ECONOMIC ATLAS OF THE HT GROUP

ANALYSIS OF SOCIAL AND ECONOMIC IMPACTS OF THE HT GROUP IN THE REPUBLIC OF CROATIA IN 2015

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CONTENTS


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ABOUT AUTHORS – THE INSTITUTE OF ECONOMICS, ZAGREB

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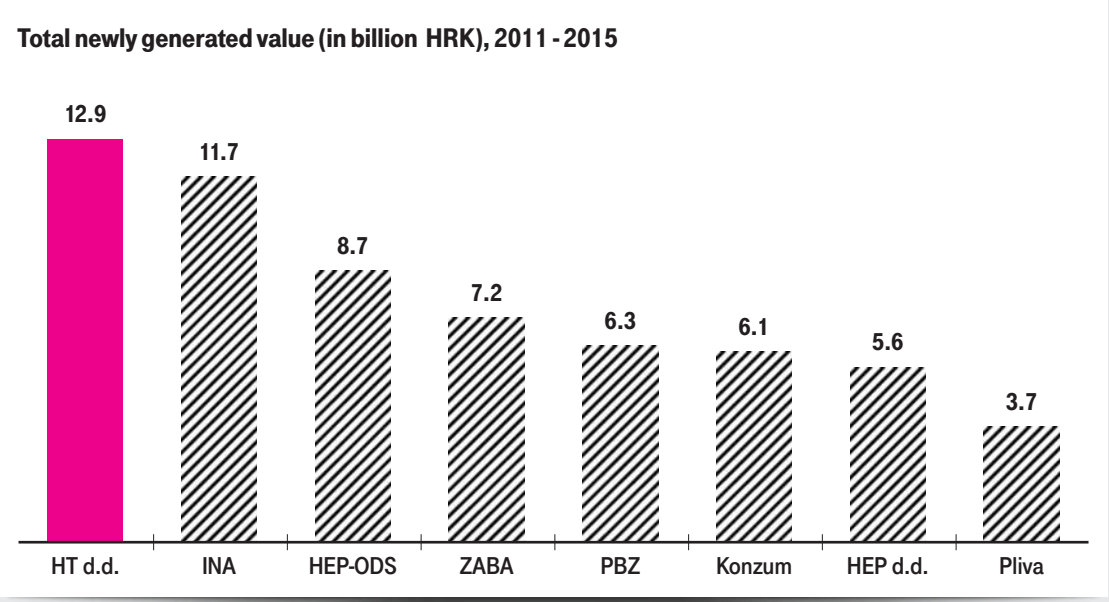
The Economic Atlas of the HT Group was developed by Maruška Vizek, D.Sc., Project Leader and Director of the Institute of Economics, Zagreb, Tajana Barbić, D.Sc., Davor Mikulić, D.Sc., and Marina Tkalec, D.Sc., as Research Team Members.

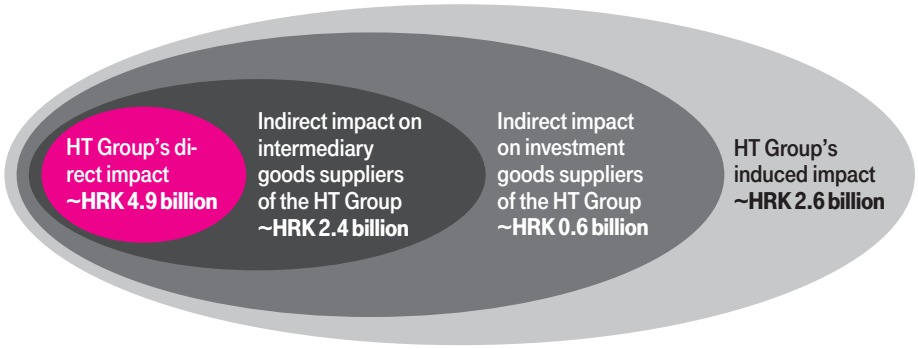
KEY FINDINGS

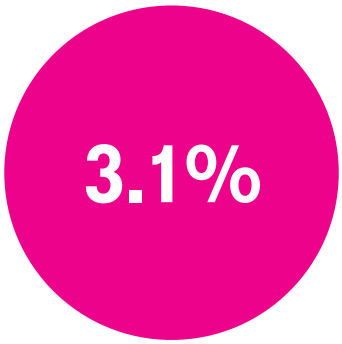
HT[1] contributes with the largest newly generated value in Croatia...



[1] Refers only to HT d.d., not the whole HT Group

...whilst the whole HT Group generates more than 3% of the total Croatian GDP

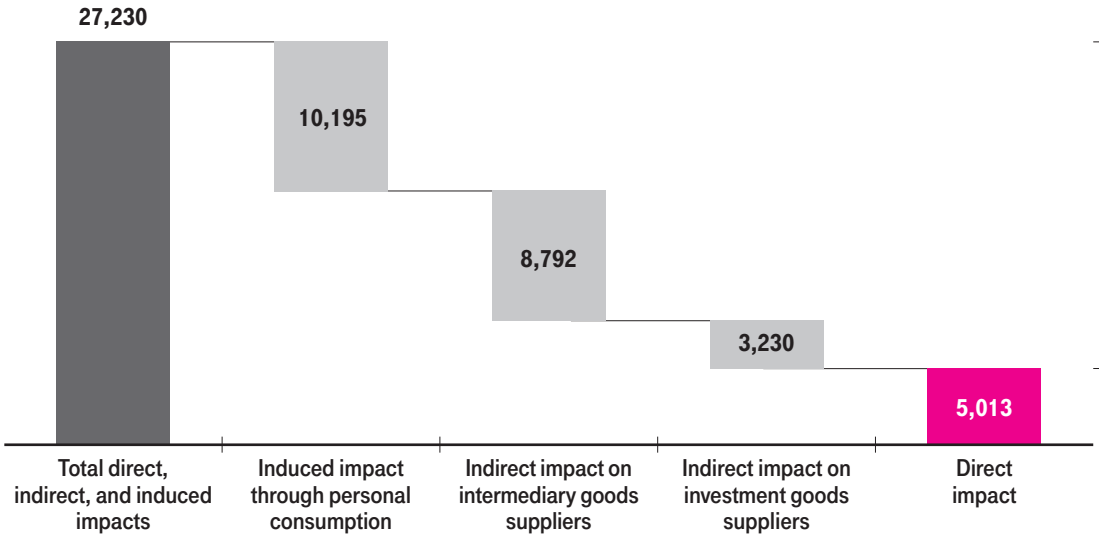




In 2015, the HT Group generated HRK 10.5 billion, i.e. 3.1% of the total gross domestic product of the Republic of Croatia

Through its activities, the HT Group has created 27 thousand jobs in Croatia

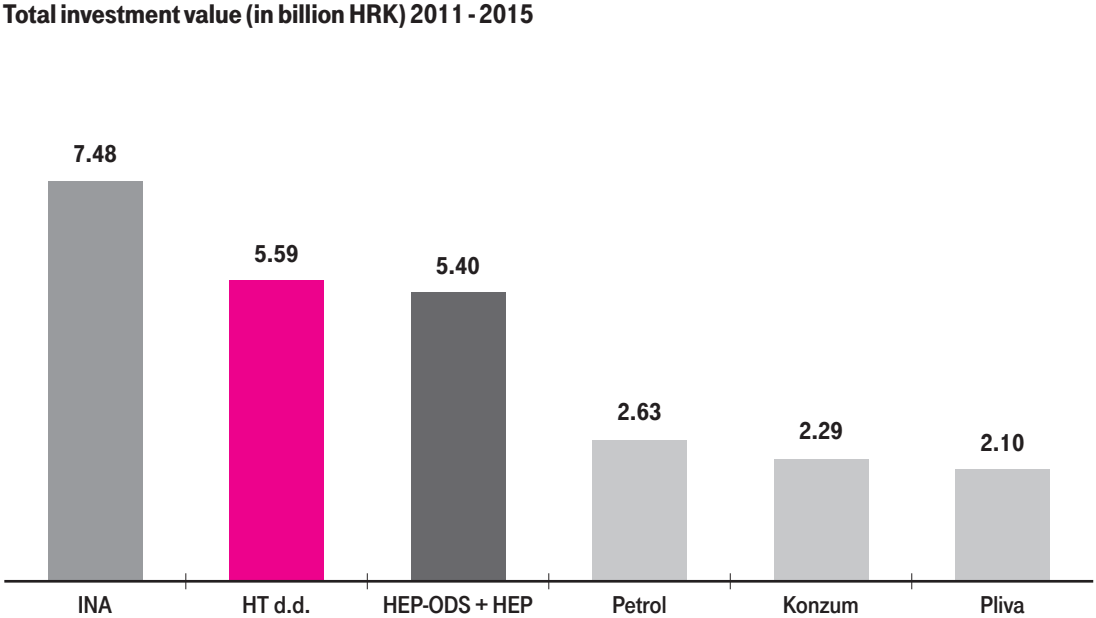
Total contribution of HT Group in creating jobs



Each job in the HT Group is related to additional 4.4 jobs in the remaining economy.

HT[1] is also the largest private investor in Croatia

Total investment value (in billion HRK) 2011 - 2015

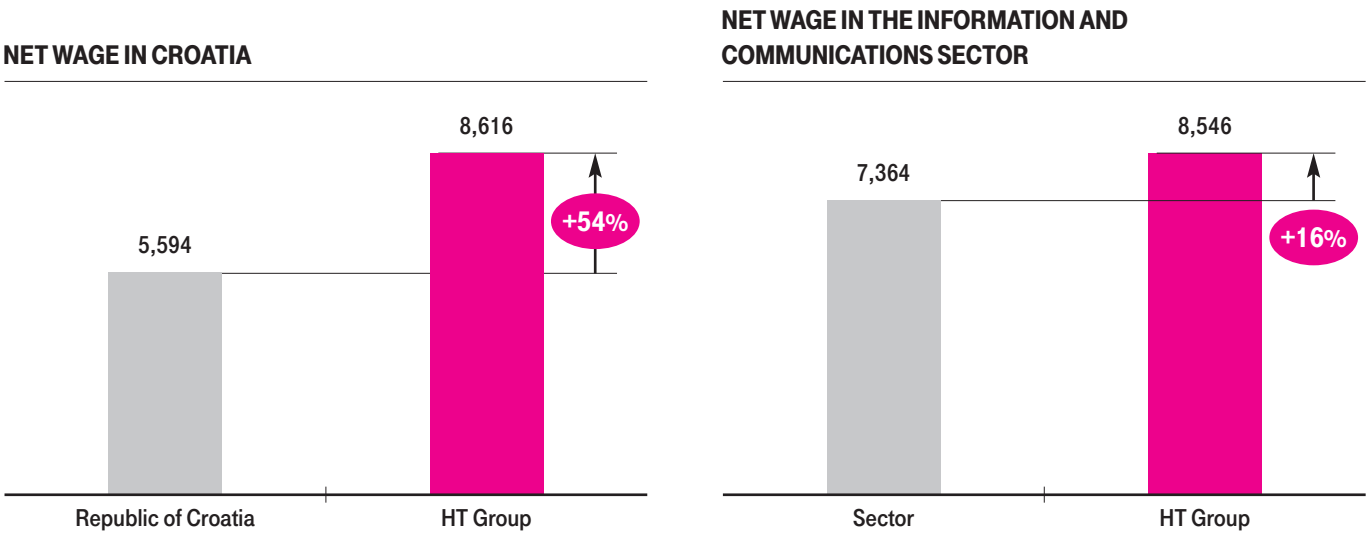


The investments of the HT Group made 2.3% of the total investments in Croatian economy in 2015

[1] Refers only to HT d.d., not the whole HT Group.

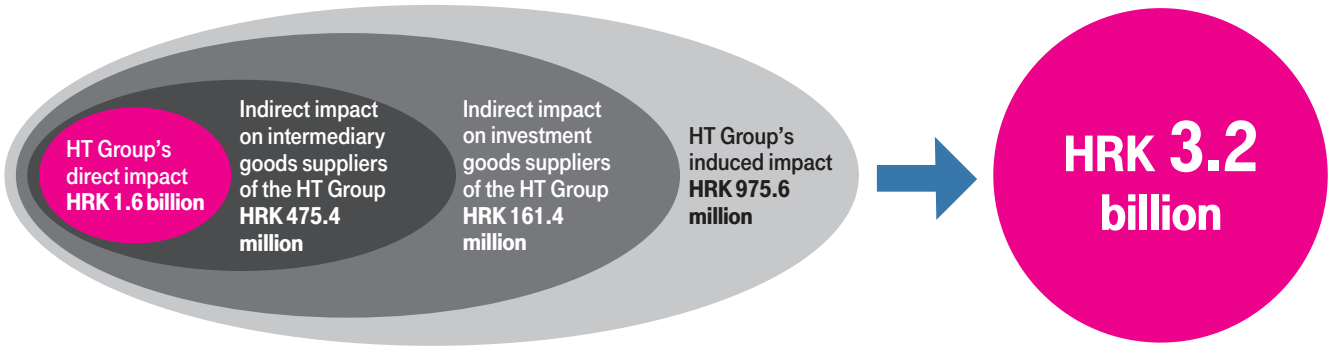
HT Group pays out 54% higher wage compared to the national average and 16% above the average of the information and communications sector

Average net wage paid out in 2015 (in HRK)



Explanatory note: The average wages of HT Group's employees by sectors refer to HT Group's companies in those particular sectors. At the same time, the average wage of HT Group's employees refers to the average wage of the entire HT Group.

In total, the HT Group contributed, both directly and indirectly, with 4% of the total budget revenue in 2015



In 2015, through its activities, the HT Group contributed to tax revenue with an amount of approximately HRK 3.2 billion, accounting for 3.8% of the total tax revenue of the consolidated general government

EXECUTIVE SUMMARY

By producing and selling its products and services, HT Group contributes to the growth and development of the Croatian economy. In the period from April to September 2016, the Institute of Economics, Zagreb developed an Economic Atlas of the HT Group presenting the results of the assessment of the HT Group's total impact on the Croatian economy in 2015. The Economic Atlas assesses the HT Group's total impact, i.e. the sum of direct, indirect, and induced impacts rated by applying the input-output model. It also assesses the impact of HT Group's investment activities on the total economic activity and the importance of the Group for both the Croatian capital market and the corporate and high-technology sectors of economy.

HT Group's total impact in 2015 is estimated separately for gross domestic product, employment, and taxes paid. Input-output model results presented in the Economic Atlas suggest that the Group had a major impact on all economic developments in the country:

- HT Group's impact on gross domestic product in 2015 is estimated to be HRK 10.5 billion, accounting for 3.14% of gross domestic product generated in Croatia in 2015. For each kuna of gross domestic product generated by the HT Group directly through its business operations, additional HRK 2.62 of gross domestic product are generated indirectly through HT Group's employees and suppliers' spending.
- In 2015, the HT Group generated in total 27,230 jobs (2.01 percent of the total employment in Croatia). Each job in the HT Group generated additional 4.43 jobs in the remaining economy. Employees whose jobs were generated from HT Group's activities, in 2015 were paid compensation amounting to HRK 3.56 billion in total.
- In 2015, the HT Group contributed through its activities to tax payments to the amount of HRK 3.2 billion (3.8 percent of the total tax revenue of the consolidated general government that year).
- By investing in the modernisation of the telecommunications infrastructure, the HT Group created the potential to improve the competitive edge of all entrepreneurs and raise the quality of life of the population. In 2015, through its investment activities, the HT Group induced HRK 950 million of the new gross value added and generated 4,658 new jobs.
- HT Group's average net wage in 2015 was 54 percent, i.e. HRK 3,021.78 higher than the national average. During the whole 2015, HT Group's employees' income was on average HRK 36,261.40 above the income of an average employee in Croatia.

As the biggest company of the Group, HT d.d., as well as the HT Group itself, plays a significant role in the Croatian corporate sector:

- In terms of size, HT d.d. is the sixth biggest company in Croatia based on the amount of revenue generated in 2015.
- HT d.d. was the first ranked company in Croatia in terms of the total newly generated value (income) for employees, owners, and the state in the 2011-2015 period. In other words, HT d.d. is a company generating the greatest value for all of its stakeholders.
- HT d.d. is a private company operating in the service sector that allocates the most money for investments. In terms of investment amount put into infrastructure, it is the best private company in Croatia.
- HT d.d. is the best company in Croatia based on the total profit generated in the 2011-2015 period.
- HT Groups it the biggest high-technology company in the Republic of Croatia and, as such, one of the drivers of the Republic of Croatia's technological development. The Group accounts for 26 percent of the gross value added in the high-technology sector and 40 percent of its net profit. HT Group is also the biggest single investor in technological infrastructure in the high-technology sector.

By listing its shares on the Zagreb Stock Exchange through an initial public offering, HT d.d. had significantly boosted the development of the Croatian capital market and shareholding in the Republic of Croatia and encouraged new participants, mostly small shareholders, to get involved in the market. During the initial public offering of HT d.d.'s shares, a total of 355 thousand private persons had invested in HT's shares, accounting for 8.2 percent of the total population of the Republic of Croatia.

HT d.d.'s shares is marked by the following characteristics:

- National private persons who represent a fifth of investors in HT d.d.'s share and who have cumulatively acquired HRK 2.4 billion from dividends, accounting for 2 per cent of the disposable household income in the dividend pay-out period.
- HT d.d.'s share has the biggest percentage in the free-float market capitalisation and the biggest percentage in the trading volume. It is also marked by superior liquidity and lower volatility (risk) compared to the market average.
- HT d.d.'s share holds a dominant position based on all performance indicators pertaining to the efficiency of asset and capital management compared to the average of the regional telecommunications companies.

One of the HT Group's strategic business goals is to strengthen corporate responsibility and long-term sustainability of the Group's business operations. In doing so, the HT Group, as the biggest high-technology company in the country and as a private service company with the highest investment commitments, plays a particularly important role in pushing the society towards digital development. Group's corporate social responsibility has resulted in a range of philanthropic activities, for which the HT Group allocated a total of HRK 19.3 million in the 2009-2015 period.

GOAL OF THE ECONOMIC ATLAS

In cartography, atlas is defined as a collection of astronomical and geographical maps systematically organised in a meaningful unit. With the aid of an atlas, we can define the location of any point in the observed space on Earth or in the universe. A counterpart to the geographical or astronomical atlas would be an economic atlas, the purpose of which is to locate and describe a single company, including all its business processes and interest groups such as employees, suppliers, shareholders, and the state, within the economic space of the country in which it operates.

Unlike tangible and visible space as shown in the geographical atlas, economic space is abstract and can be determined only through complex economic and business statistics representing the building material of the atlas. Also, the economic atlas is much more complex than the geographical one, because defining the role and importance of a certain company in the economic space of a country requires more dimensions than in a typical geographical atlas. Therefore, the economic atlas is characterised by multidimensionality, which, regardless of its complexity, should be described and integrated into a relatively broad and holistic, whilst at the same time rounded and precisely structured whole.

