovak Republic, taking into account the endogenous factors of their development.

Keywords: human potential, endogenous factors, regional development, regional disparities

Abstrakt
Súčasná regionálna politika je zameraná na presvedčenie o kľúčovom význame ľudských zdrojov pre regionálny rozvoj. Pre rozvoj regiónu sú najpodstatnejšie vnútorné zdroje (endogénne), postavenie a uplatnenie aktérov regiónu či aktivita smerovaná „zdola“. Hlavným cieľom príspevku je analyzovať a poukázať na trendy vývoja vybraných kvantitatívnych a kvalitatívnych ukazovateľov popisujúcich demografickú štruktúru v jednotlivých regiónoch (NUTS 3)Slovenskej republiky. Príspevok orientuje svoju pozornosť na hodnotenie kvality ľudského potenciálu v kontexte odlišného rozvoja regiónov v Slovenskej republike s prihliadnutím na endogénne faktory ich rozvoja.

Kľúčové slová: ľudský potenciál, endogénne faktory, regionálny rozvoj, regionálne rozdiely

Introduction

In the course of the last century, we can observe that the endogenous factors of the region are mobilized under the influence of exogenous factors and, at the same time, create space for processes of external influence. Regional disparities are largely caused by different levels of activity of endogenous entities, their different levels of activity, whether in the case of dependent or independent influence on the development of the given region.

1 Data and methodology

The monitored territory is a natural integrated whole, which is bounded by the borders of the Slovak Republic. For the purposes of the contribution, NUTS level 3 is used which – within the territory of the Slovak Republic – consists of the

following territories: Bratislavský kraj (BA), Trnavský kraj (TT), Trenčianský kraj (TN), Nitrianský kraj (NT), Žilinský kraj (ZA), Banskobystrický kraj (BB), Prešovský kraj (PO) and Košický kraj (KE). The analysed time period is the epoch from 2011 to 2023.

Subsequently, the determined values of selected parameters of the examined endogenous factors are analysed for the development of regions at the NUTS 3 level. The methodology of investigation and evaluation of endogenous factors of the development of regions is modified for the needs of the analysis of the contribution, capturing its character and peculiarities. Indicators are characterized and categorized in the monitored area, which are divided into individual categories. Each category is assigned point values (weights) from 1 to 5, with 5 being the best rating. Subsequently, after assigning the weights to the indicators, the resulting point evaluation of the individual areas can be done.

2 Endogenous factors of development

The development of the regional structure was caused by the action of various factors conditioning regional development (Rusnák – Korec, 2020). The basic elements of endogenous approaches to the support of regional development are the effort to change the atmosphere in the region, the creation of conditions for learning and participation, the inclusion of actors, the strengthening of self-confidence, the effort to arouse positive expectations, the creation of a network of actors supporting active adaptation, etc. (Ľapinová, 2019). Endogenous factors form individual elements of the spatial structure of the region, which create the region's potential. Factors such as human (social) potential, natural movement of the population, mechanical movement of the population and economic potential were selected for the contribution.

2.1 Human (social) potential

The first area of analysis of NUTS 3 regions in terms of endogenous factors is human (social) potential. In terms of the scope of the contribution and the availability of data, the gender indicator was chosen for the needs of the analysis.

2.1.1 Gender indicator

The first indicator examines the balance by gender and its development over the monitored period and it is presented in Figure 1 and Figure 2. The number and distribution of the population is influenced by the size of the region and its maturity. In particular, we can see the maturity of the region in the data from the Bratislavský kraj. The enormous growth during the monitored period is justified by the attractiveness of the region. The region that is also characterized by an increase in the proportion of men and women is the Trnavský kraj, although its growth trend in this indicator is more moderate. All other regions are characterized by a trend of a slight decrease in the proportions of men and women,

which is a global trend. In these regions, the predominance of the female population is measured

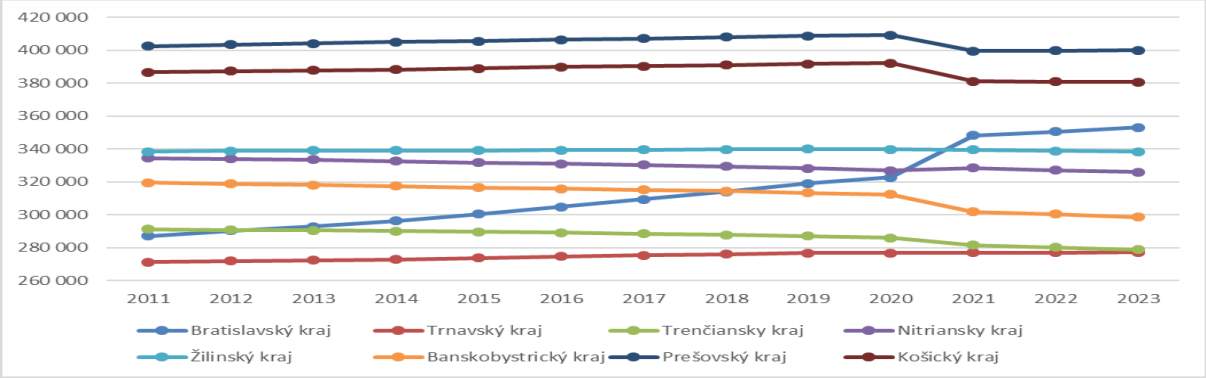

Figure 1 Balance by indicator of gender – men (person)

Source: Own processing according to data from STATdata

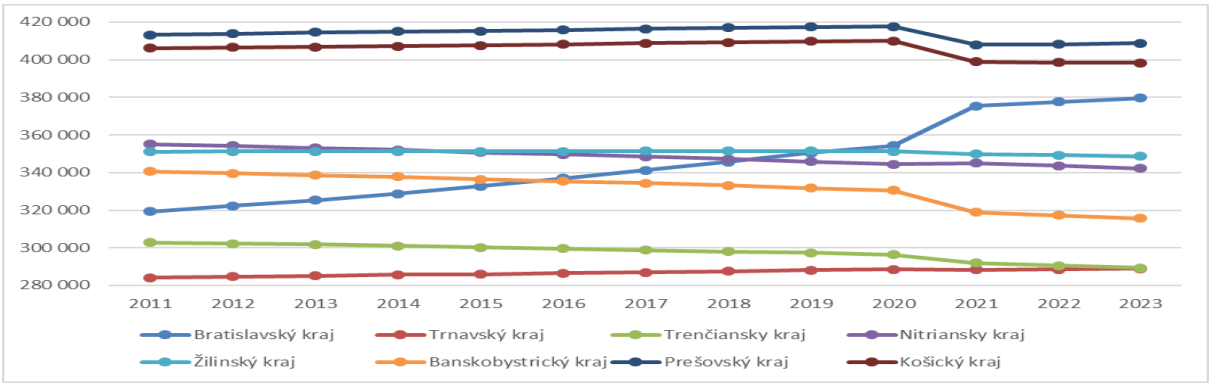

Figure 2 Balance by indicator of gender – women (person)

Source: Own processing according to data from STATdata

Table 1 Definition of weights for the indicator of gender

Indicator of gender – men (person)	Indicator of gender – women (person)
PM1: 0 – 280 000	PŽ1: 0 – 300 000
PM2: 280 001 – 300 000	PŽ2: 300 001 – 320 000
PM3: 300 001 – 320 000	PŽ3: 320 001 – 340 000
PM4: 320 001 – 350 000	PŽ4: 340 001 – 360 000
PM5: 350 001 and more	PŽ5: 360 001 and more

Source: Own processing

The subsequent definition and assignment of weights, which was based on the values in Table 1, correspond to the different development of the balance by gender. Table 2 offers an overview of the determined weights in terms of the balance by gender in the NUTS 3 regions of the Slovak Republic.

