



Yakov and Partners

Job Market Demand for IT Graduates

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Key questions

Information technology is already all around us and is critical to improving the economy and quality of life. It is no wonder that information technology is one of the most sought-after fields of study for university applicants

- What prospects await IT graduates?
- When do IT students get a job?
- What are the industries that employ IT graduates?
- Which companies do IT graduates prefer?
- Which educational track provides the best career start?
- Is a career in IT possible for women?

These are the questions we will seek to answer. And for employers, it will be interesting to learn about the income level of IT graduates and benchmark themselves against competitors and other industries so that they do not miss out on their chance to hire the best

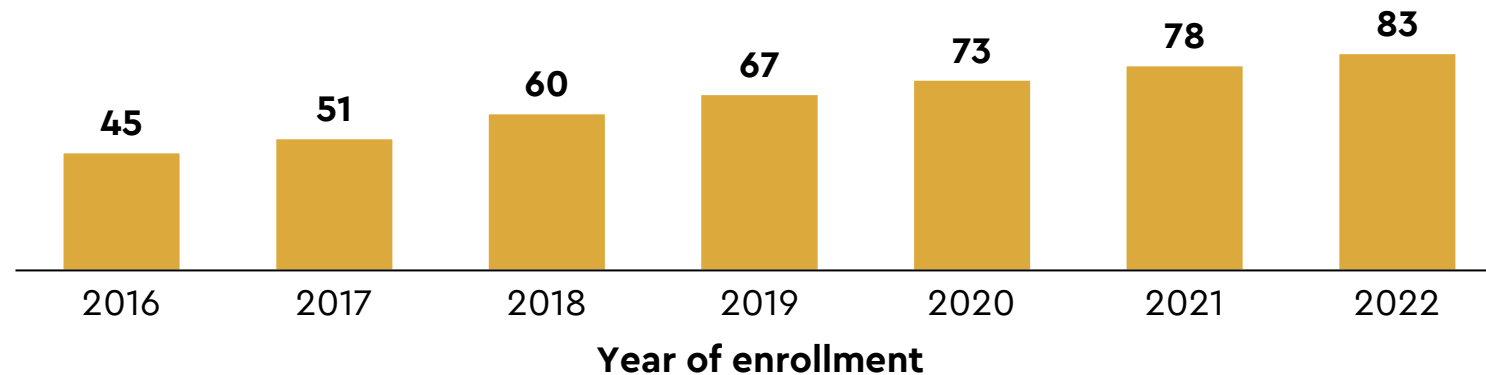
The number of IT students has nearly doubled, but getting in is only half the battle

- 1 Universities are rushing to keep up with the demand for IT degrees, increasing the number of programs and enrollments: in 2022, the number of applicants enrolled in programs exceeded 83,000, an 84% increase over 2016
- 2 Of 506 universities offering IT degrees, more than 70 launched their programs between 2016 and 2022
- 3 Nearly half of students, 55%, are enrolled in state-funded slots, with the number of state-funded slots increasing by 68% from 2016 to 2022
- 4 Enrolling is only half the battle: only 50% of IT students graduate, with a higher proportion of graduates among those enrolled in state-funded slots. Up to 60% of fee-paying students do not graduate



Universities are rushing to keep up with the demand for IT degrees, increasing the number of programs and enrollments

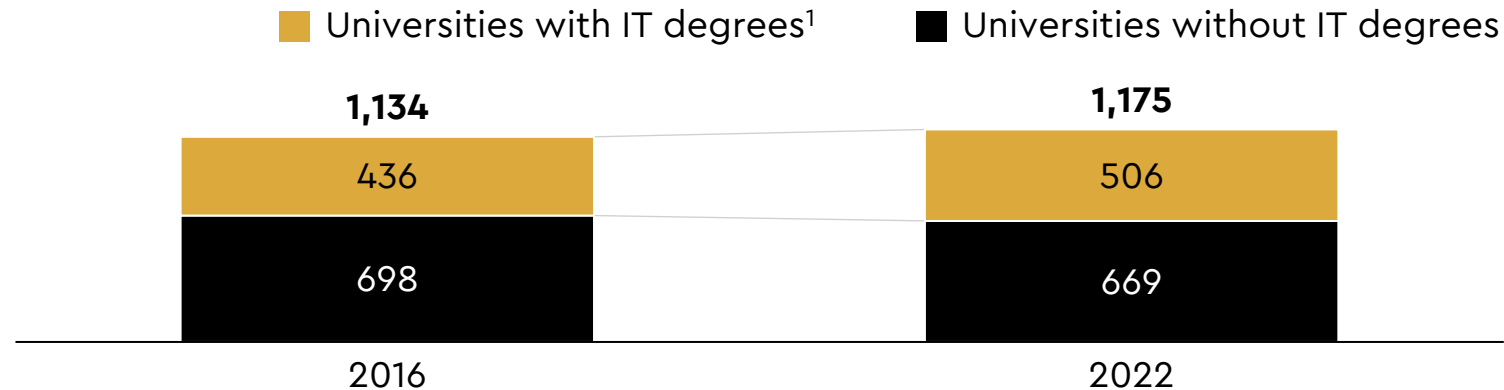
Enrollment in IT bachelor's and specialist's degree programs, thousand people



+84%

enrolled in IT bachelor's and specialist's degree programs from 2016 to 2022

Number of universities offering IT degrees



>70

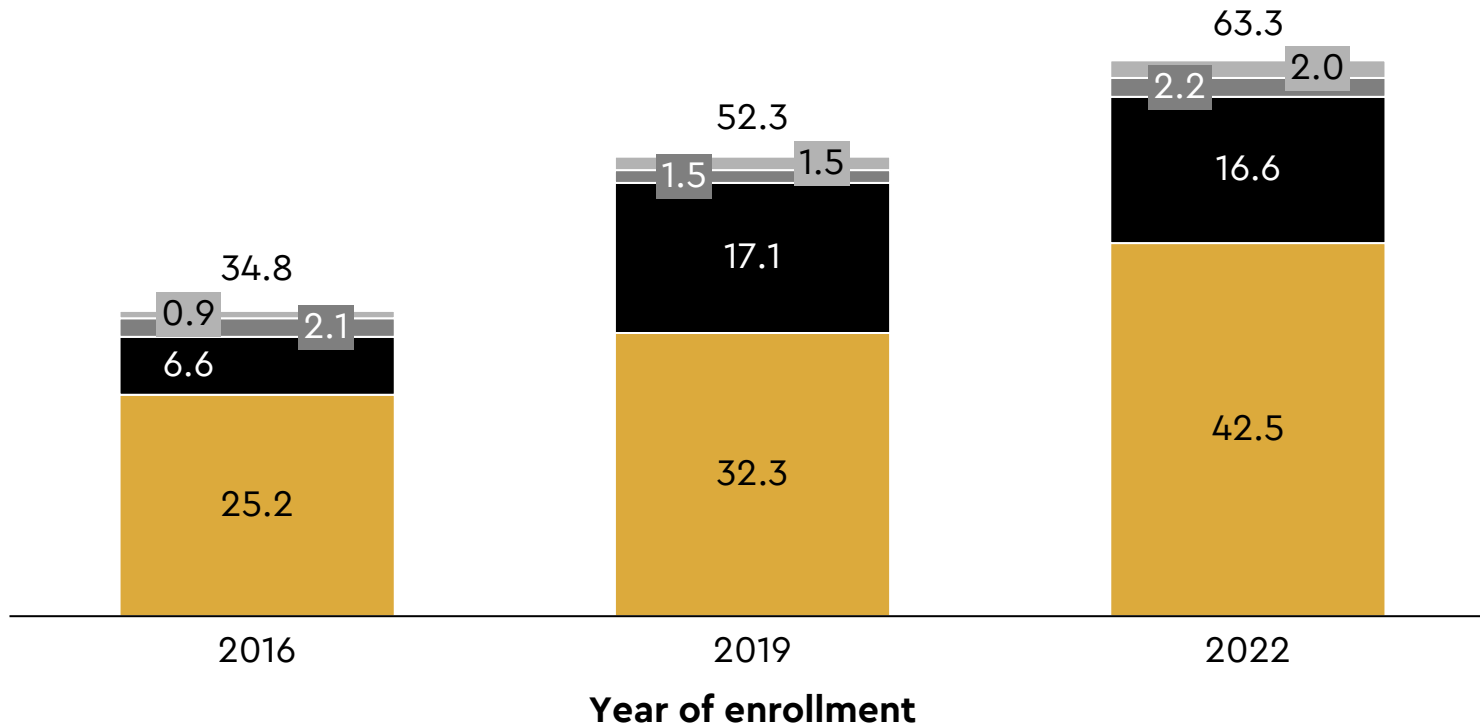
universities added IT degrees

1. Universities with at least one IT field of study

About 75% of full-time students are enrolled in state-funded or other subsidized programs

■ Enrollment quota ■ Target enrollment ■ Fee-paying ■ State-funded

Number of full-time applicants enrolled by year of enrollment¹, thousand people



82%

Growth in the number of full-time students

68%

Growth in the number of applicants enrolled in state-funded programs from 2016 to 2022¹

x2.5

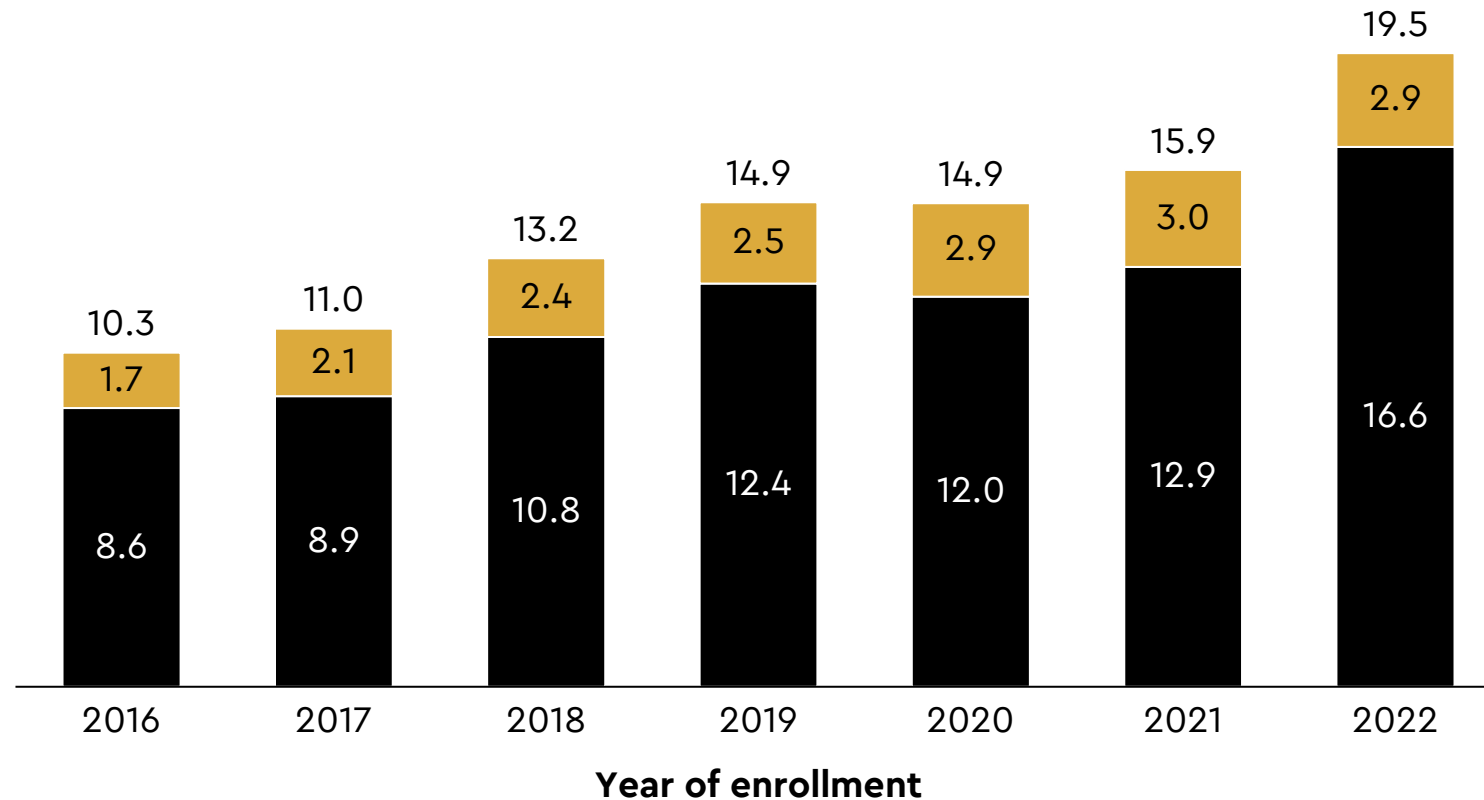
more state-funded than fee-paying students¹

1. Among full-time bachelor's and specialist's degree IT programs

The popularity of fee-paying distance and part-time education outpaces full-time programs

■ State-funded ■ Fee-paying

Number of applicants enrolled by year of enrollment¹, thousand people



89%

Growth in enrollment in distance and part-time IT programs (outpaces growth in full-time programs)

70%

Growth in the number of applicants enrolled in state-funded programs in 2016–2022¹

