

Quarterly Bulletin of Statistics Estonia

What is the economic growth engine of Estonia?

In what kind of families are children born?

How does wealth affect consumption?

4/2018



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4/2018

STATISTICS ESTONIA

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EXPLANATION OF SYMBOLS

...	data not available or too uncertain for publication
..	category not applicable
x	data are confidential
M	males
F	females

The publication is based on Statistics Estonia's data, unless specified otherwise.

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FOREWORD

This is the last issue of the Quarterly Bulletin of Statistics Estonia. It will no longer be published. Time will tell whether this is a temporary interruption and the right decision. The decision is inevitable, as the number of subscribers and buyers of the publication is very small these days. Does this change mean that the population of Estonia is less interested in statistics? Hopefully, this is not the case. It is just the end of publishing statistics on paper and in a format suitable for paper, which inevitably had an impact on the speed of disseminating information.

In the book shops, one can see a striking volume of books written by witches, psychics, etc. Free people in a free country write and read what they wish. It is disconcerting, however, how little statistics are used in public debates in the society. Unfortunately, today the most convincing claims in the disputes are not based on statistics. The problem here does not arise from statistics. The source of the problems is the inability to raise well-defined concerns, the inability or even unwillingness to use statistics in a truthful way.

Certainly, the near future (and actually already the present) of statistics is e-statistics, and most likely the e-statistics will turn, for example, into m-statistics whatever it might mean. Currently, the task of official statistics is to use to the maximum extent the opportunities that electronic applications offer and minimise all the risks of e-statistics, such as loss of data in an electronic environment. We can be certain that discontinuing publishing the Quarterly Bulletin of Statistics Estonia is not the end of publishing official statistics and analyses.

The Quarterly Bulletin of Statistics Estonia has a history of nearly 100 years. The predecessor of the Quarterly Bulletin was the Monthly Bulletin of Estonian Statistics. Its first issue was published in 1922, nearly a half a year after the founding of the State Statistical Central Bureau. In the first issue of the Monthly Bulletin of Estonian Statistics, the head of the Statistical Central Bureau, Albert Pullerits wrote that economic and social phenomena are highly complex and the reasons for these phenomena are interconnected, so that without the use of statistical methods, it is impossible to say what is connected to what and how. Every developed country inevitably has to systematise the collection of statistical data and establish some type of general order for statistics.

In 1942, ten issues of the statistical bulletin were published and, in 1943, there were five issues. During both the Estonian and German reign several double issues were published. The Monthly Bulletins bound together in volumes were hefty, serving as statistical yearbooks. Before World War II, the Monthly Bulletins were in two languages: Estonian and French. During the German period, they were in Estonian and German. The titles of the bulletins in 1943 did not include "Monthly".

The German occupation was followed by the Soviet period. Statistical publications were also published during that time, but these should not be considered as successors of the publications of independent Estonia. Yes, statistics with its theoretical bases did not essentially differ, but certainly the principles of publishing statistical publications were different. A short justification to the claim is that the statistical publications of the Soviet time were for "internal use" and an institution Glavlit was functioning at the time. This is not to say that producing statistics during the Soviet times is not worth recalling, but it should rather be done in a different context.

After the restoration of independence, the Monthly Bulletin of Estonian Statistics was issued again in 1992. The Monthly Bulletin was published until the end of 2008 and was replaced in 2009 with the Quarterly Bulletin. Small changes were constantly made in the Monthly Bulletin, the transition to the Quarterly Bulletin did not bring about revolutionary changes; it was the continuation of what was started in the Monthly Bulletin. The biggest change was that instead of the previous 12 issues four issues were published starting in 2009. The main reason was the previously mentioned decrease in interest in such publications.

Looking at the Monthly and Quarterly Bulletins in a longer perspective, very different publications come into sight. In 1922, the main purpose of the Monthly Bulletin was the release of statistical data. The data was accompanied by explanations and overviews so that users of statistics would apply them correctly and understand processes. This approach was logical in every sense in 1922 as well as many decades later, as printing statistical data was almost the only option of data release. As the options of publishing data expanded with the development of computers and computer networks, it became clear that data in printed publications was not the only or the most reasonable solution, as it is not convenient to use printed data. Currently the place of first release of statistical data is the statistical database of Statistics Estonia, and the tables of official statistics are almost never published in print. The publications of Statistics Estonia are publications which primarily provide a statistical description and analysis of Estonian development.

Over time, the Monthly Bulletin and Quarterly Bulletin of Statistics Estonia have been compiled by many people. They surely had their dreams and ideas about how to move forward with the publication. What to say in conclusion? Of course, the compilers of the Quarterly Bulletin are a little sad about a long era coming to an end. However, life continues and official statistics will remain as well as stories – the overviews and analyses – written on the basis of statistics.

Albert Pullerits, the founder of official statistics in Estonia wrote that he saw the role of the State Statistical Central Bureau also in disseminating statistical knowledge, organising courses and conferences on statistics, making statistical materials available to the public, so that people would learn to use statistical data more and explain and analyse their activities with the help of statistics.

Admittedly, the methods of dissemination and popularisation of knowledge change over time, but the task as such is still topical, and one can be completely certain that Statistics Estonia will be successful in accomplishing this task.

Mihkel Servinski
Leading analyst

WHAT IS THE ECONOMIC GROWTH ENGINE OF ESTONIA?

Jaan Õmbus

Entrepreneurial activity plays a significant role in economic development – it is often a major driver of economic growth. Entrepreneurial activity facilitates the creation of new jobs and innovation and therefore it is important to study and identify the factors that generate and keep up entrepreneurial activity. The paper makes an attempt to identify the economic sectors which create the most value added and the determinants of the generation of value added.

Value added as an indicator of economic power

We often argue in Estonia whether our wealth is increasing and whether we are catching up with wealthier economies. The discussions often get stuck in emotions and only in a few single cases, some economic indicators have been used or attempts of in-depth analysis have been made. The most popular topic is economic growth, but this is only one of many indicators. Other possible indicators include export-import ratios, entrepreneurial activity, investment indicators, etc.

There is major concern for economic development and progress, but not too many multifaceted and in-depth approaches. Therefore, it is appropriate to analyse what would boost the Estonian economy and how rapidly is Estonia moving towards its development goals.

Entrepreneurial activity has a critical role

Entrepreneurial activity plays a significant role in economic development. Entrepreneurship directly creates value added, but it also involves other impacts. For example, commercialisation of new technologies and development ideas, as well as generation of a business-focused community is regarded as a contribution of entrepreneurship. Along with overall economic activity, this has a cumulative effect and speeds up overall economic welfare growth (Stel, Caree & Thurik, 2005).

There are different types of entrepreneurial activity because projects initiated by entrepreneurs as well as the way these projects are implemented are different. For example, some people may become entrepreneurs because they have no other alternative for earning income. They are therefore looking for such projects that might earn income for them. Such projects generally are not expected to create a lot of economic value. If entrepreneurship is taken up with the wish to realise a specific opportunity, there is a good business idea on the horizon and commitment to a high-productivity project (alternative to spontaneous behaviour to keep oneself alive), this has a considerable effect on the economy (Acs, 2006).

The bigger the company, the more likely its economic activity is systematic in project implementation rather than solving a socio-economic compulsion. If there is no other alternative and entrepreneurship is taken up, either a temporary or permanent small business is normally set up. At the same time, large enterprises and those which have been in the market longer produce considerable income for the maintenance of a large organisation and for the remuneration of employees. Therefore, it would be good also from the viewpoint of statistics to use enterprises with at least 20 employees in order to evaluate the contribution of entrepreneurship – with these enterprises there is a kind of guarantee that they have economic activity and also create value added.

The above does not mean that small businesses had a negative image or would not create value. Small businesses are important and necessary for society, but in certain cases, they may represent the only way out to improve the financial standing.

In most cases, entrepreneurial activity is the major driver of economic growth. It creates new jobs and innovation and therefore, it is important to study and identify the factors that generate and keep up entrepreneurial activity. It would help the decision-makers adopt adequate measures if they understood the main determinants of entrepreneurial activity (Rusu & Roman, 2017).

Since entrepreneurship is a major driver of economic growth, the factors that trigger economic growth have been analysed in this paper based on enterprises' economic indicators. The paper focuses on the economic sectors that generate the most value added and the determinants that affect the generation of value added. Value added is the key indicator as it is the most straightforward and comprehensive among the statistical indicators available in the context where value added in the process of economic activity should be measured.

Value added in this paper is discussed based on the methodology used in Statistics Estonia. According to this, value added is calculated using the following formula: turnover + other revenue (excl. profit from sale of fixed assets and revaluation, grants related to assets) – total expenses – other operating expenses (excl. loss from sale of fixed assets and revaluation) + labour expenses + depreciation + change in inventories of work in progress and finished products (inventories at the end of the reference year less inventories at the beginning of the reference year) + fixed assets produced for own use.

Entrepreneurs put knowledge to work

Above, some theoretical viewpoints on value creation in economy were pointed out, which are based on knowledge creation and use. The following analysis is based on the concept of value added. Value added statistics helps to describe the contribution to the creation of economic value and to evaluate its magnitude.

In recent decades, many economic research papers have focused on how knowledge and economic growth are related, and how entrepreneurship influences economic growth. It is increasingly better understood how entrepreneurship, innovation and knowledge are related. On the other hand, it should be admitted that the relationship between microeconomic and overall macroeconomic growth is not yet quite clear. To understand the micro- and macroeconomic relationships we need to know first that these levels are influenced by many factors. To completely understand the related economic dynamics, attention should be focused just on knowledge creation and diffusion, and commercialisation in enterprises. It should also be studied how all this affects economic growth. It is very important to understand this system also when working out the regulations concerning knowledge creation, ownership rights, barriers to entry, movement of labour and financial markets (Braunerhjelm, 2010).

An enterprise can create value in various ways. For example, it creates value by using knowledge or is required under competition pressure to constantly find ways to cut the expenses or make processes more effective. Looking at the two methods of value creation together, entrepreneurs' activities ensure that innovative knowledge is put into practice in the most effective way. In other words, from scientific-technical perspective, while the implementation of innovative knowledge might be too expensive in practice in terms of business efficiency of this knowledge, enterprises would be often able to implement the innovations profitably. Of course, it does not work always, but sometimes just entrepreneurship may yield good results. Entrepreneurship is a buffer that is expanding the representation of knowledge brought into practice (Amigues, Besson, Cirillo & Hochet, 2010).

Table 1 presents ten economic sectors that produce the biggest value added per enterprise (total value added in 2016 in euros). The dataset includes all enterprises, irrespective of the number of employees.

Table 1. Biggest value added per enterprise by sector (economic sectors according to EMTAK 2008^a)

	Value added, euros	Number of enterprises	Value added per enterprise, euros
Wireless telecommunications activities	226,315,200	13	17,408,862
Electric power generation, transmission and distribution	524,150,700	108	4,853,247
Rail transport	22,615,300	6	3,769,217
Manufacture of parts and accessories of motor vehicles	75,508,500	24	3,146,188
Manufacture of basic chemicals and fertilisers	43,102,100	17	2,535,418
Manufacture of electric motors, generators, transformers and control apparatus	118,899,500	49	2,426,520
Manufacture of wiring and wiring devices	25,987,500	14	1,856,250
Manufacture of paints and varnishes	36,407,500	20	1,820,375
Manufacture of dairy products	61,206,900	34	1,800,203
Manufacture of electronic components	50,782,900	31	1,638,158

Source: Statistics Estonia

Wireless telecommunications activities produced the biggest value added in Estonia in 2016 – over 17 million euros per enterprise annually. The second was electric power generation, transmission and distribution with nearly five million euros per enterprise, and in the third position was rail transport with slightly less than four million euros of value added. Large value added was produced also in the manufacture of parts and accessories of motor vehicles, manufacture of basic chemicals and fertilisers, manufacture of electric motors, wiring and wiring devices. Other sectors in the top ten by value added included manufacture of dairy products.

Table 2 represents ten economic sectors that produce the biggest value added (total value added in 2016 in euros). The sectors in the table are sorted by gross value added.

^a Based on the Estonian Classification of Economic Activities (EMTAK 2008), which is the Estonian version of the international harmonised NACE classification. EMTAK has a hierarchical structure and is divided into five levels. The first four levels conform to the NACE structure and the fifth level is the national level, taking into consideration the specific aspects of the Estonian economy and the relevant legislation. EMTAK 2008 is a good and objective basis for determining the activities and a reliable source for production of statistics. The classification enables international comparability on objective bases.

Table 2. Biggest value added by sector, 2016

	Value added, euros	Number of enterprises	Value added per enterprise, euros
Renting and operating of own or leased real estate	658,400,900	3,798	173,355
Support activities for transportation	527,130,600	1,350	390,467
Electric power generation, transmission and distribution	524,150,700	108	4,853,247
Other specialised wholesale	384,914,400	1,749	220,077
Construction of residential and non-residential buildings	355,499,000	3,380	105,177
Freight transport by road and removal services	312,532,800	3,027	103,248
Retail sale in non-specialised stores	307,040,700	854	359,532
Manufacture of products of wood, cork, straw and plaiting materials	303,052,300	693	437,305
Wireless telecommunications services	226,315,200	13	17,408,862
Wholesale of household goods	212,891,100	1,169	182,114

Source: Statistics Estonia

Rental and operating of own or leased real estate (nearly 4,000 enterprises) is producing the biggest value added at the national level. The national level here represents all economic sectors encompassing the whole economic space. The opposite is an approach focused on enterprises or economic sectors. Rental and operating of own or leased real estate produces value added for 658 million euros, which is 432 million euros more than wireless telecommunications services (value added is produced by a large number of enterprises and hence, value added per enterprise is not big). The latter was producing the biggest value added per enterprise (there were only 13 enterprises in wireless telecommunications services; hence value added per enterprise was big). At the national level, wireless telecommunications services is only ninth among economic sectors by value added production.

The second by value added production at the national level is support activities for transportation, maintenance of motor vehicles, cargo handling, food service activities for drivers, etc. Total value added production in the sector is 527 million euros, which is generated by 1,350 enterprises. Like renting and operating of own or leased real estate, support activities for transportation was not in top ten in terms of value added per enterprise. Support activities for transportation are important for value added production in the national economic space, but it is produced by many different enterprises.

Electric power generation, distribution and transmission ranks high in both of the above tables. It is the second by value added production per enterprise and third at the national level. Hence, enterprises in this economic sector produce substantial value added, which boosts the national economy.

Both tables contain wireless telecommunications services. Enterprises engaged in this activity produce the most value added although ranking ninth at the national level. There are no other economic sectors that are simultaneously in both tables because the value added production varies considerably, depending on whether analysed based on enterprises' value added productivity or based on total value added produced in the economic sector.

More successful in table 1 (value added per enterprise) are the economic sectors in which fewer enterprises are operating; however, ranking high in table 2 (value added by economic activity) are sectors with more enterprises. Exceptions are wireless telecommunications services and electric power generation, transmission and distribution. The trend is more general and therefore it is important to mention it.

When speaking about economic sectors that produce the biggest value added, it is important to pay attention to their historical economic activity. In 2009–2016, the biggest value added was produced by renting and operating of own or leased real estate and support activities for transportation. In 2011, 2015 and 2016, renting and operating of own or leased real estate ranked the first by value added and the support activities for transportation ranked the second. In 2009, 2010, 2012, 2013 and 2014, their positions reversed in the ranking by value added production. These economic sectors were the leading sectors in the Estonian economy in terms of value creation throughout the period.

In 2006–2008, the biggest value added was produced by construction of residential and non-residential buildings. It was a real estate and borrowing boom and this source of value added was not surprising in this context. Construction of residential and non-residential buildings has been a producer of substantial value added also in later years, but not in the leading position.

Is economic growth possible merely with substantial value added production?

One of the logical purposes of analysing the economic space and of understanding it better is to find ways to organise the economy better or to influence economic processes so that the overall standard of living would increase and therefore all those participating in the economy would be doing better.

In real life, a question most likely to arise is whether it is possible a) to set up only such enterprises that would produce as much value added as possible, or b) to stimulate economic development in sectors of highest value added activities. Would the economic policy measures manipulated in this way have any influence on the national socio-economic development?

In theory, by creating a large number of enterprises in wireless telecommunications services we could rapidly increase production of value added. Going deeper into the topic, it becomes clear that telecommunications services can be provided to other economic agents and it makes no sense to fill in the economic space with that service for no particular reason (without

the services being consumed). Obviously, the market is facing a ceiling in this area and if the services cannot be exported on a large scale, the artificial boosting of entrepreneurship cannot create much value added to the economy.