The goal of the Economic Atlas of the HT Group is to estimate, in a systematic, credible, and consistent manner, the impact and economic importance of the HT Group for the whole economy of the Republic of Croatia. In order to achieve that goal, the Atlas presents the results of a series of analytical methods and procedures used to estimate the importance of the HT Group for the Croatian economy in several dimensions. In so doing, analyses are focused on 2015 with a view to having the findings and conclusions of the Atlas as far as possible reflect the current status of the Group's business operations. When important for analysis, data from earlier years are also taken into account. Special attention is paid to the total impact of the HT Group on economy, total impact meaning the sum of direct, indirect, and induced impacts assessed by applying the input-output model. Considering the fact that the HT Group has been investing considerable funds to develop telecommunications infrastructure and is, in terms of total investments, the first ranked company among the private service companies in Croatia, a special part of the third Chapter of the Atlas is dedicated to the impact of HT Group's investment activities on the total economic activity. The Atlas also shows the assessment of the importance of the HT Group for the corporate sector of the Republic of Croatia and the City of Zagreb, with a special analysis of the importance of the Group for high-technology sectors, which are the drivers of both the technological and the total economic development of each country. In addition to the mentioned dimensions of the economic life, the Atlas also contains an analysis of the importance of the HT Group for the Croatian capital market and an overview of allocated funds, activities, and programmes through which the HT Group has been continuously demonstrating that corporate social responsibility is an integral part of its business operations.

The following Chapter of the Economic Atlas of the HT Groups give basic information about HT Group. Chapter 3 contains an estimate of the total impacts of the HT Group on the Croatian economy, including a special Chapter dedicated to the impact of the Group's investment activity. Chapter 4 presents an analysis of the importance of the HT Group for corporate sector, whilst Chapter 5 analyses the importance of the HT Group for the Croatian capital market. Chapter 6 gives a description of corporate social responsibility activities and programmes of the HT Group, whilst the last Chapter presents the main results of the analyses discussed in the previous Chapters. The input-output model is described in more detail in the Appendix, which also contains definitions of corporate sectors.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ABOUT HT GROUP

HT Group is the leading provider of telecommunications services in Croatia, offering fixed and mobile telephony services as well as wholesale, Internet, and data services.

The core activities of Hrvatski Telekom d.d. (HT d.d. or the Company) and its subsidiary companies comprise the provision of electronic communications services and design and construction of electronic communications networks within the Republic of Croatia. In addition to the provision of fixed telephony services (fixed telephony line access and traffic, as well as fixed network supplementary services), the HT Group also provides Internet, IPTV and ICT services, data transmission services (lease of lines, Metro-Ethernet, IP/MPLS, ATM), operating with GSM, UMTS, and LTE mobile telephone networks.

HISTORY AND INCORPORATION

Hrvatski Telekom d.d. is a joint stock company, majority owned by Deutsche Telekom Europe B.V. It was incorporated on 28 December 1998 in the Republic of Croatia, pursuant to the provisions of the Act on the Separation of Croatian Post and Telecommunications into Croatian Post and Croatian Telecommunications, by which the business operation of the former HPT – Hrvatska pošta i telekomunikacije (HPT s.p.o.) was separated and transferred into two new joint stock companies, HT – Hrvatske telekomunikacije d.d. (HT d.d.) and HP - Hrvatska pošta d.d. (HP d.d.). The Company commenced operations on 1 January 1999.

Pursuant to the terms of the Law on Privatisation of Hrvatske telekomunikacije d.d., on 5 October 1999, the Republic of Croatia sold a 35% stake in HT d.d. to Deutsche Telekom AG (DT AG), and on 25 October 2001, DT AG purchased a further 16% share in HT d.d. and thus became the majority shareholder with a 51% stake. Pursuant to the Share Transfer Agreement, in December 2013, DT AG transferred 51% of its shares in the Company to T-Mobile Global Holding Nr. 2 GmbH. Pursuant to the Deed of issuance of a share against non-cash contribution, in February 2014, T-Mobile Global Holding Nr. 2 GmbH transferred 51% of the shares in the Company to CMobil B.V. In April 2015, CMobil B.V. changed its registered name into Deutsche Telekom Europe B.V.

In 2002, HT mobilne komunikacije d.o.o. (HTmobile) was established as a separate legal entity and subsidiary wholly owned by HT d.d. for the provision of mobile telecommunications services. HTmobile commenced commercial activities on 1 January 2003 and in October 2004, the company's name was officially changed to T-Mobile Croatia d.o.o. (T-Mobile).

On 1 October 2004, the Company was re-branded in T-HT, thus becoming a part of the global "T" family of Deutsche Telekom. This evolution of the corporate identity was followed by the creation of trade marks for the two separate business units of the HT Group: the fixed network operations business unit, T-Com, which also provided wholesale, Internet, and data services, and the mobile operations business unit, T-Mobile.

In May 2006, the Company acquired 100% of shares of Iskon Internet d.d., one of the leading alternative telecom providers in Croatia.

In the continuation of the privatisation of HT d.d., on 5 October 2007, the Republic of Croatia sold 32.5% of T-HT ordinary shares by initial public offering (IPO). Of the total shares in the Offering, 25% were sold to Croatian retail investors, while 7.5% were acquired by Croatian and international institutional investors. →

→ In October 2009, T-Mobile Croatia was merged into HT d.d., effective as of 1 January 2010. Group was organised into Residential and Business units. The Company's registered name was changed from HT – Hrvatske telekomunikacije d.d. to Hrvatski Telekom d.d. on 21 May 2010.

On 17 May 2010, HT d.d. completed the acquisition of IT services company Combis d.o.o., extending its reach into the provision of IT software and services for a client base that ranges from small businesses to government departments.

In June 2014, HT took over management of OT-Optima Telekom, following the completion of the pre-bankruptcy settlement procedure. Zagrebačka banka, as the largest creditor of Optima Telekom, transferred controlling rights acquired in the pre-bankruptcy settlement procedure to HT. Croatian Competition Agency has determined a set of measures defining the rules of conduct for HT with regard to management of Optima Telekom. The duration of the concentration of HT and Optima Telekom shall be limited to a period of four years, starting from HT's acquisition of control over Optima Telekom.

MEMBERS OF THE HT GROUP

Hrvatski Telekom d.d. and the following subsidiaries form the HT Group:

Company	Ownership stake of Hrvatski Telekom d.d. 31 December 2015	Ownership stake of Hrvatski Telekom d.d. 31 December 2015
Combis d.o.o.	100 %	100 %
Iskon Internet d.d.	100 %	100 %
KDS d.o.o.	100 %	100 %
e-Tours d.o.o.	100 %	100 %
Optima Telekom d.d.	19.02 %	19.11 %

COMBIS d.o.o.
Combis, a regional systems integrator, is a member of the HT Group and wholly owned by Hrvatski Telekom since 2010. The company is focused on the development of application, communication, security, and system solutions and the provision of development and integration of ICT solutions, management of ICT infrastructure and support, and with the integration of advanced technology it provides complete business solutions, tailored to the specific requirements of customers, according to the "turnkey" principle. In Croatia, it is present with eight service locations, and for years it has been active in the region, with three service locations in Bosnia and Herzegovina and in Serbia.
With the adoption of contemporary trends of European and international business, and continually improving the quality of work and working environment, Combis is today among the leading ICT companies in the region in the segment of service provision, and is the leading provider of IT services in Croatia.

ISKON INTERNET d.d.
Iskon is a contemporary telecom company recognised for its dynamic and entrepreneurial business culture and service quality, and developed relationships with residential and business customers who are provided broadband Internet access based services. In addition to the Internet, it provides telephony service and digital television (IPTV) services as well as viewing TV content via mobile devices.
The company operates as an independent company, and since 2006 it is a member of HT Group and wholly owned by Hrvatski Telekom. Through its own infrastructure, Iskon provides services in the area of Zagreb, Split, Dubrovnik, Rijeka, Pula, Osijek, Velika Gorica, Samobor, Opatija, and Solin, while its

association with the HT Group provides availability in the whole of Croatia.

KDS d.o.o.
KDS – Cable Distribution System – is a limited liability company for telecommunications services.

E-TOURS d.o.o.
e-Tours limited liability company, travel agency, is a member of the HT Group and wholly owned by Hrvatski Telekom since 2013. The company provides services of flight ticketing, accommodation, packaged travel, and car and boat rental.

OT — OPTIMA TELEKOM d.d.

Optima Telekom (OT) is a fixed telecommunications operator whose network, based on IP technology, which provides greater networking through the dominance of broadband connections, is present in more than 100 Croatian towns. By using the latest technology and global telecommunications solutions, Optima creates value added in the fixed market in Croatia. Citizens are given the option to choose and upgrade voice services, data transmission, Internet, and video content

Basic indicators of the companies belonging to the HT Group:

	Combis d.o.o.	e-Tours d.o.o.	HT d.d.	Iskon Internet d.d.	KDS d.o.o.	OT- Optima Telekom d.d.
Sector	Wholesale and retail trade	Administrative & support service activities	Information and communication	Information and communication	Information and communication	Information and communication
Activity	Non-specialised wholesale trade	Travel agency activities	Wired telecommunications activities	Wired telecommunications activities	Wired telecommunications activities	Wired telecommunications activities
Number of employees (average number based on the number of hours worked)	351	15	3,889	183	6	382
Average net wage (in HRK)	9,490	10,325	8,935	10,701	6,084	6,534
Total assets (in 000 HRK)	269,811	10,874	13,377,208	305,014	5,122	468,548
Total revenue (in 000 HRK)	595,020	18,356	6,014,665	384,128	2,701	441,445
Total expenditure (in 000 HRK)	575,847	15,877	4,893,980	375,352	2,672	429,222
EBITDA (in 000 HRK)	24,269	2,658	2,461,294	73,748	202	100,911
Profit tax (in 000 HRK)	4,084	541	227,202	-1	19	0
Net profit (in 000 HRK)	15,089	1,939	893,484	8,777	10	12,223
Newly generated value (in 000 HRK)	96,921	5,727	2,100,463	63,931	937	82,459

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HT GROUP AND CROATIAN ECONOMY

TOTAL IMPACTS

An analysis based on the input-output model was applied to assess the total economic impact of the HT Group on the Croatian economy. Appendix to the Atlas provides a detailed description of the input-output model, whilst the description given below refers only to the key elements of the model. The input-output model provides an assessment of the total economic contribution of a company or a sector to economy. In so doing, the total contribution to economy is divided in three impacts (contributions): direct, indirect, and induced impact.

Direct impact (contribution) of the HT Group arises from direct costs incurred by the Group, including wages, taxes, and profit. Direct impact is contained in direct goods and services delivered to end consumers and entrepreneurs; in the context of national accounts, the aggregate amount of the said contribution is disclosed as the indicator of gross value added, where the total **gross value added** of the HT Group equals the sum of gross values added of all the companies forming the Group.

Indirect impact (contribution) of the HT Group on the total national economy refers to the gross value added generated by all entrepreneurs included in the whole production chain of the HT Group, i.e. delivering goods and services to the HT Group.

Indirect impact extends through two channels: **the intermediary consumption channel and the channel of suppliers of investment goods** procured by the HT Group. The first round of indirect impact extension covers direct intermediary goods suppliers and investment goods suppliers from which the HT Group directly procures goods and services. Intermediary goods include products such as office supplies, energy, and promotion services. Investment goods include, for example, machines, software, and real properties. By collaborating with the Group, intermediary goods suppliers of the HT Group generate revenues and gross value added. In order to be able to produce and deliver intermediary goods and services to the units belonging to the HT Group, suppliers of the HT Group also procure intermediary goods and services on the market, thus boosting production among other entrepreneurs in the Croatian economy. In the following rounds of multiplicative impact extension, indirect impacts extend to the whole economy, i.e. all units directly or indirectly involved in the HT Group's production chain. Depending on the economy structure, which is presented in detail in input-output tables, indirect impacts extend multiplicatively through a number of steps and spread through the whole economy.

In addition to intermediary consumption channels, indirect impacts of HT Group's business operations also spread through channels of investment goods suppliers, where HT Group's procurements primarily contribute to the activities of telecommunications equipment and software producers, but also to those of other entrepreneurs involved in the production chain of investment goods producers.

Induced impact (contribution) of the HT Group arises from consumption generated by HT Group's employees, its business partners, and their suppliers whose jobs are provided by the HT Group, either directly or indirectly. Accordingly, this impact is also called the impact of induced personal consumption. Gross value added directly or indirectly related to HT Group's activities is allocated to compensations of employees, taxes, and **operating surplus.** Households spend income generated from compensations of employees on final goods and services; thus, an increase in HT Group's activities leads to an increase in personal consumption, which induces the growth of production among entrepreneurs that produce goods and services intended for personal consumption, but also all units involved in the production chain of producers of goods and services intended for such personal consumption.

Spreading of direct, indirect, and induced impacts of telecommunications services production is graphically presented as Diagram 1. →

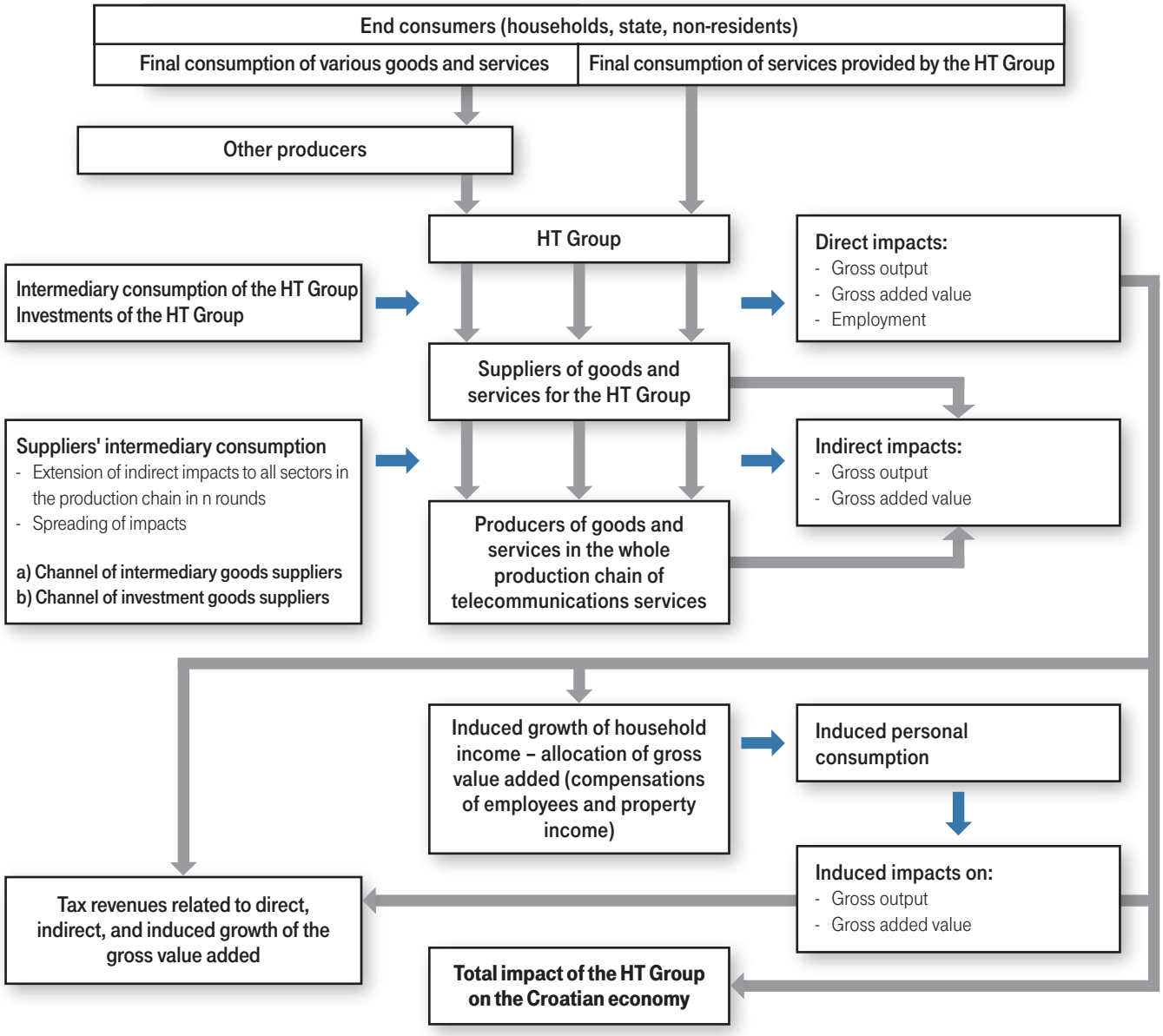
Gross value added is defined as a difference between the income generated through delivery of goods and services and intermediary consumption, i.e. the value of goods and services spent by the HT Group in the production process. Gross value added is allocated to individual components: gross compensations of employees, other taxes on production, and gross operating surplus including amortisation and net profit.

Intermediary consumption means consumption of goods used in the development of another product in its whole production chain, from primary raw materials to the final product. It equals the cost of raw materials, materials, and services used by the units of the HT Group in their production processes. Intermediary good is a product used for the purpose of producing another product or service.

Gross operating surplus represents a part of company's income earned by capital.

→ The assessment of the total HT Group's impact on the Croatian economy in 2015 is presented in Table 1. The table quantifies direct, indirect, and induced impacts of the HT Group as derived from the input-output analysis and clearly shows the spreading of indirect and induced impacts of the Group to the whole Croatian economy. Thus, the HT Group has generated, either directly, indirectly, or in an induced manner, a total of HRK 8.95 billion, i.e. 3.2 percent of the realised gross value added in economy. When the amount of paid value added tax is added to the amount of gross value added, the total HT Group's impact on the gross domestic product is estimated to be HRK 10.5 billion, accounting for 3.14 percent of the gross domestic product generated in Croatia in 2015.
In order to gain better insight into the magnitude of the total contribution made by the HT Group to the Croatian economy, it should be pointed out that over the last 15 years, the Croatian economy has achieved on average only a 1.5 percent real growth rate of the gross domestic product annually.
Through its activities, the HT Group generated, either directly or indirectly, a total of 27,230 jobs in 2015,

DIAGRAM 1 Direct, indirect, and induced impacts of HT Group's business operations on the Croatian economy



accounting for 2.01 percent of the total employment in Croatia. This also means that with each job in the HT Group, the Group generates, through its indirect and induced contributions, additional 4.43 jobs in the remaining economy. Employees whose jobs were generated through HT Group's activities in 2015 were paid compensations to a total amount of HRK 3.56 billion. Indirect impact on suppliers in the HT Group's production chain is relatively greater compared to HT Group's direct impact. This channel generates more than HRK 4 billion in gross value added and indirectly more than 17 thousand jobs. HT Group's multiplicative impacts are particularly evident in creating indirect jobs, since the average national productivity is considerably below the productivity of the HT Group, and the same output value requires hiring more persons throughout the whole supplier channel compared to the number of persons hired by the Group.