94%

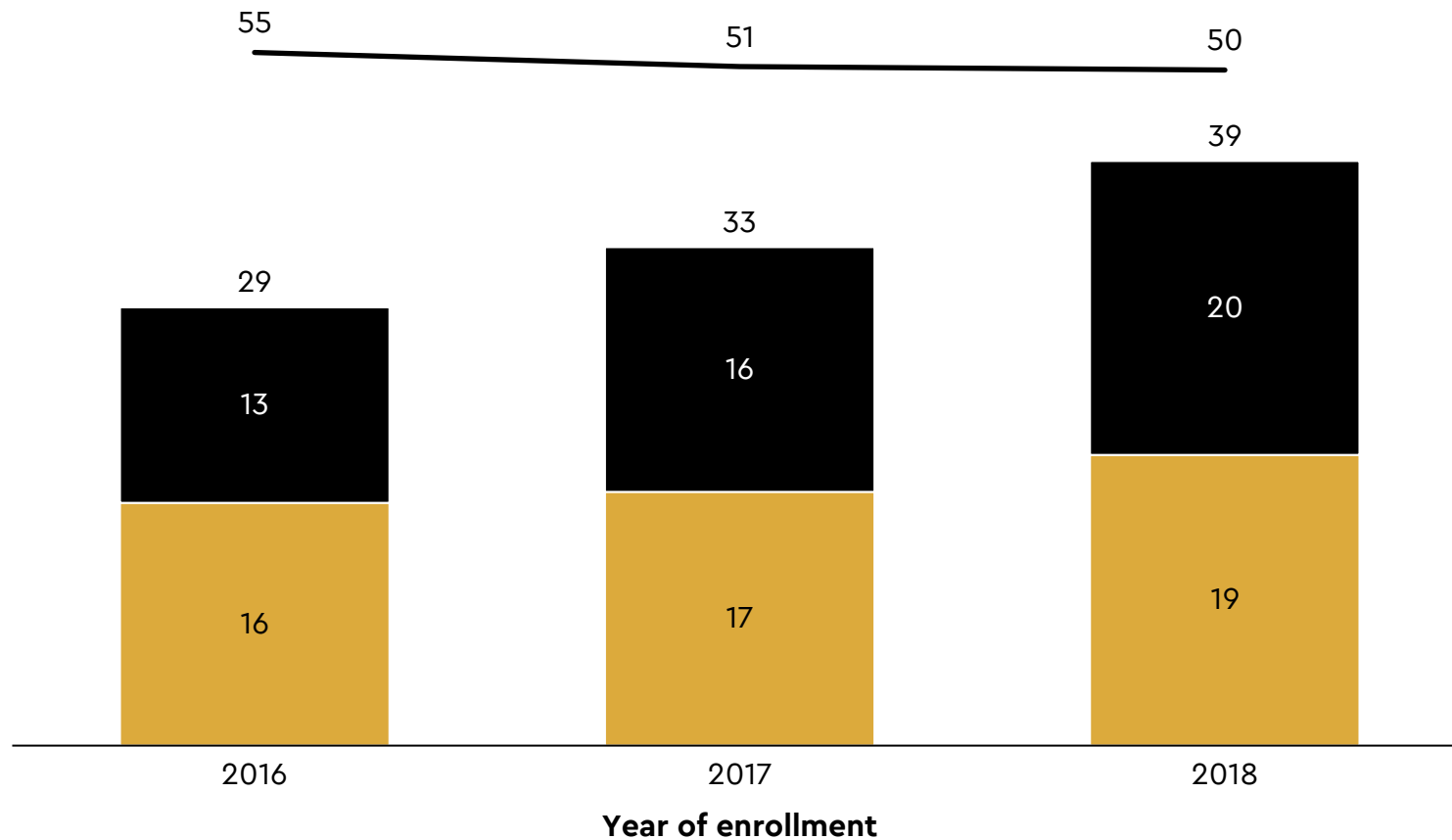
Growth in fee-based enrollments in 2016–2022¹

1. Among distance and part-time bachelor's and specialist's IT programs,

Getting in is only half the battle: only 50% of students successfully complete a bachelor's degree in 4 years, and this proportion is even lower for fee-paying students

— Share of graduates, % ■ Number of dropouts ■ Number of graduates

Conversion of students to graduates by year of enrollment¹, thousand people



4%

of students re-enroll one year after enrollment

6%

extend their studies for one year

40%

of dropouts find jobs¹

>63%

is the share of successful graduates in universities with the most sought-after graduates

41%

is the share of fee-paying bachelor's degree graduates

1. For students enrolled in full-time bachelor's degree IT programs who completed a 4-year program
 2. For several universities with a high employment rate and income of graduates

IT graduates are in demand and are sought after by BigTech and banks

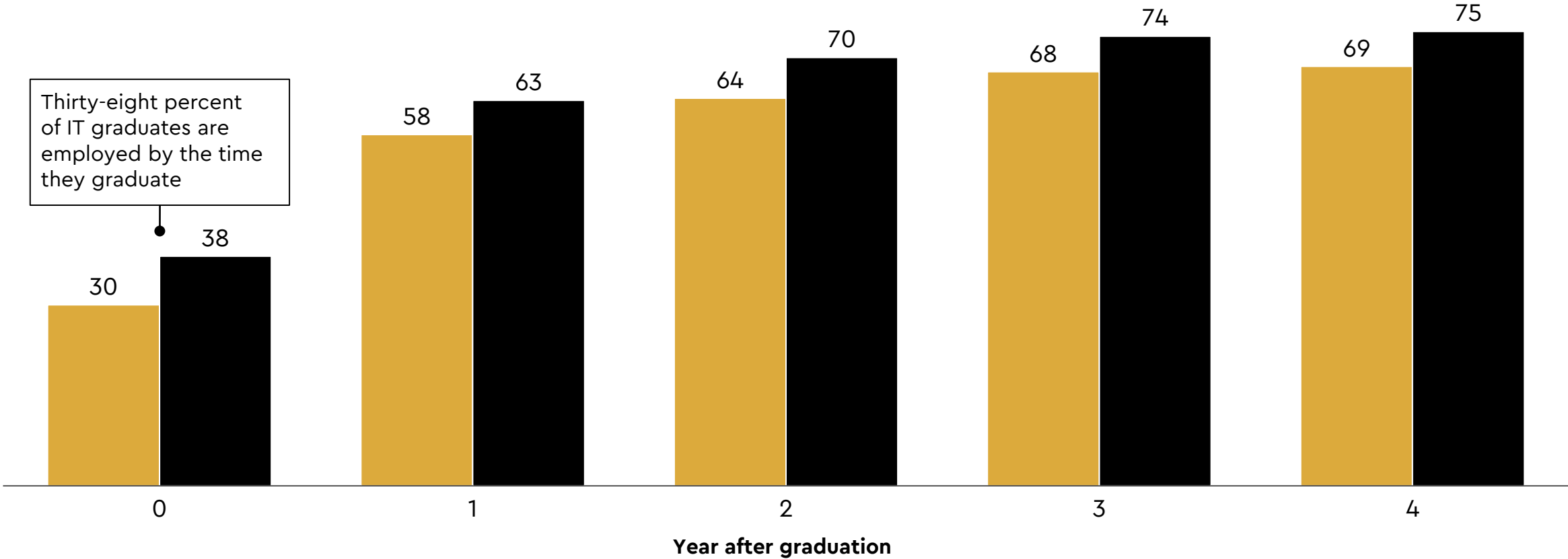
- 1 IT graduates enjoy higher-than-average employment rates, which remain high for at least 5 years after graduation. Thirty-eight percent of IT graduates are already employed at the time of graduation
- 2 IT specialists are in the top 3 in terms of income, second only to graduates in the fields of aeronautics, space, and math. Moreover, the income of IT graduates grows at a faster pace, and the difference with the income of the average graduate doubled in 2019–2022
- 3 Forty-five to fifty percent of IT graduates go into IT, finance, and science & technology – the sectors offering the highest income. IT graduates' employment in ICT companies in their field of specialization rises to forty percent in the first three years after graduation
- 4 Over fifty-three percent of IT professionals work in large companies. They favor BigTech companies and IT departments of banks
- 5 Fifty-four percent of IT professionals are employed in Moscow, the Moscow Oblast and St. Petersburg



IT graduates enjoy higher-than-average employment rates, which remain high for at least 5 years after graduation

■ All graduates ■ IT graduates

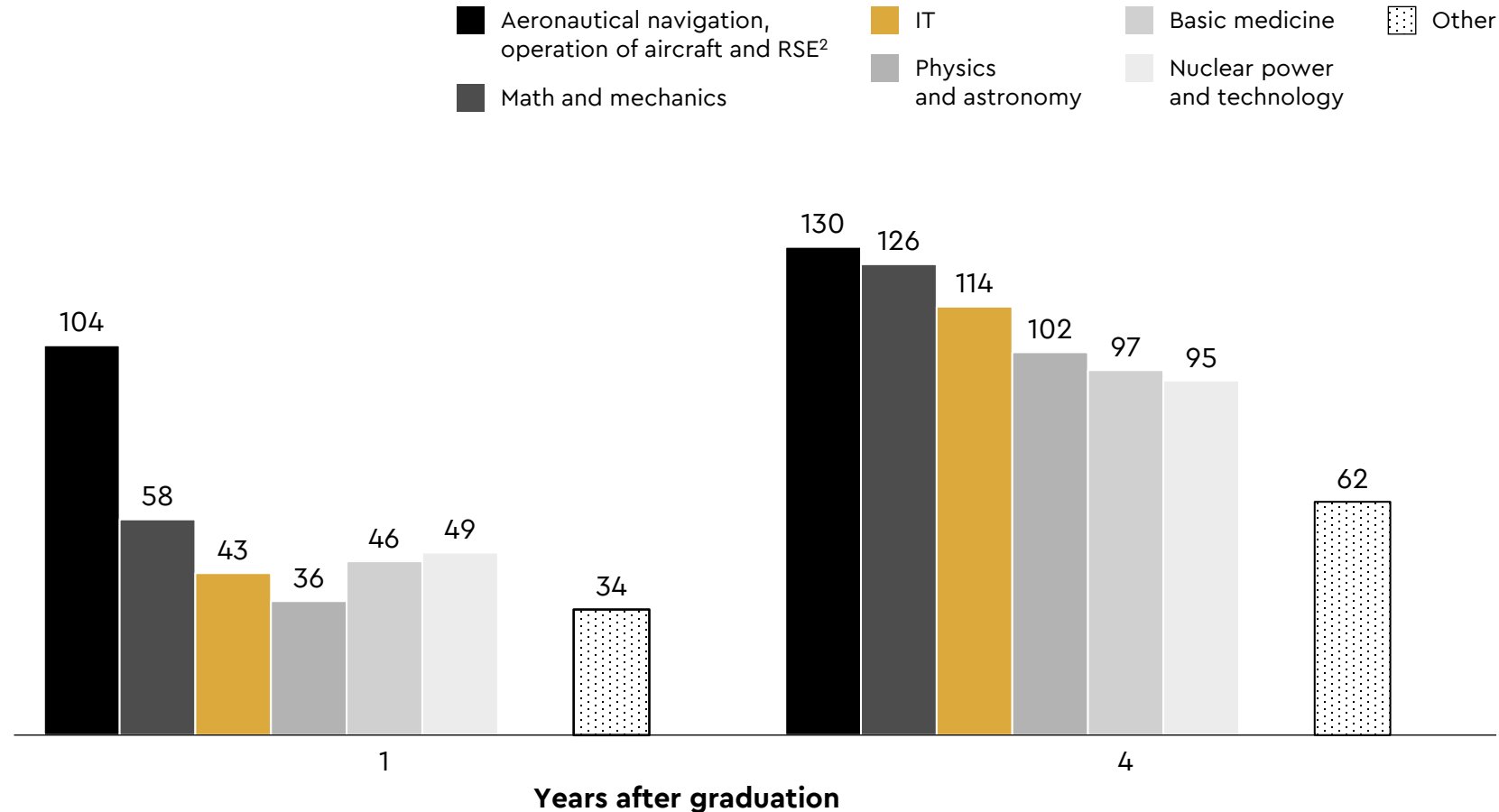
Employment rate of graduates, %¹



1. Based on graduate employment monitoring data

IT professionals are among the top income earners, behind aeronautics, space and math professionals

Income trends of graduates by discipline group¹, RUB thous



Graduates in the fields of aeronautical navigation, operation of aircraft, and rocket and space equipment, as well as mathematics consistently top the rankings in terms of graduate earnings

In the first year after graduation, IT graduates are already in the top 6 high-paying occupations in the job market, and in the fourth year after graduation they move up to third place

It may be that the not-so-high first-year paychecks reflect a certain employer mistrust of IT professionals with no prior experience