Likewise, it is not possible, considering the overall structural logic of the economic space, to boost electric power generation, transmission and distribution, and base all economic growth on such enterprises in order to generate substantial value added. Like telecommunications services, someone has to consume electricity and a local market is always limited. Unless we invent a kind of advantageous electricity production that would contribute substantially to foreign markets, it is not possible to expect a lot of value added and overall welfare growth by building our economy merely on electricity production.

The biggest value added producer at the national level is renting and operating of own or leased real estate. Neither is it possible to expect that value added could be generated merely by expanding this field of activity. Not all activities in the economic space (or most of them) can be renting of real estate. Someone should also rent it and do something else to pay the rent. Hence, an economic community cannot live on renting real estate to/from each other.

The analogy also applies to another activity producing big value added in the country – support services for transportation. In order to develop support activities for transportation, transportation should also increase rapidly because if the transportation volumes would not increase, commercial orders for support services for transportation cannot increase either. The support services for transportation cannot increase without an overall logistics boom.

Value added growth hits the wall

Value added growth is essential and should be welcomed, but it kind of hits the wall. On the one hand, the establishment of high value-added enterprises is limited because the market scope is still limited by providing specific products or services in a high value-added economic sector. A product or service gives value added when purchased.

On the other hand, value added production always depends on the business model. A high-margin business model is possible with a limited number of providers in a high value-added activity. If more providers come in, based on the overall economic dynamics, they would start pressing the profit margins down and the large value added is reduced to a small one. In other words, more enterprises in high value-added sectors would not help generate more value added in society.

In order to generate value added, attention should be focused just on knowledge creation and its diffusion, and commercialisation through entrepreneurs' activities. Innovation has an essential role to play in all of the above-named economic sectors, and most definitely in wireless telecommunications activities as well as in electricity generation. At the same time, innovation is definitely not excessive in real estate maintenance either – innovative solutions enable to find ways to more effective operation and through this directly to increasing value added.

Society creates values differently than businessmen

In order to identify the factors that ensure economic growth in Estonia and to evolve them, it is important to understand that society and businessmen create value added differently. An entrepreneur can increase value added created by him generally by increasing production output, while multiplication of output with economic-policy measures at the national level would not yield the same result. Hence, evaluation of economic development through value added is most straightforward and unequivocal, but this approach does not provide a solution to how society could get richer.

To achieve a deeper understanding of how to add value to the Estonian economy and what is the business dynamics of industries or individual enterprises that generate it, value added should be compared to other relevant economic indicators. Comprehensive analysis would enable to evaluate the gist of the growth engine of the Estonian economy and, inter alia, whether it can be influenced in a favourable direction for overall development. However, this is a topic of further analysis.

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IN WHAT KIND OF FAMILIES ARE CHILDREN BORN?

Kadri Raid, Alis Tammur

This article gives an overview of the results of the data mining^a project “In what kind of families are children born?” commissioned by the Ministry of Finance.

The whole of Europe, including Estonia, is facing demographic challenges – the population is ageing, the working-age population is decreasing and few children are born. One possibility to meet these challenges is to make Estonia a family-friendly country, where people are willing to have and raise children and age with dignity, securing that the Estonian population will become an increasing population.^b To achieve these goals, it is necessary to find out in what kind of families more children are born.

In order to do that, the concept of family needs to be defined. In Europe, a family has traditionally been described as a group of people united by marriage or filiation. Today, there are many types of family and the definition of family is vague. The traditional definition does not apply anymore. Therefore, family is no longer such an unambiguous concept.

One option is to use the definition used in official statistics, according to which, a family consists of persons living in the same household who are related as married or cohabiting partners (incl. same-sex couples) or as parent and child. Therefore, a family can comprise:

- a legally married couple or cohabiting couple without children (couple without children);
- a legally married couple or cohabiting couple with children (couple with children; children need not be had together);
- a single parent with child(ren).

It may not be possible to determine families solely on the basis of data, as the registered places of residence of family members may not coincide with where they actually live. Also the results of the 2016 pilot census of the register-based population and housing census showed that the formation of families using the place of residence data of households did not provide sufficiently accurate results. According to the data, the proportion of families with single parents was too high. Usually the analyses of reproductive behaviour focus on women; therefore, it was considered appropriate to approach the issue in the article from women's perspective. In the analysis, families are described according to the results of the partnership index, which is in development phase, and partnership records in birth documents.

Data and methodology

The following datasets were used to find an answer to the research question:

- data of the pilot census of the register-based population census and signs of partnership of the partnership index (REGREL);
- extract of the population register as at 1 January 2018;
- income data of the Tax and Customs Board for 2016 and 2017;
- data of births for 2016 and 2017.

REGREL data were used to compile a database of families, where the characteristics of families and both partners were added: sex, age, ethnic nationality, education, sources of subsistence, number of children, age of woman at birth of youngest child, living conditions, etc. The father of the youngest child was considered to be the woman's partner, as in this case, the relationship status was known and it was also known whether they had a housing loan together, owned real estate or if maintenance allowance was paid.

Based on the extract of the population register, a combined database of mothers and children was created, for which new variables were calculated: birth order and sex of children, age difference between children and mother's age at birth of child.

Based on the birth datasets, a combined database of mothers, fathers and children was created, which included information about the mother's age at birth of child, fertility rates, child's birth order, as well as ethnic nationality of both parents, child's place of residence, mother's marital status and relationship duration.

From the above-listed datasets, the data for 20–44-year-old women and their partners were used. In general, women aged 15–49 are considered to be in fertile age; however, there are few women under 20 or over 44 who give birth. In 2017, for instance, children born to women aged below 20 and to women aged 44 and over accounted for 2.1% and 0.3% of all children, respectively. The data were analysed using descriptive statistics and regression analysis.

^a Data mining service enables to look for answers to topical issues at society level, relying on national data mining capacity.

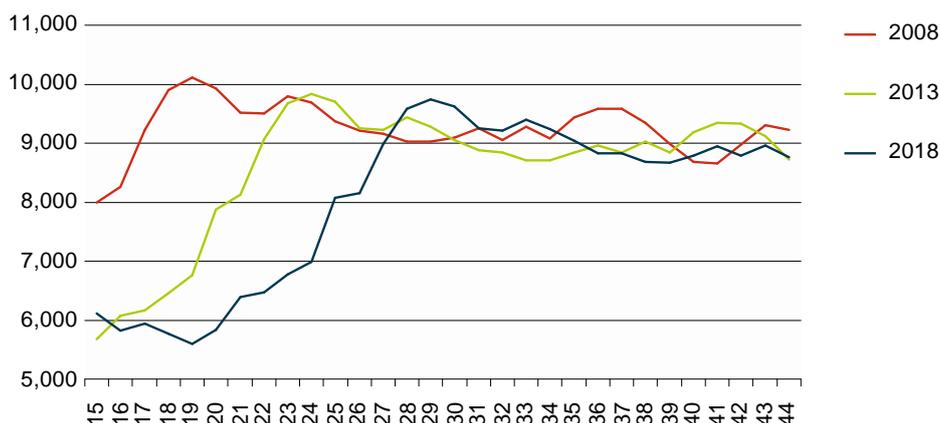
^b Development Plan for Children and Families for 2012–2020. https://www.sm.ee/sites/default/files/content-editors/Lapsed_ja_pered/laste_ja_perede_arengukava_2012_-_2020.pdf

Results

Overview of women of childbearing age

The number of children born in a year depends on the number of women of childbearing age and on the average number of children women have during their lives. The number of women of fertile age has decreased considerably over the past decade (Figure 1). In 2008, there were 277,000 women of fertile age in the population, while in 2013, there were 257,000, and in 2018, they numbered 241,000. Hence, the number of women of fertile age has decreased by 36,000 in a decade. The decrease occurs on account of younger age groups about to reach fertile age: in 2008, women aged 20–24 numbered 48,500, but ten years later, in 2018, their number is a third smaller – approximately 32,500. If the number of women of fertile age is low in the population, the probability that fewer children are born is high. To achieve the same number of births, there should be a sharp increase in the number of children per woman, so that a smaller number of women would have as many children as a third more women did earlier. This kind of a quick change does not usually happen.

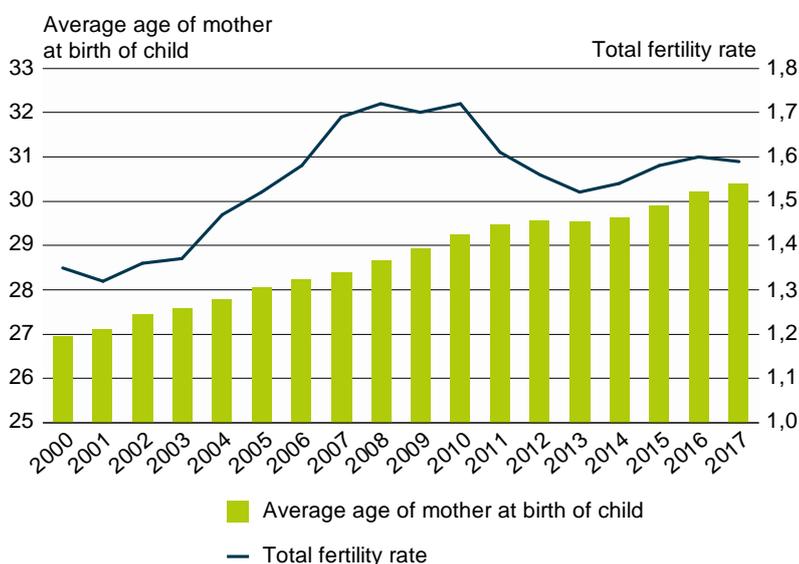
Figure 1. Number of women of fertile age, by age, 2008, 2013, 2018



Source: Statistics Estonia

The number of children born to women is usually characterised by the total fertility rate (TFR). The total fertility rate represents the average number of children per woman during her lifetime if the age-specific ratios of a given year were valid. This indicator has changed significantly over the past two decades. Until the beginning of the 2000s, the total fertility rate declined due to an increase in the age of women giving birth – births were postponed (Figure 2). However, from 2004 onwards, the fertility rate started to increase. Besides postponed childbirth, also economic growth and the introduction of the parental benefit contributed to the increase. The total fertility rate grew until 2007 from below 1.4 to 1.7. The fertility rate remained at this level in 2007–2010. At the time of economic uncertainty, the fertility rate decreased, but this happened a few years later, because the impact of decisions regarding fertility is not felt immediately. From 2013 onwards, the fertility rate started to increase again slowly, but not as fast as in the previous period of growth. By 2017, the total fertility rate had reached 1.6. During the reference period (2000–2017), also the average age of women at birth of child increased from 27 to 30. At the beginning of the past decade, it seemed that the increase in the average age of women who give birth had stabilised, but it is now evident that it continues to rise.

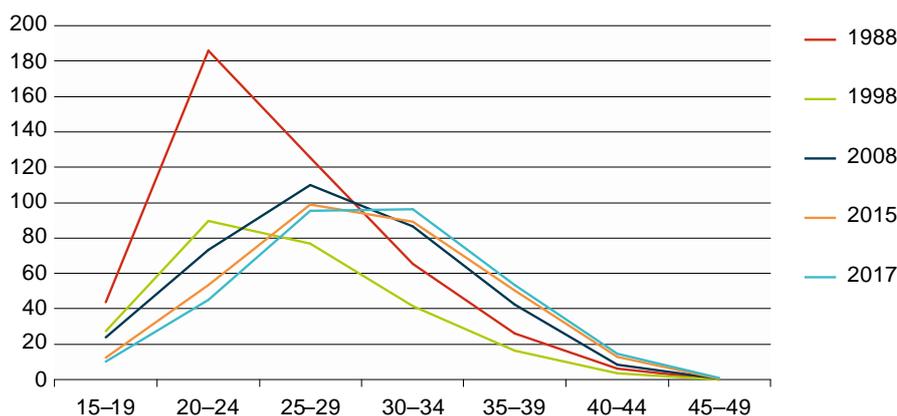
Figure 2. Total fertility rate and mother's average age at birth of child, 2000–2017



Source: Statistics Estonia

In order to detect changes in the active reproductive period, it is important to consider the age-specific fertility rate, i.e. the share of women who give birth in their respective age groups. Age-specific fertility rate shows the number of births per 1,000 women in the same age group (Figure 3). In 1988 and 1998, women aged 20–24 accounted for the largest number of births. In 2017, the most children were born to women aged 30–34, followed closely by women aged 25–29. The change occurred over the course of a year, in 2017. Besides the fact that having a child has been postponed until the older age group, the size of the multiplier's value by age is also important. In 2017, out of thousand women, 96 gave birth in the age group 30–34 and 95 in the age group 25–29. In 1988, the fertility rate was highest in the 20–24 age group – 186 out of thousand women, i.e. almost every fifth woman in the age group gave birth. In 2017, the active reproductive period was not clearly concentrated to a five year age group, but rather it was ten years (25–34). But this did not mean a higher number of births. In 1988, there were more births also among the next age group (25–29-year-olds) than in 2017 among 30–34-year-olds; the fertility rates were 126 and 96. As a result, fewer children are born compared to thirty years ago.

Figure 3. Age-specific fertility rate, 1988–2017



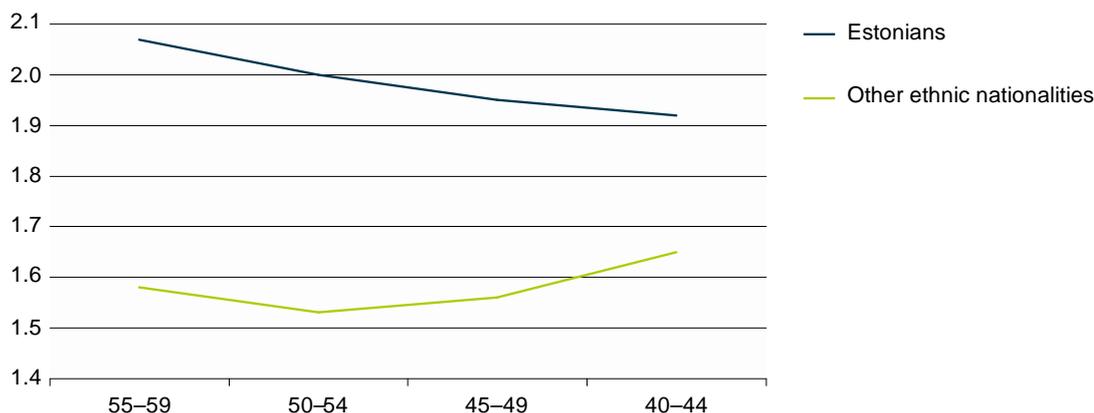
Source: Statistics Estonia

Estonia has reached an interesting and crucial demographic situation as a result of change in fertility rates. In the first few years of the 1990s, after the change in the regime, a large number of young people in family formation age returned from Estonia to Russia. Immediately after, the number of births began to decrease. The reason for this was not just the departure of immigrants of Soviet origin. As indicated above, the fertility rate also depends on the economic phase. In the 1990s, the economic downturn was accompanied by a change in the regime. It reduced the security of families, which in turn led to a reduction in the number of births. State benefits at child birth disappeared. Therefore, before planning a family, it was necessary to achieve material security, which caused an increase in the age of women at the birth of child. Today, the large cohort born in the 1980s is in childbearing age, and also the third smaller cohort of the 1990s is approaching their thirties. Therefore, if the reproductive behaviour was to stay the same, increasingly fewer children would be born in the coming years. Thus far, this has been prevented by the increasing total fertility rate: women aged 30 and over are giving birth to more children, compensating for the small number and increasingly postponed births by women in their 20s.

Impact of ethnic nationality on the number of children

In order to get an overview of the impact of ethnic nationality on the number of children, we look at the average number of children per woman at the end of their childbearing age (women aged 40–59 in five-year groups). The active childbearing age of women in the observed age groups occurred at the time of peak fertility rates in the 1980s, the period of low fertility rate in the 1990s, the period of increasing fertility rate in the 2000s, and the youngest can still have children. In Figure 4, it can be seen that on average, more children are born to Estonians than to women of other ethnic nationalities. Estonian women aged 55–59 have slightly more than two children per woman and women of other ethnic nationalities have 1.6 children per woman. Estonian women in the youngest age group (40–44) have 1.9 children per woman and women of other ethnic nationalities have 1.7 children per woman. Younger Estonians give birth to fewer children than those 10–15 years older, but it is the opposite in the case of other ethnicities – younger women give birth to more children than women in older age groups.