Indirect and induced impacts in the channels of investment goods suppliers (i.e. HT Group's investment activities) are somewhat less intensive than in the case of intermediary goods suppliers, as a certain part of equipment is procured from imports. Still, domestic producers' gross production throughout the whole procurement chain pertaining to HT Group's investment goods amounts to HRK 2 billion, generating approximately HRK 950 million in gross value added and employing more than 4,658 employees. →

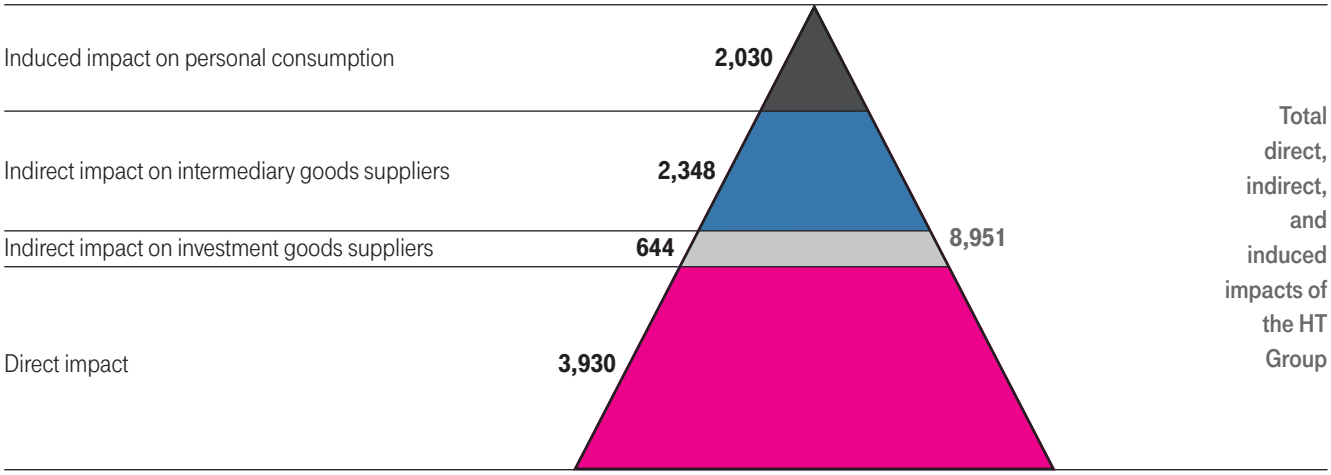
TABLE 1 Total impact of the HT Group on the Croatian economy in 2015, in HRK million

	Gross output	Gross value added	Number of employees	Compensations of employees
Direct impacts	5,782	3,930	5,013	1,154
Indirect impacts through the intermediary consumption channel				
Impact without induced personal consumption	3,765	2,348	8,792	1,137
Impact of induced personal consumption	2,668	1,727	8,767	735
Total indirect impact through intermediary consumption channels	6,433	4,075	17,559	1,872
Indirect impacts through channels of investment goods suppliers				
Impact without induced personal consumption	1,451	644	3,230	408
Impact of induced personal consumption	578	303	1,428	131
Total indirect impact through channels of investment goods suppliers	2,030	946	4,658	539
Total direct, indirect, and induced impacts of the HT Group	**14,245**	**8,951**	**27,230**	**3,564**
STRUCTURE				
Direct impacts	**40.6%**	**43.9%**	**18.4%**	**32.4%**
Indirect impacts through the intermediary consumption channel				
Impact without induced personal consumption	26.4%	26.2%	32.3%	31.9%
Impact of induced personal consumption	18.7%	19.3%	32.2%	20.6%
Total indirect impact through intermediary consumption channels	**45.2%**	**45.5%**	**64.5%**	**52.5%**
Indirect impacts through channels of investment goods suppliers				
Impact without induced personal consumption	10.2%	7.2%	11.9%	11.4%
Impact of induced personal consumption	4.1%	3.4%	5.2%	3.7%
Total indirect impact through channels of investment goods suppliers	**14.2%**	**10.6%**	**17.1%**	**15.1%**

→ Pictures 1 and 2 give a graphical presentation of the HT Group's contribution to generating gross value added and jobs with emphasis being placed on direct impacts, two indirect impacts (through intermediary consumption channels and channels of investment goods suppliers), and induced impact of personal consumption financed by direct and indirect income growth.

Assessments resulting from input-output tables allow us to determine the total gross value added directly generated by the HT Group. This method allows us to determine how much gross value added is generated by other business sectors as a result of HT Group's activities. Namely, based on the data on HT Group's business operations, as synthetised in input-output tables pertaining to Croatian economy, we know that the members of the HT Group in their production processes mostly use connection services provided by other telecommunications operators, energy, maintenance services, and promotion costs. Consequently, through the channels pertaining to demand for intermediary goods and services, the most important indirect impacts reflect on the companies providing business services.

PICTURE 1 Total contribution of the HT Group to generating gross value added in 2015
(in HRK million)



PICTURE 2 Total contribution of the HT Group to generating jobs in 2015

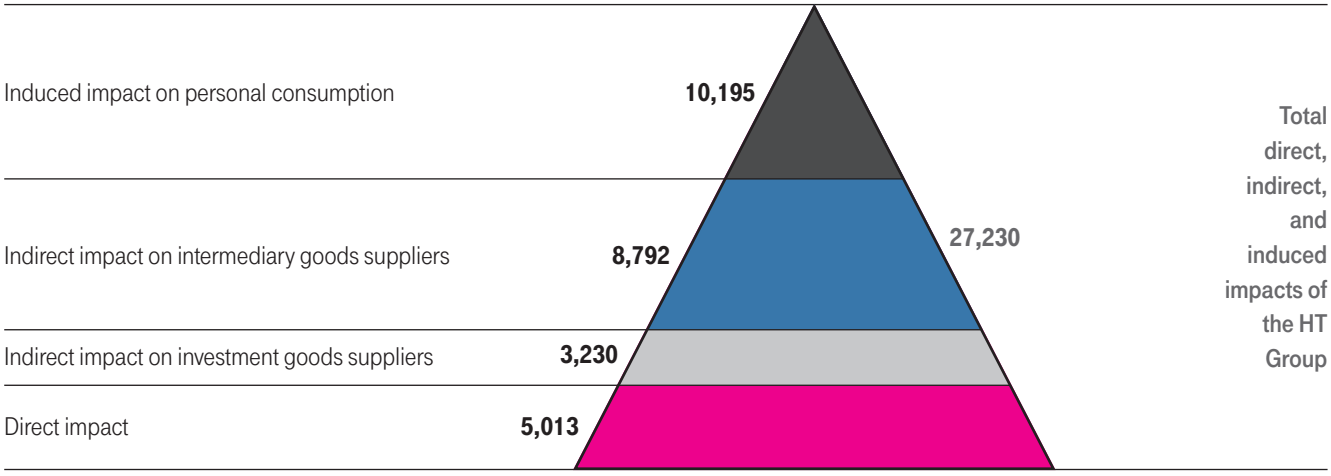


TABLE 2 Income induced by HT Group's activities per business sectors in 2015, in HRK million

	HT Group	Chain of intermediary goods suppliers	Chain of investment goods suppliers	Induced impact	Total	Structure of induced income (%)
HT Group	3,929.8	-	-	-	3,929.8	37.4
Agriculture, fishing, forestry	-	7.8	1.9	121.3	131.0	1.2
Industry	-	291.7	169.1	357.1	817.9	7.8
Construction, trade, transport, hotels, and restaurants	-	399.5	151.9	536.8	1,088.2	10.4
Business services	-	1,598.8	314.6	904.3	2,817.6	26.8
Public and personal services	-	50.0	6.2	110.2	166.4	1.6
VAT	944.0	-	-	602.3	1,546.3	14.7
Total	**4,873.8**	**2,347.8**	**643.7**	**2,631.9**	**10,497.2**	**100.0**

On the other hand, through its investment activities, the HT Group exercises the most significant impact on telecommunications equipment producers and software distributors. Table 2 and Picture 3 show the total contribution of the HT Group per business sectors broken down according to activities. It should be mentioned that in addition to gross value added, the total contribution of the HT Group to gross domestic product includes also net taxes on products (value added tax), which, in accordance with the national accounts methodology, are not categorised according to business sectors, but shown separately in Table 2, since they represent newly generated income belonging to the general government sector and not to individual business sectors. →

PICTURE 3 Income induced by HT Group's activities per business sectors in 2015, in HRK million

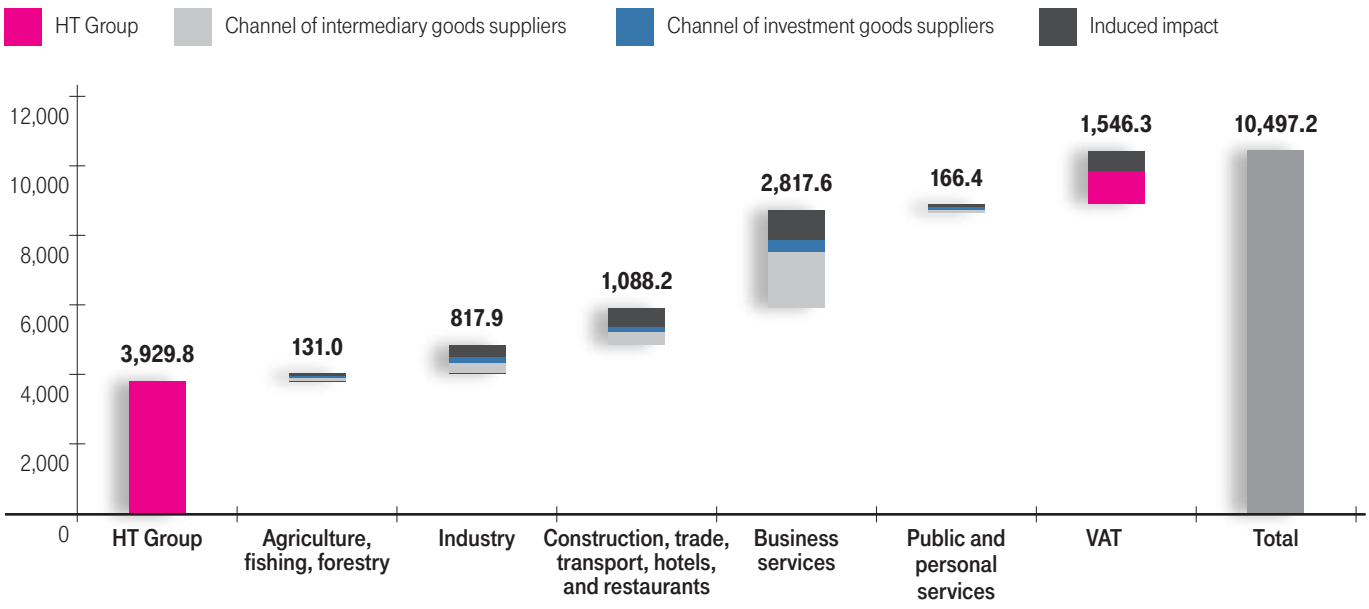


TABLE 3 Total taxes and contributions induced by HT Group's activites, in HRK million

	HT Group	Chain of intermediary goods suppliers	Chain of investment goods suppliers	Induced impact	Total
Taxes and contributions on gross wages	384.1	366.4	131.5	279.1	1,161.1
Profit tax	226.9	95.6	26.2	82.7	431.4
Other taxes on production	17.2	13.4	3.7	11.5	45.8
VAT	944.0			602.3	1,546.3
Total	**1,572.2**	**475.4**	**161.4**	**975.6**	**3,184.6**
STRUCTURE					
Taxes and contributions on gross wages	24.4%	77.1%	81.5%	28.6%	36.5%
Profit tax	14.4%	20.1%	16.2%	8.5%	13.5%
Other taxes on production	1.1%	2.8%	2.3%	1.2%	1.4%
VAT	60.0%	0.0%	0.0%	61.7%	48.6%

→ Total gross domestic product directly and indirectly induced by HT Group's activities in 2015 amounted to approximately HRK 10.5 billion. The most significant part of the gross domestic product is related to direct gross value added generated by the members of the HT Group (37.4 percent). However, **the contribution of the HT Group to the gross value added generated by the companies dealing in business service activities** (26.8 percent of the total induced gross domestic product) is also decidedly significant. Strong positive impacts of HT Group's business operations also reflect on the business operations of **the construction, trade, transport, hotels, and resorts business sector and on part of the companies belonging to the industry sector**. Impacts on agriculture and public and personal services are not strong and primarily pertain to increased induced personal consumption, whilst their share is not significant in intermediary costs and investments of the HT Group.

If value added tax is added to the gross value added directly generated by the members of the HT Group, the total gross domestic product directly related to Group's business operations in 2015 amounted to HRK 4.9 billion. Indirect impact on intermediary goods suppliers amounted to approximately HRK 2.3 billion, whilst indirect impact on investment goods suppliers was HRK 640 million. In absolute terms, the value of intermediary consumption exceeds the value of investments, which, together with a higher share of domestic producers involved in the telecommunications services value added chain, leads to a stronger boost to domestic activity compared to investment goods suppliers, as individual components of investments cannot be adequately substituted with products of domestic origin.

Induced personal consumption, including additional household consumption financed by the growth of employees' income generated in the HT Group, but also in the whole chain of intermediary and investment goods and services suppliers, contributed to an additional increase in gross domestic product in the amount of approximately HRK 2.6 billion in 2015. In addition to indirect contribution to the total economic activity and to household standard, HT Group's activities contribute significantly to the sustainability of public finances in Croatia. **The total value added tax directly and indirectly related to Group's activities amounted to more than HRK 1.5 billion, accounting for 3.6 percent of state budget revenues from this tax in 2015**.

State budget is an act estimating revenues and proceeds and determining expenses and expenditures of the state for a one-year period, in compliance with the Budget Act. State budget is adopted by the Croatian Parliament.

In addition to value added tax, the HT Group contributes directly to other tax revenues of the general government sector. An integral part of gross compensations of employees are contributions on and from wages and income tax. From its realised profit, the HT Group pays profit tax. Other taxes on production that do not depend on the realised performance also make an integral part of gross value added. In addition to directly paid taxes and contributions of the HT Group, indirect impact is also reflected in induced gross value added of other domestic producers, a part of it representing state budget revenues, i.e. revenues of local self-government units. Tax revenue shares in individual components are also based on the application of the input-output method and the data on realised revenues and expenses of the general government and on entrepreneurs' business operations in 2015.

In 2015, through its activities, the HT Group contributed to tax revenue with a total of approximately HRK 3.2 billion, accounting for 3.8 percent of the total tax revenue of the consolidated general government. Almost a half of total taxes and contributions is directly related to payments made by the units belonging to the Group, whilst the remaining amount pertains to payments made by entrepreneurs involved in the value added chain of the HT Group, i.e. VAT collected on household personal consumption, which is financed from household income. As in the case of gross value added, with regard to induced tax revenue, the impact effected through the channels of intermediary goods and services suppliers, which generate approximately HRK 480 million tax revenue, is stronger, whilst the channel of investment goods suppliers contributes to the budget with approximately HRK 160 million. Taxes on induced personal consumption of employees directly employed with the HT Group or in the chain of intermediary and investment goods suppliers amount to almost HRK 1 billion. Since in the value added tax system final costs are borne by the end consumer who is not included in the value added tax system and does not have the possibility of tax prepayment deduction, in Table 3 value added tax is assigned only to HT Group's direct activities for services provided to residential customers and taxes on induced personal consumption.

Based on tax revenue categories, almost 50 percent of the general government's total revenue induced by HT Group's activities is value added tax, followed by taxes and contributions on and from wages, which account for more than a third. Profit tax, with more than HRK 400 million related to HT Group's activities, →

General government represents a total of government units operating in a country, i.e. public authority and its institutions established by a political procedure and having legislative, judicial, and executive power over other institutional units in a certain territory. General government represents one of the main sectors of economy, and consists of the central government, regional and local self-government units, and social funds.

PICTURE 4 Total taxes and contributions induced by HT Group's activities, in HRK million

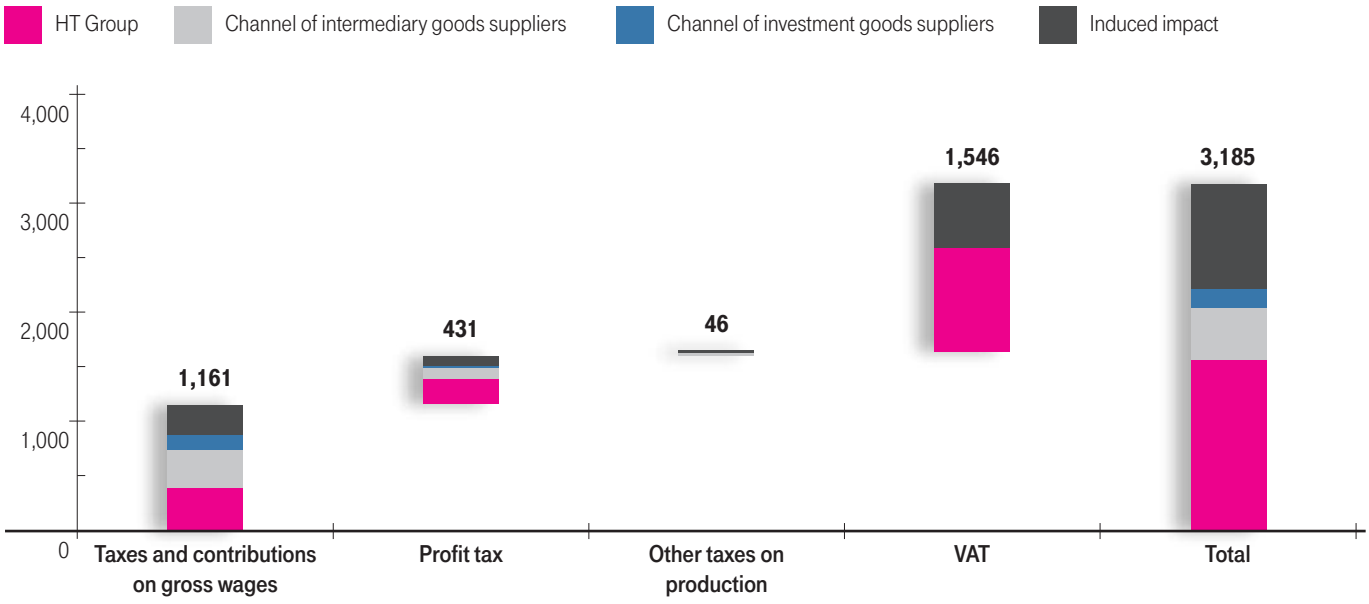


TABLE 4 Total taxes and contributions induced by HT Group's activities, in HRK million

	HT Group	Chain of intermediary goods suppliers	Chain of investment goods suppliers	Induced impact	Total
Household income	769.5	770.2	276.5	586.7	2,402.9
Gross operating surplus	2,532.1	1,102.1	205.8	1,069.6	4,909.7
Taxes and contributions	1,572.2	475.4	161.4	975.6	3,184.6
Total	**4,873.8**	**2,347.8**	**643.7**	**2,631.9**	**10,497.2**
STRUCTURE					
Household income	15.8%	32.8%	42.9%	22.3%	22.9%
Gross operating surplus	52.0%	46.9%	32.0%	40.6%	46.8%
Taxes and contributions	32.3%	20.2%	25.1%	37.1%	30.3%

→ is also a significant source of budget revenues, whilst other taxes on production, which do not depend on business results, are less yielding.