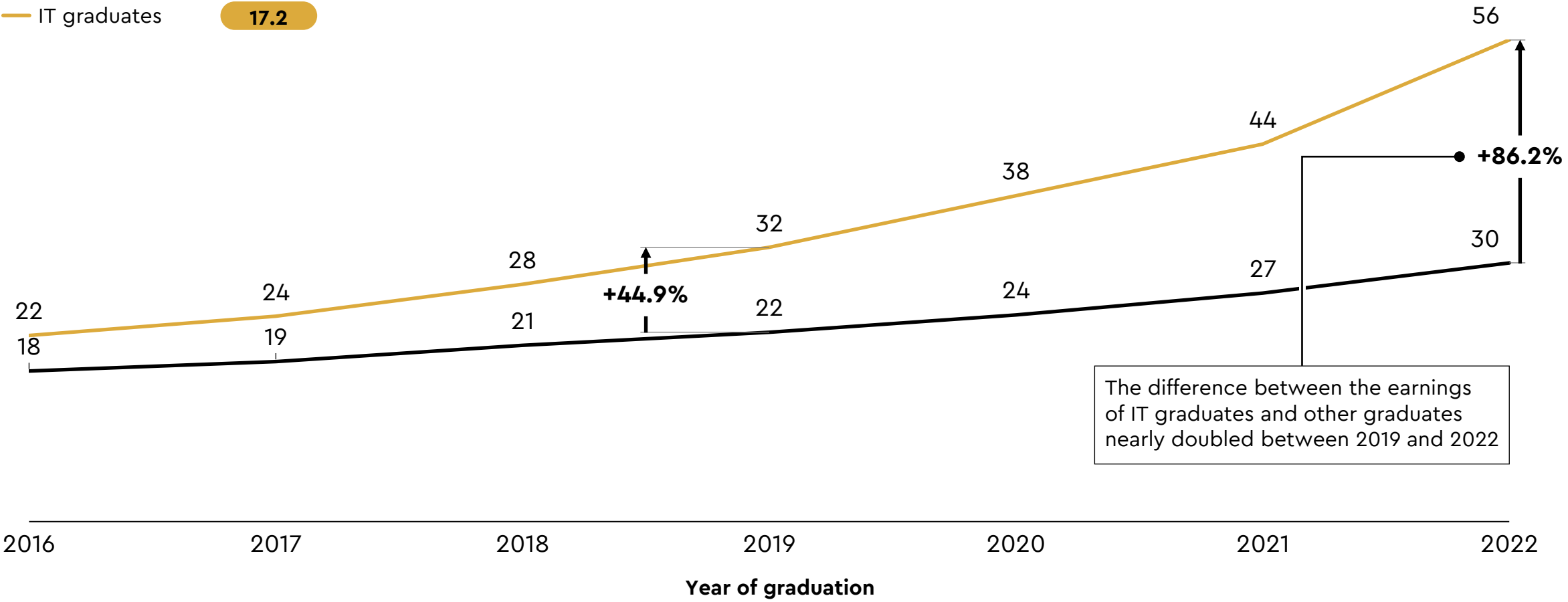
1. Data based on the 2018 bachelor's and specialist's degree graduates, excluding bottom 10% and top 10% of graduates by income level
 2. Rocket and space equipment

The income growth of IT graduates outpaces that of the average graduate, and the difference with the average graduate's income doubled between 2019 and 2022

Income of graduates, RUB thous

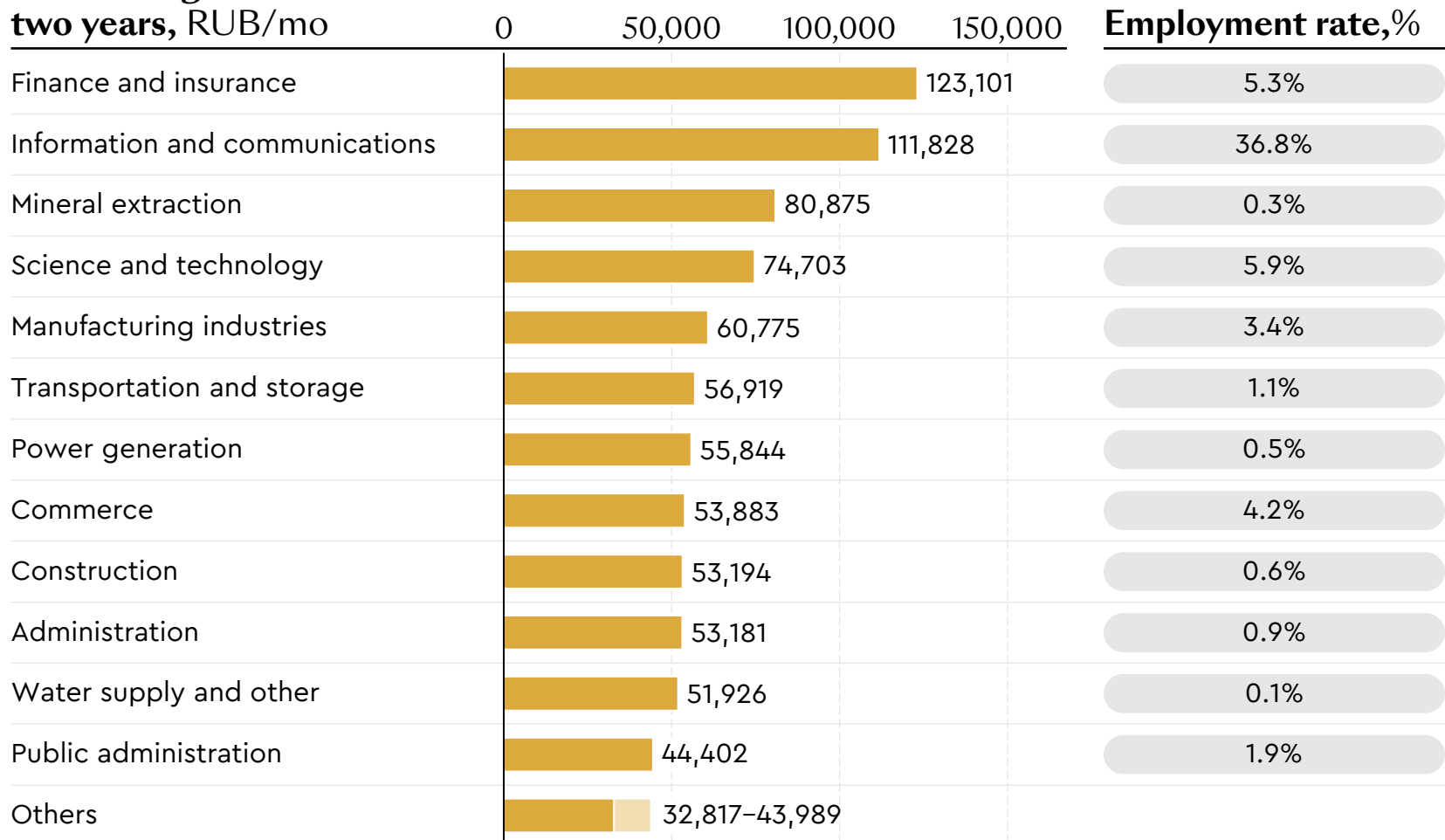
XX CAGR (2016–2022)

- Other graduates **9.4**
- IT graduates **17.2**



Key sectors of IT graduates' employment: ICT, finance, and science

Income of graduates after two years, RUB/mo



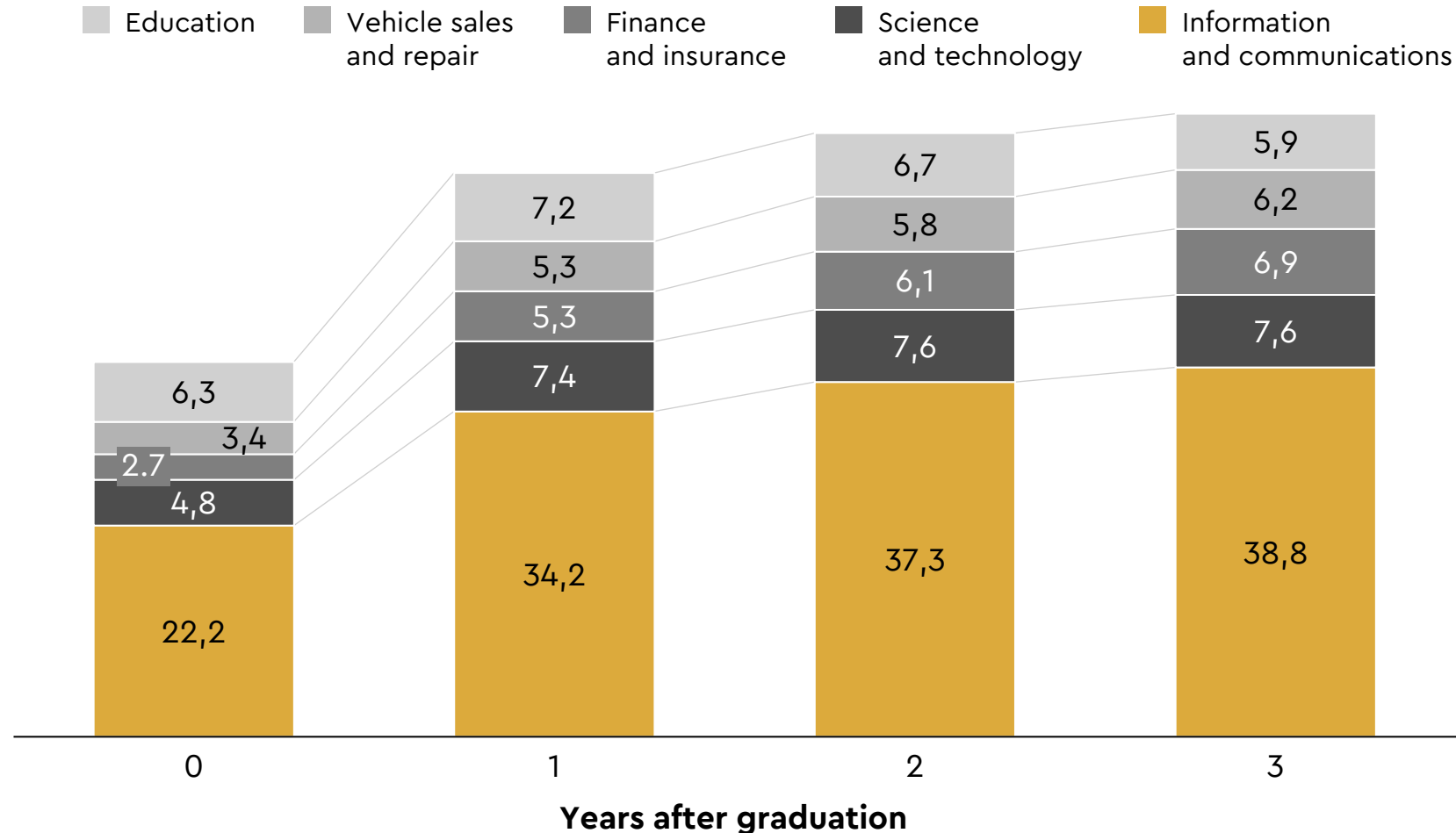
Forty-five to fifty percent of IT graduates go into IT, finance, and science and technology – the sectors offering the highest income

The income gap between the industries that lead digitalization and those that lag behind is more than three-fold

1. Data based on the 2020 IT bachelor's degree and IT specialist's degree holders

IT graduates' employment in ICT companies rises to 40% in the first three years after graduation

Top 5 sectors that employed IT graduates, %

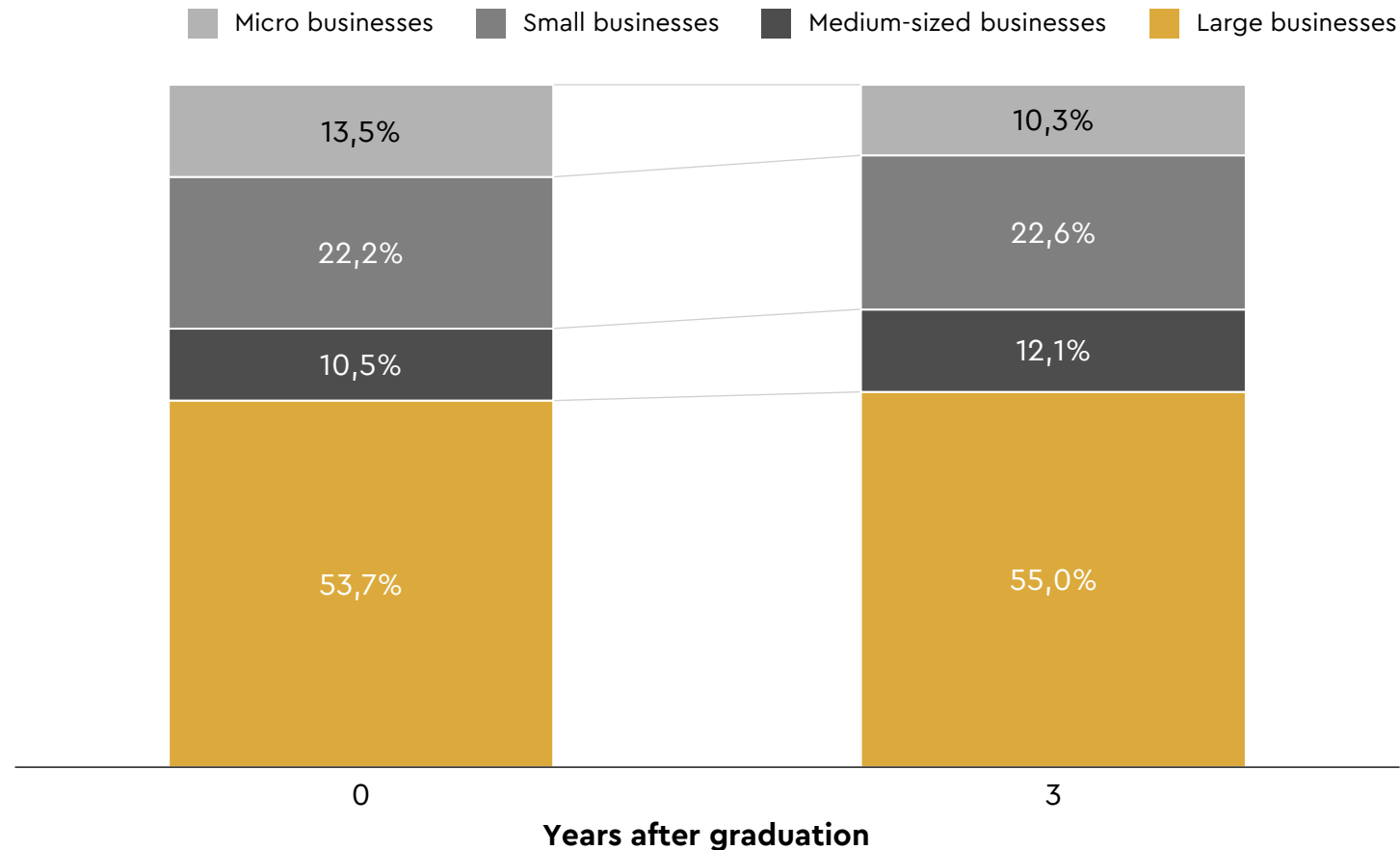


Employment in finance and insurance has grown the fastest: almost three-fold within 4 years of graduation