Table 2 Determined weights in terms of the gender indicator for NUTS 3 of the Slovak Republic

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
BA	PM1 PŽ2	PM1 PŽ3	PM1 PŽ3	PM1 PŽ3	PM1 PŽ3	PM1 PŽ3	PM3 PŽ3	PM3 PŽ4	PM3 PŽ4	PM3 PŽ4	PM4 PŽ5	PM5 PŽ5	PM5 PŽ5
TT	PM1 PŽ1	PM1 PŽ1	PM1 PŽ1	PM1 PŽ1	PM1 PŽ1	PM1 PŽ1	PM1 PŽ1	PM1 PŽ1	PM1 PŽ1	PM1 PŽ1	PM1 PŽ1	PM1 PŽ1	PM1 PŽ1
TN	PM1 PŽ2	PM1 PŽ2	PM1 PŽ2	PM1 PŽ2	PM1 PŽ2	PM1 PŽ1	PM1 PŽ1	PM1 PŽ1	PM1 PŽ1	PM1 PŽ1	PM2 PŽ1	PM2 PŽ1	PM1 PŽ1
NT	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4
ZA	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4	PM4 PŽ4
BB	PM3 PŽ4	PM3 PŽ3	PM3 PŽ3	PM3 PŽ3	PM3 PŽ3	PM3 PŽ3	PM3 PŽ3	PM3 PŽ3	PM3 PŽ3	PM3 PŽ3	PM3 PŽ2	PM3 PŽ2	PM3 PŽ2
PO	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5
KE	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5	PM5 PŽ5

Source: Own processing

2.2 Natural movement of the population

The second area of analysis of NUTS 3 regions from the point of view of endogenous factors is the natural movement of the population. In terms of the scope of the contribution and the availability of data, the indicator of natural increase of the population was chosen for the needs of the analysis.

2.2.1 Natural increase of the population

From the point of view of the selected indicator, which examines the natural increase of the population, this indicator, in its studied development, projects the conclusions from the regions that were analysed for births and deaths. In each of the monitored regions, there is a downward trend in the natural increase of the population, which also results from the increasing average age of the mother at birth, as well as from the increasing average age at death. The development of this indicator is documented in Figure 3.

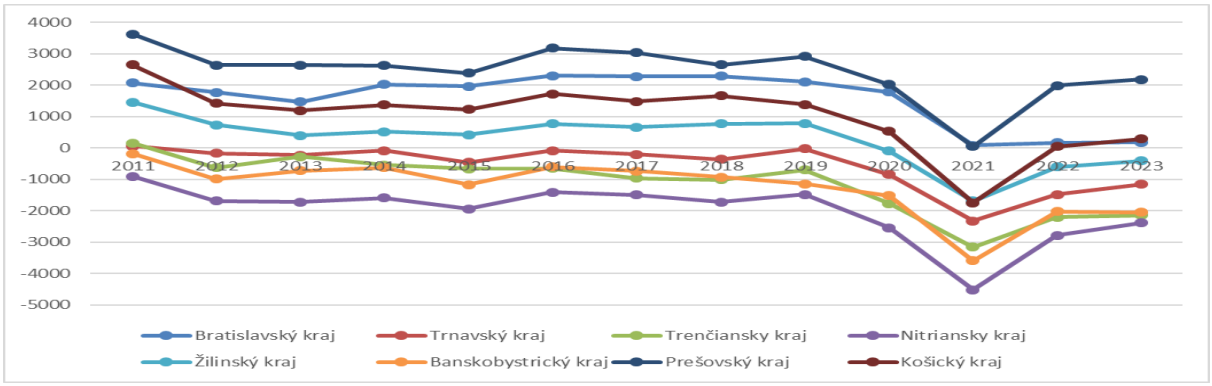

Figure 3 Balance by indicator of natural increase of the population (person)

Source: Own processing according to data from STATdata

The different development of the balance according to natural population growth also corresponds to the subsequent definition and assignment of weights, which was based on the values in Table 3. An overview of the determined weights from the point of view of the balance according to population growth in the NUTS 3 regions of the Slovak Republic is offered in Table 4.

Table 3 Definition of weights for the indicator of natural increase of the population (person)

Natural increase of the population (person)
PP1: -3 000 – -1 600
PP2: -1 599 – 0
PP3: 1 – 1 399
PP4: 1 400 – 2 399
PP5: 2 400 and more

Source: Own processing

Table 4 Determined weights in terms of the indicator of natural increase of the population for NUTS 3 of the Slovak Republic

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
BA	PP4	PP4	PP4	PP4	PP4	PP4	PP4	PP4	PP4	PP4	PP3	PP3	PP3
TT	PP3	PP2	PP2	PP2	PP2	PP2	PP2	PP2	PP2	PP2	PP1	PP2	PP2
TN	PP3	PP2	PP2	PP2	PP2	PP2	PP2	PP2	PP2	PP1	PP1	PP1	PP1
NT	PP2	PP1	PP1	PP1	PP1	PP2	PP2	PP1	PP2	PP1	PP1	PP1	PP1
ZA	PP4	PP3	PP3	PP3	0PP3	PP3	PP3	PP3	PP3	PP2	PP1	PP2	PP2
BB	PP2	PP2	PP2	PP2	PP2	PP2	PP2	PP2	PP2	PP2	PP1	PP1	PP1
PO	PP5	PP5	PP5	PP5	PP5	PP5	PP5	PP5	PP5	PP4	PP3	PP4	PP4
KE	PP5	PP4	PP3	PP3	PP3	PP4	PP4	PP4	PP3	PP3	PP1	PP3	PP3

Source: Own processing

2.3 Mechanical movement of the population

Another area of analysis of NUTS 3 regions from the point of view of endogenous factors is the mechanical movement of the population. In terms of the scope of the contribution and the availability of data, the migration balance indicator was chosen for the needs of the analysis.

2.3.1 Migration balance indicator

From the point of view of the selected indicator, which examines the migration balance, the development of its values is noticeable depending on the development of the indicators of immigrated for permanent residence and evicted from permanent residence. This reflects the fact that the Bratislavský kraj and Trnavský kraj achieved the highest values in the indicator of the number of people immigrating for permanent residence, and for that reason the indicator of the migration balance in these regions is also favourable. Prešovský kraj achieves a negative migration balance, which indicates the level of its attractiveness for human capital.

In the conditions of the regions, there is a perceived change in the trend established by the year 2022, when there are changes in the trends in the development of indicators. In the last year of the examined period, the trend changes towards more favourable conditions in terms of migration balance values, except for the Banskobystrický kraj and Trnavský kraj.