Total gross domestic product generated from HT Group's activities is distributed to national economy sectors. Table 4 and Picture 5 show the primary distribution of that income per sectors. In the total national economy income of HRK 10.5 billion generated from HT Group's activities, the largest share (46.8 percent, i.e. HRK 4.9 billion) is operating surplus, which remains available to Croatian entrepreneurs for investments and expansion of production capacities . Gross operating surplus includes fixed capital consumption and profit after tax. Since the activity of telecommunications services provision is capital intensive, the share of operating surplus in the total realised income of the Group is also relatively high, amounting to more than HRK 2.5 billion in the HT Group.

Fixed capital is defined as a stock of fixed assets in the possession of the company for more than a year. It is considered fixed because it is neither consumed nor destroyed during the process of goods and services production and can be repeatedly used in that process

In 2015, net household income resulting from net wages of HT Group's employees, i.e. net wages paid by all entrepreneurs whose economic activity was induced by HT Group's activities, amounted to approximately HRK 2.4 billion. Direct income of HT Group's employees and employees of the companies included in the value added chain of intermediary goods and services suppliers is in terms of intensity nearly equal and amounts to approximately HRK 770 million. Employees of the companies producing goods and services for induced personal consumption receive slightly less than HRK 600 million in net wages, whilst the income of employees in the value added chain of investment goods and services suppliers amounts to approximately HRK 280 million.

Total taxes and contributions accounted for 30.3 percent of the total income generated from HT Group's activities. Income generated through induced personal consumption has the largest share

[1] Based on the official data available from the national accounts system of the Republic of Croatia, it should be mentioned that the operating surplus item shows together the operating surplus of entrepreneurs and the mixed income of unincorporated companies. In Croatia, the unincorporated companies sector includes crafts and individual producers of agricultural products, where it is not possible to unambiguously determine the share of income related to owners' work input, i.e. revenue from the ownership of production assets (such as machines, equipment, and land), which partly explains a high share of this category in induced income.

of taxes and contributions as a result of particularities of the Croatian tax system, which is primarily based on the taxation of final consumption. Income generated in the chain of intermediary goods and services suppliers, where the most significant part of tax pertains to taxes and contributions on employees' income, has the smallest share of taxes and contributions.

With regard to the distribution structure of the income directly or indirectly generated from HT Group's activities, in conclusion it can be said that **all groups benefit from income growth: employees (i.e. households), public sector, and entrepreneurs, indicating a need for a deeper partner collaboration of all stakeholders to further strengthen the competitive edge of the telecommunications sector, which has significant multiplicative impacts on the Croatian economy**.

PICTURE 5 Income distribution per national economy sectors in 2015, u HRK million

DIRECT IMPACTS

After describing total impacts of HT Group's business activities on the Croatian economy, this Chapter of the Atlas focuses on direct impacts of the HT Group. Direct impacts stem from direct costs incurred by the Group, including wages, taxes, and profit. Direct impact is contained in direct deliveries of goods and services to end consumers and entrepreneurs; in the context of national accounts, the aggregate amount of the said contribution is disclosed as the indicator of gross value added, where the total gross value added of the HT Group equals the sum of gross values added of all the companies forming the Group. Picture 6 shows the basic indicators of HT Group's business operations and the link between the data on Group's business operations and the indicators in accordance with the definitions of national accounts. In 2015, HT Group's total revenues amounted to approximately HRK 6.9 billion. During 2015, the HT Group directly employed 5,013 people, accounting for 0.37 percent of employment in the Republic of Croatia in 2015. The HT Group directly generated **gross value added of HRK 3.93 billion, accounting for 1.4 percent of the total generated gross value added of the country**.

The information and communications sector, which the HT Group predominantly belongs to, generated in 2015 more than HRK 13 billion in value added and thus directly contributed to the total gross value added of the whole economy with almost 5 percent. The HT Group is the biggest company in the sector and therefore accountable for a major part of that newly generated value added.

In 2015, the HT Group paid almost HRK 227 million in profit tax, accounting for 3.6 percent of the total paid profit tax in the Republic of Croatia. This makes the HT Group not only one of the largest payers to the state budget, but also, in terms of business, a successful Group that, through its realised profit, has been continuously contributing to its shareholders, employees, state budget, and the whole economy through taxes further distributed by the state to different beneficiaries, from wages to school teachers, pension payments, to health services. HT Group accounts for 1.5 percent of total paid social security contributions and income tax, levies paid on behalf of employees, which is a very significant contribution to the state budget considering that the HT Group employs only 0.4 employees in the Republic of Croatia. Adding up profit and income tax and social security contributions, in 2015, the HT Group paid a total of HRK 611 million to the state budget. In the 2007-2015 period, the HT Group paid to the state budget almost HRK 7.7 billion in profit and income tax and social security contributions. If we add value added tax (tax on the consumption of services provided by the HT Group) to profit and income tax and social security contributions, we come to an amount of HRK 1.6 billion paid only by the HT Group to the state budget in 2015.

This means that **in 2015, the HT Group paid to the state budget almost 2 percent of the total tax revenue of the consolidated general government**. These funds could have been used in 2015 to finance, for example, a half of monthly payments for pensions. Since the information and communications sector is not predominantly an export sector in the Republic of Croatia, the HT Group, which is part of that sector, does not belong by nature to the export-oriented part of economy. In 2015, sector's total export amounted to slightly more than HRK 460 million. The HT Group accounted for a half of that amount, i.e. 57.6 percent or almost HRK 265.5 million, which puts it on the very top of the major exporters in the sector in which it predominantly operates (Picture 6).
In 2015, the HT Group employed in total 5,013 employees, of which almost 5,000 were employed in the information and communications sector, accounting for 13.7 percent of the totally employed in that sector, mostly in telecommunications activities, where every second employee is actually employed by the HT Group (Picture 7).

HT Group particularly stands out for its net wages paid to its employees, as they are well above the national average. In 2015, the HT Group paid an average net wage of HRK 8,615.78, which was 54 percent or HRK 3,021.78 above the national average (Picture 8). **During 2015, the employees of the HT Group received on average a HRK 36,261.40 higher income than an average employee in Croatia**.

National accounts represent a rounded and consistent system of accounting methods used to measure the economic activity of a country.

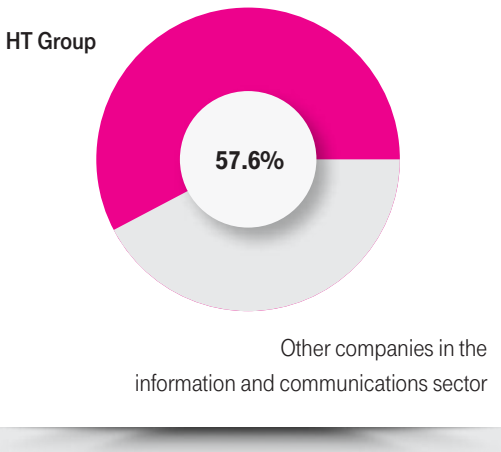
Gross production (output) includes the value of revenues from the sale of goods and services without the value of merchandise procurement costs.

Compensations of employees include paid gross wages and also certain categories that in the national accounts system are treated as compensations instead of intermediary costs (fees, awards to pupils and students, etc.).

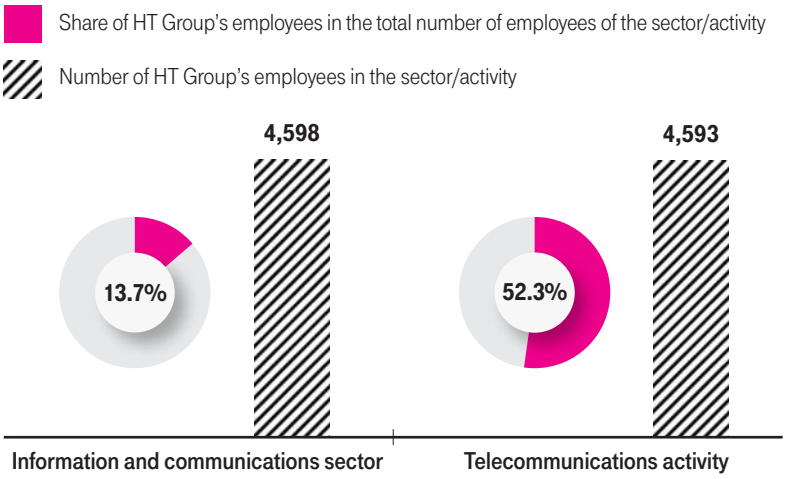
TABLE 5 Gross output, gross value added, and employment of the HT Group in 2015, in HRK million

	Gross output	Intermediary consumption	Gross value added	Compensations of employees	Gross operating surplus	Number of employees	Direct share in the gross value added of the Republic of Croatia	Direct share in employment in the Republic of Croatia
2015	5,782	1,852	3,930	1,154	2,776	5,013	1.40	0.37

PICTURE 6 HT Group's export



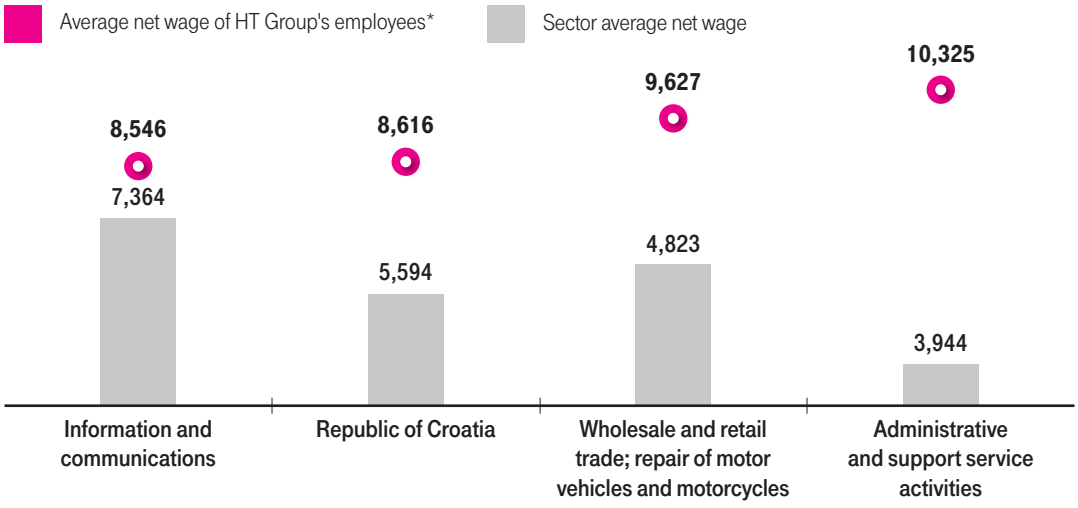
PICTURE 7 Number of employees of the HT Group



When comparing the average net wage of theHT Group with the wage paid to the employees in the information and communications sector, HT Group's employees, who in 2015 received an average net wage of HRK 8,546 (16.1 percent or HRK 1,182 above the sector average), had on average throughout the whole 2015 a HRK 14,184.05 higher income compared to the other employees in that sector. This comparison indicates that the standard of HT Group's employees is relatively higher, resulting in a higher contribution to the national economy, either through increased spending of the earned income or through savings that increase the investment capacity of society.

The previous Chapter of the Atlas has shown that HT Group's investment activities have multiple multiplicative indirect impacts on the Croatian economy. However, already the direct impact of these investments on economy is significant. For example, HT d.d., as the largest member of the HT Group, invested almost HRK 1.5 billion in new fixed assets in 2015. Compared to the previous year, it was a 37 percent increase in investments, whilst total investments in the Republic of Croatia increased by 16 percent. In 2014, HT d.d.'s investments accounted for 40.1 percent of investments in the whole information and communications sector and 2.3 percent of investments at the state level. **In the 2007-2015 period, HT d.d. cumulatively invested more than HRK 10 billion in new fixed assets, equivalent to 16.5 percent of total investments realised in the Croatian economy in 2015**.

PICTURE 8 Average net wage of HT Group's employees*



*Average wages of HT Group's employees per sectors refer to the companies of the HT Group registered in these sectors, whilst the average wage of HT Group's employees refers to the average wage across the HT Group.

IMPACT OF THE HT GROUP'S INVESTMENT ACTIVITY ON ECONOMY

With regard to investments, the HT Group is one of the most active companies in the Republic of Croatia. Only in the 2010-2015 period, the Group invested a total of approximately HRK 7.2 billion, i.e. approximately HRK 1.2 billion a year on average. The HT Group's investment activity has an evident positive trend, as confirmed by the fact that the largest amounts of investments were reported in 2013 and 2015, when investments in intangible and fixed assets amounted to more than HRK 1.4 billion (Table 6).

One of the basic characteristics of telecommunications investments is their strong potential for boosting economic growth and creation of new jobs. In so doing, the impact exercised by telecommunications investments on economy is not only short-term, as the telecommunications infrastructure is one of the foundations for the long-term growth and development of each country. Namely, in modern economies that rely on intense information exchange, telecommunications infrastructure makes information circulation easier, resulting in positive impacts on productivity, innovations, and economic growth. However, the impacts of telecommunications investments, particularly those oriented towards broadband network development, are not limited only to economy, as they affect considerably wider social processes. European Commission (2010) defines the following **areas positively affected by investments in broadband networks**:

- Local communities
- Crime, public safety, and public Internet services
- Education and skills
- Environment
- Health
- Quality of life
- Economy and employment.

Broadband networks allow for and support activities strengthening local communities and increasing social cohesion, tolerance, and respect among community members. They foster crime prevention and increase the response speed of the police and other services to emergencies and the efficiency of court proceedings. Investments in broadband networks result in increased quality of human capital driven by greater availability of information, new learning methods, and easier communication among people. The impact of broadband network investments on the environment is evident in reduced paper use, reduced waste quantities, and reduced exhausts resulting from the fact that, thanks to broadband Internet, people can work from home. Broadband Internet has a great potential to improve the health care system, mostly because it makes health information and services more easily accessible and increases the response speed of health services in emergencies. Moreover, by increasing the availability of entertainment and educational contents, by allowing for easier connection of people, by improving mutual communication, and by making employment relationships more flexible, broadband Internet increases the feeling of wellbeing and the quality of people's lives. Taking into account all the aforementioned, we can conclude that the social impacts of investments in telecommunications infrastructure are far greater and wider than direct, indirect, and induced economic impacts of investments on gross domestic product and employment, but unlike economic impacts, they are difficult to measure precisely.

On the other hand, an input-output analysis or a regression analysis are used to estimate economic impacts of investments (European Commission, 2010). In so doing, the input-output analysis includes in the total impact direct, indirect, and induced impacts described in more detail in Chapter 3.1. Based on the structural characteristics of HT Group's procured investment goods and using the input-out coefficient, the total impact of the Group's investment activity on gross value added and employment in the Croatian economy has been calculated. In so doing, indirect impacts of HT Group's investments on intermediary goods suppliers, indirect impacts on investment goods suppliers, and impacts of the total induced consumption have been presented separately.

Analysis results as presented in Table 6 suggest that only in 2015, through its investment activity, the HT Group generated 4.658 jobs and HRK 1.1 billion of gross domestic product, accounting for 0.35 percent of the gross domestic product generated in 2015. Input-output model results suggest also that in the 2010-2015 period, the HT Group created in total 22.643 jobs and generated HRK 5.5 billion of gross domestic product. The greatest impact of Group's investments on gross domestic product and employment is exercised through indirect investment goods suppliers of the HT Group, where the second-greatest impact is exercised through direct investment goods suppliers of the Group. It should be mentioned that in the analysed period, the HT Group's investment activity induced HRK 798 million in value added tax paid to the state budget.

Similar researches on USA economy (Atkinson et al., 2009) suggest that investments in telecommunications infrastructure amounting to EUR 7.1 billion can result in 64 thousand direct and 116 thousand indirect jobs.

On the other hand, Katz et al. (2010) estimate that induced impacts are slightly lower in Germany and Switzerland, but still very significant. Employment multipliers in those researches range from 1.92 to 3.62, indicating that the multiplier for the HT Group, which with 2.5 value takes the middle of that interval, can be characterised as credible.

In addition to the input-output analysis, the impact of telecommunications network investments on economic growth and employment can be estimated by a regression analysis. A particularity of such methods is that they estimate wider impacts of telecommunications infrastructure investments on the total economic activity compared to the input-output analysis. This stems from the fact that regression analysis covers also additional impacts of these investments on growth and employment through their effects on increased productivity and the quality of human capital. However, regression methods, as a rule, do not use the amount of telecommunications infrastructure investments to estimate their impact on the economic activity, they rather measure how the result of these investments, which is mostly measured on the basis of a change in Internet access speed or in broadband Internet penetration of a country, impacts the economic activity. The results of such analyses lead to the conclusion that investments in telecommunications infrastructure have a great social benefit.

In their regression analysis, Czernich et al. (2009) show on a sample of 25 OECD countries that already the introduction of broadband Internet in a country leads to a permanent increase in the gross domestic product ranging from 1.9 to 2.5 percentage points. On the other hand, Quian et al. (2009) show on a sample of 120 countries that a 10 percent increase in broadband Internet penetration increases the growth in economically developed countries by 1.2 percent. **The results of that analysis suggest that broadband network investments have a greater impact on the economic growth of developing countries, such as Croatia, where a 10 percent increase in broadband Internet penetration increases the economic growth of such countries by 1.4 percent**. This also means that, based on the results of this analysis, HT Group's investments leading to a 10 percent increase in broadband Internet penetration in the country could be expected to result in a 1.4 percent increase in the gross domestic product.

TABLE 6 Impact of HT Group's investment in the 2010-2015 period on total gross value added and employment in Croatia, in HRK million

	2010	2011	2012	2013	2014	2015	Period total	Annual average
HT Group's investments	**1,153**	**877**	**1,180**	**1,426**	**1,073**	**1,473**	**7,178**	**1,196**
GROSS VALUE ADDED, IN HRK MILLION								
Direct investment goods suppliers	324	246	314	359	270	370	1,883	314
Indirect investment goods suppliers	534	406	531	624	469	644	3,208	535
Induced personal consumption	252	192	250	294	221	303	1,511	252
Total gross value added	785	597	782	918	690	946	4,719	787
Induced VAT	133	101	132	155	117	160	798	133
Total GDP induced by HT Group's investments	**918**	**698**	**914**	**1,073**	**807**	**1,106**	**5,517**	**919**
EMPLOYMENT								
Direct investment goods suppliers	1,350	1,027	1,459	1,866	1,403	1,924	9,028	1,505
Indirect investment goods suppliers	2,424	1,844	2,537	3,134	2,356	3,230	15,524	2,587
Induced personal consumption	1,185	901	1,179	1,385	1,041	1,428	7,119	1,186
Total employment induced by HT Group's investments	**3,608**	**2,745**	**3,716**	**4,519**	**3,397**	**4,658**	**22,643**	**3,774**

HT GROUP AND CORPORATE SECTOR

Slightly more than 104 thousand legal persons (companies) operates in Croatia, employing approximately 890 thousand employees and generating annually almost HRK 640 billion revenues. These companies form the Croatian corporate sector which does not include crafts, freelancers, and active farmers who also perform economic activities, but only as physical persons. Registered legal persons in Croatia are predominantly micro-sized and small-sized companies, important for economy because of new employments and entrepreneurship development. However, large-sized companies are often of crucial importance for economy. Although there are not many of them, they have a multiple role in economy. Large-sized companies drive innovations in products and business processes, they lead new business trends, their business operations have a considerable impact on the business climate, and their investments contribute to business infrastructure development, thus increasing the competitive strength of the whole economy.