Interest in education jobs declines one year after graduation

Over 53% of IT professionals go to work for large companies

Distribution of employed graduates by company size, %



Micro business: Revenue – up to RUB 120 mln per year or the headcount of up to 15 people
Small business: Revenue – up to RUB 800 mln per year or the headcount of up to 100 people
Medium-sized business: Revenue – up to RUB 2 bn per year or the headcount of up to 250 people
Large business: Revenue – over RUB 2 bn per year or over 250 employees

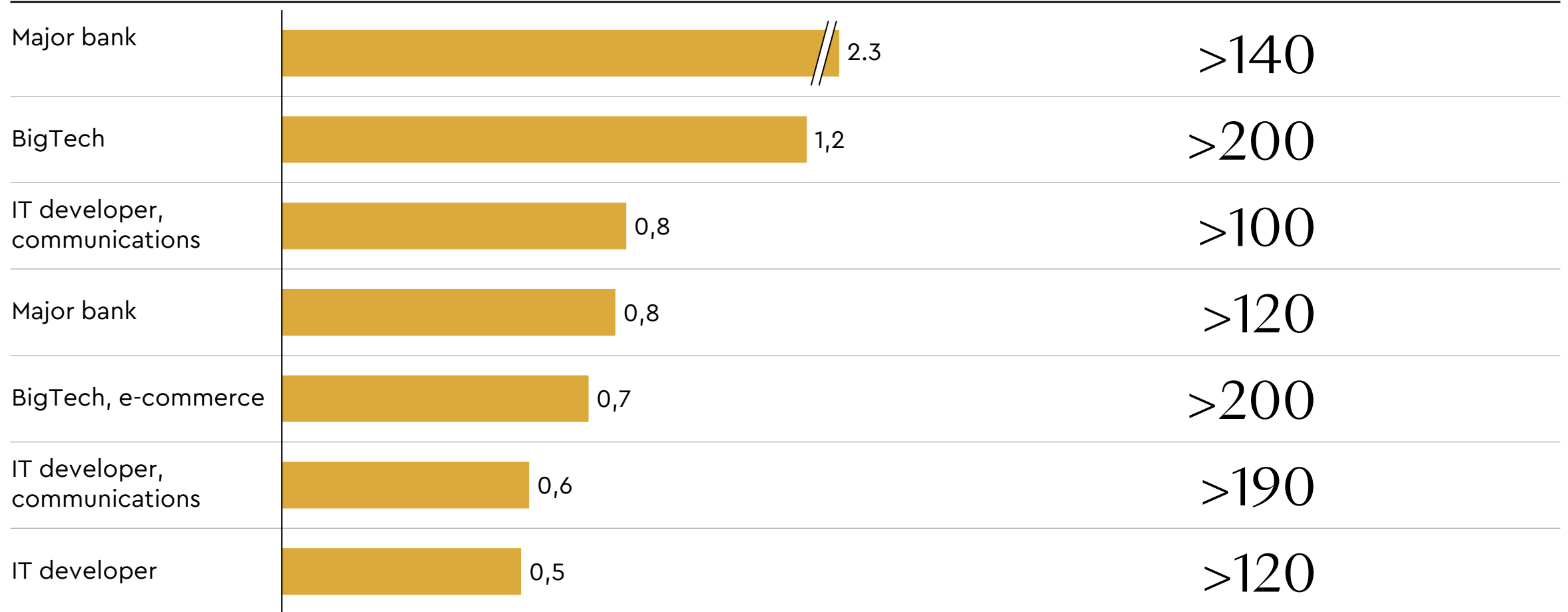
IT professionals' preference for working in a large company remains consistently high

One in five IT professionals prefer to work in medium-sized businesses

One-third of those IT professionals who are initially employed in micro businesses (including startups) move on to medium and large companies 3 years after graduation

Top employers of IT graduates: banks, IT and communications, and e-commerce

Top employers of IT graduates two years after graduation¹, % Average income of graduates, RUB thous

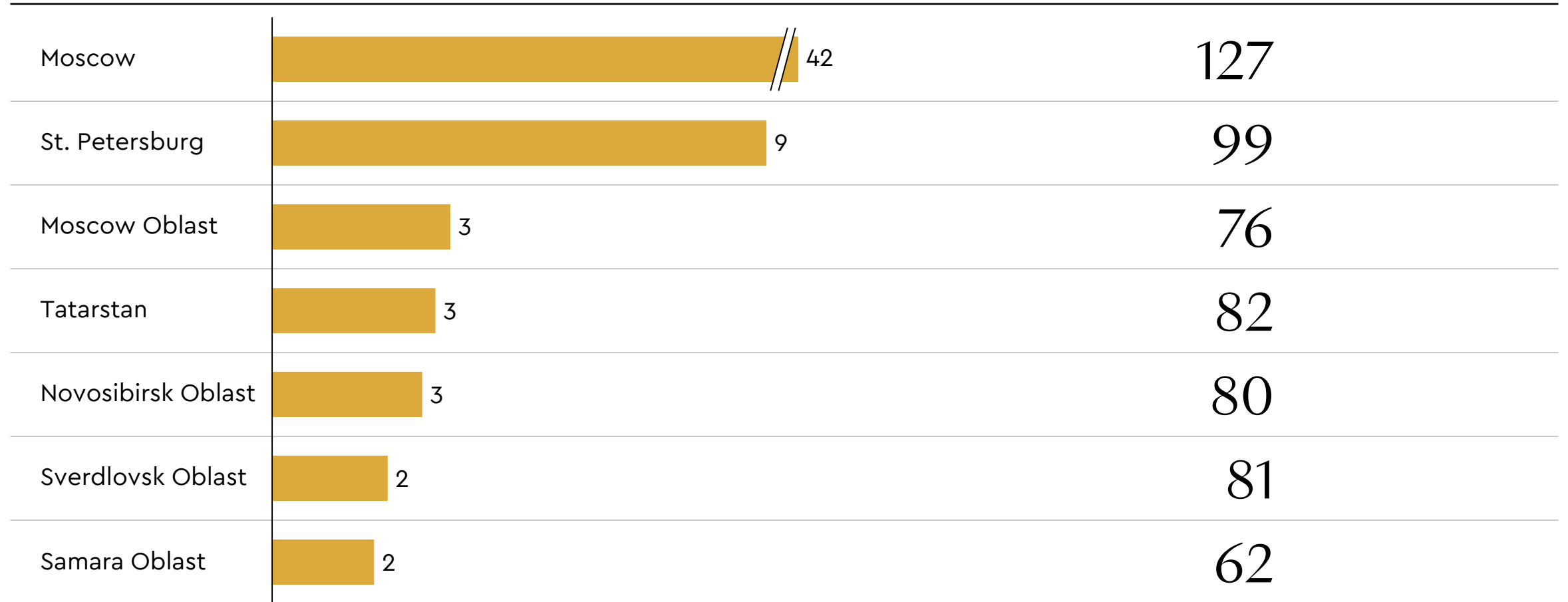


1. Based on data on the employed 2020 graduates two years later, in 2022

Over 50% of IT graduates are employed in Moscow, Moscow Oblast and St. Petersburg

Top 7 regions employing IT professionals two years after graduation¹, %

Average income² of IT graduates in the region, RUB thous



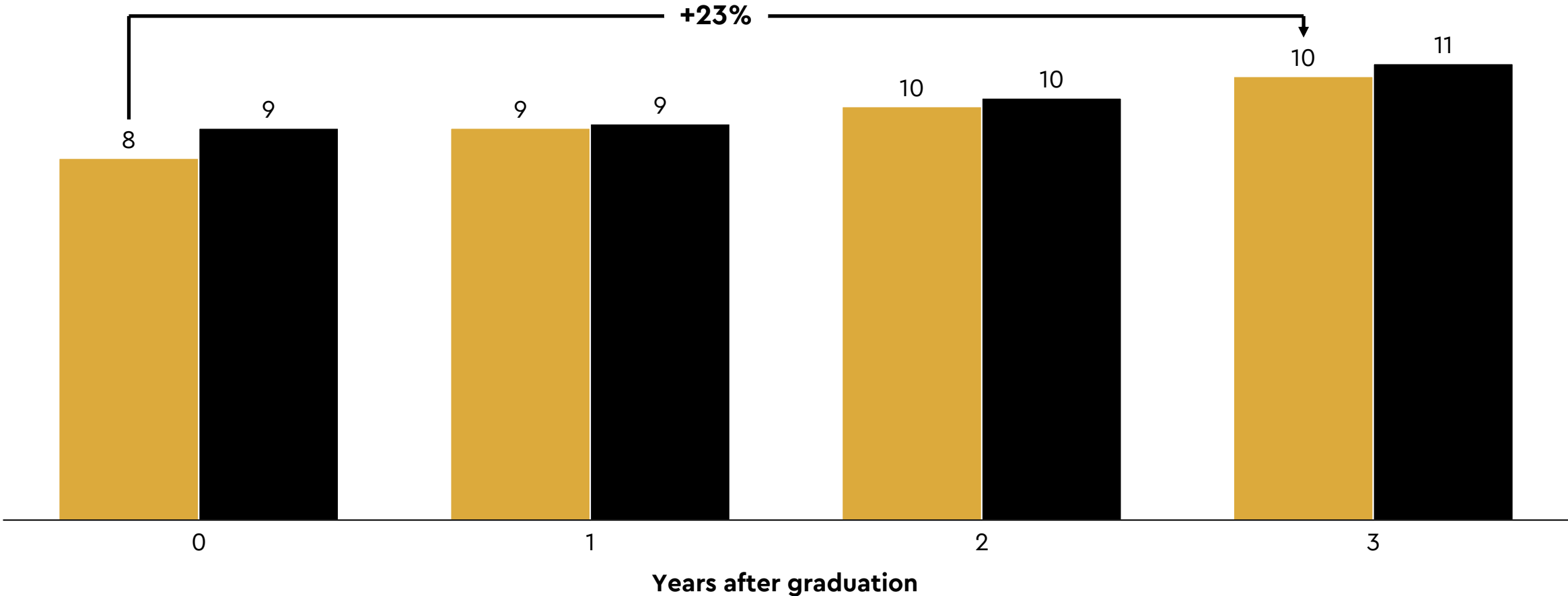
1. Based on data on the employed 2020 graduates two years later, in 2022

2. Excluding the bottom 10% and top 10% of graduates by income level

Share of IT professionals combining multiple jobs grows to 10% within the first 3 years of graduation

IT graduates All graduates

Share of IT professionals combining jobs, %



All IT careers offer a high level of income, and the most high-paying combination is IT security in an IT company or a bank