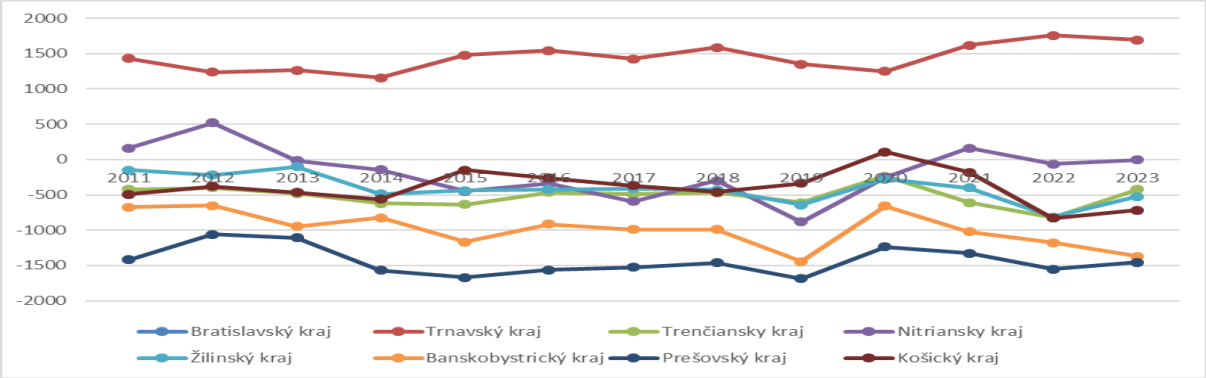

Figure 4 Balance by indicator of migration balance (person)

Source: Own processing according to data from STATdata

The subsequent definition and assignment of weights, which was based on the values in Table 5, correspond to the different development of the balance according to the migration balance. Table 6 provides an overview of the determined weights in terms of the balance of mechanical population movement in the NUTS 3 regions of the Slovak Republic.

Table 5 Definition of weights for the migration balance (person)

Migration balance (person)
MS1: (-2 000) – (-1 000)
MS2: (-999) – (-1)
MS3: 0 – 1 000
MS4: 1 001 – 2 000
MS5: 2 001 and more

Source: Own processing

Table 6 Determined weights in terms of the migration balance for NUTS 3 of the Slovak Republic

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
BA	MS5	MS5	MS5	MS5	MS5	MS5	MS5	MS5	MS5	MS5	MS5	MS5	MS5
TT	MS4	MS4	MS4	MS4	MS4	MS4	MS4	MS4	MS4	MS4	MS4	MS4	MS4
TN	MS2	MS2	MS2	MS2	MS2	MS2	MS2	MS3	MS2	MS2	MS2	MS2	MS2
NT	MS3	MS3	MS3	MS2	MS2	MS2	MS2	MS2	MS2	MS2	MS3	MS2	MS2
ZA	MS2	MS2	MS2	MS2	MS2	MS2	MS2	MS2	MS2	MS2	MS2	MS2	MS2
BB	MS2	MS2	MS2	MS2	MS1	MS2	MS2	MS2	MS1	MS2	MS1	MS1	MS1
PO	MS1	MS1	MS1	MS1	MS1	MS1	MS1	MS1	MS1	MS1	MS1	MS1	MS1
KE	MS2	MS2	MS2	MS2	MS2	MS2	MS2	MS2	MS2	MS3	MS2	MS2	MS2

Source: Own processing

2.3 Economic potential

The fourth area of analysis of NUTS 3 regions in terms of endogenous factors is economic potential. In terms of the scope of the contribution and the availability of data, indicator of the Economic dependence of young people (separately for men and women) was selected for analysis.

The development of the index of economic dependence of young people follows the development of the ratio of persons of pre-productive age to persons of productive age. It has a growing trend in each of the monitored regions, which reaches its peak in 2022. This applies to both monitored groups – men and women. The deviation from the growth averages of the monitored regions is represented by the Bratislavský kraj, which is characterized by the fastest growth during the monitored period and with a shifted growth peak to 2020. All regions are characterized by a comparable economic burden for the female population compared to the data for the male population. At the same time, the order of regions is the same when examining the male and female population (Figure 5 and Figure 6).

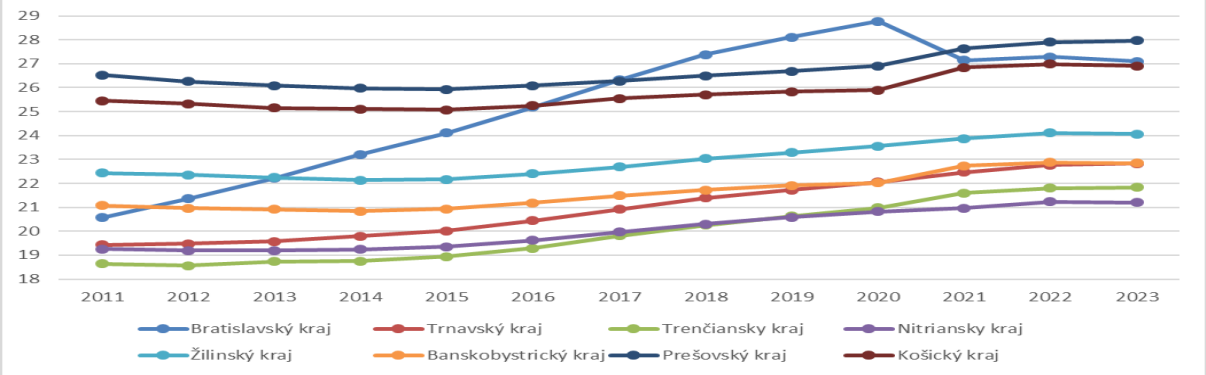

Figure 5 Balance by indicator of economic dependence of young people –men (%)

Source: Own processing according to data from STATdata

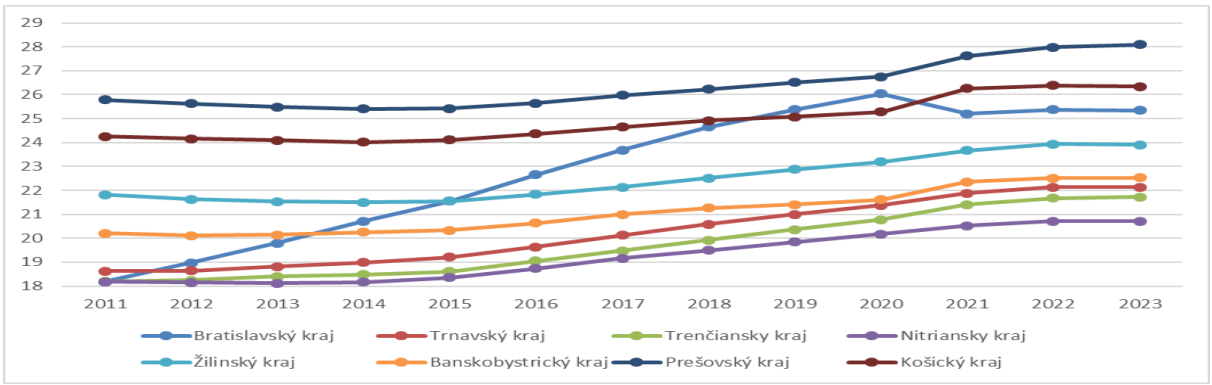

Figure 6 Balance by indicator of economic dependence of young people –women (%)

Source: Own processing according to data from STATdata

The growth of the index of economic dependence of young people reflects the overall growth of the dependence of this population group in the regions and represents an increase in the burden on the working-age population. The higher the value of the index, the higher the proportion of economically dependent young population in a given region. The different development of the index also corresponds to the subsequent definition and assignment of weights, which was based on the values in Table 7. An overview of the determined weights is offered in Table 8.