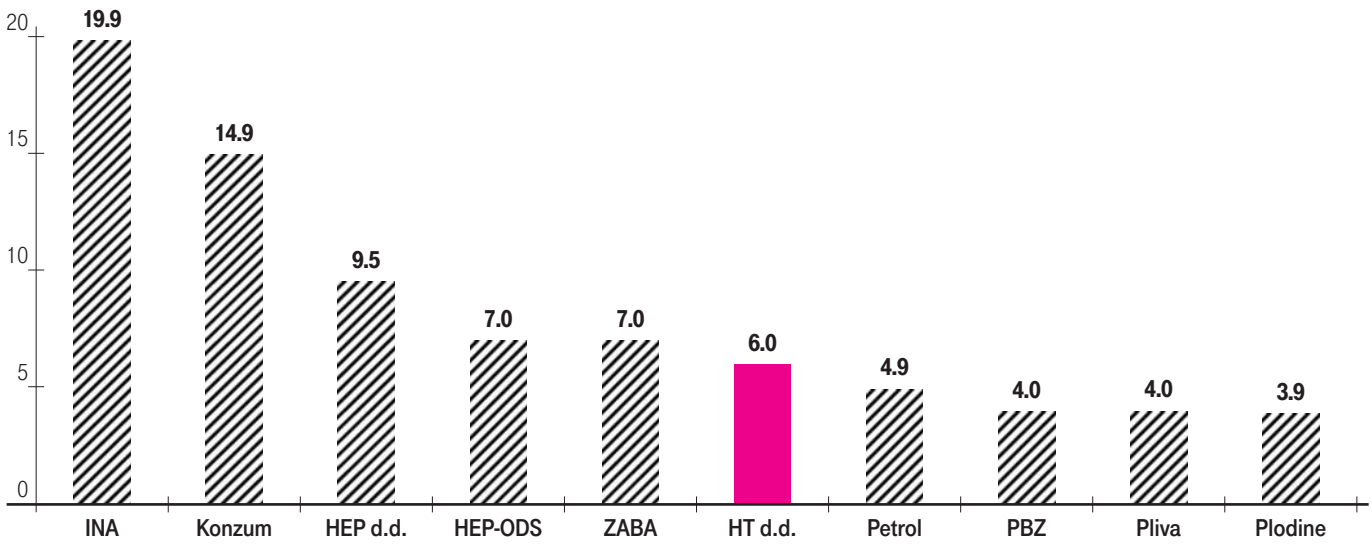
The HT Group, whose activities generated 3.14 percent of the gross domestic product in 2015 and whose business activities directly and indirectly generated more than 27 thousand jobs, is an illustrative example of a large-sized company with an exceptionally strong impact on economy. To a large degree, the HT Group owes its economic significance to its biggest member – HT d.d.

In terms of size, HT d.d. is the sixth biggest company in Croatia based on the amount of revenue generated in 2015. Applying this criterion, INA, Konzum, HEP d.d, HEP-Operator distribucijskog sustava, and Zagrebačka banka are bigger than HT d.d. The ten largest companies include also Petrol, Privredna banka Zagreb, Pliva, and Plodine. In 2015, HT d.d. generated slightly more than HRK 6 billion revenues and employed approximately 4 thousand people. →

Corporate sector represents a total of all legal persons registered in the country for economic activities.

PICTURE 9 Largest companies in the Republic of Croatia

2015 revenues (in HRK billion)



→ To gain a real insight into the size and importance of these companies, they need to be analysed over a longer period of time. Accordingly, Table 7 shows their cumulative business indicators for the 2011-2015 period. Data source is Poslovna Hrvatska.

Compared to the other nine largest companies in the country, in the 2011-2015 period, HT d.d. stood out for the following aspects of its business operations:

- HT d.d. generated the largest amount of **newly generated value,** it being defined as the income received by the company's employees, owners, and the state (through income and profit tax) from the business operations of the company;
- HT d.d. generated the largest amount of **EBITDA** and the largest amount of net income;
- HT d.d., in addition to INA, recorded the highest investment commitments;
- HT d.d., in addition to HEP d.d., recorded the highest **labour productivity** measured by the amount of newly generated value per employee.

Newly generated value is defined as the income generated by a company for its workers, owners, and the state (through payment of income and profit tax and surtax).

EBITDA represents a company's earnings before interest, taxes, depreciation, and amortisation.

A special emphasis should be put on the fact that HT d.d. is the most important company in Croatia in terms of newly generated value. Newly generated value can be defined as the gross value added minus the income generated by physical capital (such income is also called **amortisation).** Accordingly, newly generated value can be also considered a livelier version of gross value added, as it takes into account the income of the living production factors (workers, owners, and the state as a whole) minus the income of the non-living ones (fixed assets). Creating new values is the modus operandi of companies' investment activities. As already said, among the ten largest companies in Croatia, HT d.d. is the second largest company based on the amount of new investments. It should be pointed out that a significant portion of INA's investments refers to investments in production capacities of that company. On the other hand, the largest portion of HT d.d.'s investments is directed towards telecommunications infrastructure development, leading us to conclude that, **when compared to other private companies, HT d.d. invests**

TABLE 7 Cumulative business indicators for the 10 largest companies in the Republic of Croatia for the 2011-2015 period

	INA	Konzum	HEP d.d.	ZABA	HEP ODS	HT d,d,	Petrol	PBZ	Pliva	Plodine
Number of employees (period average)	8,269	11,913	428	4,203	8,242	**4,969**	647	3,390	1,798	2,991
Total revenues (in HRK million)	127,517	68,648	61,459	34,706	27,455	**33,758**	19,340	21,879	16,999	16,739
EBITDA (in HRK million)	12,238	4,620	3,761	-	7,499	**14,599**	417	-	3,339	1,532
Profit tax (in HRK million)	-167	338	411	807	495	**1,297**	16	527	-513	26
Net income (in HRK million)	1,085	1,064	4,486	3,316	2,649	**6,949**	152	3,602	2,213	188
Newly generated value (in HRK million)	11,653	6,112	5,645	7,224	8,724	**12,863**	449	6,285	3,723	1,276
Newly generated value per employee (in HRK million)	1.4	0.5	13.2	1.7	1.1	**2.6**	0.7	1.9	2.1	0.4
Investments (in HRK million)	7,476	2,287	707	-	4,693	**5,596**	2,629	-	2,100	457

the most in infrastructure development. HT d.d. is also a private company operating in the service sector that allocates the most money for investments. By making such an effort, HT d.d. has created a potential to improve the competitive strength of all entrepreneurs and increase the quality of life of the population through the digitalisation of society. By pursuing the improvement of telecommunications infrastructure, HT d.d. allows new knowledge and information to be used as quickly as possible and at the lowest possible costs, thus making business operations of the existing entrepreneurs easier, boosting the establishment of new companies, and raising the competitive strength of the whole economy.

In addition to comparing the largest company of the HT Group with other companies, in order to gain a better insight into the importance of the HT Group, it is useful to take into consideration the size of the Group measured by its shares in the main aggregates of the corporate sector. In so doing, we use six definitions of corporate sectors, from the widest to the narrowest one, that correspond to the sectors in which the HT Group operates:

- Corporate sector;
- Service sector;
- Knowledge and high-technology sector;
- Knowledge and high-technology service sector;
- Knowledge-intensive service sector;
- Information and telecommunications sector.

Corporate sector is also the widest definition of analysed sectors, covering all legal persons registered in the Republic of Croatia. Service sector is part of the corporate sector, which, like all companies of the HT Group, is registered for service activities. Knowledge and high-technology sector is another sector which the companies of the HT Group also belong to. It consists of production and service companies applying knowledge and high technologies in their business operations. Knowledge and high-technology service sector consists of only service companies applying knowledge and high technologies in their business operations, whilst knowledge-intensive service sector includes all service companies applying in their business operations specialised knowledge, but not high technologies. Information and telecommunications sector consists of companies whose business operations include information and telecommunications services. A detailed description of all activities belonging to the second, third, fourth, fifth, and sixth sector can be found in Appendix 2 to the Atlas. Since the companies of the HT Group are covered by all six definitions of sectors, to gain insight into the importance of the HT Group for these sectors, its share in the standard aggregated business indicators of the sectors, such as assets, profit, and investments, needs to be calculated. These shares are disclosed in Table 8. →

Labour productivity is defined as the ratio of produced goods and the number of employees needed to produce them. It can also be described as a company's successfulness in goods or services production compared to used production resources.

Amortisation is a procedure to write off the value of intangible assets during their useful life-cycle.

TABLE 8 HT Group's shares in the aggregates of the corporate sector of the City of Zagreb in 2015 (%)

	Corporate sector	Service sector	Knowledge and high-technology sector	Knowledge and high-technology service sector	Knowledge-intensive service sector	Information and telecommu-nications sector
Total assets	1.3	2.6	28.0	41.4	7.5	40.3
Capital and reserves	2.9	6.5	45.1	62.7	16.1	61.8
Total revenues	1.1	1.9	18.0	27.3	8.6	26.0
Total expenditures	1.0	1.7	16.2	24.9	8.0	23.7
Period profit	5.5	8.7	39.7	53.3	15.3	51.2
Investments	3.5	7.1	36.0	44.6	22.3	44.9
Number of employees	0.6	1.1	11.8	16.2	3.4	15.4
Gross value added	2.7	5.0	26.4	35.4	13.5	34.8
Gross wages	1.3	2.2	15.0	20.6	6.4	20.5

TABLE 9 Business indicators of the HT Group and the corporate sector

	HT Group	Corporate sector	Service sector	Knowledge and high-technology sector	Knowledge and high-technology service sector	Knowledge-intensive service sector	Information and telecom-munications sector
Labour productivity (gross value added per employee, in HRK)	**783,930**	171,561	166,277	350,607	358,108	210,729	348,035
Capital productivity (gross value added per physical capital unit, in HRK)	**0.70**	0.27	0.36	0.87	0.92	0.80	0.95
Capital endowment of labour (physical capital value per employee, in HRK)	**1,120,205**	634,660	468,099	403,458	387,796	262,797	366,040
Investments per employee (in HRK)	**270,510**	45,949	40,578	88,612	98,049	41,074	93,026
Average net wage (in HRK)	**8,616**	5,031	5,104	7,621	7,480	5,754	7,153

→ It also makes sense to compare HT Group's average indicators, such as productivity, investments per employee, and average net wage, compared to the average values realised by the mentioned sectors according to these indicators. Table 9 gives an overview of these indicators.

Indicators shown in Table 8 suggest that although the companies of the HT Group make only six out of more than a hundred thousand companies forming the Croatian corporate sector, they account for 3.5 percent of investments, 2.7 percent of gross value added, and 5.5 percent of profit of the whole corporate sector. The importance of the HT Group is even greater if it is considered only as a service company. Namely, it generates 7.1 percent of investments, 5 percent of gross value added, and 8.7 percent of profit of the whole incorporated service sector in Croatia. However, nowadays, economic growth depends on the ability of countries to achieve technological advancement and to organise effective production of more complex products requiring intensive use of knowledge and high technologies. But, in order for countries to be able to achieve technological advancement, the economy sector, which intensely applies knowledge and new technologies, needs to be propulsive. **The HT Group, which predominantly belongs to the knowledge and high-technology sector, can be considered the driver of the technological development of the country. It is the largest company in that sector, accounting for 36 percent of total investments and 26 percent of the gross value added of the high-technology sector.**

HT Group is also compared with the high-technology service sector. Namely, modern economies have been increasingly turning away from manufacturing activities, basing their development on sophisticated services. On the other hand, economies that in their development rely on primitive services are, as a rule, not able to generate income per capita that would be comparable to the wealthiest countries, which are focused on the production of goods with high value added and on sophisticated services. Sophisticated services, particularly those applying knowledge and high technologies in production processes, have been therefore increasingly gaining on importance in modern societies. The HT Group is a market leader in this sector as well. It accounted for almost a half of

Primitive services are services whose delivery does not require specialised knowledge or the use of high technologies.

TABLE 10 HT Group's shares in the aggregates of the corporate sector of the Republic of Croatia in 2015 (%)

	Corporate sector	Service sector	Knowledge and high-technology sector	Knowledge and high-technology service sector	Knowledge-intensive service sector	Information and telecommu-nications sector
Total assets	2.2	4.5	33.1	45.3	10.7	44.3
Capital and reserves	4.5	11.1	51.8	66.5	23.8	64.9
Total revenues	2.2	3.4	21.8	31.3	12.8	29.8
Total expenditures	1.9	2.9	19.6	28.6	11.7	27.2
Period profit	10.2	16.2	50.7	61.7	28.3	57.6
Investments	7.3	13.7	40.8	46.9	36.1	47.1
Number of employees	1.5	2.2	17.0	22.2	5.9	21.3
Gross value added	5.5	9.0	32.5	40.6	18.5	39.8
Gross wages	2.7	4.0	19.1	25.3	9.2	25.3

investments of the high-technology service sector and over a third of the total gross value added generated by this sector in 2015.

HT Group's success is also evident in the comparison of its main economic indicators with corporate sectors. It should be pointed out that **HT Group's labour productivity exceeds the average labour productivity values of corporate sectors under all definitions, with a special emphasis being placed on the fact that HT Group's productivity is 356 percent above the average of the total corporate sector**.

Capital endowment of labour and the amount of investments per employee in the HT Group is also many times higher compared to the averages of all six corporate sectors. Thus, investments per employee, amounting to HRK 270 thousand per employee in the HT Group, are almost 500 percent above the average of the whole corporate sector and 205 percent above the high-technology sector. Finally, it should be mentioned that the average net wage in the HT Group deviates to a considerable degree from corporate sectors under all definitions. Compared to the average of the whole corporate sector, the average net wage in the HT Group is higher by 71 percent (HRK 3,583), whilst in relation to the high-technology sector, the difference is 13 percent (HRK 995).

Since HT d.d.'s subsidiaries, with the exception of the smallest one (KDS d.o.o.), and HT d.d. itself are registered in the City of Zagreb and perform a considerable part of their activities in Zagreb, the significance of the HT Group for the economy of the Croatian capital needs to be defined as well. Thus, the HT Group generates 7.3 percent of total investments of the whole corporate sector registered in the capital city and 5.5 percent of gross value added (Table 10). As with corporate sectors for the whole territory of the Republic of Croatia, the HT Group is of particular importance for the high-technology sector of the City of Zagreb. It accounts for 41 percent of total investments and 33 percent of the total value added of the high-technology sector of the capital city. Therefore, it can be concluded that the HT Group is an important factor of the technological development of the Croatian capital.

Capital endowment of labour is defined as the quantity of a company's physical capital available per employed company worker.

HT GROUP AND CAPITAL MARKET

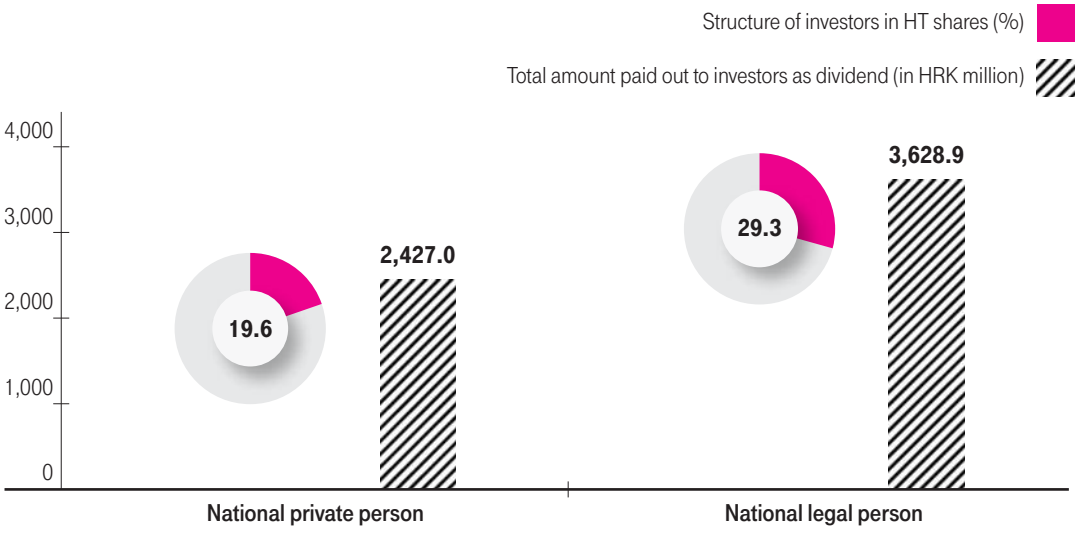
THE IMPORTANCE OF HT D.D.'S SHARE FOR THE CROATIAN CAPITAL MARKET

HT d.d. is one of 150 companies nowadays listed on the Zagreb Stock Exchange. HT d.d.'s share is listed on the Official Market. In addition to Optima Telekom d.d.'s share, HT d.d.'s share **is the only share in the telecommunications sector**.
HT d.d.'s share is an integral part of the following equity indices published by the Zagreb Stock Exchange: **CROBEX**, **CROBEX10**, CROBEXplus, and CROBEXtr.
HT d.d.'s share is an integral part of the following equity indices published by the Vienna Stock Exchange: **CECE Telecom**, CECE Extended, and SEE Traded Index.
HT d.d.'s share was listed on the Zagreb Stock Exchange in 2007, when the initial public offering of company's shares was conducted.

By conducting the initial public offering and thus listing shares on the Stock Exchange, HT d.d. considerably boosted shareholding development in the Republic of Croatia and the involvement of new participants, particularly small shareholders, in the capital market. Market development was further positively impacted in 2007 by the fact that the same year additional six national companies conducted their initial public offerings of shares.

It is interesting that in 2015, the Zagreb Stock Exchange recorded the first initial public offering after a seven-year dry period, which affected both the total national economy and the capital market. In this context, HT d.d.'s share has proved to be very important not only for market development, but also for the existence of the Croatian capital market.
Unlike the total market and the average share on the Zagreb Stock Exchange, HT d.d.'s share has proved to be a reliable and rational choice for institutional investors and small shareholders in the post-listing period. Strong interest of institutional investors is expected considering **the superior liquidity of the HT d.d.'s share**.
Throughout the entire capital market contraction, the HT Group managed to send a message of business stability through regular dividend pay-outs, which have been duly made every year since the initial public offering. Small shareholders have rewarded such an approach (Picture 10). →

PICTURE 10 Structure of investors in HT d.d.'s shares and dividend pay-out in the 2008-2015 period (in HRK million)



Zagreb Stock Exchange (ZSE) is a main actor of the Croatian capital market. Founded in 1991, it manages the Regulated Market and the Multilateral Trading Facility. Company shares are listed on the Zagreb Stock Exchange in compliance with the listing rules in the following quotations on the Regulated Market: Prime Market, Official Market, and Regular Market. The Stock Exchange publishes the following equity indices: CROBEX®, CROBEX10©, CROBEXplus, CROBEXtr, five sectoral indices (industry, construction, tourism, transport, and food sector) and two debt indices.