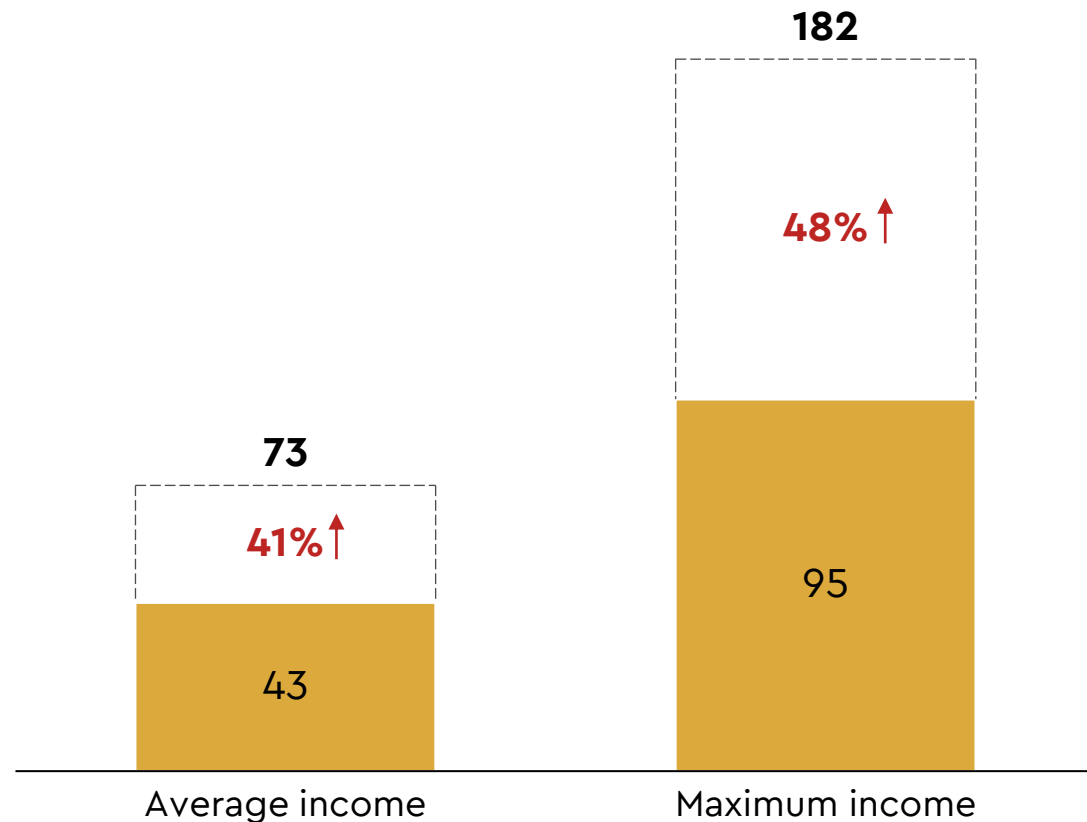
- 1 IT degrees can increase income by 41% over market levels with a bachelor's degree and by 50% with a master's degree
- 2 The highest income for IT graduates is in IT and finance: the average monthly income is over RUB 100,000 two years after graduation
- 3 Income differences between graduates' fields of work can be as high as 400% three years after graduation
- 4 Information security professionals earn 17% more than graduates in the most popular field of informatics and computer science (ICS)
- 5 It is more important to choose a top university than an IT specialization when launching a career



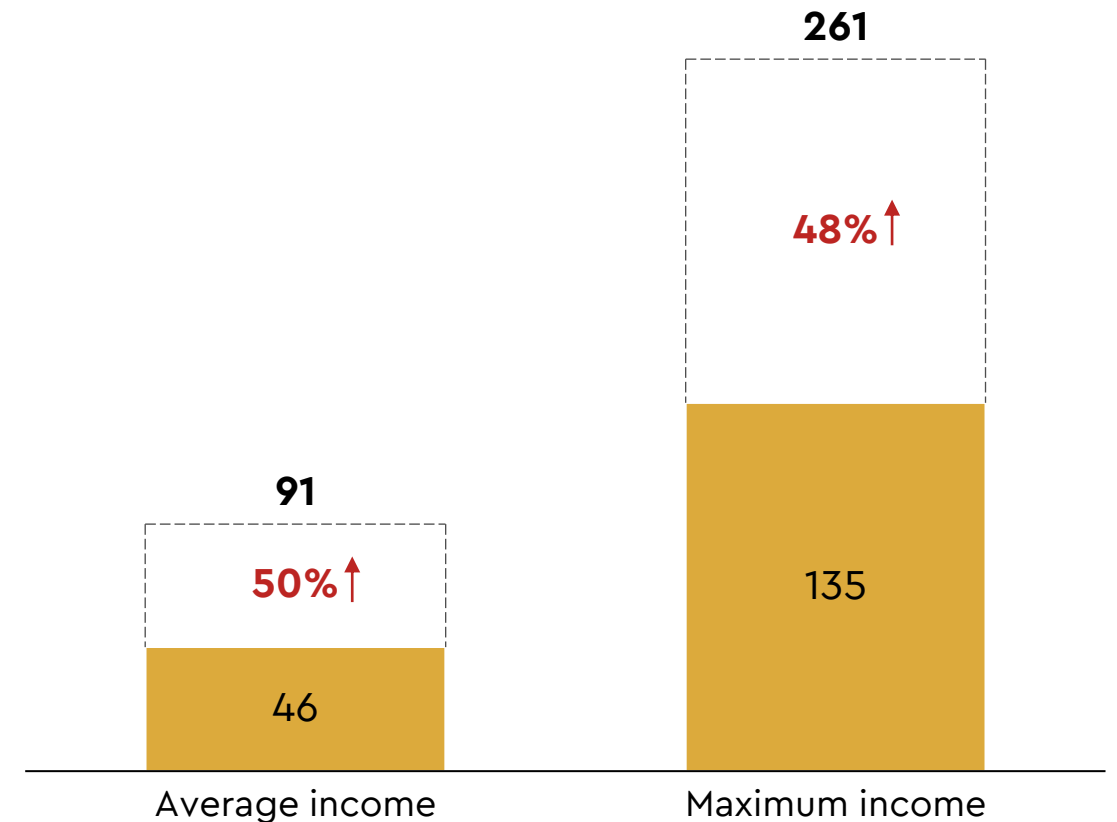
IT degrees can increase income by 41% over market levels with a bachelor's degree and by 50% with a master's degree

Income of IT graduates (dashed box) Income of other graduates (solid bar)

Income¹ of 2021 bachelor's degree graduates one year after graduation, RUB thous



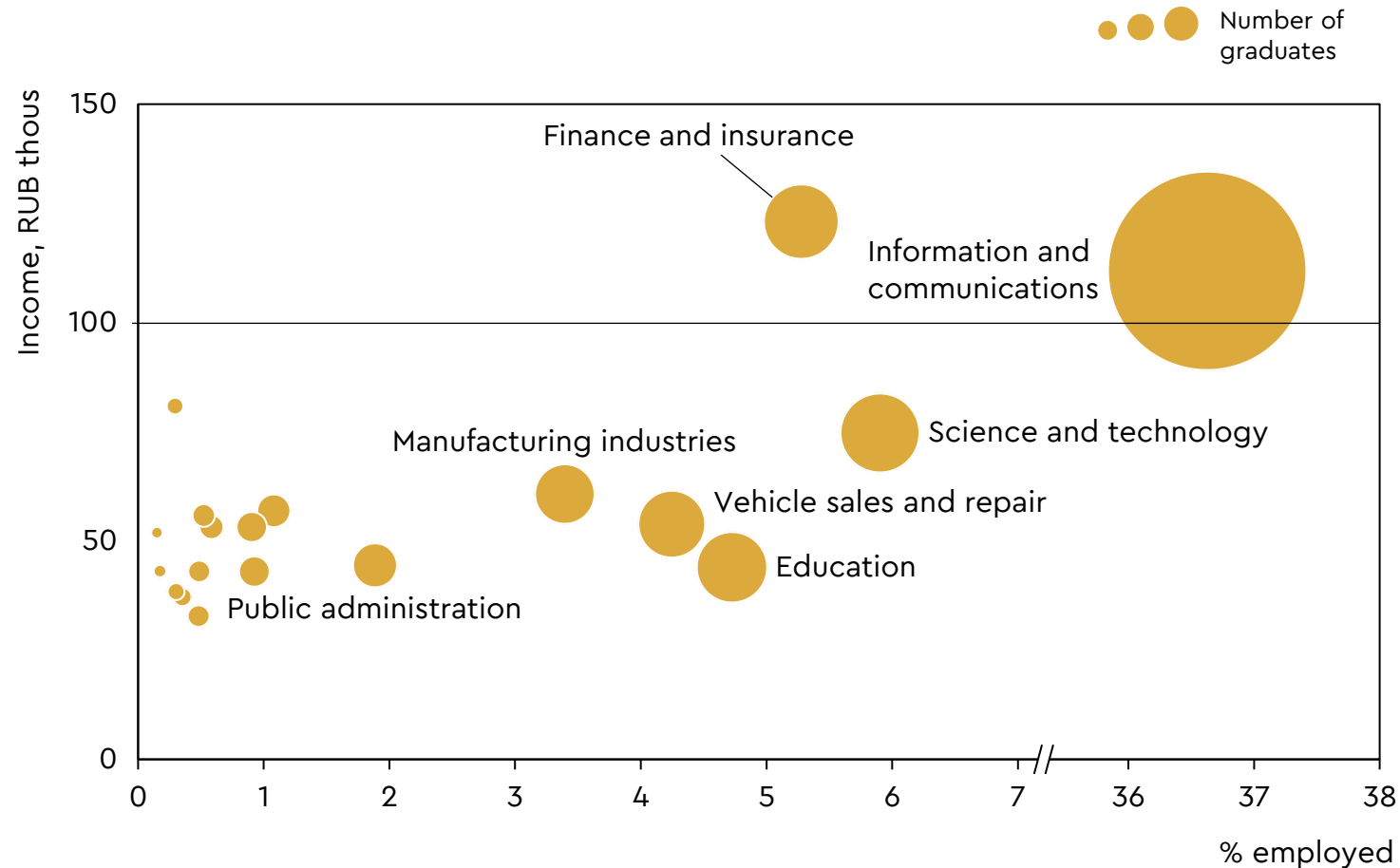
Income¹ of 2021 master's degree graduates one year after graduation, RUB thous



1. Excluding the bottom 10% and top 10% of graduates by income level

The highest income for IT graduates is in IT and finance

Ratio of graduates' earnings to employment rate two years after graduation



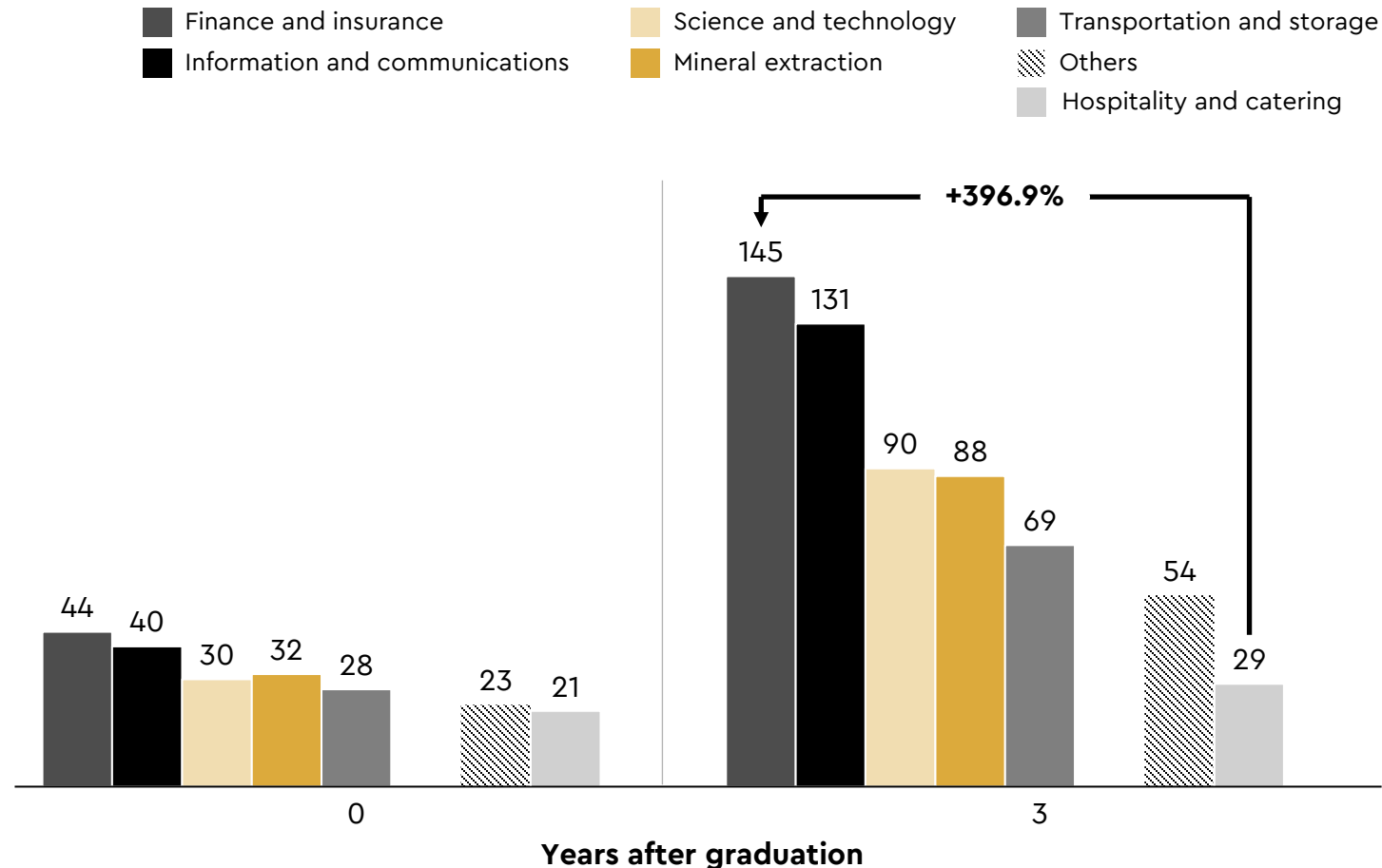
Ten most in-demand employment sectors for IT graduates