Figure 4. Number of children per woman by ethnic nationality, 2018

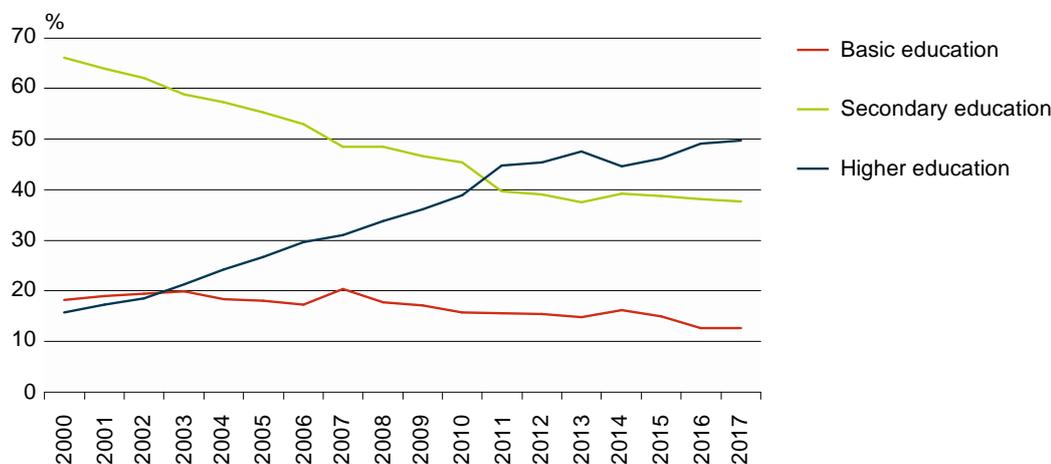


Source: Statistics Estonia

Impact of education on the number of children

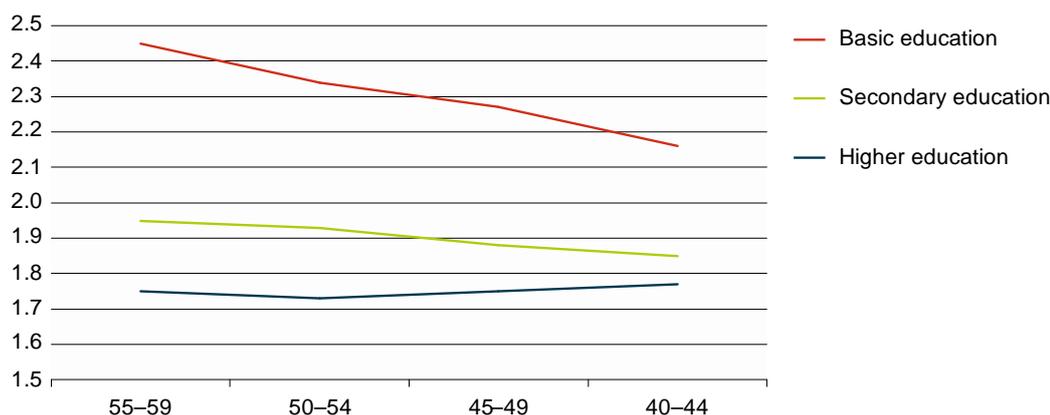
In 2017, of women aged 20–44 living in Estonia, 11% had basic or lower education, 43% had secondary education or vocational education based on secondary education and 46% higher education. Among women who had a child in the same year, 13% had basic education, 37% secondary education and 50% higher education. Women with higher education have been the most numerous group who give birth since 2011 (Figure 5). Their share increased significantly between 2000 and 2010 and has remained relatively stable. During the period considered, the share of women with secondary education and basic or lower education decreased. On the one hand, it can be explained by the increased popularity of higher education in Estonia. On the other hand, it is also important to note that women’s age at childbirth has risen – children are born after women have obtained education and achieved material security. The average age of women at childbirth also differs according to the level of education. In 2017, the average age at childbirth for women with basic education was 28 years, with secondary education 29 years and with higher education 32 years.

Figure 5. Women who had a child, by education, 2000–2017



Source: Statistics Estonia

The following will look at the impact of education on the number of children at the end of childbearing age (Figure 6). Women with lower level of education have more children at the end of their childbearing age. Although the number of children per woman has decreased, it exceeds the replacement level also in the youngest age group (40–44). Women with higher education aged 55–59 had an average of 0.7 children less than women with basic education. However, the number of children of women with higher education has not decreased but rather increased, and the respective age group (40–44 years old) has had just 0.4 children less than women with basic education. Thus, the gap in the average number of children per women with basic and higher education has declined by the end of childbearing age.

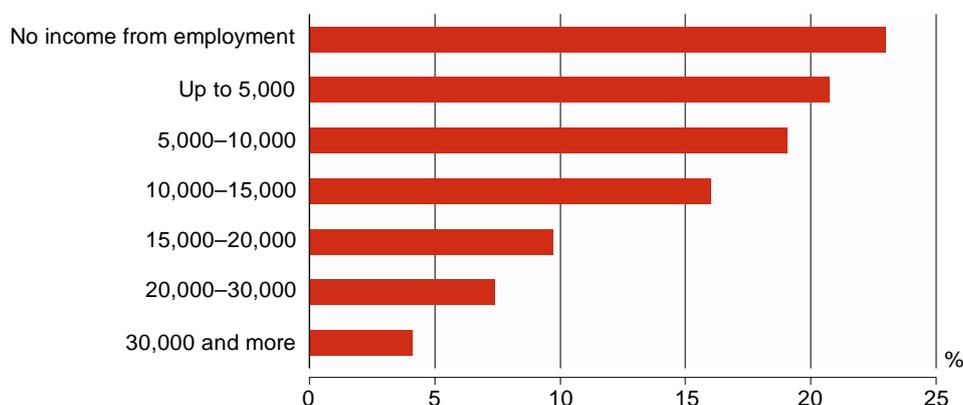
Figure 6. Number of children per woman, by education, 2018

Source: Statistics Estonia

Income of women who had a child

As the country's economic growth increases births, consequently, the family's economic situation also affects the fertility rate. The following gives an overview of the income from employment received a year earlier by women who had a child in 2017, in other words, during the period on the basis of which their parental benefit was calculated. 23% received no income from employment and 21% received income in the amount of the minimum wage (the minimum monthly wage was 430 euros, which is 5,160 euros a year if the person worked full-time for a minimum wage during the 12 months of the year) (Figure 7). It should be taken into account that it has not been considered for how many months people actually received income. Women who received income from employment might not have worked for the whole year: for example, they might have graduated from school and only entered the labour market, or were on parental leave with another child.

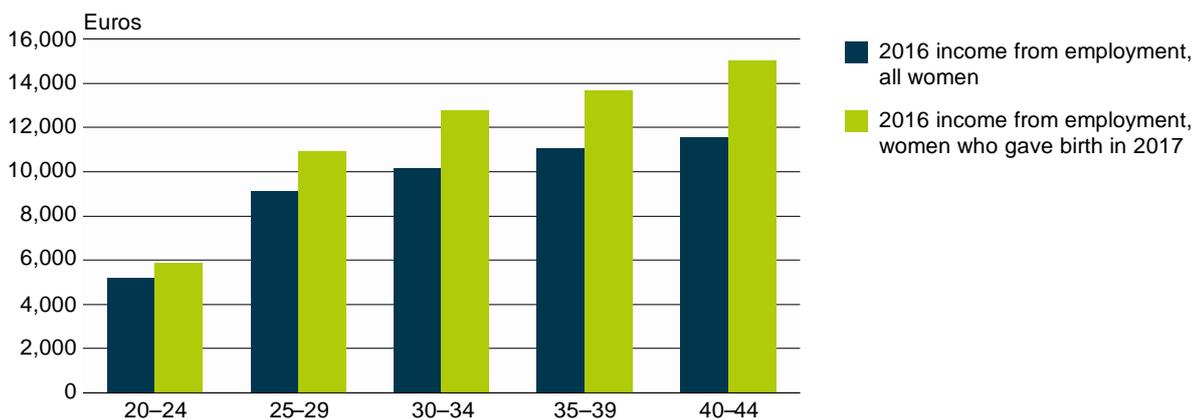
A 20–44-year-old woman earned an average of 10,200 euros per year and a woman who gave birth in 2017 earned 11,700 euros. A person earning average monthly wages (in 2016, the average monthly wages and salaries were 1,146 euros) should have earned nearly 14,000 euros in 2016. About a third of the women who gave birth and earned income from employment the previous year earned more than the average annual wages. A quarter of all women aged 20–44 received annual income exceeding 14,000 euros.

Figure 7. 2016 income from employment of women who gave birth in 2017

Source: Estonian Tax and Customs Board, Statistics Estonia

The incomes of women in older age groups were higher than those of women in younger age groups (Figure 8). Women who had a child had earned approximately average wages in the 35–39 age group and above average wages in the 40–44 age group. The share of women who had earned no income from employment was more or less stable at 22–24% in all age groups. A separate analysis of age groups revealed that more than half of the women who did not earn income from employment in 2016 and a third of those whose income from employment was below 5,000 euros had had a child in the previous three years, due to which they may not have worked in the meantime or had worked for a short period and/or part-time.

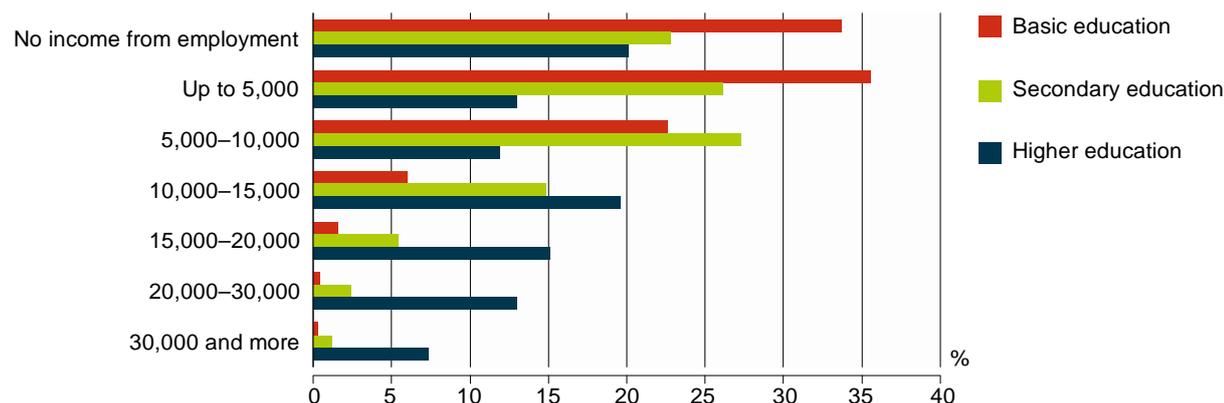
Figure 8. Average income from employment of women who had a child and all women, 2016



Source: Estonian Tax and Customs Board, Statistics Estonia

When looking at education and income from employment, it appears that women with higher education dominated among mothers with annual wages over 10,000 euros, and mothers with basic education most often had no income from employment (Figure 9). More than a third of mothers with basic education earned less than 5,000 euros per year, more than a quarter of mothers with secondary education earned 5,000–10,000 euros per year and more than a third of mothers with higher education earned over 15,000 euros per year.

Figure 9. Average income from employment of women who had a child, by education, 2017

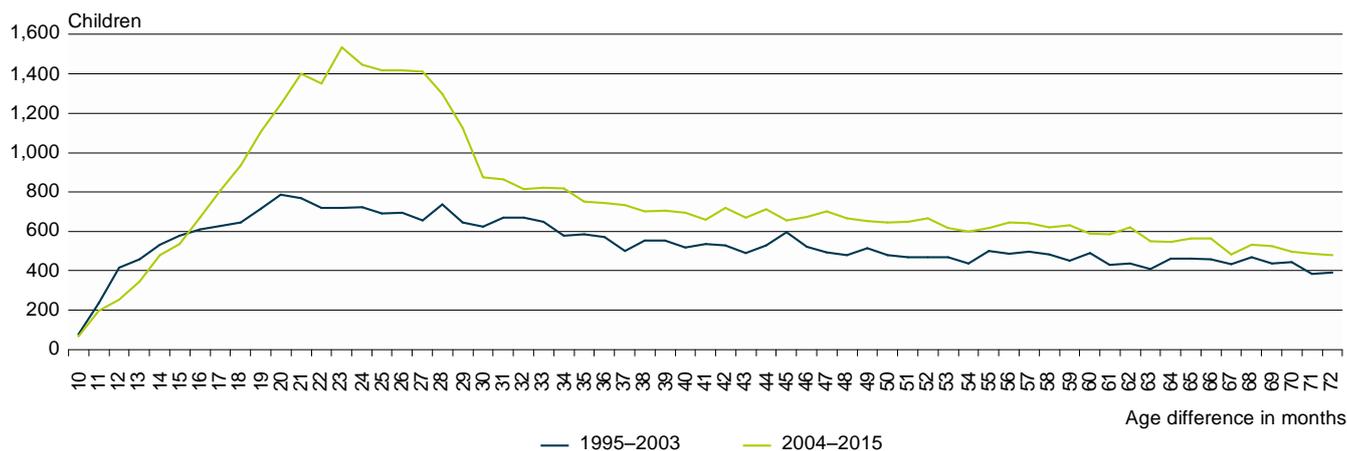


Source: Estonian Tax and Customs Board, Statistics Estonia

Impact of family policy on the age difference between children

In December 2003, the Parental Benefit Act was adopted in Estonia, which encourages consecutive births of children. If the next child is born within two and a half years from the birth of the previous child, the parental benefit is calculated on the basis of earlier income if it exceeds the current income. This has a major impact on planning the next child. Figure 10 shows the age difference of children in months before and after the adoption of the Parental Benefit Act. Before the adoption of the act, the age differences in months were not as distinct. After the adoption of the Parental Benefit Act, the birth of the next child is often planned before the younger child is two and half years old. Thus, when the family already has a small child, the birth of the next child is often planned to take place before the child is 30 months old.

Figure 10. Age difference between children before and after the adoption of the Parental Benefit Act, 1995–2003 and 2004–2015

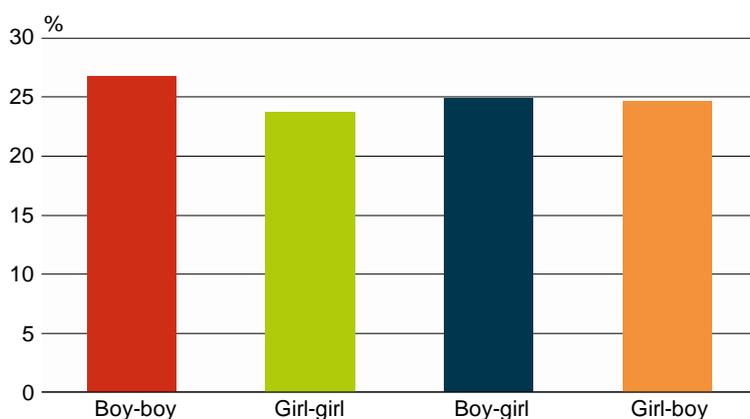


Source: Statistics Estonia

The impact of child sex on family planning

If there are already two children in the family, the decision to have another child or children may be affected by the sex of the first two children. Previous studies have indicated that a couple is more likely to have a third child if the first two children are of the same sex.^a In order to get an overview of whether this pattern could apply in Estonia, we observe women whose year of birth is 1965 or later and whose first two children are either boy-boy, girl-girl, boy-girl and girl-boy (Figure 11). As slightly more boys are born, there are more families with two boys and the share of families with two girls is on average smaller. 49.5% of women have their first two children of different sex.

Figure 11. Families with at least two children by sex of first two children, 01.01.2018

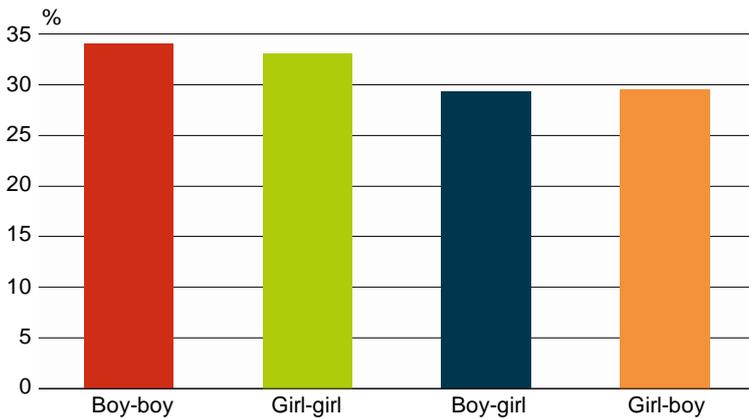


Source: Statistics Estonia

Next, we will look at how likely it is that families with four different combinations of children will have at least one more child. It appeared that families with two children of the same sex are more likely to have a third child compared to families where there are children of different sexes. In families with a son and a daughter, a third child is born in approximately 29.4% of cases (Figure 12). In families with two daughters, a third child is born in 33.1% of cases, and the highest probability for a third child is in families with two sons – 34%. On the basis of mere statistics, it cannot be claimed that parents of children of the same sex have had another child because they desired to have one of the opposite sex. It may be just a desire to have a third child, irrespective of the desired sex of the child. The probability of having a boy or a girl is quite balanced. The likelihood of having a boy is higher only by 1–2% (106 boys per 100 girls). The probability of having a child of different sex decreases slightly if there are already three children of the same sex, but it still exceeds 45%, which is essentially not a substantial decrease. Therefore, the chances of having a boy or a girl are still more or less equal.