Table 7 Definition of weights for the economic dependence of young people (%)

Economic dependence of young people - men	Economic dependence of young people – women
ZM1: 26,00 and more	ZŽ1: 26,00 and more
ZM2: 24,00 – 25,99	ZŽ2: 24,00 – 25,99
ZM3: 22,00 – 23,99	ZŽ3: 22,00 – 23,99
ZM4: 20,00 – 21,99	ZŽ4: 20,00 – 21,99
ZM5: 19,99 and less	ZŽ5: 19,99 and less

Source: Own processing

Table 8 Determined weights in terms of the indicator of the economic dependence of young people for NUTS 3 of the Slovak Republic

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
BA	ZM5 ZŽ5	ZM4 ZŽ5	ZM3 ZŽ5	ZM2 ZŽ4	ZM2 ZŽ3	ZM2 ŽZ3	ZM1 ZŽ2	ZM1 ZŽ2	ZM1 ZŽ2	ZM1 ZŽ1	ZM1 ZŽ2	ZM1 ZŽ2	ZM1 ZŽ1
TT	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ5	ZM4 ZŽ4	ZM4 ZŽ4	ZM4 ZŽ4	ZM4 ZŽ4	ZM3 ZŽ4	ZM3 ZŽ3	ZM3 ZŽ3
TN	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ4	ZM4 ZŽ4	ZM4 ZŽ4	ZM4 ZŽ4	ZM4 ZŽ4
NT	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ5	ZM5 ZŽ5	ZM4 ZŽ4	ZM4 ZŽ4	ZM4 ZŽ4	ZM4 ZŽ4
ZA	ZM3 ZŽ4	ZM3 ZŽ4	ZM3 ZŽ4	ZM3 ZŽ4	ZM3 ZŽ4	ZM3 ZŽ4	ZM3 ZŽ3	ZM2 ZŽ3	ZM2 ZŽ3	ZM2 ZŽ3	ZM3 ZŽ3	ZM4 ZŽ3	ZM4 ZŽ3
BB	ZM4 ZŽ4	ZM4 ZŽ4	ZM4 ZŽ4	ZM4 ZŽ4	ZM4 ZŽ4	ZM4 ZŽ4	ZM4 ZŽ4	ZM4 ZŽ4	ZM4 ZŽ4	ZM3 ZŽ4	ZM3 ZŽ3	ZM3 ZŽ3	ZM3 ZŽ3
PO	ZM1 ZŽ5	ZM1 ZŽ5	ZM1 ZŽ5	ZM2 ZŽ5	ZM2 ZŽ5	ZM1 ZŽ5	ZM1 ZŽ5	ZM1 ZŽ1	ZM1 ZŽ1	ZM1 ZŽ1	ZM1 ZŽ1	ZM1 ZŽ1	ZM1 ZŽ1
KE	ZM2 ZŽ2	ZM2 ZŽ2	ZM2 ZŽ2	ZM2 ZŽ2	ZM2 ZŽ2	ZM2 ZŽ2	ZM2 ZŽ2	ZM2 ZŽ2	ZM2 ZŽ2	ZM2 ZŽ2	ZM2 ZŽ2	ZM2 ZŽ2	ZM2 ZŽ2

Source: Own processing

2.4 Human potential in terms of endogenous factors of regional development

Human potential from the point of view of functioning within NUTS 3 – as defined also within the monitoring of the contribution objective – is subject to the conditions and developments of endogenous and exogenous factors of regional development. From the point of view of endogenous factors, Table 9 offers us analysed indicators of human and economic potential, natural and mechanical movement of the population in a clear form. The final values are the result of averaging the values that the indicator showed over time.

According to analysis of selected indicators of social potential as an endogenous factor of regional development, Prešovský kraj and Košice kraj were

ranked first due to the favourable development in the number of the population compared to the other investigated regions. The indicators of economic potential in the resulting survey brought us the first positions for Trenčianský kraj and Nitriansky kraj due to the values achieved when examining the economic dependence of young people. From the point of view of the natural movement of the population, Prešovský kraj was the best, which was also indicated by its position within the investigation of this endogenous factor of regional development. Based on the analysis of selected indicators of the mechanical movement of the population, the Bratislavský kraj took the first position, which was strongly pushed to this position by the development of the indicator of the immigrated population.

Table 9 Overview of investigated indicators of endogenous factors for NUTS 3 of the Slovak Republic

Endogenous factors – human (social) and economical potential								
	BA	**TT**	**TN**	**NT**	**ZA**	**BB**	**PO**	**KE**
Gender – men	PM 1,8	PM1	PM1	PM4	PM4	PM3	PM5	PM5
Gender – women	PŽ 3,2	PŽ1	PŽ 1,5	PŽ4	PŽ4	PŽ3	PŽ5	PŽ5
Dependence - men	ZM 2,2	ZM 4,6	ZM 4,9	ZM 4,9	ZM 2,7	ZM 3,9	ZM 1,2	ZM 2,0
Dependence - women	ZŽ 3,2	ZŽ 4,6	ZŽ 5,6	ZŽ 4,9	ZŽ 4,6	ZŽ 4,0	ZŽ 3,8	ZŽ2
Endogenous factors – natural and mechanical movement								
	BA	**TT**	**TN**	**NT**	**ZA**	**BB**	**PO**	**KE**
Natural increase	PP4	PP 2,1	PP 2,0	PP 1,4	PP 3,0	PP 2,0	PP 4,9	PP 3,6
Migration balance	MS5	MS4	MS 2,1	MS 2,3	MS2	MS 1,8	MS1	MS 2,1
Status of NUTS 3	5.	7.	8.	1.	3.	6.	2.	4.

Source: Own processing

The investigation of endogenous regional development at the level of NUTS 3 within the Slovak Republic pointed to several conclusions of the evaluation of the quality of human potential.

From the point of view of social potential, it is concluded that the NUTS 3 regions that achieved the highest positions in this study are characterized by a better age structure of the population. This results from the fact that, just as in the world, and in the conditions of the Slovak Republic too, we are beginning to encounter the trend of population aging and deterioration of the population structure. In Slovakia, these trends begin to manifest themselves first in the more developed regions, and for that reason these NUTS 3 are placed in the last positions when monitoring human potential. It is very paradoxical to evaluate the quality of human potential in this sphere, since naturally the better age structure of the population is defined as the optimal basis for high-quality human potential. Currently, when the population is aging, it is necessary to redefine the quality of human potential to the conditions set in this way. As a result, the older population

no longer represents a population with a lower quality of human potential, but thanks to better health care, many experiences, better conditions for the educational field or the field of their application, it ranks among the population group that can be rated as having a high quality of human potential.

Economic potential as another factor of the endogenous development of the region, which was examined within the contribution, used the indicator of economic dependence in its analysis. This indicator points to the area of dependence of young people, which is directly and proportionally related to the age distribution of the population of that region. The economic field represents a very important indicator of the assessment of human potential.

Natural movement and mechanical movement of the population represent two sides of the same area. On the one hand, there is the natural movement of the population, which reflects the indicators studied so far. On the other hand, we have the mechanical movement of the population, where its development and subsequent resulting in positions for NUTS 3 of Slovak Republic show us where human capital in connection with human potential is most moved and thus localized. In this area, the resulting positions of the regions show us where human capital accumulates due to its better use and thus where its quality is evaluated best.