- 1 Information and communications
- 2 Science and technology
- 3 Finance and insurance
- 4 Education
- 5 Vehicle sales and repair
- 6 Manufacturing industries
- 7 Public administration and military security, social security
- 8 Transportation and storage
- 9 Healthcare and social services
- 10 Administration and related services

1. Data based on the 2020 IT graduates

Income differences between graduates' fields of work can be as high as 400%

Income¹ of IT professionals by employer sector, RUB thous



1. Data based on the 2019 IT graduates three years after graduation, average income excluding bottom 10% and top 10% by earnings

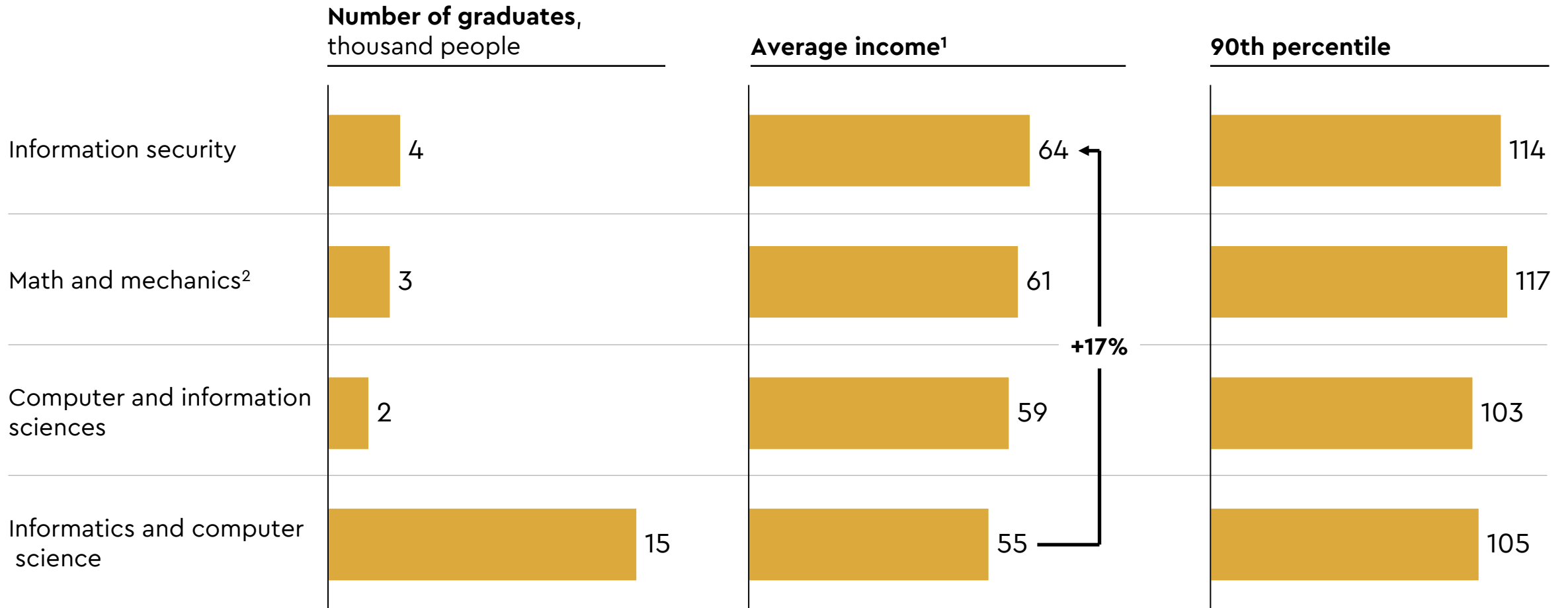
The finance and insurance sector offers the highest earnings for IT graduates

The ICT sector is second, while science and mineral extraction come in third (with science lagging slightly behind at the start, but catching up with mineral extraction in terms of income 3 years after graduation)

The hospitality and catering sector is the least preferred career option

Information security professionals earn 17% more than graduates in the most popular field of informatics and computer science

Income of graduates by IT specialization¹, RUB thous



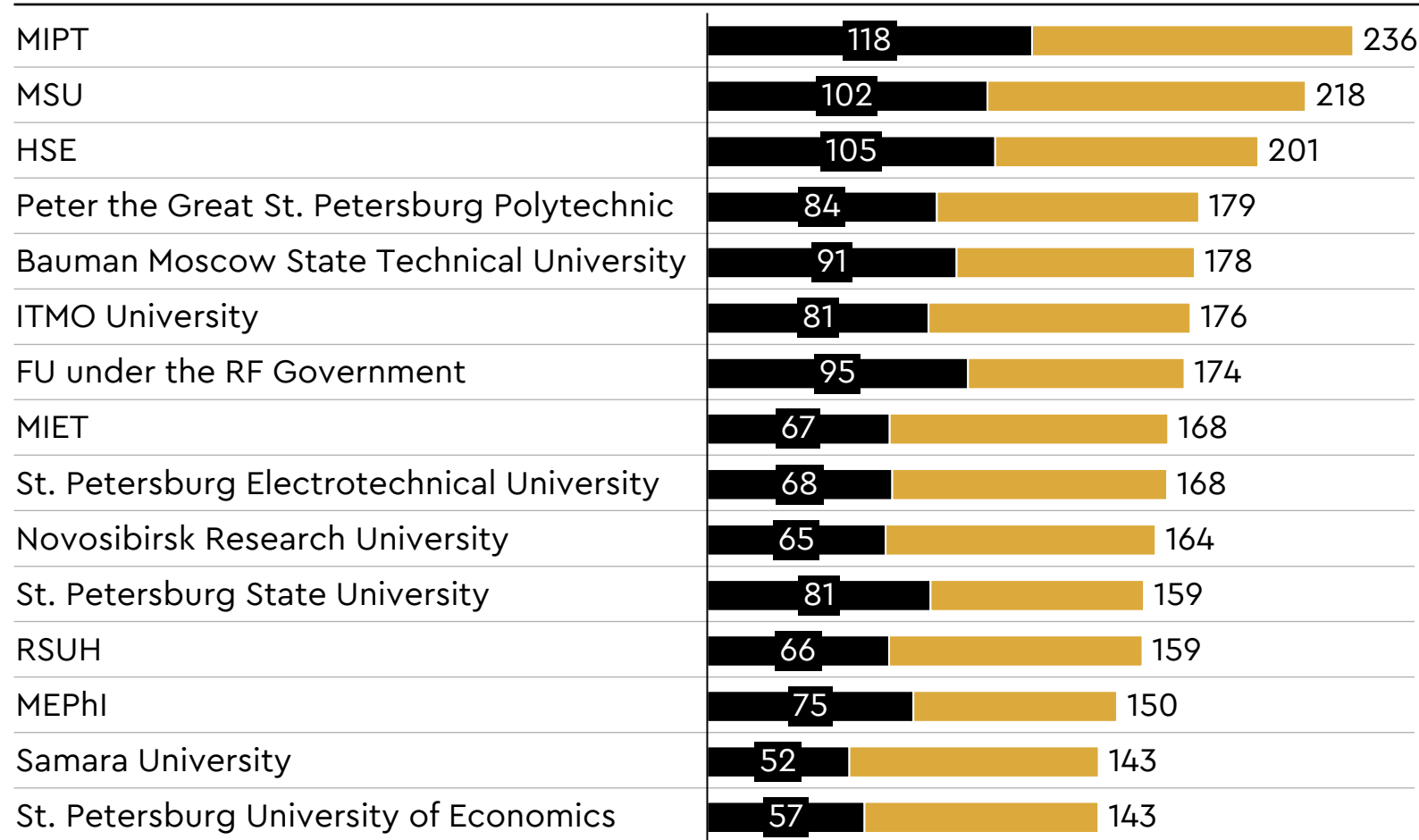
1. The 2021 bachelor's and specialist's degree graduates and their incomes one year after graduation, excluding bottom 10% and top 10% by income

2. This group includes only the Applied Mathematics and Computer Science disciplines

Top 15 Russian universities for IT professionals in terms of graduate pay

Income after 3 years (yellow) Income after one year (black)

Income¹ of IT graduates three years after graduation, top 15 universities, RUB thous



The strongest career start by income in IT fields is provided by the top 15 universities

In addition to Moscow and St. Petersburg universities, the top 15 also include IT programs offered by regional universities: Novosibirsk and Samara

There are also many regional universities in the top 50 IT programs: Voronezh State University, Far Eastern Federal University, Tatishchev Astrakhan State University, Volga State Technological University and other regional universities

1. The 2019 graduates and their incomes three years after graduation, in 2022

The most effective career start for an aspiring IT professional is one year before graduation

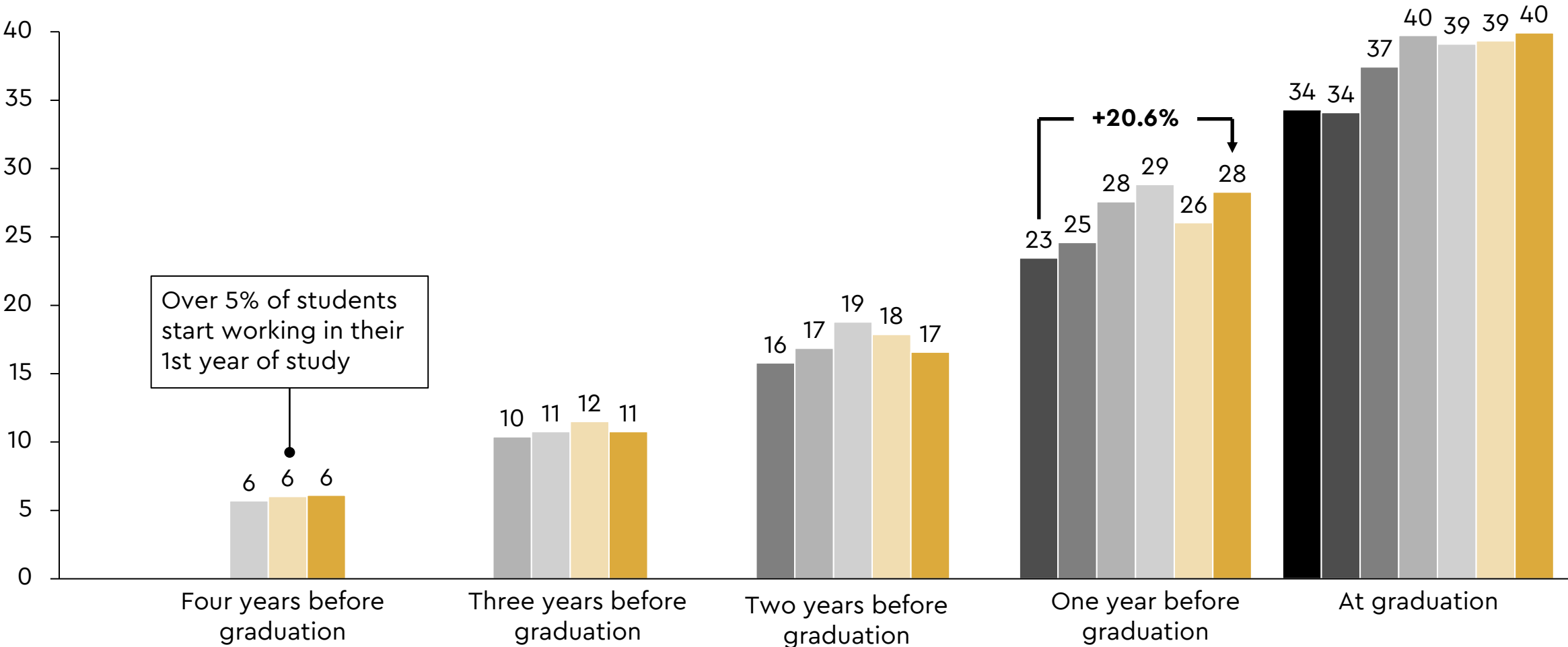
- 1 Up to 40% of graduates are already employed at the time of graduation, with a quarter starting work a year before graduation or earlier
- 2 Starting work 1–2 years before graduation gives about a 20 percent pay advantage over a horizon of three years after graduation compared to those who started working upon graduation. Interestingly, students who started work in the first or second year of their bachelor's degree course lose out in terms of earnings to those who start work in their final year. This may be due to the difficulty of combining studies with work during junior university years
- 3 During their studies, IT students most often work part-time in BigTech companies, banks or their own universities, with 56% of IT graduates continuing working in the same company after graduation



Up to 40% of graduates are already employed at the time of graduation, with a quarter starting work a year before graduation or earlier