^a <http://www.ingender.com/Gender-info/Odds-of-having-another-boy-or-girl.aspx>

Figure 12. Share of mothers who had a third child by sex of the first two children, 01.01.2018

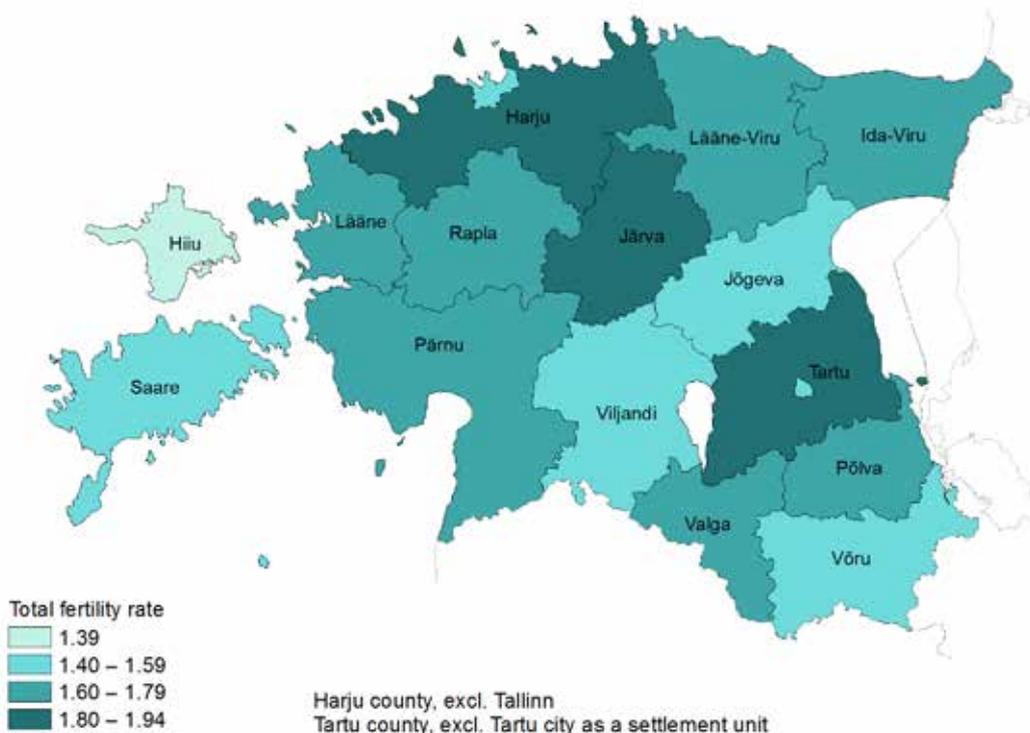


Source: Statistics Estonia

Regional differences in fertility rate

The fertility rate in Estonia differs also by region, and a regional comparison of birth rates gives an overview of this. In the case of Harju and Tartu counties, the settlement units of Tallinn and Tartu have been considered separately from the counties. In 2017, the fertility rate in Estonia was 1.59. Among counties, the fertility rate was highest in Järva county (1.94) and lowest in Hiiu county (1.49). The fertility rate was quite high also in Harju and Tartu counties – respectively 1.88 and 1.86. Fertility rates in the cities of Tartu and Tallinn, however, are considerably lower than the rates for counties – 1.43 in Tallinn and 1.55 in Tartu. This shows that families where children are born tend to live outside city borders. The general trend among young families is to settle in new residential areas around bigger cities. Real estate there is cheaper, providing more room for children to grow and play. Jobs are close by in the city and there are more options to choose a kindergarten or school for children. Some families also decide to move further away from the city centre and settle in rural regions.

Map 1. Fertility rates by county (after administrative reform of October 2017), 2017



Source: Statistics Estonia

Factors favouring and inhibiting having children

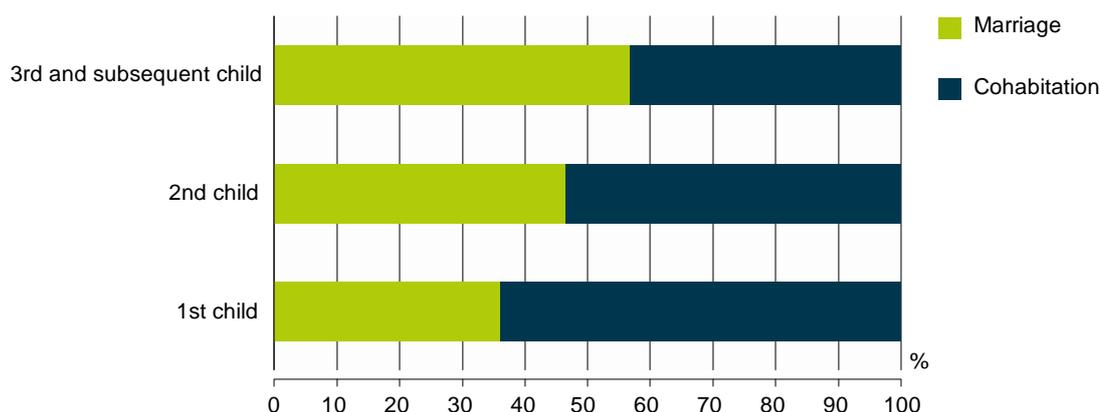
In addition to the above, logistical regression analysis was conducted to look at factors that promote and inhibit the likelihood of having a child. Women in active childbearing age (20–44) living in Estonia on 01.01.2016 were included in the model. There were a total of 218,000 such women and 12% of them had a child in the next two years. The results of the regression analysis show that the probability of having a child in the following two years is increased by the following factors: marriage,

an existing housing loan and ownership of real estate. This shows that feelings of stability and security contribute to having a child. Also divorce increases the probability of having a child in the following two years. An explanation is that after divorce, a child is born from a relationship with a new partner. It was also confirmed that the probability increases also when the youngest child in the family is under two and a half years old. The probability of having another child is decreased by the greater age of the previous child – the older the youngest child, the lower the probability of the birth of another. The probability of having another child also decreases with the woman's age.

Children are born into families with two parents

The most important prerequisite for having a child is couple relationship: more than 90% of children are born to couples in a relationship. More children are born to cohabiting than to married couples. This has been the case in Estonia since 2004. In 2017, 53% of children were born to cohabiting couples and 41% to married couples (6% were born to single parents). Nearly two thirds of first children are born to cohabiting couples (Figure 13). Second children are born almost equally to married and cohabiting couples. Third and subsequent children are born somewhat more to married couples.

Figure 13. Birth order of child and parents' type of union, 2017

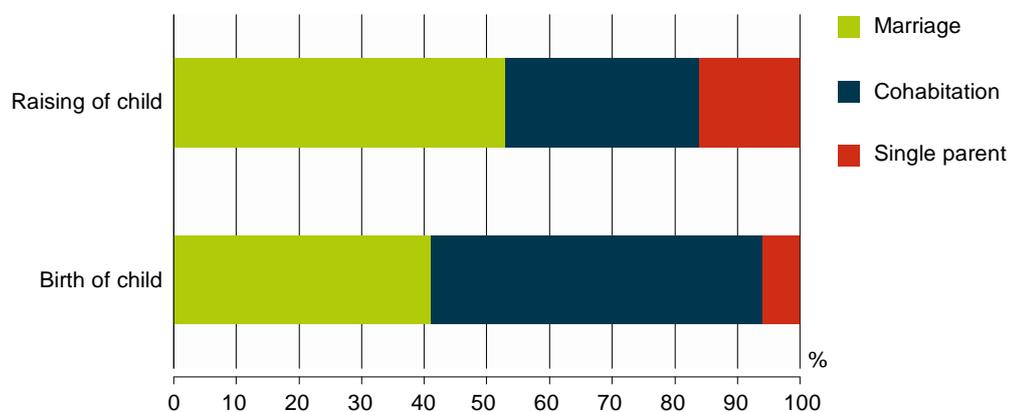


Source: Statistics Estonia

Nearly a third of couples getting married today have children together, which shows that the place of marriage in life has changed (Raid, 2018). Earlier, couples got married and only then started to plan a family, but nowadays marriages more often occur after the birth of a child. Cohabiting couples may not have decided before the birth of their child about the type of union they prefer. At the same time, having a child together may make them think more about marriage.

Although more children are born to cohabiting couples, children are raised more often in families of married parents (Figure 14). In Estonia, 53% of minor children are raised by married parents, 31% by cohabiting couples and 16% by single parents. Compared to other European Union countries, Estonian families with children are characterised by a smaller share of families based on marriage and larger share of families based on cohabitation.

Figure 14. Family types where children are born and where they are raised, 2017^a



Source: Statistics Estonia, Eurostat

^a Eurostat data have been used for family types where children are raised; in Estonia, the data are collected with the Estonian Social Survey (ESS).

Summary and conclusions

As a result of changes in the society, fertility throughout Europe (incl. Estonia) has become an increasingly topical issue: the population is ageing, the number of working-age people is decreasing and fewer children are born. To ensure that the Estonian population shall become an increasing population, Estonia should become a family-friendly country where people are willing to have and raise children. To achieve this goal, the current situation needs to be established. This article provided an overview of the kind of families into which children are born.

Currently, there are still large cohorts of women in active childbearing age, but there are considerably fewer women in the cohorts that have reached and are about to reach fertile age. In the last couple of decades, also the age at which women are having children as well as the active childbearing age have increased. It is, therefore, particularly important to support families' desire to have children, because if the fertility behaviour does not become more positive, there will be fewer women in the future who could give birth, and consequently, fewer children will be born. In general, more children are born by ethnic Estonians, and women with higher education number highest among women giving birth. While the fertility rate for women with basic education continues to be somewhat higher at the end of their childbearing age than for women with higher education, it can be claimed that the gap has narrowed. As regards income from employment of women who had a child, it is expectedly lower in younger age groups and higher in older age groups. The impact of family policy on planning children was notable – after the introduction of the parental benefit, which encourages consecutive births, the birth of the next child is more often planned to take place before the youngest in the family is two and a half years old. It was also found that families where the first two children are of the same sex are somewhat more likely to have a third child.

The fertility rate in Estonia differs by region, and based on regional differences it can be said that more children are born in Järva, Tartu and Harju counties. Families with children also tend to live further away from large cities (Tallinn and Tartu), in new residential areas or elsewhere in rural areas, where there is more room.

Children are born into families with two parents. First children are more often born to cohabiting couples but raised in families of married parents. This means that some couples get married after they have children together. Another prerequisite for birth of a child is a certain degree of financial stability.

The main findings can be summed up as follows: children are born more often into families where there already is a young child, where parents are married or in a cohabiting union, are financially secure and live outside bigger cities.

Contributors to the data mining project "In what kind of families are children born?" include Alis Tammur, Ene-Margit Tiit, Helle Visk, Kadri Raid, Kaja Sõstra and Toomas Kirt.

Sources

Raid, K. (2018). Family formation – from traditional model to multiplicity of choices. *Quarterly Bulletin of Statistics Estonia* 3/2018. Tallinn: Statistics Estonia.

HOW DOES WEALTH AFFECT CONSUMPTION?

Märt Leesment

Quite often, money is used as the measure of wealth. Consumer demand has a direct impact on supply, i.e. the activity of entrepreneurs. Thus, it is good to understand the correlation between consumption and economic development, whether and how wealth affects the consumption of goods and services and how the consumption pattern is related to both the economic development of countries as well as the wealth of their households.

Introduction

The purpose of the article is to explore the correlation between consumption pattern and economic development. Feldman et al (2016) defines economic development as the expansion of capacities that contribute to the advancement of society through the realisation of individuals', firms', and communities' potential. The end purpose of economic development is to increase (economic) prosperity and improve the quality of life (ibid). Increasing cult of consumption has led to a situation, where consumption has become one of the most important indicators of wealth.

Magrabi et al (1991) describe theories concerning the relation between wealth and consumption.

- The greater the consumption, the greater the wealth.
- Comparison of actual consumption level with a standard: the lower it is from the standard, the lower the wealth.
- Comparison of household's current and former consumption: if the level increases, the household perceives greater wealth and vice versa; in this case the absolute value is not as significant.
- Wealth also depends on consumption structure, e.g. the ratio of essential products (compulsory expenditures) vs luxury goods: the greater the opportunity to consume luxury goods, the greater the wealth.

The article focuses on the consumption structure approach, i.e. it observes possible differences in the composition of expenditure of wealthier and poorer European countries (and Estonian households), and the extent of consumption of products and services in economically more advanced countries.

Seale et al (2003) studied a similar issue and compiled an extensive international review, involving data from 114 countries. They concluded that the share of expenditure on food decreased as the wealth of a country increased, and this varied a lot, ranging from 73% (in Tanzania) to 10% (in USA). As the wealth of a country increased, the share of expenditure on clothing and footwear decreased. The share of expenditure on education was rather higher in wealthier countries, but it depended to a great extent on the particular country's education system and its quality. The share of expenditure on housing, energy, household goods, health, transportation, communication and other goods generally increased in line with the income. The share of expenditure on health was less than 4% in poorer countries and 10% in wealthier countries. The share of expenditure on recreation (as luxury goods or service) increased along with the growth in income.

The impact of income on the composition of household's expenditure may vary by different economic models. Among other things, this may be affected by openness of the economy, urbanisation and demographic characteristics of population (Chai, 2018).

Whether or not there have been changes in the patterns over time can be seen from the data on the consumption pattern in Estonia and in Europe collected in the course of the Household Budget Survey, as well as the data from the survey of the Estonian workers budget in 1925 (Riigi Statistika Keskbüroo, 1926) carried out before World War II.

Composition of expenditure vs wealth

Overall composition of expenditure of households in Estonia and the European Union

Table 1 shows the composition of expenditure of households in EU countries in 2015. There are no data available for several countries, and thus, the EU average is not published. It can be noticed that there are rather significant differences by countries, arising from traditions, cultural background, climate, but also other factors. Presumably, one of the most significant aspects is wealth of the country or households. Undoubtedly, income has an impact on expenditure: the wealthier the household, the more it can spend. However, how does that affect the composition of expenditure? The following section will provide a more detailed analysis of the expenditure, paying attention to the correlation of wealth and the share of a particular category of expenditure in household's total expenditure.