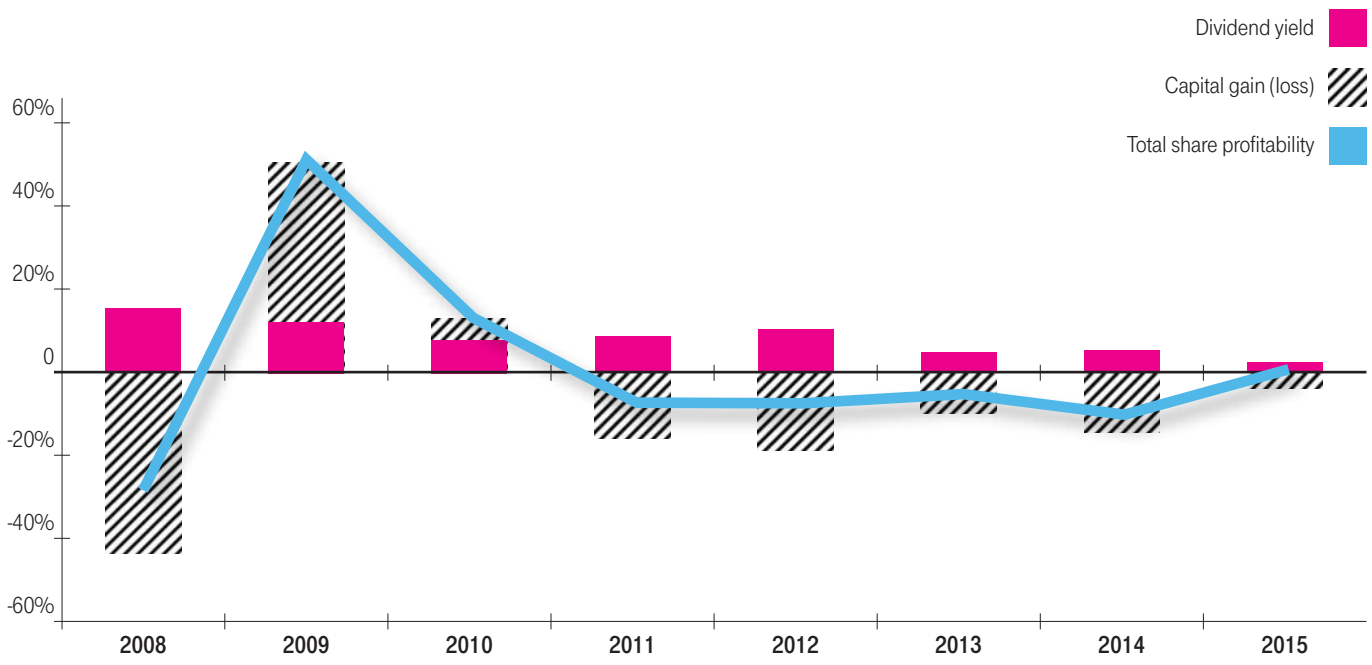
→ **During the initial public offering of HT d.d.'s shares**, a total of 355,000 national private persons invested in HT's shares, accounting for **8.2 percent of the total population of the Republic of Croatia. National private persons represent a fifth of investors in HT and have cumulatively acquired HRK 2.4 billion from dividends, accounting for 2 per cent of the disposable household income in the dividend pay-out period.**
National legal persons hold a third of issued HT d.d.'s shares and have been paid out dividends to the amount of HRK 3.6 billion. 441 national legal persons have invested in HT d.d.'s shares.
Foreign legal persons hold approximately 51 percent of issued HT d.d.'s shares.
To the present day, HT d.d. has paid out a total of HRK 12.4 billion in dividends to its shareholders.

In the period after the initial public offering of shares, the HT Group paid out to its shareholders an average dividend of HRK 19 per share.
After 2013, the dividend per share was below the average one, partly as a result of HT Group's increased investments in the same period. The profit reinvested in recognised investment opportunities over the last several years can be expected to reflect favourably on shareholders in the near future through an increase in the price of the company's share. In 2015, HT's dividend yield was 4.3% (Picture 11). In addition to paid-out dividend of HRK 6 per share and slower share price decrease at the annual level, **the total profitability of the HT d.d.'s share in 2015 was positive, after four consecutive years during which the total share profitability was negative.**

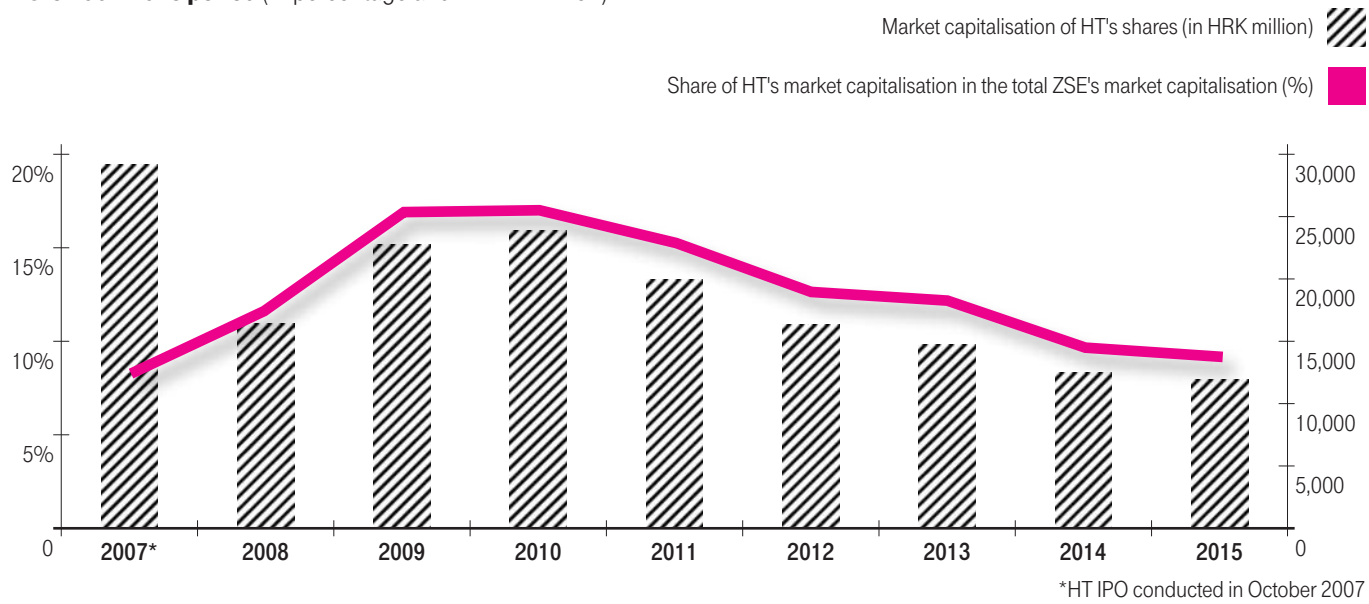
In the post-listing period, HT d.d.'s share has always been among the top three shares with the largest market capitalisation share in the total market capitalisation of the Zagreb Stock Exchange (Picture 10). In the 2008-2009 period, HT d.d.'s share had the largest market capitalisation share in the total market capitalisation of the Zagreb Stock Exchange. In the five years following that period, it ranked second after INA d.d. based on the mentioned indicator.
In 2015, market capitalisation of HT's shares was 9.2 percent of the total market capitalisation of shares on the Zagreb Stock Exchange.

Market capitalisation is a measure of the size of a company or a market, determined by multiplying the share price by the number of issued shares of an individual company.

PICTURE 11 Total profitability of the HT d.d.'s share (in percentage)



PICTURE 12 Share of HT d.d.'s market capitalisation in the total market capitalisation of the Zagreb Stock Exchange in the 2007-2015 period (in percentage and in HRK million)



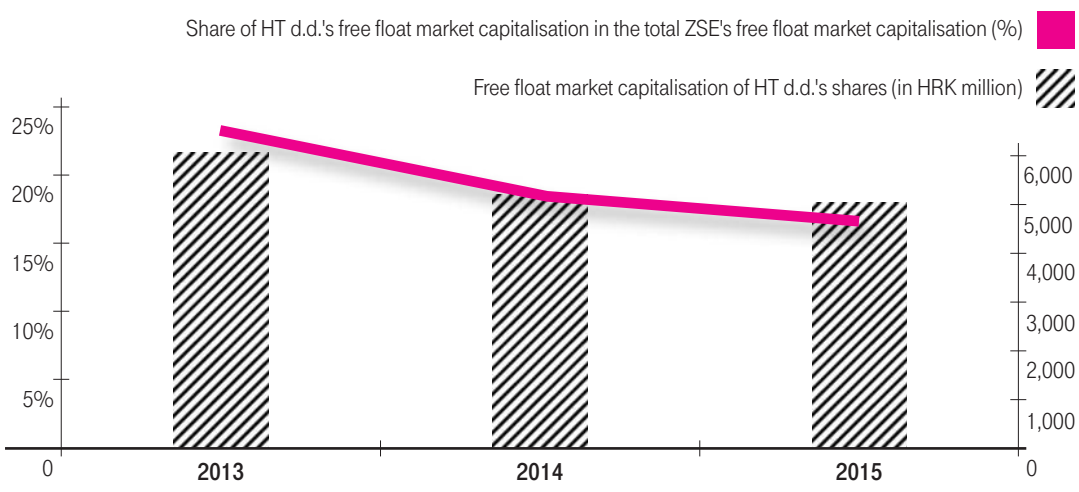
*HT IPO conducted in October 2007

HT d.d.'s share has had the highest individual share in the free float market capitalisation of shares traded on the Zagreb Stock Exchange for the last three years (Picture 13).

In 2015, the free float market capitalisation of HT d.d.'s shares was 16.5 percent of the total free float market capitalisation of shares on the Zagreb Stock Exchange.

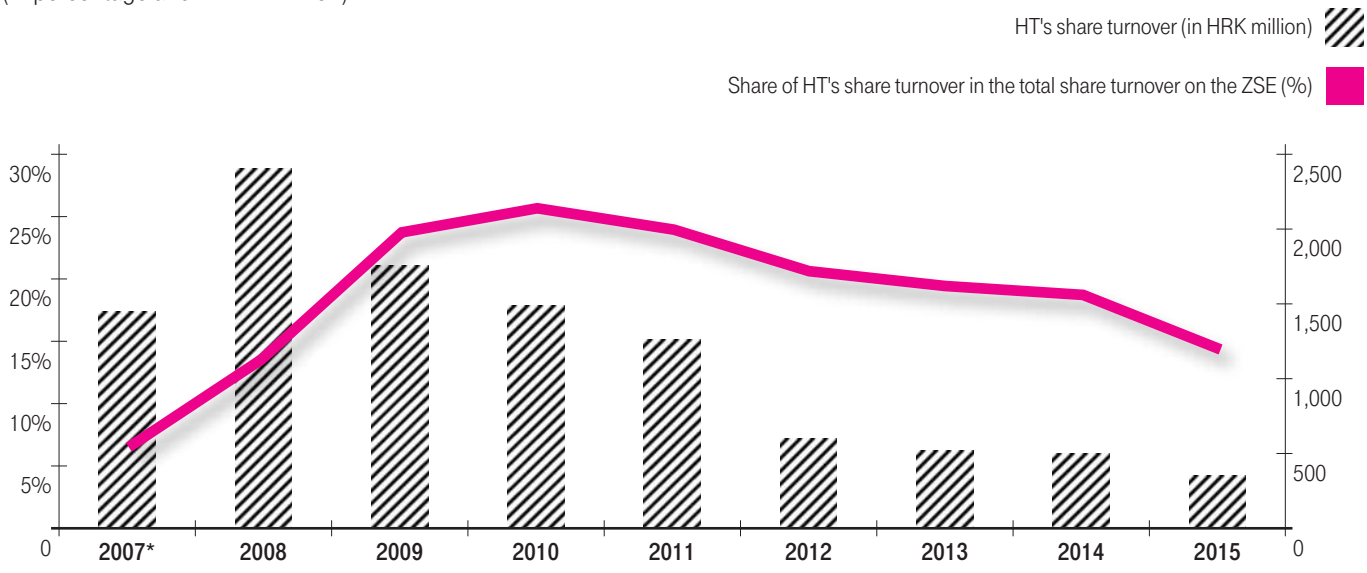
In 2013, HT d.d.'s shares accounted for almost a quarter of the free float market capitalisation of shares traded on the Zagreb Stock Exchange.
HT d.d.'s share high activity is evident in the level of generated turnover and resulting liquidity.
HT d.d.'s share generated the largest turnover compared to other shares on the Zagreb Stock Exchange in 2015 and all observed years after the initial public offering. →

PICTURE 13 Share of HT-a d.d.'s free float market capitalisation in the total market capitalisation of the Zagreb Stock Exchange in the 2013-2015 period (in percentage and in HRK million)



Free float market capitalisation is determined by multiplying the share price by the number of free floating shares of a company on the market. The value of shares owned by e.g. the state and state institutions, strategic partners, company management, and other shareholders with significant participation is deducted from the total market capitalisation.

PICTURE 14 Share of HT d.d.'s share turnover in the total share turnover on the Zagreb Stock Exchange
(in percentage and in HRK million)



*HT IPO conducted in October 2007

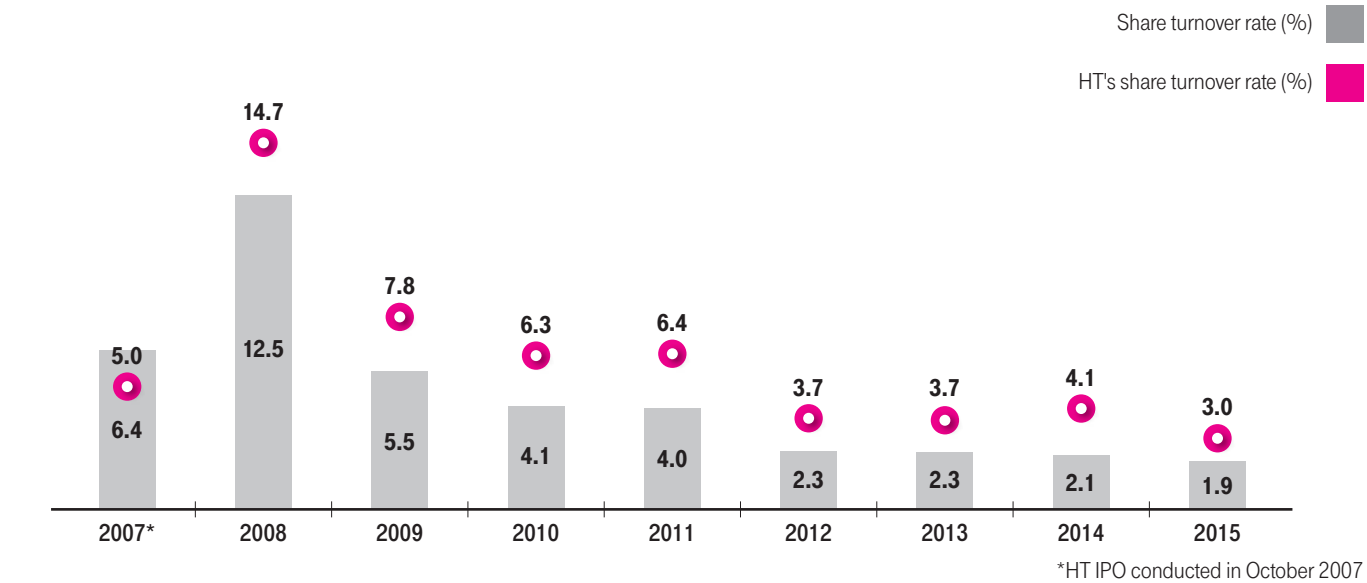
Liquidity or share turnover rate represents the quotient of the generated turnover and the annual market capitalisation.

In 2010, HT d.d.'s share turnover accounted for **more than a quarter** of the total share turnover on the Zagreb Stock Exchange.

Relatively high HT d.d.'s share trading volume makes its sale easier and has a positive impact on its attractiveness, which has, among other things, attracted and kept a large number of investors.

HT d.d.'s share has been more liquid than an average share on the market throughout the years following the initial public offering. For the last five years,

PICTURE 15 Total share turnover rate and HT d.d.'s share turnover rate in the 2007-2015 period (in percentage)



*HT IPO conducted in October 2007

the HT d.d.'s share turnover rate has been almost continuously 60 percent higher than the total share turnover rate, whilst in 2014, HT d.d.'s share was almost two times more liquid compared to the total market.

Low liquidity on transition markets, such as the Croatian market, represents a problem as it indicates the inability of the market to give companies an opportunity to procure cheap capital and the unwillingness of investors to trade at high implicit trading costs. Low liquidity compromises the development and the very existence of the capital market.

Although the role of the HT d.d.'s share is very important to this end, the domestic market needs to offer more investment opportunities to investors.

HT D.D.'S SHARE AND COMPARABLE STOCK EXCHANGE INDICES

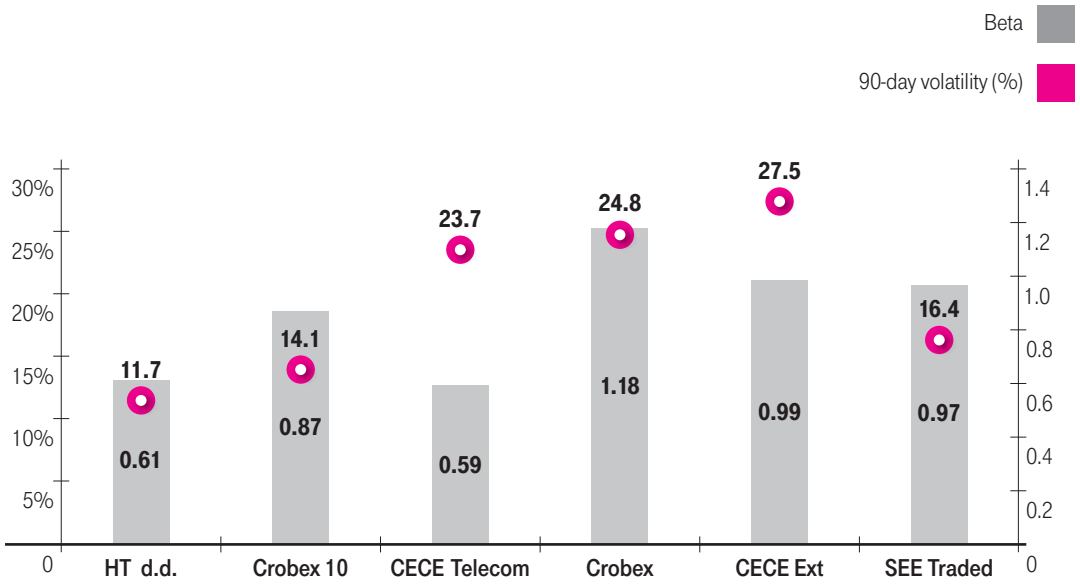
Below, the HT d.d.'s share is compared with the average values of the national, regional, and sectoral indices which HT d.d.'s share is an integral part of.

HT d.d.'s share is the least volatile share compared to the average volatility of the indices which the HT d.d.'s share belongs to (Picture 16).

In general, the HT d.d.'s share is mostly less risky compared to the average risk related to the indices which HT d.d.'s share is an integral part of.

Both risk measures indicate lower risk of the HT d.d.'s share compared to the average risk of the ten best shares on the Croatian market and →

PICTURE 16 Risk of the HT d.d.'s share and selected indices in June 2016



Crobex – ZSE equity index comprising 25 shares with maximum individual weight of 10% which are traded 80% of trading days.