Year of graduation: 2016 2017 2018 2019 2020 2021 2022

Share of employed by year of graduation, %¹

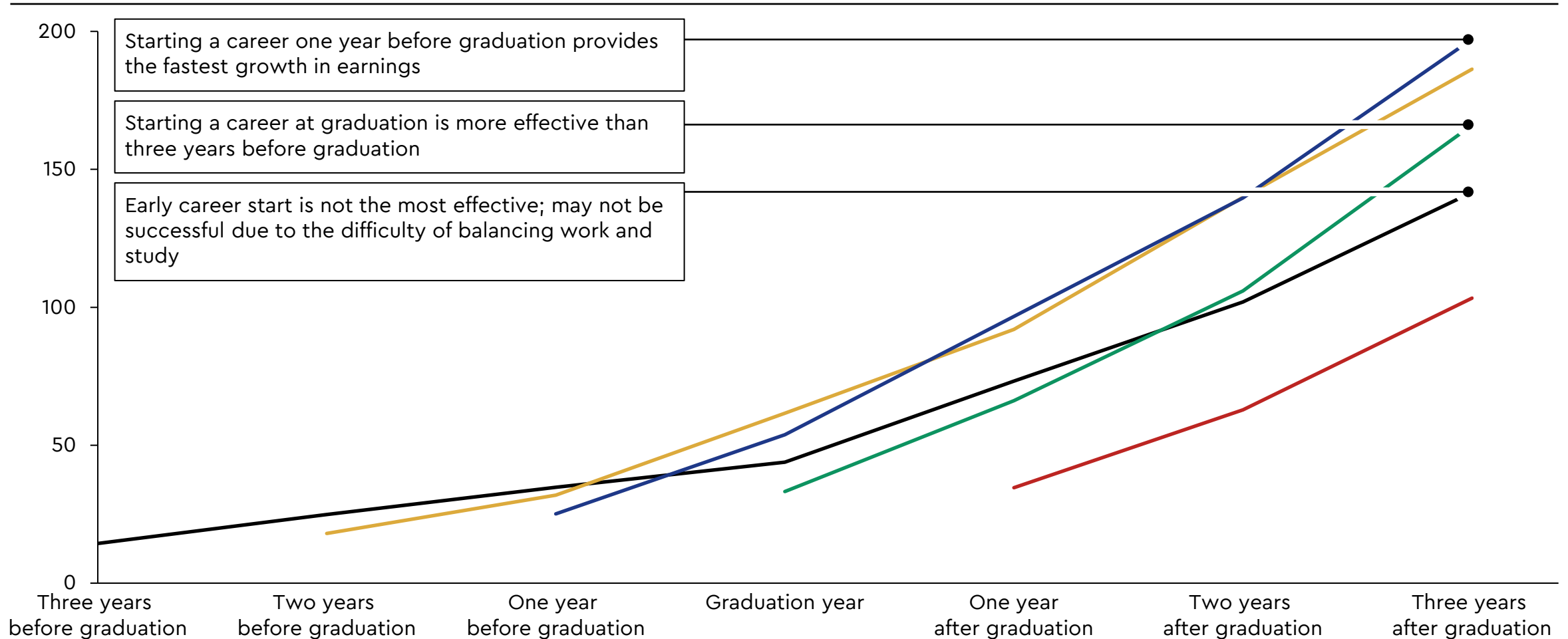


1. Based on employment data

Starting work 1–2 years before graduation ensures the fastest income growth going forward

Career start: — Three years before graduation — Two years before graduation — One year before graduation — At graduation — One year after graduation

Average salary¹, RUB thous



1. Case study of the 2019 Applied Mathematics and Computer Science graduates

During their studies, IT students most often work part-time in BigTech companies, in banks and in their own universities

	Top employers of IT students one year before graduation ¹ , %	Average income, RUB thous
BigTech	1.9	>80
Bank	1.3	>50
Bank	1.1	>50
Developer	1.0	>35
University	1.0	>45
Developer	0.8	>30
Developer	0.7	~20

56%
of IT graduates continued to work in the same company after graduation

1. Bachelor's and specialist's degree graduates of 2022

Master's IT programs provide an income boost and are becoming more popular among both IT professionals and related professions

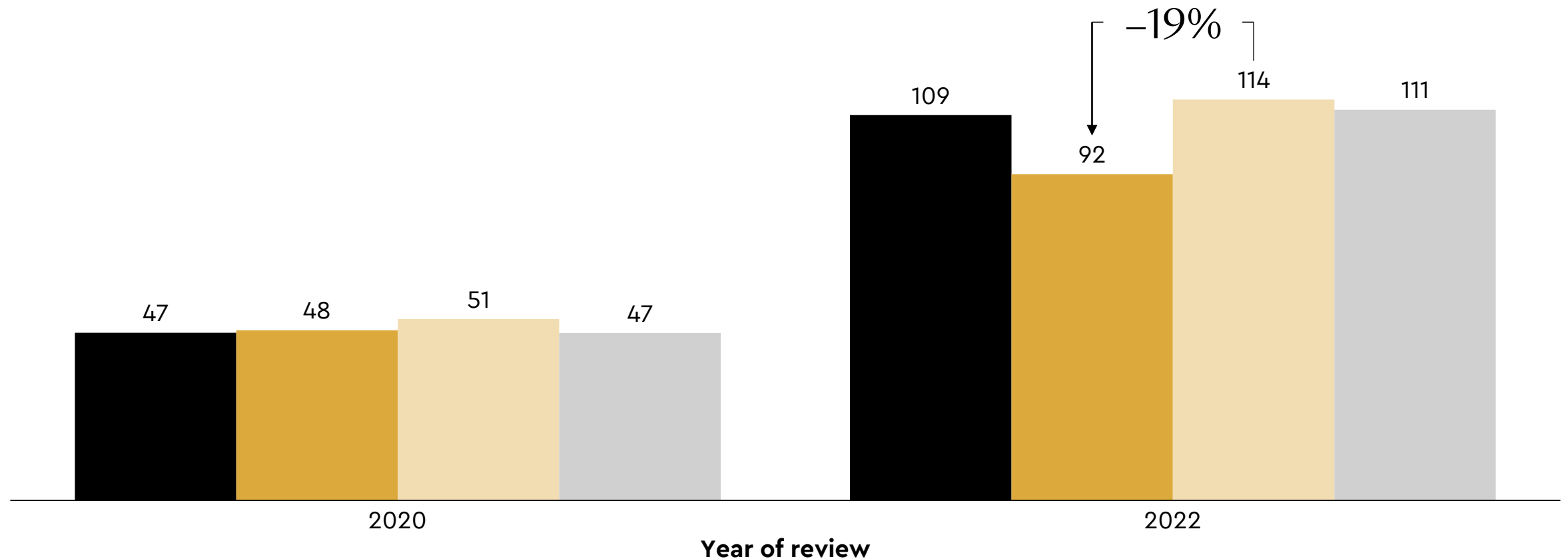
- 1 Enrolling in a master's program for IT professionals with a bachelor's degree can increase income by 19%
- 2 Demand for master's IT programs grew in 2022, but only one in two IT graduates enrolls in a master's program
- 3 Female IT graduates show a 6% decrease in interest in master's programs, while men show an 8% increase
- 4 There was a 7% increase in the interest in master's degree programs among bachelor's IT graduates
- 5 Seventy-two percent of those enrolled in master's IT programs do not have an IT background



Enrolling in a master's program for IT professionals with a bachelor's degree can increase income by 19%

■ Specialist's degree¹ ■ Bachelor's degree (not enrolled in a master's program) ■ Enrolled in a master's program (after bachelor's program) ■ Graduated from a master's program (after a bachelor's degree)

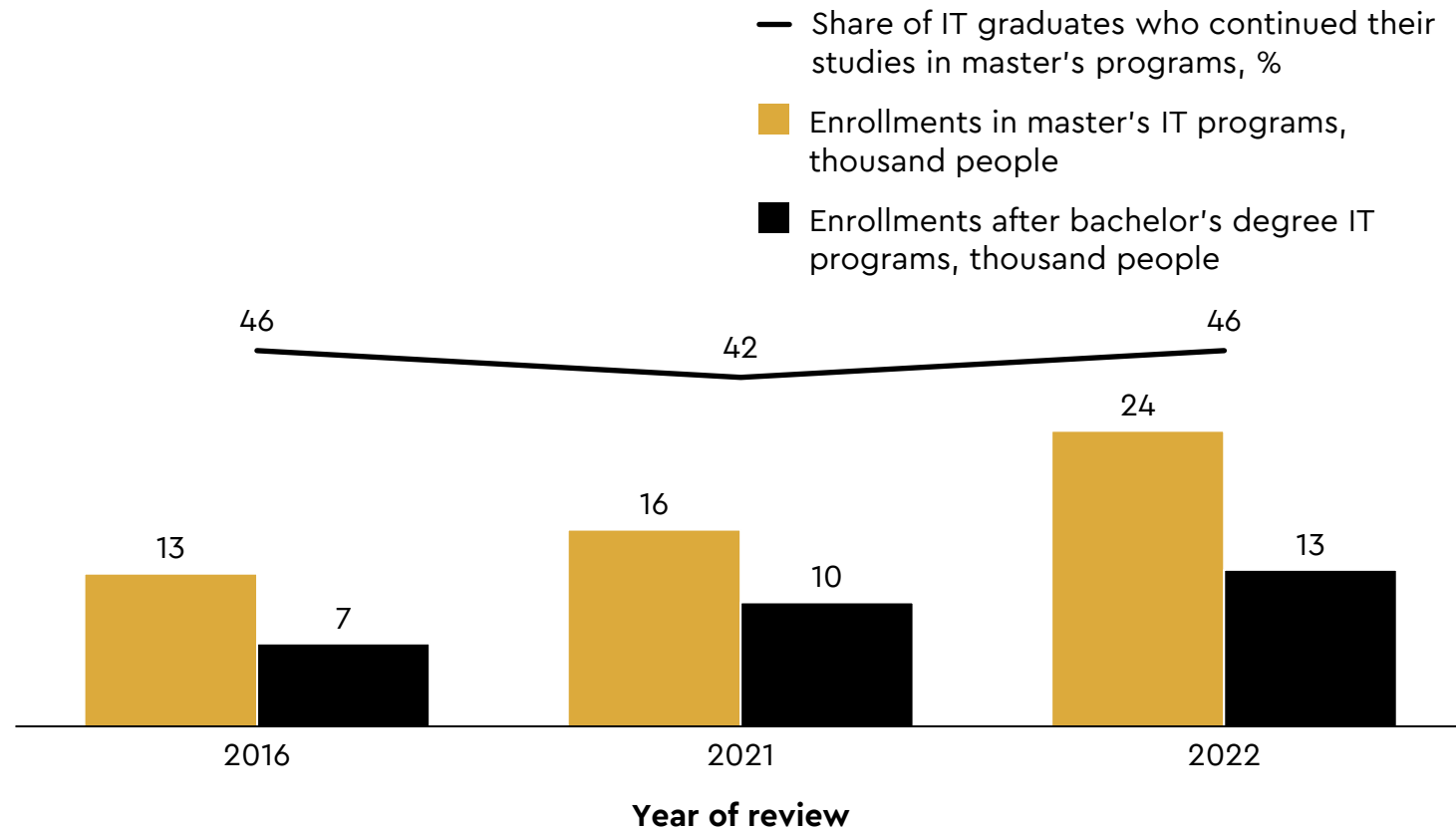
Average salaries for 2019 graduates, RUB thous



1. 2020 graduates of the specialist's program

Demand for master's IT programs is growing, but only one in two IT graduates go on to master's programs

Enrollments in master's degree programs, thousand people



>52%

of IT professionals enrolled in a master's program chose the same specialization¹

>89%

of IT professionals in the master's programs chose IT specializations¹

Comment

Interest in master's IT programs remained stable between 2018 and 2021: 13,000–16,000 enrollments per year

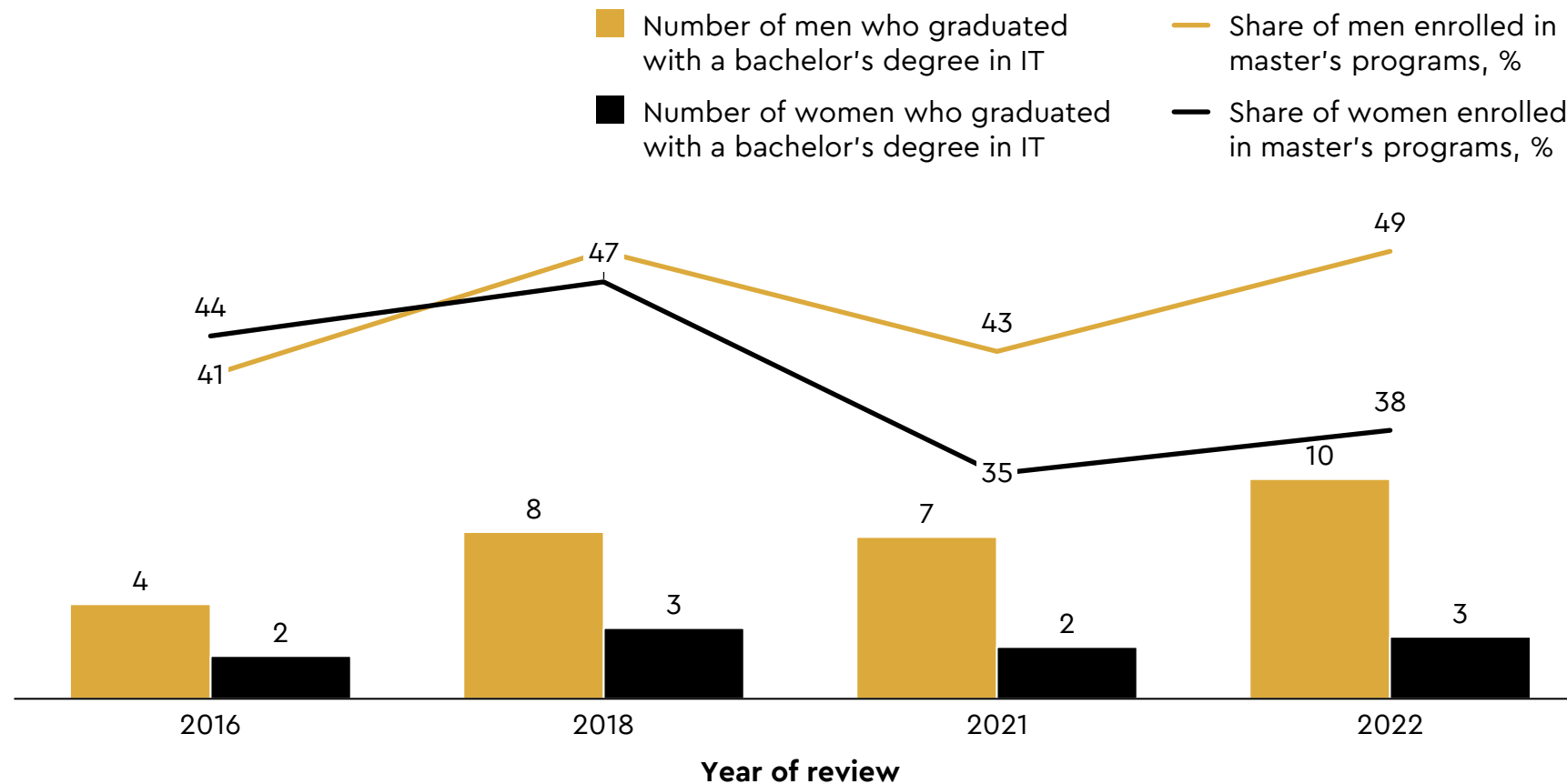
Less than half of bachelor's degree IT graduates go on to master's programs