Table 1. Composition of expenditure of households in the European Union, 2015^a

	Food and non-alcoholic beverages	Alcoholic beverages and tobacco	Clothing and footwear	Housing, water, electricity	Furnishings, household equipment	Health	Transport	Communication	Recreation and culture	Education	Restaurants and hotels	Miscellaneous goods and services
Luxembourg	8.7	1.3	5.3	34.9	6.3	2.4	14.1	2.5	6.9	0.8	8.3	8.5
Ireland	11.5	2.3	4.3	31.7	3.8	2.3	12.9	3.8	8.3	2.3	6.4	10.5
Austria	11.8	2.3	4.9	26.1	7	3.8	14.2	1.5	11.5	1.1	6.9	9
Netherlands	10.6	2.9	4.5	30.4	5.1	1.3	12.5	3.2	8.4	1.3	5.7	14
Sweden	11.7	1.8	4.3	32.1	5.6	2.1	13.7	3.2	14.3	0.2	3.7	6.5
Germany	11.5	1.6	4.7	33	4.8	4	13.4	2.6	10.2	0.8	5.1	8.3
Belgium	12.9	2	4.5	28.7	5.8	4.6	13	3	8.2	0.5	6.3	10.6
Finland	12	2.2	3	31.5	4.3	3.4	15.5	2.6	9.2	0.1	5	11.3
Italy	17.9	1.8	4.7	35.4	4.2	4.6	10.7	2.5	5.1	0.6	4.9	7.5
Malta	19.8	2.3	7.9	8.4	7.4	5.6	14.2	4.3	8	2.8	8.3	10.8
Spain	15	1.9	5.1	31.8	4.2	3.5	11.5	2.9	5.8	1.4	9.3	7.5
Czech Republic	21.1	3.1	5.3	22.3	6.3	2.7	11	4.4	9.9	0.6	5.9	7.2
Cyprus	15.3	1.6	5.8	25.5	5.2	5.2	12	4.1	4.4	4.5	8.9	7.5
Slovenia	14.5	1.8	5.7	26.4	4.2	2.1	17.6	4.8	7.2	0.9	4.8	10.1
Slovakia	19.5	2.7	4.7	31.6	4.7	2.8	10.8	4.8	6	0.7	4.6	7.2
Estonia	23.6	3.7	5.4	16.8	6.7	4.3	13.1	4.7	10.9	1.3	4.2	5.3
Lithuania	24.4	3.1	5.4	33.4	4.2	5.2	8.1	3.3	5	0.6	2.8	4.5
Greece	18.8	3.5	4.9	28	3.9	6.4	9.7	3.5	4	2.8	8.8	5.7
Hungary	19.9	2.7	3.4	37	3.2	4.1	9.1	5.8	5.3	0.7	2.9	5.9
Poland	21.1	2.2	4.8	34	4.4	4.6	7.7	4.4	5.9	0.9	3.6	6.4
Latvia	24	3	5.5	23.7	4.3	5.8	11.9	4	7.1	1.2	4.4	5.2
Croatia	24	2.7	5.5	31.8	3.7	2.4	10.6	4.5	4.8	0.9	2.2	7
Romania	30.2	6.1	4.5	35.4	3.3	3.8	4.9	4	3.1	0.3	1.1	3.2
Bulgaria	26.6	4.2	3.5	33.2	3.6	5	6.8	4.2	4.2	0.5	4.3	3.9

^a Countries with available data, arranged in descending order based on the value of GDP per capita (%)

Source: Eurostat

For households in Estonia, the most important category of expenditure in 2016 (data of 2016 is already available for Estonia) consisted in food and non-alcoholic beverages, which constituted on average 23.4% of the total expenditure. The next category was expenditure on housing with 16.4%. These two categories represent compulsory expenditure, i.e. they are unavoidable for the household. Considerable expenditures were also transport (12.2%) and recreation (10%).

The following offers a brief glimpse into the results of the first household budget survey. It appears that the consumption pattern in 2016 significantly differs from the pattern observed 91 years ago. The first analogous survey of Estonian workers budget (Riigi Statistika Keskbüroo, 1926) carried out in Estonia in 1925 studied the socioeconomic situation of worker households in Tallinn and Narva. In 1925, worker households in Tallinn spent 58.5% of the total expenditure on "nutrition". The survey sample for Narva was remarkably more limited and the data of the two cities were not aggregated, thus only the indicators for Tallinn have been included. Significant share of expenditure included clothing (15.7%), apartment rent (7.5%), and heating and lighting (5.8%).

The organisers of the survey concluded that such results indicated an extremely limited lifestyle. However, the results gained in post-world-war Estonia were not exceptional. The surveys carried out in several foreign countries in the early 20th century also showed a great share of expenditure on food. The compilers of the survey on the Estonian workers budget in 1925 concluded that the greater the total amount of household's expenditure (or the amount of income) and the smaller the number of household members, the lower the percentage of expenditure on satisfying physical needs, i.e.:

- the poorer the household, the greater the share of expenditure on food in total expenditure (Engel's law);
- the wealthier the household on average, the greater the expenditure on apartment or dwelling, but the smaller the average share of these expenditures (back then it was referred to as Schwabe's law);
- the wealthier the household, the larger the share of expenditure on clothing.

Thus, households with low income had very little left over to spend on other categories of expenditure, i.e. they had very limited opportunities for satisfying social and intellectual needs.

Based on the data of Estonia and other EU countries, the article will now explore the impact of wealth on the consumption pattern today, and whether the patterns occurring in the beginning of the previous century still apply.

Expenditure on food and non-alcoholic beverages

Food and non-alcoholic beverages are essential for life and they constitute one of the categories of expenditure with the greatest significance: indicator ranged from 8.7% in Luxembourg to 30.2% in Romania. This category of expenditure has the strongest correlation with wealth. However, the correlation is negative, i.e. the more the GDP per capita exceeds the EU average, the lower the share of expenditure on food and non-alcoholic beverages (Pearson's correlation coefficient is -0.76). Negative correlation is even stronger with regards to expenditure per household (according to purchasing power standard): the correlation coefficient is -0.89 .

The share of expenditure on food in households with different level of wealth both in Estonia and in comparison with the rest of Europe has been discussed in the 3rd issue of the Quarterly Bulletin (Leesment, 2018).

Considering the essential nature of food products (and non-alcoholic beverages), the following will focus on the situation within that category. In European countries, the expenditure on meat products accounted for one fifth to one quarter of the total expenditure on food and non-alcoholic beverages. A significant portion of expenditure on food consisted in expenditure on bread and cereal products and milk, cheese and eggs.

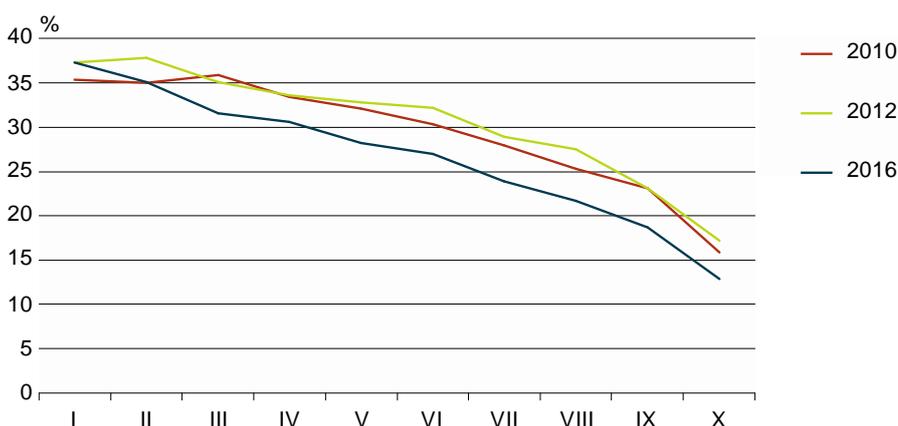
Which food products are consumed relatively more and relatively less in less wealthy countries and households? Both the country's GDP value and average expenditure per household had the strongest correlation with the share of expenditure on "soft drinks" or mineral water, other non-alcoholic beverages and juices. Pearson's correlation coefficients were 0.59 and 0.7, respectively. Thus, the poorer the country, the less money is spent on soft drinks, because it is logical that under financial distress, people would primarily cut expenses on food products that have low nutritional value. Statistically significant positive correlation (albeit only with the level of expenditure of households) occurred with regard to the consumption of fruits. Negative (moderate) correlation between GDP and the level of expenditure of households occurred in the case of milk, cheese and eggs, as well as oils and fats. Statistically stronger correlation was also present between the level of expenditure of households and the share of expenditure on meat products.

There was no difference in the situation of Estonia and the rest of Europe. Similarly to other European countries, meat products were the largest product group in the total expenditure on food in Estonia, accounting for 19% of the total expenditure on food and non-alcoholic beverages in 2016. Expenditure on milk, cheese, eggs and cereal products combined constituted 15% of the expenditure on food.

The correlation between the share of consumption of various more detailed food groups and wealth of households has also been observed for Estonia. For Estonian data, two methods have been used for determining the wealth: a) correlation coefficient calculated based on the income decile according to the equivalised household income (data for 2016), using individual data; b) graphic representation of the expenditure per household member by expenditure decile in 2010, 2012 and 2016, data from public database. It should be noted that the lower the decile, the smaller the income or expenditure.

Pearson's correlation coefficient was -0.21 between the share of expenditure on food and non-alcoholic beverages and equivalised income decile, meaning that as the wealth increases, the share of expenditure on food tends to decrease. Figure 1 presents the share of expenditure by deciles in 2010, 2012 and 2016.

Figure 1. Share of expenditure on food and non-alcoholic beverages per household member by expenditure deciles in Estonia, 2010, 2012 and 2016



Source: Statistics Estonia

There were weak correlations between income levels and the share of different product groups. They were still statistically significant in case of the share of cereal products; meat products; milk, cheese and eggs; fruit; non-alcoholic beverages, but the correlation coefficients were small. As for other food products (such as sauces and condiments, ready-to-eat foods, baby food), the highest correlation was 0.12; it was almost as high (0.11) for fruits. The strongest correlation in the case of oils and fats was -0.16 . Although it can be said that in the case of increased wealth, the consumption of fruit is more likely to increase than the consumption of oils and fats, there is no reason to claim that the composition of expenditure on food of poorer households differs significantly from that of the wealthier households. Naturally, we must take into account that the need for nutrients is pretty much the same and does not depend on wealth. However, the sources of nutrients may vary remarkably

within a group of food products (in terms of price). For example, meat products can stand for both cooked sausage and filet mignon, fish may mean Baltic herring or salmon.

Alcoholic beverages, tobacco and narcotics

Unlike the previous category of expenditure, alcohol, tobacco and narcotics are not essential for life. Furthermore, life should be even better and healthier without consuming such products (although such statement may be contested by addicts.) The share of the said expenditure was the smallest in Luxembourg (1.3%) and the greatest in Romania (6.1%). Similarly to the category of food and non-alcoholic beverages, the correlation was negative between wealth and the share of expenditure on alcoholic beverages, tobacco and narcotics, albeit a little less prominent: correlation with GDP was -0.52 and with the level of expenditure of household -0.72 . In the case of this category of expenditure, one must consider that due to negative social attitude, the expenditure on alcoholic beverages, tobacco and narcotics is often undisclosed, and thus relevant data can be underestimated.

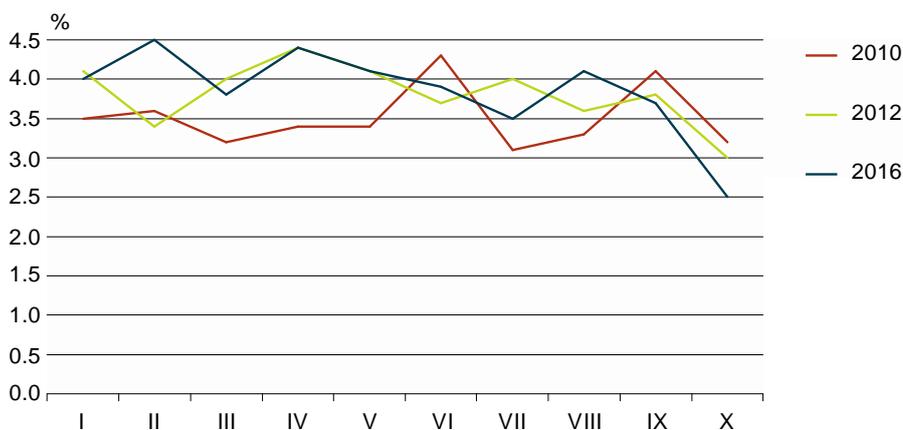
This category of expenditure essentially includes only expenditure on alcoholic beverages and tobacco, because the expenditure on narcotics was insignificant in 2015 (according to the households responding to the survey). As for other countries, the Netherlands had a clearly higher indicator (0.3% of total expenditure).

Looking into the situation in this category reveals rather great differences between countries. There are countries, where relatively more is spent on tobacco (more than two thirds of the expenditure in this category) and relatively less (less than one third) on alcoholic beverages (e.g., Bulgaria, Cyprus, Romania, Greece). However, there are also countries where relatively less (one third) is spent on tobacco and relatively more (two thirds) on alcoholic beverages (e.g., Lithuania, Finland, Luxembourg, Belgium, Sweden and Estonia). As for alcoholic beverages in particular, the share of expenditure was highest in the Baltic countries (especially in Lithuania). The share of expenditure on wine was the greatest in Belgium and relatively more was spent on beer in Slovenia.

Previously it was established that the share of expenditure depends on the wealth of a particular country as well as the wealth of its households. Is there a wealth-specific difference between the share of expenditure on alcoholic beverages, tobacco and narcotics on the national level? It is impossible to see an absolutely clear trend when exploring the share of expenditure on alcoholic beverages, tobacco and narcotics in this category in different countries by income quintiles. Nevertheless, it can be said that the share will more likely decrease as the wealth of households increases. Clear exceptions were Bulgaria and Romania, where higher level of income also meant greater share of expenditure on alcoholic beverages, tobacco and narcotics. Thus, Bulgarians and Romanians with lower income were forced to significantly limit their expenditure on stimulants. The trend was rather negative also in Latvia. In wealthier countries, there occurred a clear trend that a higher income level meant a lower share of expenditure on alcoholic beverages and tobacco (and narcotics).

In 2016, the average expenditure on alcoholic beverages and tobacco per household member in Estonia accounted for 3.6% of the total expenditure, the majority of it on alcohol. Pearson's correlation coefficient was -0.1 between the expenditure on alcoholic beverages and tobacco and equivalised income decile, i.e. despite the decrease in the share of expenditure on alcoholic beverages and tobacco in the case of increased wealth, the correlation is too weak to make certain conclusions. The share of expenditure by deciles in 2010, 2012 and 2016 is shown in Figure 2. It is apparent that although the households in the last decile have significantly smaller share of expenditure than in the one before last, there is no clear trend between the lower deciles.

Figure 2. Share of expenditure on alcoholic beverages and tobacco per household member by expenditure deciles in Estonia, 2010, 2012 and 2016



Source: Statistics Estonia

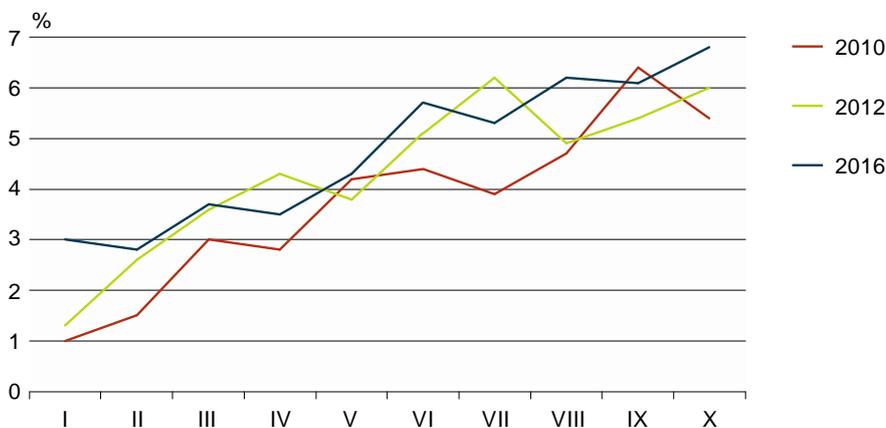
Clothing and footwear

There was no correlation between the share of expenditure on clothing and footwear and the wealth of a particular country and its households, i.e. expenditure on clothing is more likely affected by other factors. The share of such expenditure in total expenditure was smallest in Finland (3%) and greatest in Malta (7.9%), i.e. there is no clear climate-specific connection either (based on a simple assumption that people living in colder areas need to wear more clothes). In all countries concerned, more than a half of the expenditure in this group is spent on clothing: the most in Finland, Sweden and Luxembourg, the least in Romania, which in turn had the highest expenditure on footwear.

There was no correlation between wealth and the share of expenditure on clothing and footwear in different countries. However, at country level, it was observed that the share of expenditure on clothing and footwear increased along with the increase in income levels. Poorer households are forced to limit their expenditure on clothing and footwear relatively more than their average expenditure.

In 2016, the average expenditure on clothing and footwear per household member in Estonia was 5.3% of the total expenditure. Pearson's correlation coefficient was 0.06 between the expenditure on this product group and equivalised income decile, i.e. the correlation is statistically significant but weak. However, when looking at the average share of expenditure by expenditure deciles, it is clear that the higher the expenditure decile, the greatest the share of expenditure on clothing and footwear in the total expenditure (Figure 3).

Figure 3. Share of expenditure on clothing and footwear per household member by expenditure deciles in Estonia, 2010, 2012 and 2016



Source: Statistics Estonia

Housing, water, electricity, gas and other fuels^a

Housing, water, electricity gas and other fuels is the highest expenditure category for households in the European Union: in 2015, their share in total budget ranged from 8.4% in Malta to 37% in Hungary.

There was no direct correlation between the wealth of countries (expressed by expenditure of households and GDP) and the share of a particular category of expenditure. Presumably, this depends greatly on the share of people who own their dwelling and those who rent it.