Crobex 10 – ZSE equity index comprising 10 shares from the CROBEX Index with the largest free float market capitalisation and with maximum individual weight of 20%.

CECE Telecom – regional sectoral equity index of the Vienna Stock Exchange comprising the best shares of telecommunications companies listed on stock exchanges in Bucharest, Budapest, Belgrade, Ljubljana, Prague, Sofia, Warsaw, and Zagreb. It currently includes Hrvatski Telekom, Netia SA, Orange Polska SA, Telekom Slovenije d. d., Magyar Telekom Tavkozlesi Nyrt, and O2 Czech Republic.

CECE Extended – regional equity index of the Vienna Stock Exchange comprising the best shares included in the CECE Composite Index (CECE) and the South-East Europe Traded Index (SETX). It currently comprises 25 shares listed on stock exchanges in Bucharest, Budapest, Belgrade, Ljubljana, Prague, Sofia, Warsaw, and Zagreb.

SEE Traded Index – regional equity index of the Vienna Stock Exchange comprising 18 best shares listed on stock exchanges of South and Eastern Europe – Bucharest, Belgrade, Ljubljana, Sofia, and Zagreb.

→ the average risk of the regional indices comprising the best shares on the markets concerned.

The beta of the HT d.d.'s share shows that the risk of HT d.d.'s shares is lower than the market one, similar to the index comprising shares of the selected regional telecommunications companies.

Despite the challenges of a matured market with which telecommunications companies are faced on Central and Eastern European markets, the systematic risk measures indicate a lower risk of investments in telecommunications sector on the observed transition markets compared to the total market.

It is interesting that the 90-day volatility is considerably lower with the HT d.d.'s share compared to the volatility of the CECE Telecom Index, which comprises shares of the selected regional telecommunications companies.

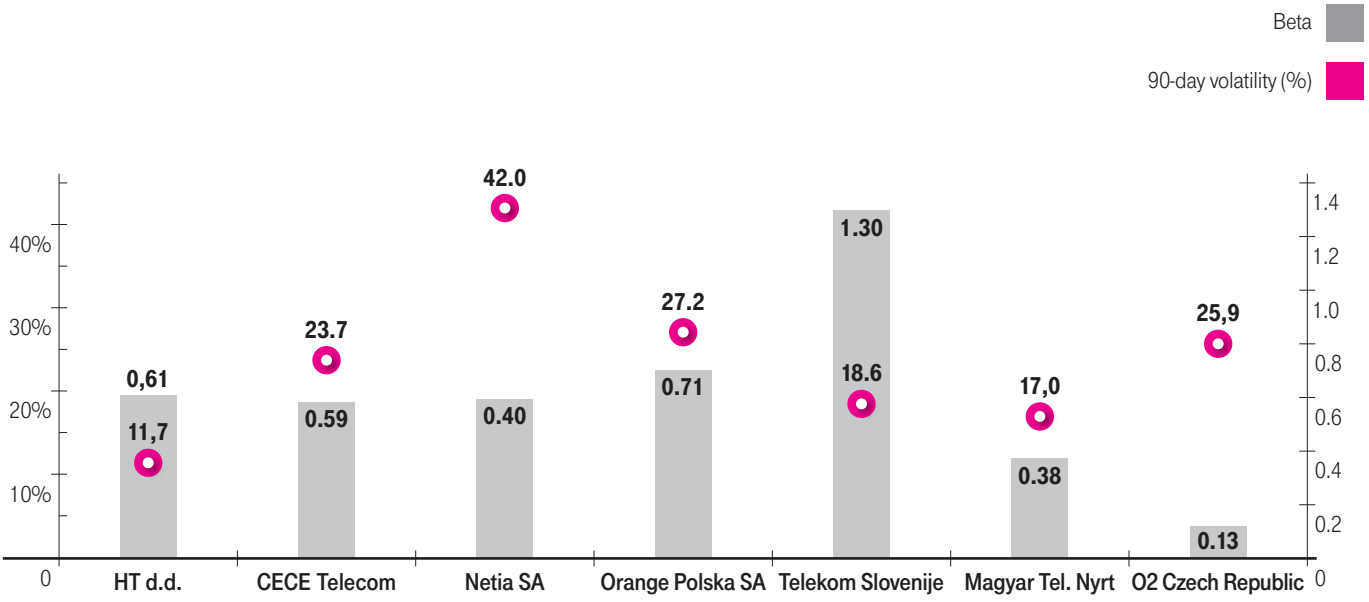
Taking into consideration that the systematic risk measured by beta is even for the HT d.d.'s share and the CECE Telecom Index, a conclusion can be drawn that a higher average volatility of shares of the selected regional telecommunications companies is primarily caused by a higher company-specific risk.

A similar conclusion can be made taking into consideration the risk indicators for the shares of the best regional telecommunications companies currently included in the CECE Telecom Index (Picture 17).

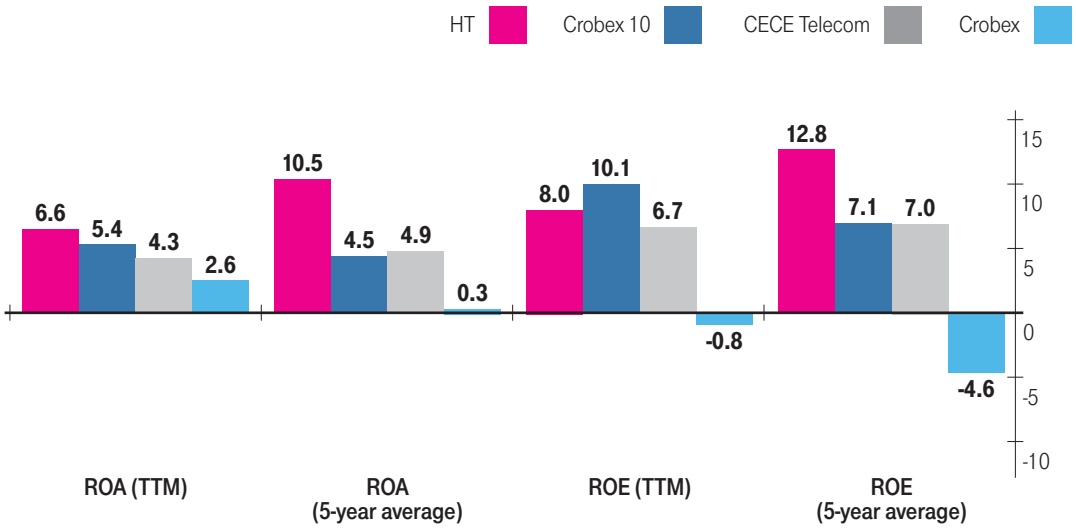
Although aggregated data make it harder to precisely isolate the cause of the company-specific high risk with regard to the shares included in the CECE Telecom Index compared to the HT d.d.'s share, the causes of the HT Group-specific lower risk can certainly be found in superior asset and capital management (Picture 18). The HT d.d.'s share holds a dominant position according to all indicators for the efficiency of asset and capital management compared to the average of the regional telecommunication companies.

Volatility is a statistical measure of the dispersion of returns for a given share or share index. It represents the variability of the return of a share or index compared to the expected return over a certain period of time (e.g. 90 days). It measures the total risk of a share or index and is calculated by using the standard deviation (σ) or variance (σ2) between returns. The total share risk consists of a systematic and a specific risk. A higher volatility usually means a higher share risk.

PICTURE 17 Risk of the HT d.d.'s share and the shares included in the CECE Telecom index in June 2016



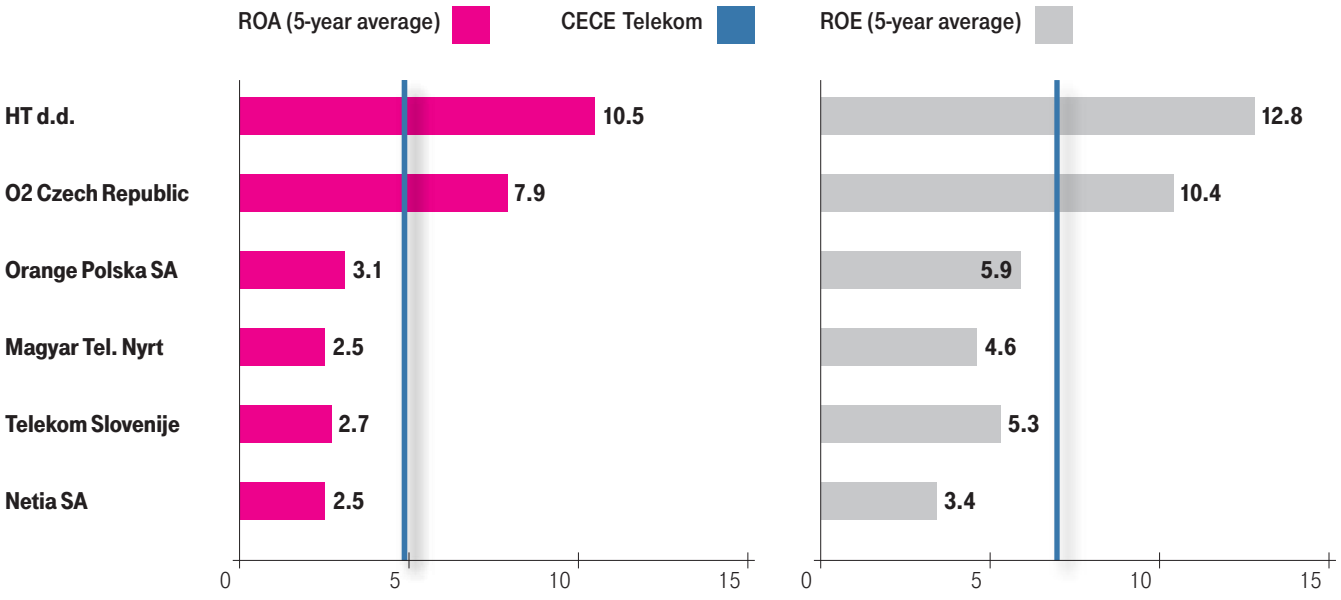
PICTURE 18 Efficiency of asset and capital management (in percentage), HT d.d. and averages of selected indices



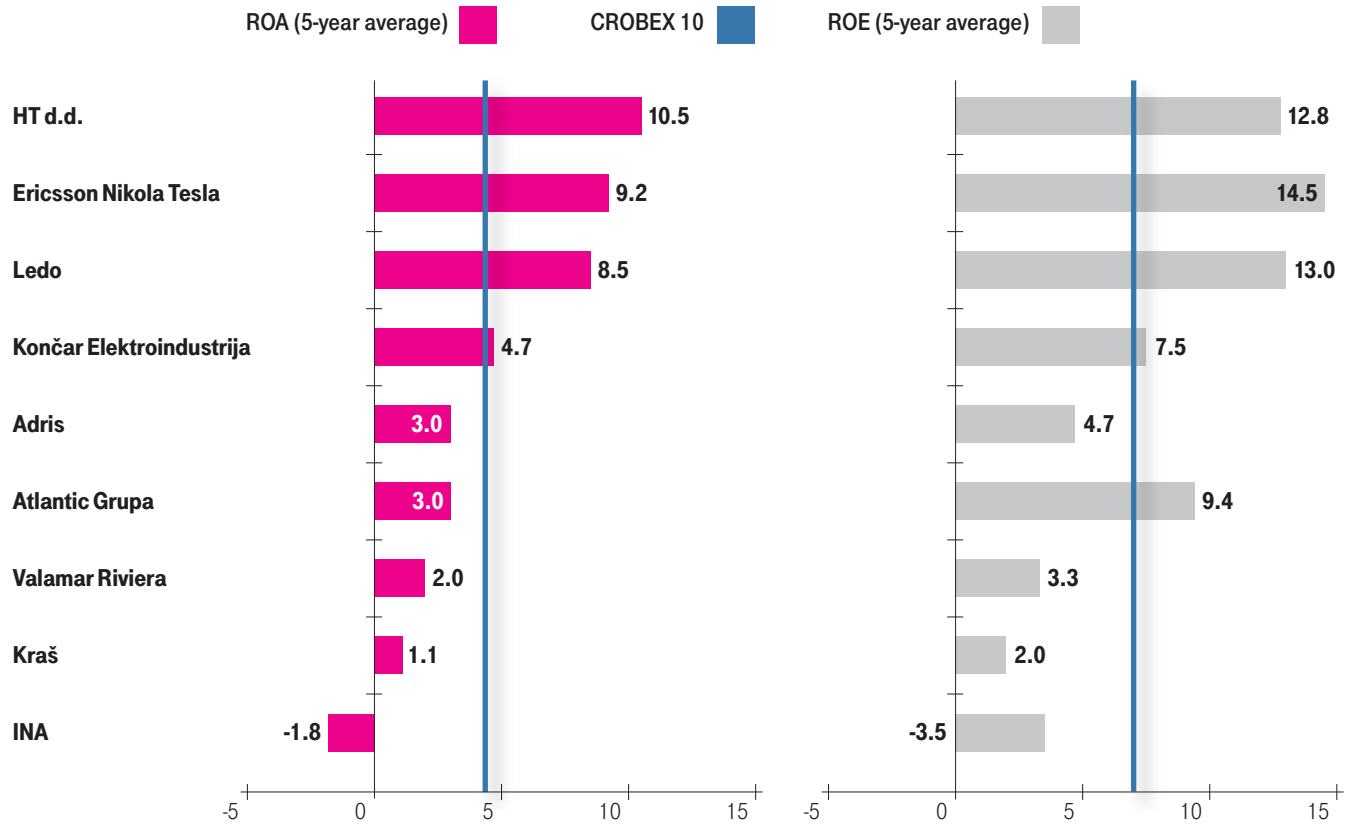
The HT Group is more **efficient** in **asset management than an average company included in the CROBEX10 Index** on the domestic capital market. When analysing **the efficiency of asset and capital management over the last five years, the HT Group shows better performance than all its regional competitors** included in the CECE Telecom Index (Picture 19). →

Beta of a share is a measure of the systematic risk of a share – it measures the risk of a share compared to the market. The market has a beta of 1.00. If a share has a beta of greater than 1, the share is riskier than the market, whilst a beta of less than 1 indicates that the share is less risky than the market.

PICTURE 19 Efficiency of asset and capital management (in percentage), HT d.d. and shares included in the CECE Telecom Index



PICTURE 20 Efficiency of asset and capital management (in percentage), HT d.d. and shares included in the CROBEX10 Index



→ In the five-year period, **the HT Group has managed its assets more efficiently than all ten best companies whose shares are included in the prestigious domestic CROBEX10 Index** (Picture 20).
In the five-year period, **the HT Group has, on average, managed capital more efficiently than an average company included in CROBEX10 on the domestic capital market.**

When analysing individual companies included in CROBEX10, in the last five years, the HT Group was among the top three most efficient companies based on the asset management criterion.

HT GROUP AND CORPORATE SOCIAL RESPONSIBILITY

One of the strategic goals of the HT Group's business operations is to strengthen corporate responsibility and long-term sustainability of the Group's business operations. Accordingly, through a set of diverse activities, the Group strives to reach the community in which it operates, thus setting goals that are not directly related to its business performance. A particularly worth mentioning is the contribution of the HT Group, as the largest high-technology company in the country and as a private service company with the largest investment commitments in the country, to propelling the digital development of society.

In 2015, HT Group adopted the Corporate Social Responsibility Policy, which is designed as a basis to be used by the Group for definition, maintenance, monitoring, and further development of its responsibility with regard to corporate responsibility and related obligations, as well as of its work and coordination processes. The Policy has also been adopted by all other members of the HT Group. In so doing, the HT Group recognises the following types of corporate responsibility covered by its business activities, continuous monitoring, and improvement:

- Responsibility towards the society;
- Responsibility towards employees;
- Responsibility towards customers;
- Responsibility towards suppliers;
- Responsibility towards the environment.

Since HT d.d. is the largest company of the Group, the activities undertaken by HT d.d. with regard to corporate social responsibility make a strong mark on the corporate social responsibility of the whole Group. Therefore, it should be pointed out that HT d.d. has adopted a Strategy of corporate social responsibility and sustainable business operations defining three main areas which the company's activities are focused on:

- Technology and communication;
- Education and digitalisation;
- Environmental protection.

In the context of the technology and communication area, HT d.d. aims to enable the best possible connection in private and professional life, develop innovative and top quality telecommunications solutions, and offer services that will improve everyday life of all citizens through communications and connectivity. In the context of the education and digitalisation area, HT d.d. aims to provide access to telecommunications services to as many people as possible and to integrate them into a knowledge society. Moreover, the company wishes to make advanced technologies available to everyone and at any time. In the context of the environmental protection area, HT d.d. aims at responsible use of resources and reduction of greenhouse gas emissions. →

As the largest member of the HT Group and the sixth largest company in the Republic of Croatia, HT d.d., which has the most funds at its disposal, organises its philanthropic activities in the context of "Together We Are Stronger", an annual umbrella donation programme.

Since the goal of the Economic Atlas of the HT Group is to estimate, in a systematic, credible, and consistent manner, the impact and economic importance of the HT Group for the whole economy of the Republic of Croatia, Group's corporate social responsibility towards the society, evident in the Group's collaboration with educational, cultural, and scientific institutions, non-governmental organisations taking care of persons with special needs and disadvantaged people, and organisations promoting civil society values, is of particular importance. Especially worth mentioning are philanthropic and voluntary activities of the Group. **In the 2009-2015 period, Group's dedication to philanthropic activities resulted in a total of HRK 19.3 million of HT Group's donations**.

As the largest member of the HT Group and the sixth largest company in the Republic of Croatia, HT d.d., which has the most funds at its disposal, organises its philanthropic activities in the context of "**Together We Are Stronger**", an annual umbrella donation programme. Once a year, the programme calls for applications with a view to providing support to the projects focused on the improvement of the quality of life in local communities in the areas of technology and communication, education and digitalisation, and environmental protection. Since the launch of the programme in 2006, HT d.d. has supported the implementation of almost 240 valuable projects with an amount exceeding HRK 8 million. Having recognised the importance of investing in the popularisation of science among younger generations, in 2016, as part of the "Together We Are Stronger" programme, HT d.d. has provided financial support to the two best STEM projects in the area of new technologies and knowledge – "Internet of Things in Croatian Primary Schools in 2016" and "Campus" – which strive to raise the quality of primary school education in the field of science, technology, engineering, and mathematics. Thanks to the received donation, each of the projects will be able to implement a range of activities introducing children and youth through play to the world of science, where the employees of HT will also contribute to the projects with their knowledge and experience.

The owner of the project "**Internet of Things in Croatian Primary Schools in 2016**" is the Institute for Youth Development and Innovativity. The first project phase aims to bring together around fifty schools and almost 750 pupils. The project will enable the development of pupil and teacher potential in the area of robotics through previously established Croatian Makers robotics game, where the youngest generations will be taught advanced concepts of automation and develop their IT skills in a practical, entertaining, and comprehensive way. The project capitalises on the relations with the best educators and their schools developed through the Croatian Makers programme, particularly through the Croatian Makers League, whose first round gathered 1,150 pupils in 19 centres all over the country with 1,100 robots donated by the Institute for Youth Development and Innovativity. The goals of the project "Internet of Things in Croatian Primary Schools in 2016" are: to introduce advanced concepts of automation and Internet of Things in the Croatian school system, to popularise the

concept of the Internet of Things, including "smart houses", with the Croatian public, and to develop IT skills of the youngest population (lower primary school classes) by strengthening their Logo programming skills.