Figure 7 illustrates the development of population density and is intended to confirm or refute the ranking of regions in terms of our human capital analysis. The position of the Bratislavský kraj is obvious here, which despite its smallest area shows the highest level of population density in its territory. This is due to the location of the capital Bratislava within the territory of the region. In other regions, the values change with minimal deviations in terms of time, a higher increase is noticeable only in the conditions of Bratislavský kraj.

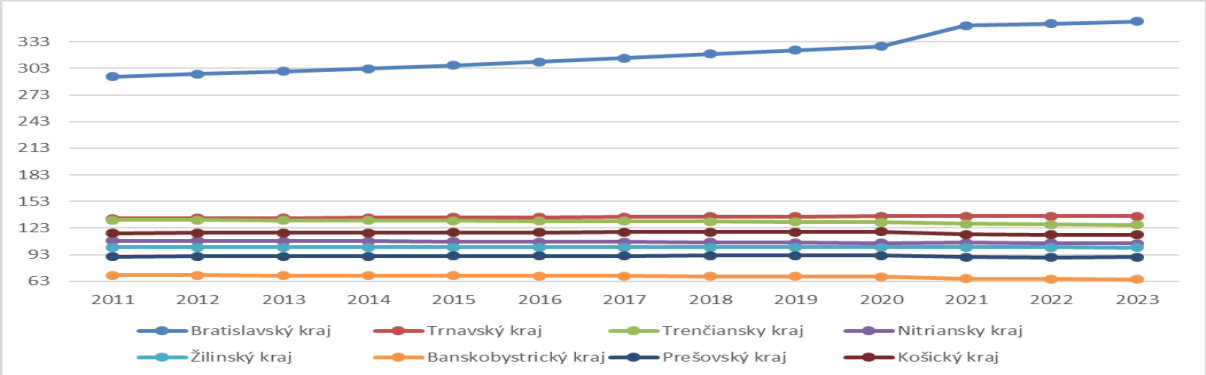

Figure 7 Balance by indicator of population density (person per km2)

Source: Own processing according to data from STATdata

The subsequent definition and assignment of weights, which was based on the values in Table 10, correspond to the different development of the index. Table 11 offers an overview of the determined weights in terms of the population density index in the NUTS 3 regions of the Slovak Republic.

Table 10 Definition of weights for the indicator of population density (person per km2)

Population density (person per km^2)
HO1: 0,00 – 90,99
HO2: 91,00 – 100,99
HO3: 101,00 – 124,99
HO4: 125,00 – 200,99
HO5: 201,00 and more

Source: Own processing

Table 11 Determined weights in terms of the indicator of population density for NUTS 3 of the Slovak Republic

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
BA	HO5	HO5	HO5	HO5	HO5	HO5	HO5	HO5	HO5	HO5	HO5	HO5	HO5
TT	HO4	HO4	HO4	HO4	HO4	HO4	HO4	HO4	HO4	HO4	HO4	HO4	HO4
TN	HO4	HO4	HO4	HO4	HO4	HO4	HO4	HO4	HO4	HO4	HO4	HO4	HO4
NT	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3
ZA	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3
BB	HO1	HO1	HO1	HO1	HO1	HO1	HO1	HO1	HO1	HO1	HO1	HO1	HO1
PO	HO2	HO2	HO2	HO2	HO2	HO2	HO2	HO2	HO2	HO2	HO1	HO1	HO1
KE	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3	HO3

Source: Own processing

If we focus on these regions from the point of view of the development of the regional GDP per capita compared to the Slovak average (Figure 8), Bratislavský kraj maintains a significant distance from other regions and reflects the fact that human capital is applied here with the effective use of its potential. This indicates its high concentration, which is a consequence of suitable conditions for the development of human potential, while similar conclusions also apply to the Trnavský kraj.

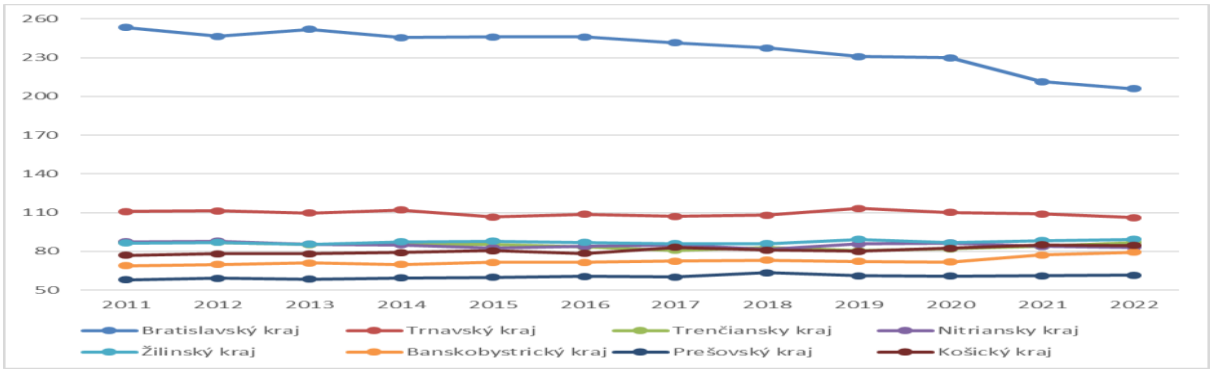

Figure 8 Balance by indicator of share of regional GDP per capita (%)

Source: Own processing according to data from STATdata

Despite the high level of regional GDP per inhabitant for the Košický kraj, this territory is characterized by a lower percentage compared to the Slovak average. This indicates that the environment in this region – despite the growing attractiveness for the application of human capital – is characterized by areas that are not motivating for the development of human potential (whether we are talking about the level of wages, the offer of more sophisticated job positions,

etc.). The subsequent definition and assignment of weights, which was based on the values in Table 12, correspond to the different development of the index. Table 13 offers an overview of the determined weights in terms of the share of regional GDP index in the NUTS 3 regions of the Slovak Republic.

Table 12Definition of weights for the indicator of share of regional GDP per capita (%)

Share of regional GDP per capita (%)
SR1: 0 – 59,99
SR2: 60,00 – 79,99
SR3: 80,00 – 99,99
SR4: 100,00 – 199,99
SR5: 200,00 and more

Source: Own processing

Table 13 Determined weights in terms of the indicator of share of regional GDP per capita for NUTS 3 of the Slovak Republic

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
BA	SR5	SR5	SR5	SR5	SR5	SR5	SR5	SR5	SR5	SR5	SR5	SR5
TT	SR4	SR4	SR4	SR4	SR4	SR4	SR4	SR4	SR4	SR4	SR4	SR4
TN	SR3	SR3	SR3	SR3	SR3	SR3	SR3	SR3	SR3	SR3	SR3	SR3
NT	SR3	SR3	SR3	SR3	SR3	SR3	SR3	SR3	SR3	SR3	SR3	SR3
ZA	SR3	SR3	SR3	SR3	SR3	SR3	SR3	SR3	SR3	SR3	SR3	SR3
BB	SR2	SR2	SR2	SR2	SR2	SR2	SR2	SR2	SR2	SR2	SR2	SR2
PO	SR1	SR1	SR1	SR1	SR1	SR2	SR2	SR2	SR2	SR2	SR2	SR2
KE	SR2	SR2	SR2	SR2	SR3	SR2	SR3	SR3	SR3	SR3	SR3	SR3

Source: Own processing

The share of GDP in the Slovak average also results from the areas in which human capital is used in which region. In the more developed regions, which reach a high percentage of the average GDP of Slovakia, the labour force is used in more sophisticated areas of production and in services. In less developed regions, this representation is lower, and factors such as inadequate infrastructure, lagging in the inflow of foreign investments, and in some cases even geographical location also contribute to lower development. The concentration of the application of human capital in sectors with lower added value, which are also associated with a lower level of financial or other motivational evaluation, reduces the possibilities for the effective use of human capital.