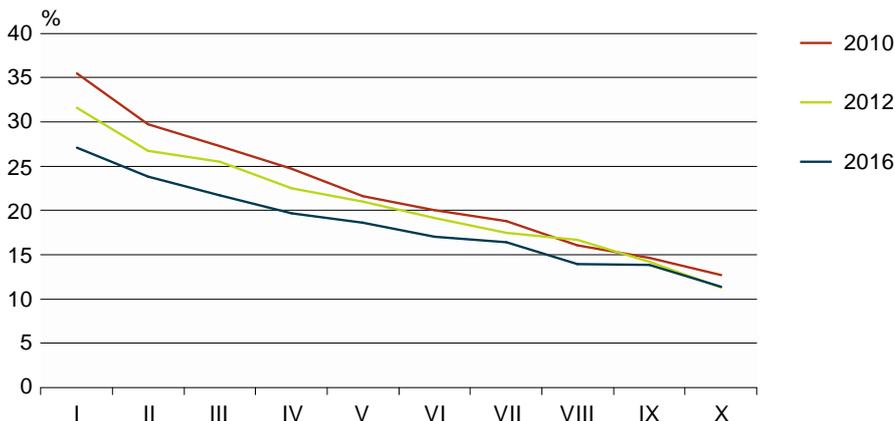
In the countries concerned, approximately a half of the expenditure on housing, water, electricity, gas and other fuels was spent on rental expenditure. Rather a considerable amount of housing-related expenditure was spent on electricity and heating. However, the significance of energy consumption varies by countries: the share was the greatest in the Czech Republic, great in Estonia and other Baltic countries, but insignificant in several Western and Southern European countries. It can be assumed that climate has considerable impact on the significance of that category of expenditure.

In general, it can be concluded that the wealthier the quintile of household, the smaller the share of housing, water, electricity, gas and other fuels in the household total expenditure.

In 2016, the average expenditure on housing per household member in Estonia was 16.4% of the total expenditure. The correlation coefficient was -0.17 between the share of the said category of expenditure and the equivalised income decile of household, i.e. on average, the share decreases as the wealth increases. Figure 4 shows a clear correlation in 2010, 2012 and 2016.

^a Includes rental expenditure; housing maintenance and repair costs; water supply and miscellaneous housing-related services; electricity, gas and other fuels (such as coal, firewood, etc.).

Figure 4. Share of expenditure on housing per household member by expenditure deciles in Estonia, 2010, 2012 and 2016



Source: Statistics Estonia

Furnishings, household equipment and routine household maintenance^a

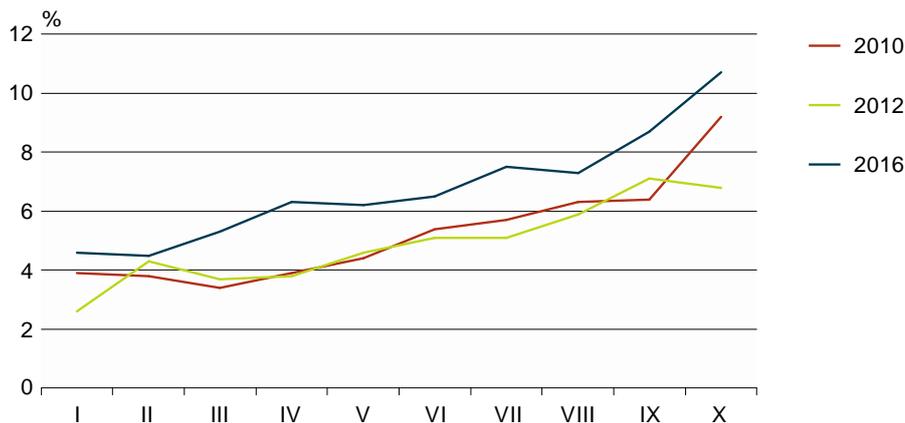
Although the share of expenditure on furnishings, household equipment and routine household maintenance tends to be greater in wealthier countries, the correlation between the indicators is statistically insignificant (at 0.05). The share was smallest in Hungary (3.2%) and greatest in Malta (7.4%).

Main articles of expenditure on furnishings, household equipment and routine household maintenance include furniture and furnishings, the share of expenditure of which was greatest in Austria and Luxembourg, smallest in Romania, Hungary and Greece. Other significant articles were non-durable household goods (for example various cleaning and care products): the proportion was greatest in Romania and Hungary, smallest in Germany and Luxembourg. Considerable amounts were also spent on large appliances (relatively the most in Slovakia and relatively the least in Italy, the Netherlands and Romania).

Although there is no clear correlation between the wealth of countries and the share of expenditure, it is possible to argue that the higher the income quintile of a particular household, the greater the share of the household's expenditure on furnishings, household equipment and routine household maintenance.

In 2016, the average expenditure on household equipment per household member in Estonia was 7.6% of the total expenditure, and it was more than in previous years. The correlation coefficient was 0.16 between the share of expenditure on household equipment and the equivalised income decile. Expenditure on household equipment and routine household maintenance of a wealthier household accounted for a greater share in total expenditure, which was also the case in previous years (Figure 5).

Figure 5. Share of expenditure on household equipment and routine household maintenance per household member by expenditure deciles in Estonia, 2010, 2012 and 2016



Source: Statistics Estonia

^a Contains such categories as furniture and furnishings, carpets and other floor coverings; household textiles; household appliances; glassware, tableware and household utensils; tools and equipment for house and garden; goods and services for routine household maintenance.

Health^a

There was a statistically significant, but not strong negative correlation between the share of expenditure on health and GDP. Out of the countries concerned, the share of expenditure on health in total household expenditure was smallest in the Netherlands (1.3%) and greatest in Greece (6.4%).

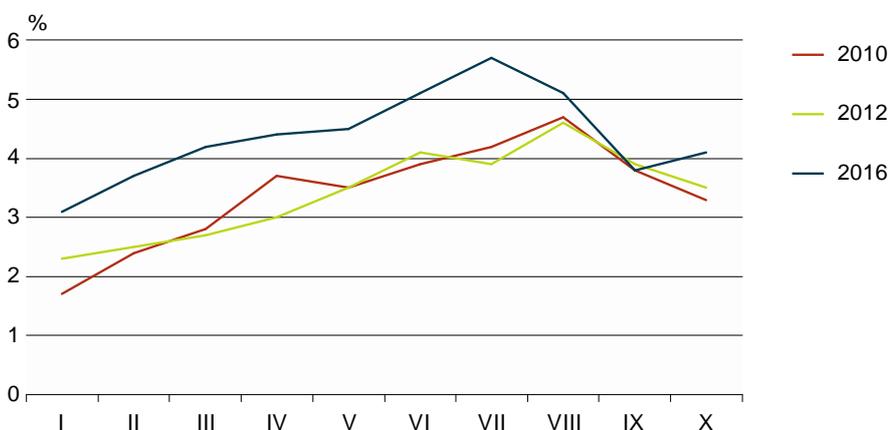
When comparing the expenditure on health in different countries, attention should be paid to the fact that they depend greatly on the healthcare system, which may vary by countries. For example, there is a difference in the nature and extent of services and pharmaceutical products compensated by the state. However, the data indicate that the expenditure on health constitutes a proportionally greater share of the total household budget in less wealthy countries. The need to take care of health is universal, irrespective of whether the household is wealthy or poor.

A remarkable share of expenditure on health was spent on pharmaceutical products, amounting to as much as three quarters of the total expenditure on health in some countries. The share of such expenditure was greatest in Slovakia, Bulgaria and Lithuania. There is a clearly outlined trend that the greater the average wealth of a household, the smaller the share of expenditure on pharmaceutical products. The share of expenditure on medical services on the other hand, shows the opposite direction. A relatively large share of expenditure on health is spent on dental services. However, this indicator varies a lot by countries, i.e. it indicates whether dental care is compensated and to what extent.

There was no general one-way pattern found between the level of income and the share of expenditure on health among the countries concerned. The share in income quintiles remained mostly stable, meaning that in the case of increase in wealth, the expenditure on health increased at a relatively similar pace as all other expenditure. However, there were countries where that curve decreased, such as the Baltic countries and Bulgaria, but there were also countries with an upward curve, such as Germany and Ireland.

The expenditure on health constituted on average 4.4% of the total expenditure per household member in Estonia in 2016. The correlation coefficient was -0.1 between the share of expenditure on health and the equivalised income decile of household. Figure 6 shows a clearly positive correlation up to the seventh and eighth expenditure decile, but becomes negative in wealthier households. This may be caused by the fact that the highest deciles include people at their best working age, whose expenditure on pharmaceutical products (as well as other healthcare products and services) is relatively low.

Figure 6. Share of expenditure on health per household member by expenditure deciles in Estonia, 2010, 2012 and 2016



Source: Statistics Estonia

Transport^b

There was a moderate positive correlation between the share of expenditure on transport and the wealth of a particular country and its households, i.e. the wealthier the country, the greater the share of expenditure. The share of expenditure ranged from 4.9% in Romania to 17.6% in Slovenia. When comparing the countries, one must keep in mind that the expenditure on transport depends greatly on the size and population density of the country, but also on the advancement and system of public transport (such as free public transport).

Fuels constitute the greatest item of expenditure in the transport category. The share of expenditure on fuels and lubricants for transport equipment was smallest in Luxembourg, Finland and Belgium, and greatest in Romania, Lithuania and Bulgaria. The main category of expenditure was purchase of passenger cars, but it varied a lot: e.g., more than a half of the expenditure on transport was used for purchase of passenger cars in Luxembourg and only 6% in Romania and Bulgaria. Romania and Bulgaria, on the other hand, had the greatest share of expenditure on transport services.

The correlation between expenditure on transport and income level unambiguously points out that the wealthier the household, the greater the share of expenditure on transport. Wealthier households acquire more expensive vehicles, and

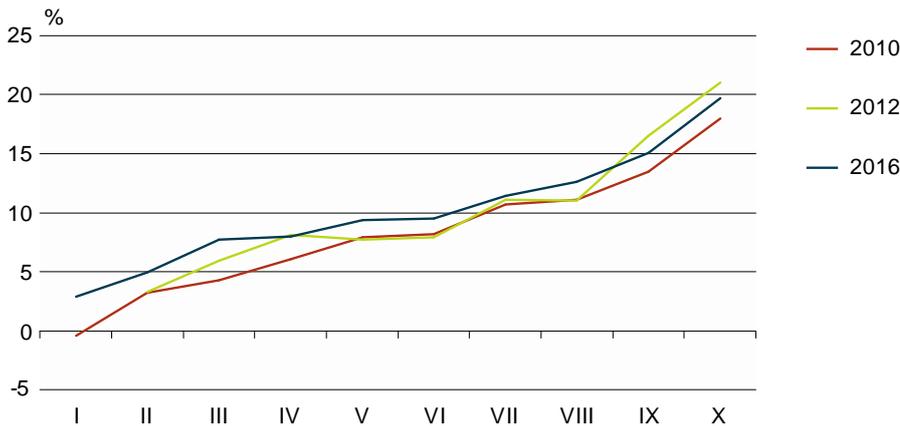
^a Includes medical products, appliances and equipment (e.g. pharmaceutical products, vitamins); out-patient services; hospital services.

^b Includes purchase of passenger cars; spare parts, maintenance and repairs of transport equipment; fuels and lubricants; services related to personal transport equipment (e.g. parking spaces, garages, road tolls, driving lessons and driver's licence); carriage of passengers and other transport services.

they often have more than one vehicle per household. Many poor people cannot afford to purchase a vehicle at all (in that case the expenditure is made on public transport). More expensive vehicle often requires more costly service. It also appears that in wealthier countries, the difference between the average share of expenditure on transport in the case of households in the highest and lowest income quintile is less prominent than in poorer countries.

In 2016, the average expenditure on transport per household member in Estonia was 12.2% of the total expenditure. The correlation coefficient was 0.08 between the household's equivalised income decile and expenditure on transport. Figure 7 indicates that the correlation is stronger in the case of the lowest and highest expenditure deciles. As for Estonia, a significant difference in the share of expenditure on transport is seen between rural and urban population: in 2016, the average expenditure on transport was 14.4% for rural population and 11.4% for urban population, while urban population spent a little less on public transport than rural population.

Figure 7. Share of expenditure on transport per household member by expenditure deciles in Estonia, 2010, 2012 and 2016



Source: Statistics Estonia

Communication^a

The wealthier the country or its households, the smaller the share of expenditure on communications in total expenditure. The share of expenditure on communications did not differ much by country: the indicator ranged from 1.5% and 5.8%.

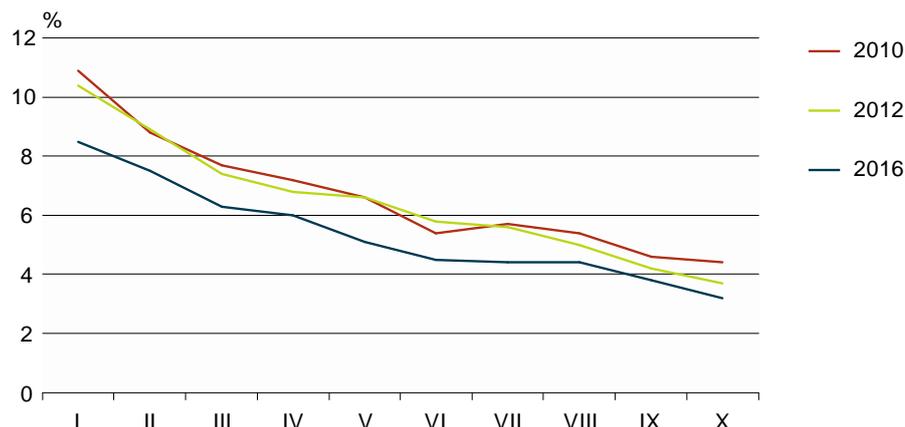
The majority of expenditure in the countries concerned was spent on services; purchase of devices for communication services was rather insignificant and the share of expenditure on postal services was even less significant.

The comparison of national average values indicated a negative correlation between wealth and the expenditure on communications per household, but when considering income levels of households, there were no clear patterns in the share of expenditure on communications among the European countries concerned. Nevertheless, it was noticeable that in most countries the share of expenditure on communications was remarkably smaller in the case of households in the fourth income quintile compared to households in the fifth quintile. Possible reasons include the fact that the population in the fifth quintile, or the wealthier population generally use communication packages in a similar price class. Such packages probably satisfy the needs of wealthier people as well. Although wealthier people most likely buy somewhat more expensive phones, it is unlikely that they do that noticeably more often than their fellow citizens with lower income.

In 2016, the share of expenditure on communications per household member in Estonia was 4.7% of the total expenditure. Although Figure 8 indicates that the share of expenditure on communications decreased as the wealth increased, the correlation between the share and the equivalised income decile was statistically significant based on the data of 2016. Thus, the economic situation has not forced Estonian households with a lower income to limit their expenditure on communications to a significant extent, i.e. the expenditure on communications did not differ remarkably by the level of wealth of a household in terms of absolute values.

^a Includes postal services; telephone equipment and services, internet services.

Figure 8. Share of expenditure on communication per household member by expenditure deciles in Estonia, 2010, 2012 and 2016



Source: Statistics Estonia

Recreation and culture^a

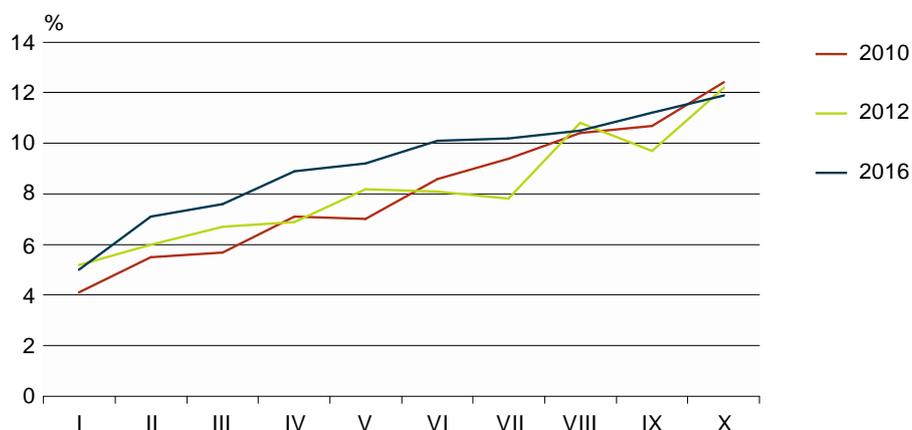
There were positive correlation coefficients between the share of expenditure on recreation and culture and countries' GDP and expenditure level of households, but they were still weak and had no statistical significance at the level of 0.05. However, one has to consider that the result was noticeably affected by the indicator of Luxembourg (very high GDP, but average share of expenditure). After excluding the indicator of Luxembourg, the correlation between GDP and share of expenditure becomes moderately strong and statistically significant. In 2015, the share of expenditure on recreation and culture in household's average total expenditure in the countries concerned was smallest in Romania (3.1%) and greatest in Sweden (14.3%).