The owner of the "**Campus**" project is the **Astronomical Society Višnjan**. The project is designed as a system of residential workshops (schools and camps) for primary and secondary school pupils.

In addition to pupils interested in the STEM area, the project plans to work also with teachers, mentors, assistants, and volunteers dealing with the youth in the STEM area. Camp attendees will be provided the opportunity to participate in diverse STEM-related activities. As a result of the donation, workshops will involve around 450 children, which tripled the number of the children involved thus far. The Astronomical Society and one of the most productive observatories in the world have developed the project within Science and Education Centre Višnjan, whilst Višnjan Observatory is planning to spend the funding donated in this competition for the purchase of equipment required for the interdisciplinary Laboratory for Biology, Chemistry, and Astrobiology (LABOS) integrated in the camp. The "Campus" project aims to raise the attractiveness of and interest in STEM areas among children and youth, to work on vocational training of teachers and mentors in STEM areas, to achieve the necessary space and material conditions so that as many children and youth as possible can experience the work in STEM areas through residential programmes, and to motivate children and youth to choose careers in science, technology, and leadership.

Moreover, it should be pointed out that in addition to financial support, HT d.d. also makes its services, expertise, and technical resources available to the society. Namely, since 2001, HT d.d. has been supporting a large number of initiatives by providing humanitarian telephone lines, thus enabling the widest public to participate and give its financial support and fully waiving its earnings from such calls. Hence, in 2015, HT d.d. supported the "RTL Helps Children" Association, the Ana Rukavina Foundation, and the Union of Societies Our Children Croatia.

HT d.d. is also playing a key role in the development of a knowledge society by supporting various gatherings of technological experts, such as WinDays, the MIPRO Conference, the COMBIS Conference, the SEE Cloud Computing Forum, the Bug Future Show, the Idea Knockout, and other events related to the ICT and telecommunications sector and their communities. HT d.d. also supports the Weekend Media Festival and the Communications Days recognised as meeting places that bring together marketing professionals and communicators. The second member of the HT Group, Combis, has been also traditionally fostering and supporting knowledge exchanges at different ICT conferences both inside and outside Croatia. In 2015, Combis sponsored Cisco Connect, Microsoft WinDays, Oracle Day, the OMGcommerce Conference, the Telco Cloud Forum, and two IDC conferences in Ukraine and Poland.

Astronomical Society Višnjan is the owner of the "Campus" project financially supported by Hrvatski Telekom in the context of the "Together We Are Stronger" project.

CONCLUSIONS

Through the production and sale of its products and services, the HT Group has been making a considerable contribution to the development and growth of the Croatian economy. The analysis presented in the Economic Atlas of the HT Group allows for the following conclusions:

- **HT Group makes a considerable contribution to the Croatian economy**
  - The total impact of the HT Group on GDP is estimated to be HRK 10.5 billion, accounting for 3.14 percent of the GDP generated in Croatia in 2015
  - For each directly contributed kuna, the Group generates additional HRK 2.62 in indirect contribution to GDP through HT Group's employees and suppliers' spending
  - HT Group generated in total 27,230 jobs in 2015 (2.01 percent of the total employment in Croatia)
  - For each job in the HT Group, Group's activities generate additional 4.43 jobs in the remaining economy
  - HT Group's activities generated approximately HRK 3.2 billion in paid taxes (3.8 percent of the total tax revenue in 2015)

- **HT Group is an important driver of investment activities and the technological development of the country**
  - In the 2007-2015 period, HT d.d. invested more than HRK 10 million
  - HT d.d. is a private company from the service sector which has put the most money in investments and which is, judging by the size of investments in infrastructure, the best private company in Croatia
  - HT Group is the largest high-technology company in the country, accounting for 26 percent of the gross value added and 40 percent of the profit of the high-technology sector
  - HT Group is the largest single investor in technological infrastructure in the high-technology sector
  - By investing in the advancement of the telecommunications infrastructure, the HT Group creates the potential to improve the competitive edge of all entrepreneurs and raise the quality of life of the population

- **HT d.d. is an important stakeholder in the Croatian corporate sector**
  - HT d.d. is the sixth largest company in Croatia based on its total revenues
  - HT d.d. is the first ranked company in Croatia in terms of the total newly generated value (income) for employees, owners, and the state in the 2011-2015 period
  - HT d.d. is also the best company in Croatia based on the total profit generated in the 2011-2015 period

- **By listing HT d.d.'s shares on the Zagreb Stock Exchange, the HT Group had significantly boosted the development of the capital market and shareholding in Croatia**
  - National private persons have cumulatively acquired HRK 2.4 billion from HT d.d.'s dividends, accounting for 2 percent of the disposable household income in the dividend pay-out period
  - HT d.d.'s share has the highest portion in the free float market capitalisation and the highest share in the trading volume, as well as superior liquidity and lower volatility (risk) compared to the market average
  - HT d.d.'s share holds a dominant position according to all indicators for the efficiency of asset and capital management compared to the average of the regional telecommunication companies →

→ The results of the assessment of the HT Group's impact on the Croatian economy presented in the Economic Atlas clearly indicate the importance of large-sized companies, such as HT Group, for the total economic activity of a country. The results also suggest that all interested groups of stakeholders, from company owners to employees, suppliers, and the state, participate in and directly benefit from the company's success. In the case of HT Group, corporate social responsibility, through which the company participates in the establishment and promotion of a knowledge society, technological progress, digitalisation, education, and sustainable development, plays an important role in the wider distribution of the company's success.

However, a single company, regardless of its size and significance for the economy, cannot carry the economic growth of a country alone. This requires a number of successful companies able to compete on international markets and to continuously introduce innovations in their business operations. But this also requires a stimulating business climate, efficient public administration and judiciary, a simple and predictable tax system, and macroeconomic stability. The companies have no control over these economic and institutional prerequisites for propulsive business operations, where the very lack of such prerequisites can reduce the success of even those companies that are stable and show a significant potential for future growth, thus minimising the future growth of the whole economy.

The state and public policy makers are those who must, by continuously focusing their activities on the establishment and improvement of business prerequisites, provide for the stability of business operations and undisturbed further development for the companies such as HT Group, because, as suggested by the results of the analyses presented in the Economic Atlas, not only owners, employees, suppliers, and the state budget benefit from the stability of HT Group's business operations, but also the society as a whole.

DODATAK 1.

METHODOLOGY

The estimate of the total HT Group's contribution is based on the application of the input-output methodology. In its best known form, the input-output analysis refers to the application of a static input-output model designed by Wassily Leontief, American economist of Russian origin.

The input-output approach divides national economy into n sectors, where the value structure of deliveries of each sector can be described by the following set of equations:

$x_1 = a_{11}{}^{D}x_1 + \ldots + a_{1j}{}^{D}x_j + \ldots a_{1n}{}^{D}x_n + f^{D}{}_1$
$x_i = a_{i1}{}^{D}x_1 + \ldots + a_{ij}{}^{D}x_2 + \ldots a_{in}{}^{D}x_3 + f^{D}{}_i$
$x_n = a_{n1}{}^{D}x_1 + \ldots + a_{nj}{}^{D}x_j + \ldots a_{nn}{}^{D}x_n + f^{D}{}_n.$

x represents the value of a single sector's gross production (from 1 to n), whilst on the right-hand side of the equation is the value structure of deliveries of each sector. a_{ij} indicators are called technical coefficients describing the share of goods and services for intermediary consumption which the sector i delivers to the sector j in the amount of the sector j's production. Thus, the gross production of each sector is delivered to other production sectors in the value determined by technical coefficients and by the gross output of these other sectors and to final consumers (f^D).

HT Group's deliveries can be shown as a single row, i.e. as an equation in the system. The total value of telecommunications services production is delivered to final consumers (f^D) and other producers in the national economy in accordance with the share of telecommunications services in their output. In a matrix overview, an input-output model in which the use of goods and services is divided to domestic and foreign origin can be more clearly recorded as:

$A^D x + f^D = x$
$x - A^D x = f^D$
$(I - A^D)x = f^D$

Matrix A^D is a matrix describing the production technology of each production sector. Each column of the matrix shows the share of domestic inputs required to produce an output unit of the sector j (a_{ij}, i=1 do n). The product of multiplication of the matrix AD and the output value (x) is the total intermediary consumption of each sector. The sum of the total intermediary and final consumption equals the value of production in the national economy for each of n sectors, where the final demand equals the difference between the output and the intermediary demand. The system solution, i.e. determination of the domestic production level with the set final consumption of domestic products and services is:

$x = (I - A^D)^{-1} f^D.$

In economics literature, the $(I-A^D)^{-1}$ matrix is called Leontief inverse matrix, where the sum of each column shows the production multiplier for a certain production sector, i.e. the indicator of the total output increase in the national economy resulting from an increase in the final demand for a single production unit of that specific sector. The total demand for telecommunications services is determined by final demand (personal consumption, government consumption, consumption of non-profit-making institutions, investments, and export). Through their demand, consumers determine the quantity of services directly delivered to final consumers, but also the delivery level for telecommunications services provided to other domestic producers which use telecommunications services in their production processes.

In addition to the production level necessary to deliver the set amount of final demand, the input-output model provides answers to questions about gross value added and employment per production sectors necessary to deliver a certain amount of final uses.

Gross value added vector marked as v =(v1, v2...vn) represents the sum of the components of gross value added v=w+t+o, where each component is also an n-dimensional vector showing the distribution of the individual components of value added per production sectors.

Since labour and capital are also inputs used in the production process, Leontief production function used in the input-output model also presumes their fixed share in gross value added. If we define matrix V as a gross value added matrix whose columns contain elements of the share of each component of gross value added (GVA) in the total production of a certain sector, then, based on the input-output model, we can also calculate the gross value added contained in the production required to meet the set level of final deliveries.

$BDV = V(I - A^D)^{-1} f^D$ →

A set exogenous level of final demand for goods and services allows for the calculation of not only the gross output level, but also of the gross value added to be generated in each production sector in production processes intended to meet the final demand.

Type I output multiplier
(covering only direct and indirect impacts)

An increase in the final production of domestic goods directly affects revenues, i.e. gross production of telecommunications, but also of other sectors which directly deliver goods and services intended for additional final consumption. In order to produce the required quantity of final production, telecommunications services suppliers must procure production inputs from other domestic and foreign producers in accordance with the characteristics of the production process. The input-output model presumes the existence of the Leontief production function characterised by a fixed share of production inputs in the amount of production of a certain production sector, as described in the matrix A. In the first step, an increase in the final demand for telecommunications sector's products implies an increase in production value, but also in the consumption of intermediary goods and services delivered by suppliers. Sector's domestic intermediary consumption is determined by the existing technology described by input-output coefficients. In the second step, an increase in the intermediary consumption of the ith sector impacts the increase of revenues of domestic sectors producing goods and services used in the production process of the ith sector. Increased production of all sectors delivering goods and services leads to the growth of HT and its intermediary consumption, in accordance with the structure of inputs used by HT, which is also described by the corresponding columns of the matrix A. The total value of the increase in domestic production, which is directly and indirectly related to the increase in autonomous final consumption, is shown by the Leontief inverse, i.e. by the $(I - A^D)^{-1}$ matrix.

The production (output) multiplier of the sector i is defined as the total value of production of all economic sectors in the total national economy needed to meet the final demand for telecommunications services in the amount of a single unit shown as monetary expression.

Type I gross value added multiplier

An analysis of the impacts of the change in exogenous final demand is usually related to the impacts on the development of gross value added, which equals the difference between the gross output and the intermediary demand. Production sectors use other production sectors' inputs, and only the difference between the gross production and the value of used inputs represents a measure of value added that remains available for distribution to income components – gross wages, net taxes, and operating surplus – which are spent on final goods and services, leading to an increase in the level of wellbeing in the national economy.

$$GVA = V(I - A^D)^{-1}f^D$$

The elements of the matrix V represent input-output coefficients for gross value added, i.e. the share of individual components of gross value added in the gross output of each national economy sector. If the product of multiplication of the Leontief inverse matrix and the final demand is multiplied by the matrix of shares of individual components of gross value added, this will result in an increase in gross value added arising from the growth of final demand for domestic production sectors' products, specifically telecommunications services.

Gross value added multiplier is a ratio between the individual elements of the row vector $v(I - A^D)^{-1}$ and the elements of the row vector v, showing the share of gross value added in the gross output of each activity. A unit increase in the final demand for telecommunications services will result in a direct increase in gross output and, consequently, in gross value added of that sector. However, with the extension of multiplicative impacts to other production sectors, an increase in the gross output of all sectors will result in a multiplicative increase of gross value added in the total national economy. The resulting ratio between the total gross value added directly and indirectly related to telecommunications services delivery and the gross value added directly generated in HT is called the gross value added multiplier.

Type I employment multiplier
Similar to gross value added, the multiplication of the Leontief inverse matrix and the row vector e gives the total direct and indirect increase of employment in the total national economy as a result of a unit change in the final demand for HT's goods and services.

Type I employment multiplier is a ratio between the total employment increase covering direct and indirect impacts of a change in final demand e(I - AD)-1 and the ratio between the number of employees and the production of each production sector (specifically telecommunications services), reflecting only direct needs for production labour factor for each sector.

Model with endogenous components of final demand, induced impacts, and type ii multiplier
In accordance with the economic theory, individual components of final demand can be expected not to be fully exogenous, but dependant on other model variables, such as gross value added level and generated income level. This primarily refers to personal consumption, which in most macroeconomic models depends on generated income level and the increase of output and gross value added which is distributed within the economy and increases disposable household income, where such increased disposable household income will in turn result in an additional increase in personal consumption.

With regard to the exogenism of final production, two model types are to be distinguished: the open one and the closed one. The open model divides economy into two segments. The first segment comprises production sectors where there is an inter-sectoral connection among different sectors in accordance with their technological processes and where each sector's production level depends on the production generated by other sectors. The second segment comprises non-production sectors driving final demand, which is fully exogenous under the assumptions of the open model. In the open model, exogenous final demand determines, through the demand for production sectors' goods and services and inter-sectoral technological connection, the total production level in the economy, where, however, production and income levels have no impact on final demand.

Type II gross value added multiplier comprising direct, indirect, and induced impacts
In a technical sense, induced impacts are included by constructing the matrix H, which, in addition to direct and indirect impacts comprised by the type I multiplier, includes an additional row, i.e. a column with household sector's income and spending. This allows for the inclusion of induced impacts pertaining to the increase of each sector's production and resulting from both the existence of inter-sectoral links among production sectors and the production generated to meet additional personal consumption induced by income growth.

Production growth in each sector entails household income growth resulting from an increase in gross wages. Since in the closed model personal consumption depends on income generated, production growth leads to an additional increase in the production intended to meet increased personal consumption induced by income growth as a result of the initial increase in production.

Type II gross value added multiplier
In the closed model with the household sector, the gross value added multiplier, in addition to direct and indirect changes of gross value added, comprises also induced impacts, i.e. the gross value added generated also by the producers delivering goods and services to meet additional personal consumption induced by a growth in economic activity related to telecommunications services delivery. The ratio between the total growth (direct, indirect, and induced impacts) of gross value added, which is induced by a unit increase in final demand, and the direct growth of gross value added in the unit directly delivering products for final consumption is called the type II gross value added multiplier.

In addition to total gross value added multipliers, it is possible to calculate multipliers for individual components – gross wages, net taxes, and operating surplus – in such a way that instead of the vector v, a corresponding vector using the share of an individual component of gross value added (w, t, o) is used.

→

In the closed model, the type II multiplier, which shows the total change in the number of employees induced by a growth of exogenous final demand, is based, as well as gross value added, on the pre-multiplication of the matrix Hx and the row vector e (indicator of the required number of employees per output unit). The ratio between the total employment increase, which includes direct, indirect, and induced impacts of the change in final demand eHx, and the ratio of the number of employees and the production of each production sector reflecting only direct needs for production labour factor e, is called the type II employment multiplier.

The application of the type I multiplier for the telecommunications sector allows for the quantification of indirect impacts on gross production value, gross value added, and employment. The multiplier from officially published input-output tables has been applied to the 2010-2012 period, whilst to the period from 2013 to the present, the multiplier resulting from the RAS method, which updates old technological coefficients in accordance with the later data on structural characteristics of the economy from the national accounts system of the Republic of Croatia, has been applied. It is evident that the strongest indirect impacts on employment are made on the suppliers in the telecommunications services production chain.

Comparison of multipliers

Table 11 shows type I and type II multipliers from the available 2004 and 2010 input-output tables for telecommunications activities and from the estimated 2013 input-output tables based on the RAS method. 2004 multipliers are based on the old CPA 2002 classification, so that no separate data for post and telecommunications are available. Production processes in these two categories are relatively heterogeneous, and the smaller multiplier can be assigned to the postal activity, which is in terms of labour more intensive and bases its production process primarily on simple technologies, whilst the production process pertaining to telecommunications services is more complex and stronger multiplicative impacts are to be expected. This is particularly evident in the employment multiplier, as direct needs for employees per output unit are considerably higher in the postal sector compared to telecommunications, meaning that the denominator containing direct needs for employees is high and affects the lower multiplier.

TABLE 11 Comparison of multipliers for the telecommunications sector

	Multiplier & gross					
	Output	value added	Employment	Output	value added	Employment
2004*	1.536	1.489	1.674	2.115	1.984	2.579
2010	1.463	1.416	2.595	1.830	1.741	3.966
2013	1.651	1.596	2.790	2.105	2.024	4.572

*The 2004 multiplier includes the post and telecommunication sector.

APPENDIX 2

DEFINITIONS OF CORPORATE SECTORS

Knowledge and high-technology sector
Manufacture of basic pharmaceutical products and pharmaceutical preparations
Manufacture of computer, electronic, and optical products
Motion picture, video, and television programme production, sound recording and music publish activities
Programming and broadcasting activities
Telecommunications
Computer programming, consultancy, and related activities
Information service activities
Scientific research and development

Knowledge and high-technology service sector
Motion picture, video, and television programme production, sound recording and music publish activities
Programming and broadcasting activities
Telecommunications
Computer programming, consultancy, and related activities
Information service activities
Scientific research and development

Knowledge-intensive service sector
Water transport; Air transport
Publishing activities; Motion picture, video, and television programme production, sound recording and music publish activities;
Programming and broadcasting activities; Telecommunications;
Computer programming, consultancy, and related activities;
Information service activities
Financial and insurance activities
Legal and accounting activities; Activities of head offices, management consultancy activities; Architectural and engineering activities; Scientific research and development; Advertising and market research; Other professional, scientific, and technical activities;
Veterinary activities
Employment activities
Security and investigation activities
Public administration and defence; Compulsory social security;
Education; Human health and social work activities; Arts, entertainment, and recreation

Information and communications sector
Publishing activities
Motion picture, video, and television programme production, sound recording and music publish activities
Programming and broadcasting activities
Telecommunications
Computer programming, consultancy, and related activities
Information service activities

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