Conclusion

The previous analysis of the regions showed the diverse position of the NUTS 3 regions of the Slovak Republic (Table 14). More developed regions were placed in worse places due to unfavourable developments in indicators such as the natural increase of the population or the composition of the population. It is precisely such indicators that have pushed more developed regions to weaker positions because they copy developed regions from abroad, in which these negative trends have been characterized for a long time.

Table 14 Overview of status of NUTS 3 of the Slovak Republic

Status of region NUTS 3 of the Slovak Republic								
	BA	**TT**	**TN**	**NT**	**ZA**	**BB**	**PO**	**KE**
Endogenous factors	5.	7.	8.	1.	3.	6.	2.	4.
Density	1.	2.	3.	5.	6.	8.	7.	4.
Regional GDP	1.	2.	5.	4.	3.	7.	8.	6.

Source: Own processing

When evaluating the structure of the NUTS 3 regions of the Slovak Republic with regard to their comparison according to population density and the share of regional GDP in the national one, we see clear first rungs for Bratislavský kraj and Trnavský kraj. In other positions, minor deviations from the positions can be seen, which also result from the size of the territory of the region. Within the conditions of Slovakia and individual NUTS 3 regions, we can conclude that each region is characterized by human capital with different advantages. However, the scope of its development and application is debatable. The quality of human potential can only be increased through the effective partnership of all subjects of the region – from its management to its residents, from public to private subjects, but also from international to national spheres. The creation of optimal regional infrastructure as a basis for increasing the quality of human potential should take place with the expansion of the orientation of economies to the creative sector.

Differences in the development of regions in Slovakia are not a modern issue. However, the paper offered a partial insight into the connections and impacts of such differences in regional development on human capital and potential. By examining various areas of endogenous development of the region, the contribution tried to underline the fact that each indicator has its weight and its possibilities of influencing human capital and potential in the region.

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ENVIRONMENT- FOCUSED ECONOMIC TOOLS OF PUBLIC POLICY

EKONOMICKÉ NÁSTROJE VEREJNEJ POLITIKY ZAMERANÉ NA ŽIVOTNÉ PROSTREDIE

Eva MIHALIKOVÁ – Tomáš ŠTULLER

Abstract
Public policy is an interdisciplinary scientific discipline and is used to solve various problems of individual branches of the economy, including environmental policy. It uses a range of tools for this, including economic tools, which are enshrined in legal regulations. The contribution is oriented to the identification and analysis of the economic instruments applied in the Environmental Fund for the protection of the environment. The data relate to the selected areas, namely data about air, water and waste, presented in two categories of economic tools – as the tools that could have a positive stimulus (subsidies, loans) or as the tools that could discourage polluters from certain behavior type (fees, sanctions). The contribution highlights the importance of economic instruments in environmental policy as they are an effective tool in reducing pollution.

Keywords: public policy, environmental policy, instruments, fees, subsidies, loans, fines

Abstrakt
Verejná politika je interdisciplinárnou vednou disciplínou a je využívaná na riešenie rôznych problémov jednotlivých odvetví hospodárstva, nevynímajúc politiku životného prostredia. Využíva k tomu celý rad nástrojov, vrátane ekonomických nástrojov, ktoré sú zakotvené v právnych predpisoch. Príspevok je orientovaný na identifikáciu a analýzu ekonomických nástrojov uplatňovaných v Environmentálnom fonde pri ochrane životného prostredia. Prezentované údaje sa zameriavajú na oblasť ochrany ovzdušia, vôd a na oblasť odpadového hospodárstva a sú sledované v dvoch kategóriách ekonomických nástrojov – ako nástroje, ktoré môžu mať pozitívny stimul (dotácie, úvery) alebo ako nástroje, ktoré môžu odradiť znečisťovateľov od určitého typu správania (poplatky, sankcie). Príspevok zdôrazňuje dôležitosť ekonomických nástrojov v environmentálnej politike, lebo sú považované za účinný nástroj pri znižovaní znečistenia životného prostredia.

Kľúčové slová: verejná politika, environmentálna politika, nástroje, poplatky, dotácie, úvery, pokuty

Introduction

Public policy represents an essential part of every society. It is a package of decisions and measures applied by the Government in efforts to solve the society problems and reach the set forth goals. Governmental power disposes of the range of various tools that it is authorized to apply and thereby influence relations in the society, and materialize its visions. Significant group of the public policy tools refers to the scope of economic tools.

With these economic tools, the Government influences the economic activities of consumers and businesses in the country. The issues have emerged along with the boom of the economic activities, related to their adverse environmental effects. A room has been created here for the state environmental policy representing a part of the public policy. Our aim in this paper is to point out to the economic tools applied by the Environmental Fund when implementing the environmental policy.

1 Public policy and its tools

It can be noted at the outset that there is no universal definition of public policy, and it can be viewed from multiple perspectives. The expression „public policy" should be distinguished on two basic levels – as a denomination of the scientific discipline and concurrently as a social practice. Public policy as a scientific discipline studies the public and its problems in general. It is an interdisciplinary scientific discipline with the analysis of the processes of formation and satisfaction of public interests being its subject and attention is directed towards the institutional provision of these processes mainly from the point of view of the public and civil sector (Potůček a kol., 2016). Seeing the public policy as a social practice, there are five characteristics associated with it. Public policy represents the system of goals, activities and measures of the public authorities, containing also the allocation and redistribution of disposable resources. This could act as a stimulating factor of behavior of particular subjects involved. Public policy also includes a wide diapason of governmental activities created by both day-to-day activities and long-term strategies. (Kráľová, 2009)

Beblavý (2002) speaks of the public policy as of adopted political decisions and programs not only on general level but also in particular areas. We can briefly say that it is a summary of what the public administration bodies perform or want to perform in particular areas of interest. At the same time, the public policy deals with questions of what is or should be performed within the governing process.

We can also state that the public policy represents a mechanism that allows transformation of the public interests into the required public wealth and services. In this light, the public policy is dedicated to the study of particular governmental activities with the aim to substantiate the decisions made by the government/s. (Mitaľ, 2022)

Kováčová and Králik (2017) state that uniform value assumption is essential for the public policy that would enable simpler discussion on the public interest subject where various individual, group and institutional interests collide. Such confrontation of interests results in the acceptation of certain public interests implementation by the public power authorities.

Malíková and Daško (2018) classified the public policy in various categories, for example categories based on:

- societal life fields – social, economic, health, environmental, etc.
- subject of focus – family, pension, drugs, etc.
- administration focus - communal, regional, state.

We could mention further factors of the public policy classification in various categories, for example according to coordination method (orders, bans, regulations), according to program types (financial accommodation program, construction program), or according to legislation rules.