The main item of expenditure in the recreation and culture category was package travel, on which Bulgarians, Austrians and Swedes spent more than one third of the total expenditure on recreation and culture. Thus, travelling is not the domain of only rich countries. Other important items of expenditure besides miscellaneous goods included culture, recreation and sports services.

In general, the wealthier the households (or the higher the income quintile), the greater their expenditure (share in total expenditure) on recreation and culture. It is logical, because for households under financial distress, recreation and culture is one of the first categories to save on.

In 2016, the average expenditure on recreation per household member in Estonia was 10% of the total expenditure. Compared to other categories of expenditure, the correlation between the equivalised household income decile and expenditure on recreation was slightly stronger, reaching 0.22, but still remaining weak. This correlation is supported by the graph in Figure 9.

Figure 9. Share of expenditure on recreation per household member by expenditure deciles in Estonia, 2010, 2012 and 2016



Source: Statistics Estonia

^a Includes audio-visual, photography and information processing equipment (e.g., radios, stereos, TV-sets, cameras, binoculars, personal computers, software, storage devices); other major durables for recreation and culture (caravans, trailers, water and aircraft, horses, large gaming and sports equipment, games and hobby goods, sports equipment, hiking equipment); musical instruments; garden supplies, plants and flowers; pets and pet supplies; attendance and participation in recreational and sports events or using of recreational and sports services; culture services; games of chance; newspapers, books and stationery; package holidays.

Education

European countries had no statistically significant correlation between the wealth of a particular country and the share of expenditure on education. The share of expenditure on education in the total expenditure remained generally marginal both in Estonia (only 1% in 2016) and in other European countries, and thus this topic is not analysed in detail. The share of expenditure on education depends rather more on the education system of a particular country than the wealth of its residents. For example, many countries provide free formal education, but there might be differences in obtaining higher education.

Restaurants and hotels

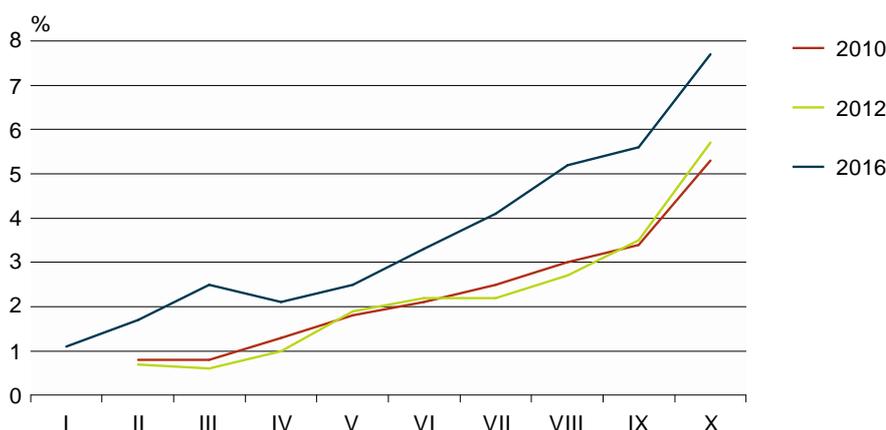
The share of expenditure on restaurants and hotels, or eating out and accommodation has moderate (and positive) correlation with the GDP of a particular country and a slightly stronger correlation with the average household income, ranging from 1.1% in Romania to 9.3% in Spain. In case of the expenditure in this category, other aspects to consider besides the wealth of the country include regional and cultural differences. For example, some Mediterranean countries (Spain, Cyprus, Greece, and Malta) have a high ranking. Eastern European countries stand out with the lowest indicators.

The majority of expenditure on restaurants and hotels concerns food service. The share of expenditure on accommodation is less than one third, with the Netherlands and Finland having the highest indicator.

It can be confidently stated that the higher the income quintile of the household, the greater its expenditure on eating out and accommodation. For example, in Estonia, the share of expenditure was 6.1% for households in the highest quintile and 1.1% for households in the lowest quintile.

Average expenditure on restaurants and hotels per household member in Estonia accounted for 4.5% of the total expenditure. Of the categories of expenditure, the correlation between the household equivalised income decile and the share of expenditure was strongest, with the correlation coefficient at 0.29. The share of expenditure on eating out and accommodation increases in line with wealth, which is also shown in Figure 10.

Figure 10. Share of expenditure on restaurants and hotels per household member by expenditure deciles in Estonia, 2010, 2012 and 2016



Source: Statistics Estonia

Miscellaneous goods and services^a

The expenditure on miscellaneous goods and services is in moderate correlation with the GDP level and in a slightly stronger positive correlation with the average household income. Thus, the wealthier the household, the more money they have left over for other expenditure. The expenditure on miscellaneous goods and services varies quite a lot depending on the household budget: the share of the indicator was smallest in Romania (3.2%) and greatest in the Netherlands (14%).

Personal care and insurance are more significant items of expenditure in this category. As for personal care, the greatest expenditure was made on personal care products, e.g. in Romania, Bulgaria and Lithuania, they constituted the majority of the expenditure in this category. The expenditure on insurance varied quite a lot by country; the Netherlands stood out with the greatest share, but great shares were also found in Slovenia and Slovakia. In these three countries, the main expenditure was incurred on health related insurance, but on average, the most significant type of insurance in the countries concerned was insurance connected with transport.

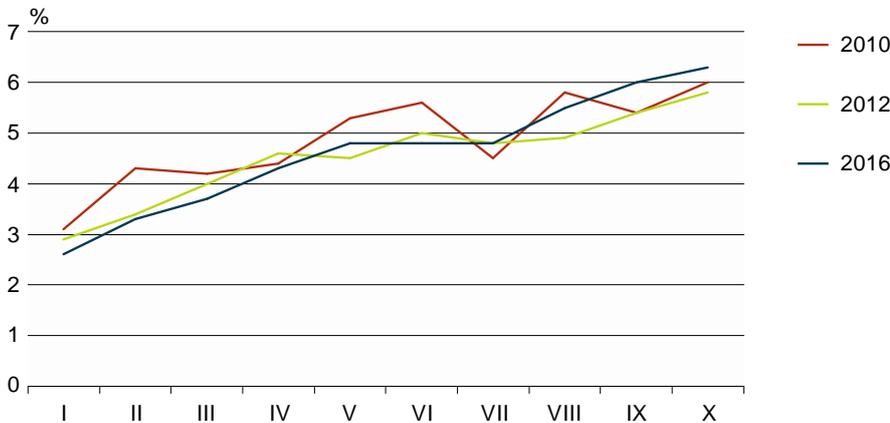
Despite the fact that there is no major difference in the expenditure on miscellaneous goods and services for households in the lowest and the highest quintile, there appears to be a pattern that the wealthier the household, the greater the share of

^a Personal care (e.g. hairdresser, beautician); electrical personal care devices (shavers, hair-dryers); body care preparations (hygiene products, cosmetics); prostitution; jewellery, watches; bags; personal items (bags, infant supplies); childcare services; nursing homes and retirement homes (and services at home); insurance; other financial services (e.g. service fees); other services (state fees, legal assistance and accounting services, funeral services, other fees and services).

the said expenditure. Here, the Netherlands represents an exception, where expenditure on miscellaneous goods and services is in proportion with the average total expenditure of households at different income levels.

In Estonia, the average expenditure on miscellaneous goods and services accounted for 5.1% of the total expenditure. The correlation coefficient between the share of expenditure on miscellaneous goods and services and the household equivalised income decile was statistically significant and positive, but weak like in other groups (0.16). The share of expenditure on miscellaneous goods and services per household member by expenditure decile increased (Figure 11).

Figure 11. Share of expenditure on miscellaneous goods and services per household member by expenditure deciles in Estonia, 2010, 2012 and 2016



Source: Statistics Estonia

Summary

Money often serves as the measure of wealth: the more money, the more it can be traded for goods and services. But whether and how does wealth affect the type of goods and services consumed? This article explored the presence and extent of a correlation between the consumption pattern and economic development of countries as well as the wealth of households in a particular country.

Changes in the composition of expenditure of households correlate with wealth, irrespective whether it is determined in national or international comparison. The wealthier the country and its households, the greater the share of expenditure on miscellaneous goods and services, eating out and accommodation, and transport. Poorer households spend relatively more on food and non-alcoholic beverages, alcoholic beverages and tobacco, and communication products and services.

A negative correlation between the wealth and share of expenditure was strongest in the case of expenditure on food, meaning that these data also supported Engel's law. People generally satisfy first the needs essential for survival, such as a full stomach and roof above one's head. Expenditure on food and housing are also seen as compulsory expenses. This is also reflected by the logic of commonly known Maslow's hierarchy of needs (Maslow, 1943). However, food and housing may also reflect the wealth of population and serve as indicators of social status. The trend of expenditure on communications is similar to that of compulsory expenditure: as the wealth increases, their importance decreases, meaning that poorer households do not significantly limit expenditure on communications. Allegedly, the internet is included in basic human needs.

In the light of the aforesaid, we may rephrase the question and ask whether the consumption patterns of the people of a particular country might reflect the level of development of that country. However, it is not recommended to conclude that increased consumption of one or another product or service would ensure wealth for the country and its residents. Nevertheless, consumer demand has direct impact on supply, i.e. the activity of entrepreneurs.

Hopefully, it does not follow from the article that wealth is based on consumption alone. However, it can be argued that when the quality of life depends on the size of the wallet, the wealth of a household can be seen from the share of essential expenditure necessary for survival – compulsory expenditure: decrease in that expenditure goes hand in hand with the increase in material wealth. Wealthier households are able to spend on other categories both in terms of absolute and relative figures. Looking at the ranking of an average Estonian household in Europe, we still have room for development.

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MAIN INDICATORS, 2013–2018

Main indicators by year and quarter, 2013–2018

Period	Average monthly gross wages and salaries, euros ^a	Change of average monthly gross wages and salaries on same period of previous year, % ^a	Average monthly old-age pension, euros ^b	Employed ^c thousands	Unemployed ^c
2013	949	7.0	327.4	621.3	58.7
2014	1,005	5.9	345.1	624.8	49.6
2015	1,065	6.0	365.6	640.9	42.3
2016	1,146	7.6	386.0	644.6	46.7
2017	1,221	6.5	405.4	658.6	40.3
2013					
1st quarter	900	6.3	315.9	610.1	67.5
2nd quarter	976	8.5	331.3	632.1	55.0
3rd quarter	930	8.8	331.4	627.1	53.3
4th quarter	986	7.6	331.0	616.1	58.9
2014					
1st quarter	966	7.3	330.9	605.8	56.6
2nd quarter	1,023	4.8	349.9	629.5	47.7
3rd quarter	977	5.0	350.0	633.7	51.3
4th quarter	1,039	5.3	349.6	630.3	42.7
2015					
1st quarter	1,010	4.5	349.5	623.1	44.2
2nd quarter	1,082	5.8	371.3	640.1	44.4
3rd quarter	1,045	6.9	370.9	661.0	36.5
4th quarter	1,105	6.4	370.7	639.4	43.9
2016					
1st quarter	1,091	8.1	370.6	630.0	43.6
2nd quarter	1,163	7.6	391.4	657.0	45.3
3rd quarter	1,119	7.1	390.2	653.3	52.9
4th quarter	1,182	7.0	390.3	638.2	45.1
2017					
1st quarter	1,153	5.7	390.7	646.8	38.4
2nd quarter	1,242	6.8	409.9	653.5	49.0
3rd quarter	1,201	7.4	409.1	666.6	36.5
4th quarter	1,271	7.5	409.3	667.4	37.2
2018					
1st quarter	1,242	7.7	417.4	650.5	47.4
2nd quarter	1,321	6.4	449.9	666.6	35.8
3rd quarter	1,291	7.5	447.5	666.6	36.8

^a Since 1999, the average monthly gross wages and salaries do not include health insurance benefits.

^b Data of the Social Insurance Board.

^c Population aged 15–74.

Main indicators by year and quarter, 2013–2018

Labour force participation rate ^a	Employment rate ^a	Unemployment rate ^a	Consumer price index	Producer price index of industrial output	Period
	%		change on same period of previous year, %		
68.0	62.1	8.6	2.8	4.1	2013
68.0	63.0	7.4	-0.1	-1.6	2014
69.4	65.2	6.2	-0.5	-2.0	2015
70.4	65.6	6.8	0.1	-0.7	2016
71.6	67.5	5.8	3.4	3.6	2017
					2013
67.7	61.0	10.0	3.5	4.6	1st quarter
68.7	63.2	8.0	3.4	4.7	2nd quarter
68.0	62.7	7.8	2.8	3.9	3rd quarter
67.5	61.6	8.7	1.5	3.3	4th quarter
					2014
66.8	61.1	8.5	0.6	-1.2	1st quarter
68.3	63.5	7.0	0.0	-2.0	2nd quarter
69.1	63.9	7.5	-0.6	-1.1	3rd quarter
67.9	63.6	6.3	-0.5	-2.0	4th quarter
					2015
67.8	63.3	6.6	-0.9	-1.6	1st quarter
69.6	65.1	6.5	0.0	-1.7	2nd quarter
70.9	67.2	5.2	-0.5	-2.7	3rd quarter
69.5	65.0	6.4	-0.5	-2.1	4th quarter
					2016
68.6	64.1	6.5	-0.4	-1.4	1st quarter
71.5	66.9	6.5	-0.7	-1.6	2nd quarter
71.9	66.5	7.5	0.4	-1.1	3rd quarter
69.6	65.0	6.6	1.3	1.5	4th quarter
					2017
70.2	66.3	5.6	3.0	2.8	1st quarter
72.0	66.9	7.0	3.1	3.7	2nd quarter
72.0	68.3	5.2	3.7	4.4	3rd quarter
72.2	68.4	5.3	3.8	3.2	4th quarter
					2018
71.4	66.6	6.8	3.1	3.0	1st quarter
71.9	68.2	5.1	3.3	2.3	2nd quarter
72.0	68.2	5.2	3.6	3.2	3rd quarter

^a Population aged 15–74.

Main indicators by year and quarter, 2013–2018

Period	Volume index of industrial production ^a	Volume index of electricity production ^a	Export price index	Import price index	Construction price index	Construction volume index ^b
change on same period of previous year, %						
2013	4.1	10.9	-1.1	-1.6	5.2	-0.1
2014	3.9	-6.3	-2.6	-2.2	0.5	-2.1
2015	0.3	-16.6	-3.9	-3.8	0.5	-4.5
2016	3.4	18.3	-0.5	-2.3	-0.8	4.6
2017	7.7	13.2	5.5	4.5	1.5	17.7
2013						
1st quarter	3.8	21.7	-0.8	-0.1	5.6	0.8
2nd quarter	5.4	16.0	-0.9	-2.6	5.2	-0.4
3rd quarter	5.1	14.7	-1.2	-2.1	5.3	3.6
4th quarter	2.1	-4.7	-1.7	-1.5	4.7	-4.7
2014						
1st quarter	1.6	-19.2	-2.3	-2.4	2.3	-2.9
2nd quarter	2.6	-2.4	-2.2	-1.7	0.8	-3.5
3rd quarter	4.8	-7.0	-2.2	-1.1	-0.2	-7.4
4th quarter	6.7	2.7	-3.7	-3.6	-0.7	6.5
2015						
1st quarter	3.5	-0.3	-4.3	-4.7	0.1	-1.2
2nd quarter	1.3	-23.4	-3.3	-1.9	0.7	-4.2
3rd quarter	-1.2	-22.1	-4.5	-4.3	0.6	-2.7
4th quarter	-2.2	-20.5	-3.6	-4.2	0.7	-5.0
2016						
1st quarter	-1.4	-5.6	-3.0	-4.0	-0.7	5.3
2nd quarter	0.9	4.1	-2.4	-4.5	-1.3	6.3
3rd quarter	5.0	41.8	-0.1	-2.2	-0.7	2.4
4th quarter	9.0	32.9	3.6	1.7	-0.5	4.9
2017						
1st quarter	12.7	31.0	6.7	6.6	0.7	20.3
2nd quarter	10.9	42.0	5.7	4.3	1.5	17.5
3rd quarter	3.5	-13.1	5.3	3.7	1.7	17.6
4th quarter	4.3	-7.0	4.2	3.3	2.1	16.4
2018						
1st quarter	3.9	-1.9	2.1	1.6	1.8	21.1
2nd quarter	4.8	-13.3	2.0	3.1	2.0	20.1
3rd quarter	3.2	5.5	2.6	4.7	1.4	16.2

^a Short-term statistics. The data for 2017 may be revised.