The power bearing authority implements its plans, concepts or strategies through the public policy tools. Similar to the public policy definition, there are numerous insights of numerous authors related to specification and concretization of particular tools. Konečný (2021) classified the public policy tools in a few categories:

Strategic – conceptual tools playing a key role in defining the state public policies. They are applied in the stage of formulation and setting forth goals and they include various analyses and prognoses of scientific institutions.

Economic tools refer to governmental expenditures, tax burden, subsidy schemes, grants and various sanction mechanisms.

Legal tools, sometimes called also legislation or regulation tools, are considered the primary group of the public policy tools (along with the economic tools). Laws represent the most frequently used legal tool of the public policy. Further tools include decrees and regulations that serve for implementation of particular laws.

Organizational – administrative tools include the structure of the public policy authorities. Power authorities and provision for their offices significantly influences the public policy effectiveness. Along with the public administration offices, public services providers represent an integral part thereof, for example educational and cultural institutions or social facilities. (Konečný, 2021)

Beblavý (2002) characterizes the public policy tools as the means that the power bearer use for fulfillment of preliminary set forth goals. It is solely at the power bearer discretion whether they exercise their intentions in this particular issue and what form of the tool/s they use.

2 Economic public policy tools

Many authors (Potůček, 2016; Veselý, 2007) prioritize taxes and tax burden within the economic tools. Assurance of public services provision represents a primary tax purpose; however, in the terms of public policy, tax burden represents a tool enabling to condition a positive behavior or discourage from a negative behavior. Indirect limitation of certain goods, services or activities utilization is possible through imposition of high tax burden on such goods,

services or activities. On the other hand, deductible items of the income tax, exemption from tax duty or reduction of tax rate in case of certain goods and services supports consumption and has a positive impact on behavior of the public.

Subsidies, grants, contributions or loans with favorable interest rate represent further economic tools considered as positive economic stimuli. They are fundamentally aimed at positively influencing and motivating subjects to perform certain beneficial activities that are currently performed in insufficient extent or quality. (Beblavý, 2002)

Public budgets represent a significant tool of the public policy with primarily emphasized state budget. We shouldn´t forget the budgets of the higher territorial wholes or the state and purpose funds. Through the budgets, major part of financial tools is redistributed among particular subjects involved. Non-budgetary funds, e.g. Environmental Fund, represent an integral part of the budgetary system. (Konečný, 2019)

While the economy and public policy represent separate disciplines, their mutual cooperation is essential in practice where they are mutually influenced and interconnected. Economic policy, through which the state discharges its functions and implements its measures, is of utmost importance for the public policy. Adequately chosen priorities and programs of the public policy positively influence the sustainable development. (Liptáková, 2024)

3 Analysis of economic tools in environmental policy

Environmental policy is an integral part of the public policy. Its aim is to influence businesses´ and consumers´ behavior in order to change their decisions that could adversely affect the environment. In order to reach these goals, environmental policy disposes of a range of economic tools that blend together within the economic tools of the public policy.

Pollution limitation can be in the form of commands (environmental standards and limits) or market-based instruments (environmental taxes, subsidies, permits). In practice, market-based instruments work better than command and prohibition instruments. (Antelo, Bru, Peón; 2023)

Romančíková (2006) distinguishes between direct and indirect economic tools of the environmental policy. As results from the denomination, direct tools influence environmental behavior directly. They are usually embodied in legal regulations and they refer to particular orders, bans, standards or rules. Their fulfillment can be conditioned with sanction mechanisms. Indirect tools stimulate environment polluters to reduce their adverse environmental impacts or their parts through their decisions. Indirect tools comprise various environmental taxes, charges, fees or levies.

A well-implemented environmental policy has the ability to condition innovation, competitiveness and the uptake of cleaner technologies (Satoğlu,

Salmon, 2024). Environmental innovation is a specific tool. These can act to reduce pollution at source, and allow businesses to improve their environmental impact (Liao, 2018). So-called green finance, which applies financial instruments and services to financially ecologically sustainable projects and investments, is also receiving more and more attention. (Mahmood, Zaied, Abedon; 2024)

The state purpose fund – Environmental Fund was chosen for more detail research of the applied economic tools to the environmental policy. Environmental Fund is a legal entity with registered office in Bratislava. It was founded pursuant to Act No. 587/2004 Coll. on Environmental Fund, determining its position and primary mission. The purpose of the Environmental Fund foundation refers to provision for the state support in the area of environmental support, care and creation, and the fund is controlled by the Ministry of Environment of the Slovak Republic.

The data were elaborated from the annual reports of the Environmental Fund for period of years 2019 – 2023 and certain data were obtained from the Environmental Fund upon request for information provision. The data relate to the selected areas, namely data about air, water and waste, presented in two categories of economic tools as pointed out by E. Vedung (Konečný, 2021). He divided the economic tools to those that could have a positive stimulus (subsidies, contributions, favorable loans, ...) or those that could discourage from certain behavior type (taxes, charges, sanctions...).

3.1 Charges and sanctions as discouraging economic tools

The primary purpose of discouraging tools is to deter polluters from harming the environment. They refer to the principle „Polluter Pays“ and can have a form of environmental taxes, charges, fines and sanctions. Environmental Fund is associated with environmental charges. Jaďuďová (2015) states that these charges are paid to the Environmental Fund and serve for environmental goal funding.

Environmental charges represent an income of the Environmental Fund and they are classified in two categories:

- charges for pollution, and
- charges for natural resources utilization.

Within the analysis we focused on the charges related to environmental pollution, namely:

Charges for air pollution, regulated in Act No. 190/2023 Coll. on Charges for Air Pollution. The charges are calculated from the basis – the amount of emission released in the atmosphere, and they are paid by legal entities and physical entities – businesses that operate a stationary air pollution source and pay for releasing the pollutants in the atmosphere.

Charges for wastewater release in surface waters, regulated in the Governmental Regulation No. 755/2004 Coll., determining the amount of non-regulated payments, amount of charges and the details related to introduced payment for

water use. Charges for wastewater release in surface waters are paid by the subject that releases wastewater in surface waters in excess of set forth limit and exceeded the concentration and balance limits in the respective pollution indicator. *Charges for waste storage,* regulated in Act No. 329/2018 Coll. on Charges for Waste Storage. The charge for storage of waste on the waste heap or the charge for storage of waste on the sludge bed shall be paid by the waste generating subject (payer). The charge is calculated by operator of the waste heap as multiplication of waste quantity by waste unit tariff rate.

Table 1 contains the values of particular charges for environmental pollution during the monitored period. Charges for waste storage whose values have exceeded the other charges many times and represent the long-term highest numbers with 42% increase compared to the initial year. On the contrary, charges for wastewater sluicing represent the lowest values that increased by 52 % during the monitored period. Development of air pollution charge is considered as positive since it dropped by approx. 25 % compared to the initial year.