^b Construction activities in Estonia and in foreign countries. The data for 2017 may be revised.

In the case of volume index of industrial production and construction volume index, statistics according to the Estonian Classification of Economic Activities (EMTAK 2008, based on NACE Rev. 2).

Main indicators by year and quarter, 2013–2018

Agricultural output price index ^a	Agricultural input price index ^a	Gross domestic product (GDP) by chain-linking method ^b	Balance of current account as percentage of GDP, % ^c	Net sales of enterprises, million euros, current prices ^d	Period
change on same period of previous year, %					
6.7	3.0	1.9	0.5	50,357.2	2013
-5.7	-2.3	2.9	0.8	50,328.6	2014
-13.0	-0.8	1.9	1.8	49,065.8	2015
-2.5	-1.9	3.5	2.0	50,194.5	2016
21.9	1.5	4.9	3.2	54,973.5	2017
2013					
12.9	5.5	3.1	-0.6	12,054.1	1st quarter
27.4	4.8	1.0	0.9	12,733.1	2nd quarter
14.5	2.2	1.6	0.1	12,808.7	3rd quarter
-12.4	-0.4	2.1	1.6	12,761.3	4th quarter
2014					
4.0	-2.7	1.6	-3.2	11,798.0	1st quarter
-4.5	-2.8	2.8	1.3	12,869.6	2nd quarter
-10.0	-2.1	3.0	1.2	12,666.7	3rd quarter
-9.8	-1.4	4.1	3.5	12,994.3	4th quarter
2015					
-23.4	-1.1	1.8	-1.5	11,531.1	1st quarter
-18.6	-0.4	2.7	4.1	12,475.7	2nd quarter
-8.9	1.0	2.0	3.1	12,359.5	3rd quarter
-4.1	-0.7	1.1	1.4	12,699.5	4th quarter
2016					
-3.3	-1.0	3.8	-1.8	11,726.0	1st quarter
-7.7	-2.4	2.2	2.9	12,651.7	2nd quarter
-5.3	-2.3	3.5	5.1	12,619.2	3rd quarter
3.0	-1.8	4.4	1.4	13,197.6	4th quarter
2017					
21.6	0.1	4.9	1.9	12,686.9	1st quarter
28.5	1.3	5.8	2.2	13,969.9	2nd quarter
28.8	2.2	3.9	4.3	13,823.8	3rd quarter
14.1	2.4	4.8	4.1	14,492.9	4th quarter
2018					
-2.3	2.4	3.3	-1.4	13,701.3	1st quarter
-3.4	2.1	3.8	2.1	15,326.8	2nd quarter
0.7	3.6	4.2	1.2	15,499.2	3rd quarter

^a The data for the 1st and 2nd quarter 2018 have been revised.

^b Reference year 2010. The data for the 2nd quarter 2018 have been revised.

^c Data of Eesti Pank. The data for the 2nd quarter 2018 have been revised.

^d Short-term statistics. Statistics according to the Estonian Classification of Economic Activities (EMTAK 2008, based on NACE Rev. 2).

Main indicators by year and quarter, 2013–2018

Period	Revenue of state budget ^a	Expenditure of state budget ^a	Surplus of state budget ^a	Exports ^b	Imports ^b	Balance of trade ^b
	million euros, current prices					
2013	6,556.2	6,853.0	-296.9	12,288.2	13,902.5	-1,614.4
2014	6,677.5	6,488.4	189.1	12,006.0	13,788.1	-1,782.0
2015	6,792.7	7,157.3	-364.6	11,575.3	13,096.7	-1,521.4
2016	7,318.8	7,326.8	-8.0	11,896.9	13,514.8	-1,617.9
2017	9,309.4	9,242.1	67.2	12,875.8	14,759.4	-1,883.6
2013						
1st quarter	1,395.0	1,490.3	-95.3	3,098.1	3,405.8	-307.7
2nd quarter	1,862.9	1,593.7	269.2	3,173.3	3,611.9	-438.6
3rd quarter	1,697.3	1,763.3	-66.1	2,977.4	3,431.1	-453.7
4th quarter	1,601.0	2,005.7	-404.7	3,039.4	3,453.7	-414.3
2014						
1st quarter	1,565.0	1,506.8	58.2	2,837.8	3,276.0	-438.2
2nd quarter	1,730.4	1,537.0	193.4	3,005.3	3,492.8	-487.5
3rd quarter	1,591.6	1,546.6	45.0	3,042.7	3,470.4	-427.7
4th quarter	1,790.5	1,898.0	-107.5	3,120.3	3,549.0	-428.7
2015						
1st quarter	1,601.1	1,810.7	-209.6	2,832.7	3,187.3	-354.6
2nd quarter	1,739.1	1,692.6	46.5	2,990.6	3,339.9	-349.4
3rd quarter	1,676.3	1,709.8	-33.5	2,831.6	3,261.8	-430.3
4th quarter	1,776.2	1,944.2	-168.0	2,920.6	3,307.6	-387.2
2016						
1st quarter	1,850.6	1,874.8	-24.2	2,779.1	3,228.9	-449.8
2nd quarter	1,844.1	1,643.7	200.4	3,027.8	3,488.7	-460.9
3rd quarter	1,742.3	1,775.1	-32.8	3,015.7	3,315.4	-299.8
4th quarter	1,881.8	2,033.1	-151.3	3,074.4	3,482.2	-407.3
2017						
1st quarter	2,055.2	2,098.8	-43.6	3,096.3	3,750.4	-654.0
2nd quarter	2,328.8	2,287.7	41.1	3,268.4	3,724.8	-456.5
3rd quarter	2,191.1	2,173.6	17.5	3,171.7	3,526.0	-354.3
4th quarter	2,734.2	2,682.0	52.3	3,339.4	3,758.0	-418.8
2018						
1st quarter	2,218.0	2,313.4	-95.3	3,280.4	3,816.0	-535.6
2nd quarter	2,630.0	2,536.6	93.5	3,690.4	4,219.0	-528.5
3rd quarter	2,369.9	2,365.8	4.1	3,623.4	3,994.6	-371.2

^a Data of the Ministry of Finance. Since 2017, the accounting of state budget execution is accrual-based. Since 2017, the revenues and expenditures also include allocated tax revenues collected by the Tax and Customs Board. The data for the 1st and 2nd quarter 2018 have been revised.

^b Data for the current year are revised monthly; data for the previous years are revised twice a year.

Main indicators by year and quarter, 2013–2018

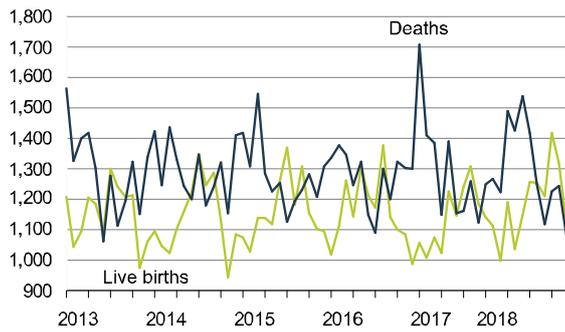
Carriage of goods, thousand tonnes ^a	Carriage of passengers, thousands ^a	Retail sales volume index ^b	Production of meat (live weight) ^c	Production of milk ^c	Production of eggs ^c	Period
78,726	216,040.5	6	1.4	7.0	5.8	2013
75,141	211,015.1	7	1.2	4.3	5.0	2014
66,219	213,990.2	8	3.1	-2.7	2.5	2015
65,354	207,531.7	6	-4.3	0.0	-2.6	2016
56,434	208,053.8	3	-9.6	0.6	-1.2	2017
2013						
21,040	55,234.3	5	3.3	2.8	-0.9	1st quarter
19,463	53,601.1	6	0.0	6.9	-2.7	2nd quarter
18,749	53,297.5	5	1.7	8.7	18.1	3rd quarter
19,474	53,907.6	6	0.6	9.7	9.9	4th quarter
2014						
19,220	54,844.4	6	5.3	10.1	18.1	1st quarter
17,376	52,806.9	6	0.0	4.7	2.6	2nd quarter
18,559	51,113.9	7	0.0	4.2	-6.7	3rd quarter
19,986	52,249.9	7	-0.3	-1.4	7.4	4th quarter
2015						
18,063	57,669.1	9	2.7	-4.6	-8.6	1st quarter
15,958	54,095.2	7	4.9	-4.2	0.8	2nd quarter
15,954	50,425.1	8	-0.3	-2.9	6.5	3rd quarter
16,245	51,800.7	8	5.1	0.9	11.9	4th quarter
2016						
16,177	52,968.6	7	-7.8	4.0	15.1	1st quarter
15,352	53,418.5	7	-0.7	2.9	5.0	2nd quarter
16,763	49,779.6	4	0.0	-2.3	-10.7	3rd quarter
17,062	51,365.0	5	-8.3	-4.4	-17.1	4th quarter
2017						
13,830	53,683.3	5	-15.5	-1.7	-9.9	1st quarter
12,741	53,479.0	4	-7.1	-1.4	-5.2	2nd quarter
13,786	50,457.4	3	-11.0	1.0	6.6	3rd quarter
16,076	50,434.1	1	-5.0	4.7	6.1	4th quarter
2018						
13,803	50,252.4	1	13.8	2.6	10.1	1st quarter
14,674	52,514.6	1	1.5	3.2	16.7	2nd quarter
16,015	48,879.3	3	7.7	2.7	8.1	3rd quarter

^a Carriage data of Estonian transport enterprises. The data on the carriage of goods for 2nd quarter 2018 have been revised. The data on the carriage of passengers for 2017 and 1st and 2nd quarter 2018 have been revised.

^b Short-term statistics. The data for 2017 may be revised. Statistics according to the Estonian Classification of Economic Activities (EMTAK 2008, based on NACE Rev. 2).

^c Preliminary data for 2018.

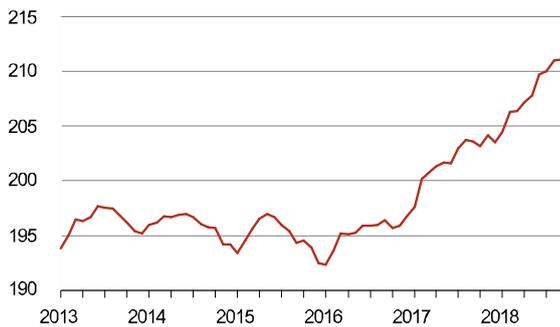
Natural change of population



Unemployment rate of population aged 15–74



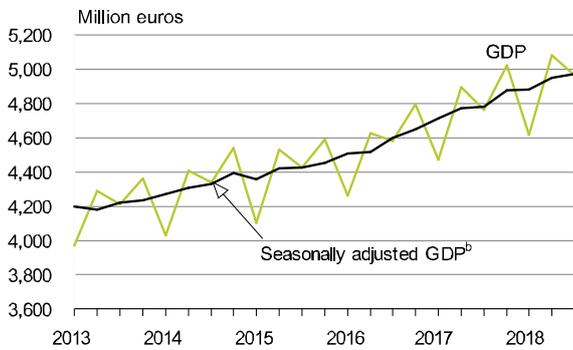
Consumer price index, 1997 = 100



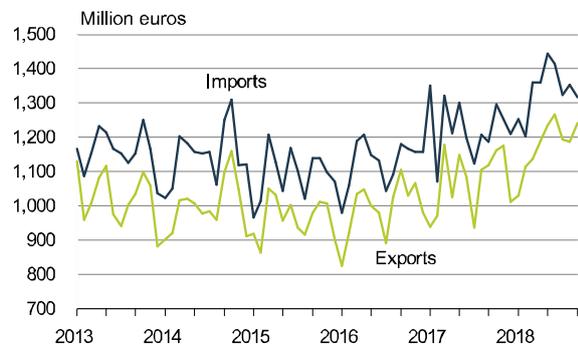
Producer price index of industrial output, 2010 = 100



Gross domestic product at chain-linked volume (reference year 2010)^a



Foreign trade



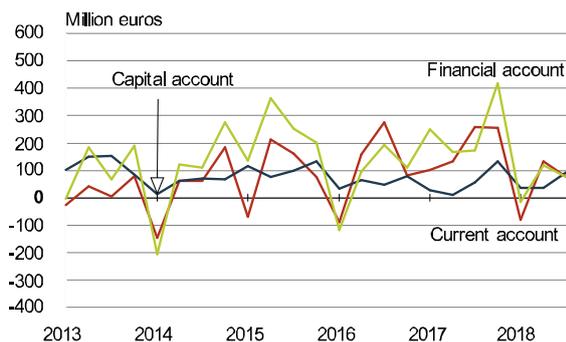
^a Values calculated by chain-linked index of reference year (values at reference year are multiplied by chain-linked index of the calculated period). Reference year is a conditional year for calculating chain-linked data and starting point of the series of chain-linked indices. Chain-linked index is a cumulative index for chain-linking sequential periods and it expresses the growth rate of a component compared to the reference year.
^b Seasonal adjustment of time series means identifying and eliminating regular within-a-year influences to highlight the underlying trends and short-run movements of economic processes. GDP is seasonally and working-day adjusted.

Average monthly exchange rate of the US dollar against the euro



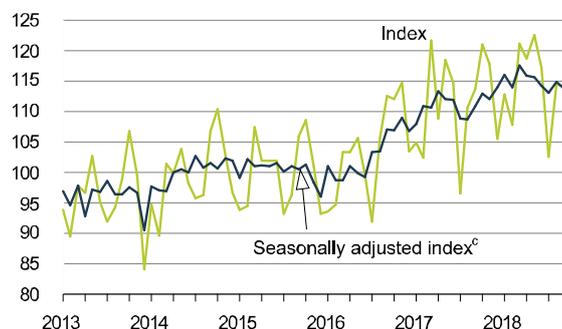
Source: European Central Bank

Balance of payments



Source: Eesti Pank

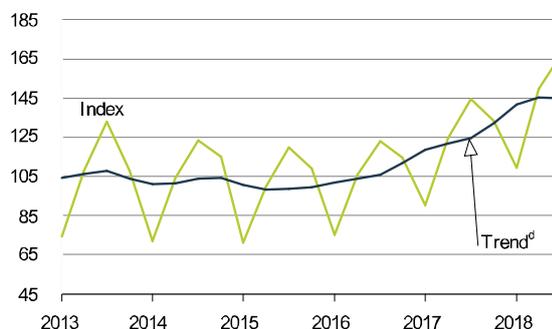
Volume index of industrial production, 2015 = 100^a



^a Statistics according to the Estonian Classification of Economic Activities (EMTAK 2008, based on NACE Rev. 2).

^c Seasonal adjustment of time series means identifying and eliminating regular within-a-year influences to highlight the underlying trends and short-run movements of economic processes.

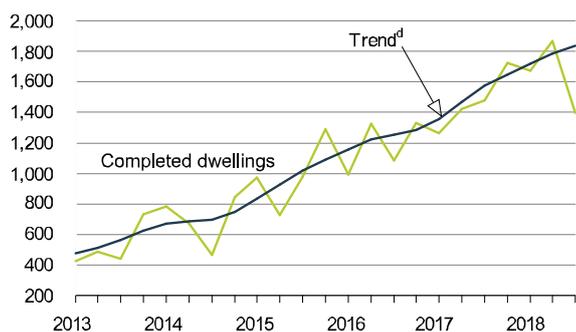
Construction volume index, 2015 = 100^b



^b Construction activities in Estonia and in foreign countries. Statistics according to the Estonian Classification of Economic Activities (EMTAK 2008, based on NACE Rev. 2).

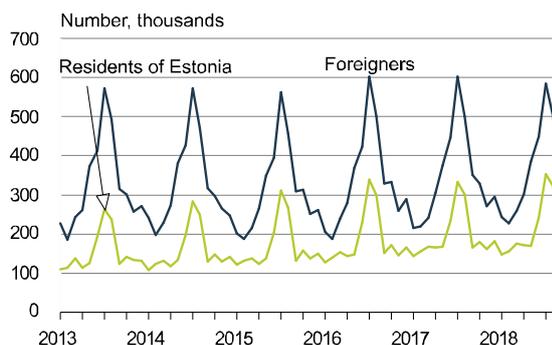
^d Trend – the long-term general development of the time series.

Completed dwellings



^d Trend – the long-term general development of the time series.

Nights spent by accommodated persons



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