Table 1 Charges for environmental pollution (in euros)

Charges for pollution	2019	2020	2021	2022	2023
Charges for air pollution	10 049 690	7 616 289	7 801 670	9 144 715	7 542 069
Charges for wastewater release in surface waters	2 176 413	3 327 454	3 127 874	3 065 308	3 319 119
Charges for waste storage	20 833 953	25 627 270	31 625 248	30 422 314	29 606 884

Source: own processing based on the annual reports of the Environmental Fund

Sanctions represent another income of the Environmental Fund from the discouraging economic tools. Environmental Fund imposed two types of sanctions, namely sanction for breach of financial discipline and another sanction for breach of legislative regulations in the area of environment. Table 2 summarizes the data about sanctions related to breach of legislative regulations in the area of air and water protection, and waste. The highest sanctions were imposed for breach of the Water Act, however the situation has changed during the last year and sanctions imposed for breach of the Waste Act reached currently the highest values.

Table 2 Fines imposed by the Environmental Fund (in euros)

Fines by violations	2019	2020	2021	2022	2023
Air protection Act	209 382	119 155	253 881	377 858	340 267
Water Act	459 971	338 276	723 582	871 337	656 954
Waste Act	366 782	239 802	552 582	526 851	696 661

Source: own processing based on the annual reports of the Environmental Fund

3.2 Subsidies and loans as positive economic stimuli

Another part of the analysis is dedicated to economic tools of the Environmental Fund, which can be considered as positive stimuli in relation to environmental protection. These tools represent the Environmental Fund support provided in the form of subsidies and loans focused on the above named areas, i.e. air, water and waste.

Environmental Fund is a provider of funds in the form of subsidies and loans to the applicants presenting the projects in compliance with the state environmental policy goals (Environmental Fund, 2022). The Fund publishes the area of its activities on annual basis including the activity specification, to which applications for support can be filed. Specification of the activity contains for example the group of subjects authorized to apply for contribution, definition of the activity being subject to provided support, requirements of the application and deadline for the application filing. Subsequently, the Fund shall perform check and evaluation of the filed applications and publish the list of applications together with the decision on subsidy provision. (Act No. 587/2004 Coll.)

Table 3 Subsidies provided by the Environmental Fund (in euros)

Subsidies provided on	2019	2020	2021	2022	2023
protection of air	3 329 899	2 989 000	3 136 948	1 423 656	944 150
protection and use of water	30 309 610	52 253 717	15 332 284	4 954 419	16 806 374
development of waste management	3 279 741	5 065 487	7 371 801	3 741 290	8 341 738

Source: own processing based on the annual reports of the Environmental Fund

Table 3 contains the provided subsidies to protection of air, protection and use of waters, and to development of waste management and circular economy. The table clearly indicates that the highest amount was granted to the support of projects focused on waters protection and use. Primarily, the projects dealing with water conduits infrastructure were supported, as well as the projects of wastewater purification plants building, and building of sewer systems, etc. Waste management represents another supported area. It is the only area with reported increase of the provided subsidies compared to the initial year (except year 2022).

Waste management is the area in which the Environment Fund receives the most applications for subsidies and provides the most. This is illustrated in the following figures.

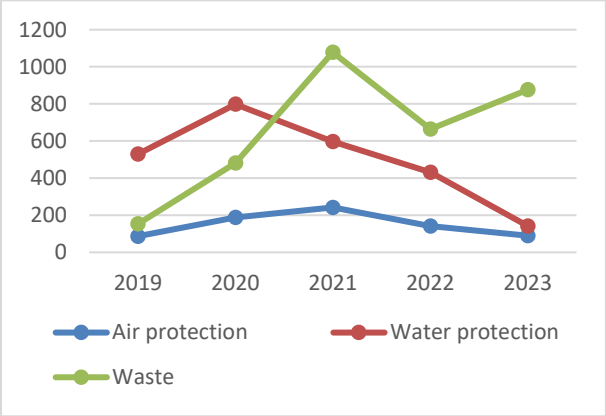

Figure 1 Required subsidy (in number)

Source: own processing

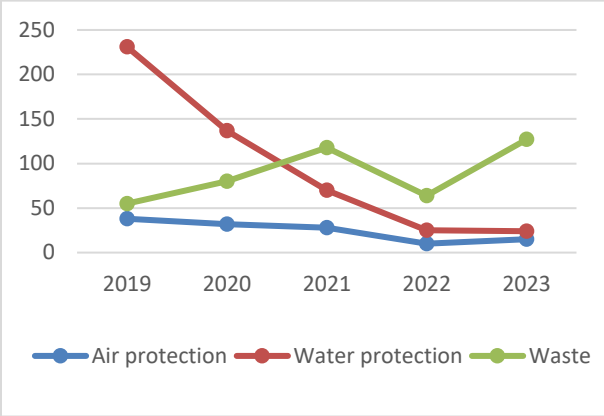

Figure 2 Provided subsidy (in number)

Source: own processing

The highest success rate in obtaining subsidies was in 2019 (water and air 43%, waste 36%). In the most recent year, 2023, the success rate was 17% for water and for air and 14% for waste.

Capital investments are mostly supported by loans in order to ensure environmental protection in compliance with the goals of environmental policy in the Slovak Republic on national, regional and local level. Loans provided from the Environmental Fund are due within three to twenty years and they are favorable thanks to low interest rate (0.1% p. a.). Further advantages include zero charges for loan provision, for premature installments or for loan monitoring. We should also highlight the fact that liabilities from such provided loan to municipalities or higher territorial wholes are not included in total debt of the municipalities or higher territorial wholes. (Environmental Fund, 2023)

Table 4 Loans provided by the Environmental Fund (in euros)

Loans provided on	2019	2020	2021	2022	2023
air protection	878 514	202 603	-	52 631	7 504 156
protection and use of water	-	173 333	-	353 391	10 079 806
development of waste management	-	-	-	17 049	1 444 852

Source: own processing based on the annual reports of the Environmental Fund

Table 4 contains loans provided for air and waters protection, and for waste management development. The table clearly indicates that the loans weren´t provided in each of the analyzed years. Most loans were provided for air protection during the monitored period. The highest amount of the loan was focused on waters protection and use in 2023. Waste management refers to the least supported area by loans.

Conclusion

Attention was paid to the characteristics of the public policy and its tools, focusing on the economic tools. Subsequently, the economic public policy tools were linked to the environmental policy where the tools with positive stimulus on environmental protection were defined on one hand, and the tools that should discourage from behavior adversely affecting the environment on the other hand.

Analysis of the economic tools of environmental policy was performed on basis of data obtained from the Environmental Fund. Speaking of the discouraging tools, development of selected charges for environmental pollution was monitored, as well as the development of sanctions levied by the Environmental Fund for breach of legislative regulations in the area of environment. Regarding the positive tools, attention was paid to provision of subsidies and loans from the funds of the Environmental Fund.

Through our analysis, we found that charges and fines are generally increasing, while support in the form of subsidies and loans is low. Although there is significant interest in subsidies (especially in waste management), only 15-17% are being funded. We assess this situation negatively, as subsidies help implement new ecological technologies.

Finally, we should mention that each economic tool fulfills an important function in environmental protection and helps influence the behavior and actions of various stakeholders towards improving environmental quality.

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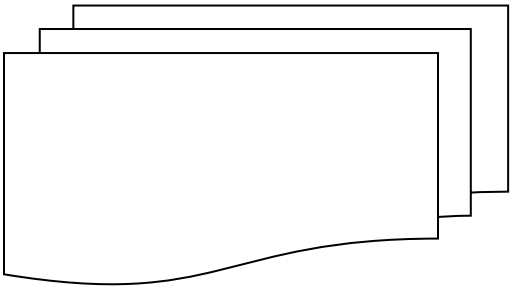

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