In 2022, enrollment in master's IT programs increased by 50%

1. Based on the 2022 graduation data

In 2022, most of the surge of interest in master's programs came from male graduates; there was little growth in demand from women

Enrollments in master's programs by IT graduates, thousand people



Prior to 2018, female bachelor's degree IT graduates enrolled in master's programs at a higher rate than men

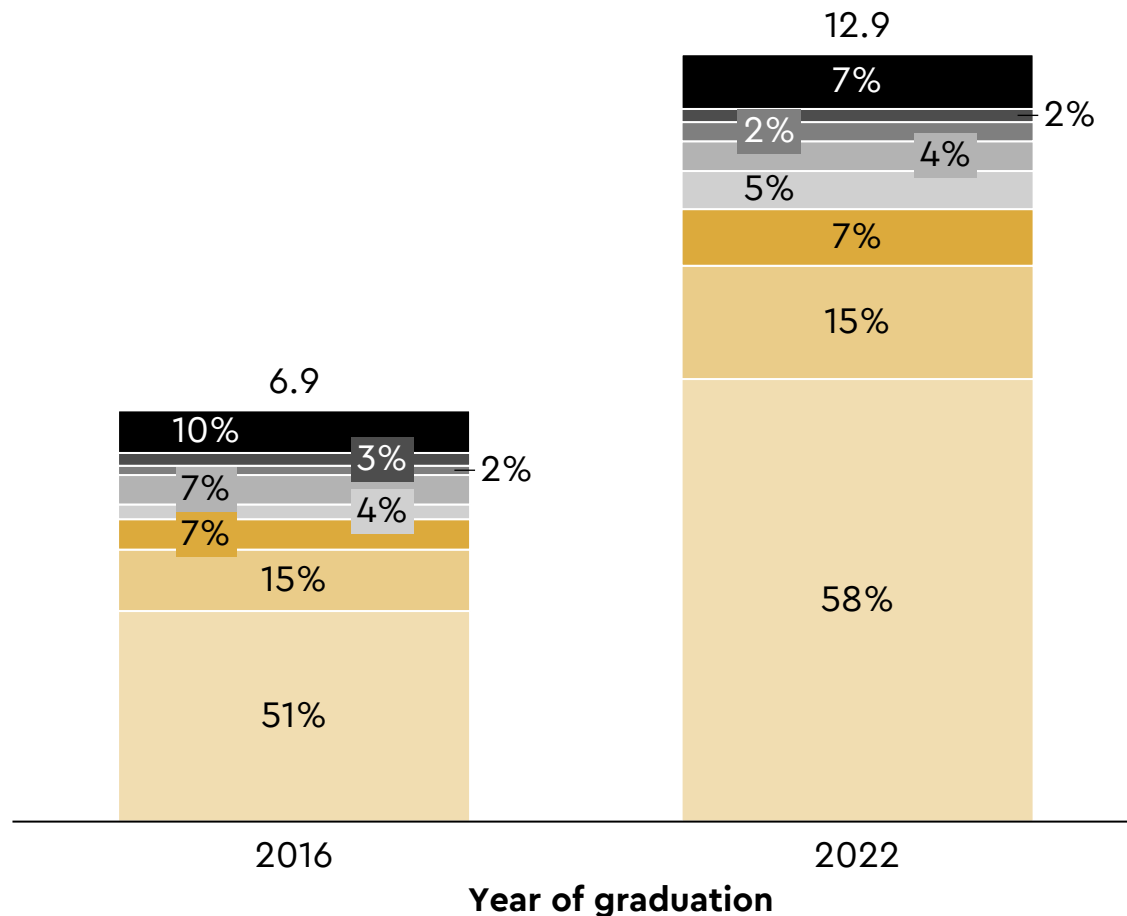
After 2018, nearly one in two men with an IT degree went on to pursue a master's degree, while interest from girls was closer to 33%

In 2021, interest in pursuing a master's degree declined, by 5% for men and by 7% for women

1. For the time period under study, i. e. 2016–2022

Bachelor's degree IT graduates prefer to continue their studies in IT or related fields

Distribution of master's programs chosen by graduates of bachelor's IT programs, thousand people



Aggregated groups of master's degree programs

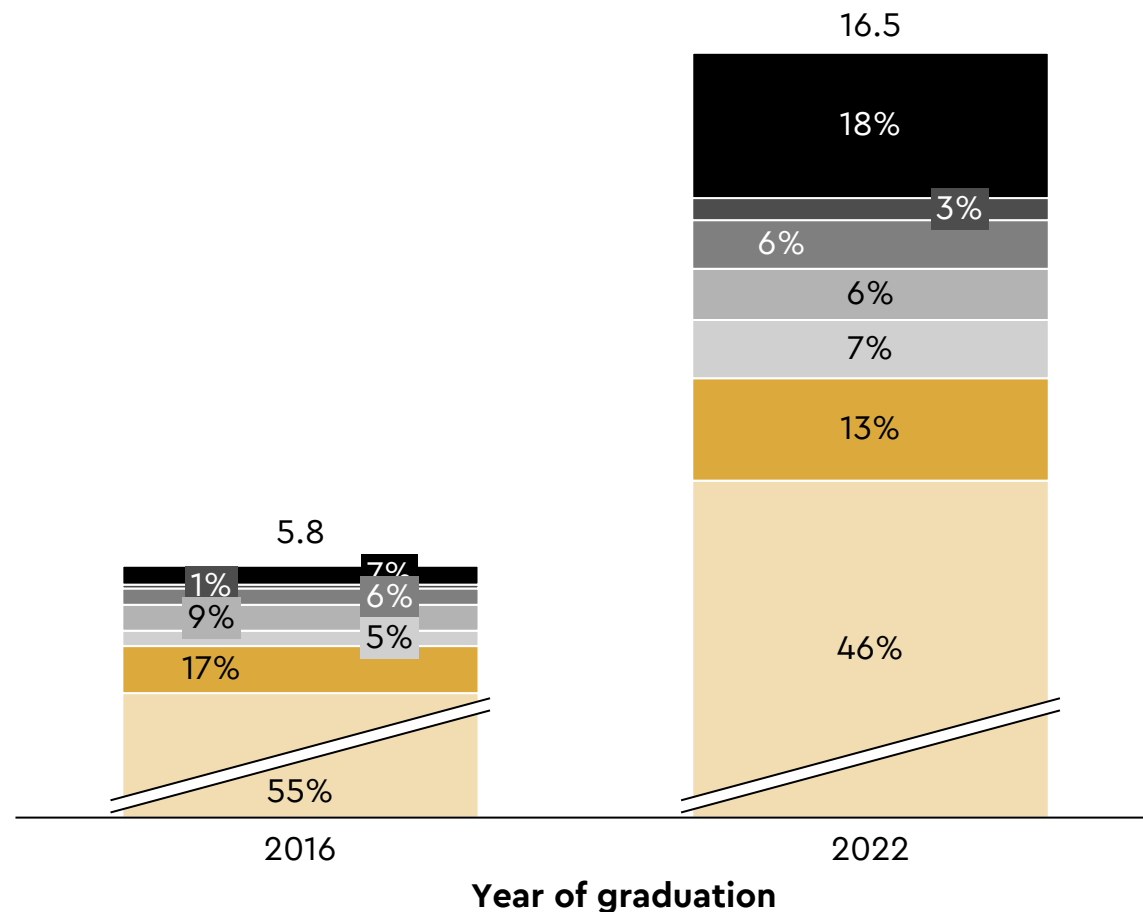
- Others
- Education and Pedagogical Sciences
- Engineering Systems Management
- Economics and Management
- Information Security
- Computer and Information Sciences
- Math and Mechanics
- Informatics and Computer Science

Over 85% of bachelor's degree IT graduates choose IT or related fields of study (Mathematics and Mechanics) at the master's level

The interest of IT graduates in Economics and Management and Education and Pedagogical Sciences declined from 10 to 6%

In 2016–2022, interest in master's IT degrees grew among bachelor's degree holders in Economics and Electronics Engineering

Enrollments in master's IT programs by holders of various bachelor's degrees, thousand people



Groups of bachelor's programs

- Others
- Electronics, Radio Engineering and Communication systems
- Information Security
- Computer and Information sciences
- Economics and Management
- Math and Mechanics
- Informatics and computer science

The vast majority of applicants to master's IT programs have bachelor's degrees in IT

The number of bachelor's degree graduates in Economics and Management enrolling in master's IT programs has increased 3.8 times in 6 years – they now account for up to 7% of those enrolling in IT and related master's degree programs

There has also been a surge of interest in master's IT programs from Electronics and Radio Engineering graduates

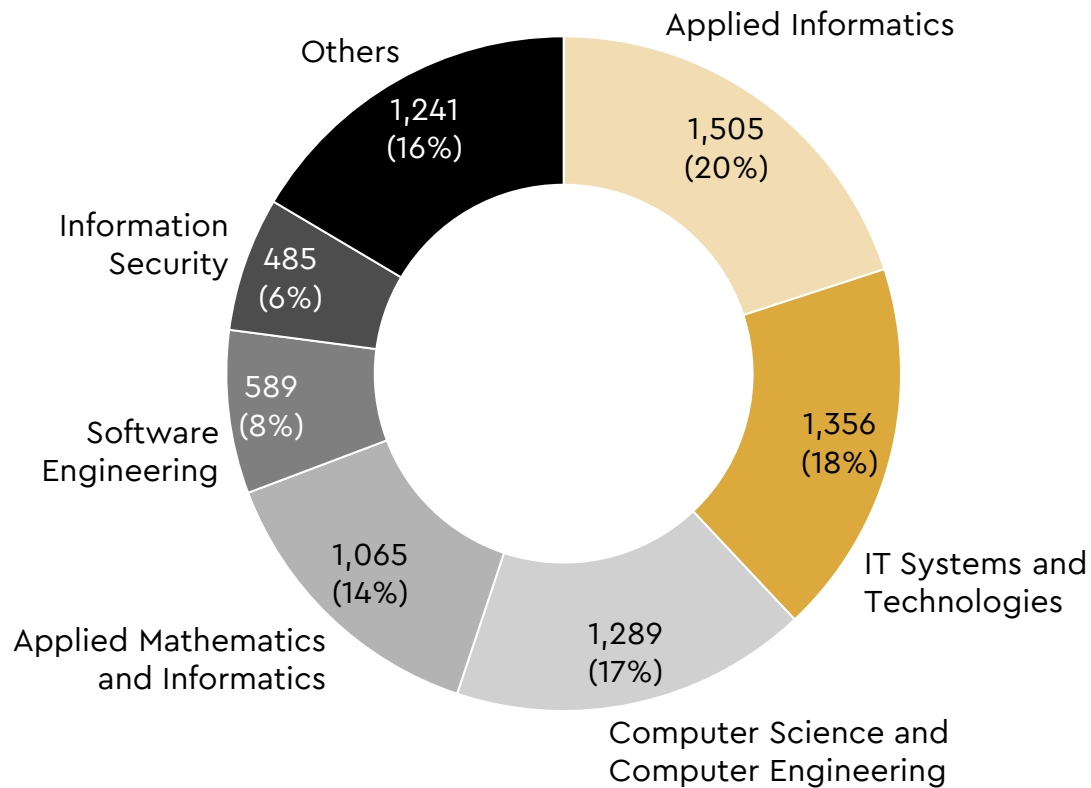
Female IT graduates still get paid less and are more likely to choose jobs in other sectors

- 1 The proportion of women enrolled in IT degree courses ranges from 20% (Software Engineering) to 38% (Mathematics and Computer Science) and has been declining since 2021, reaching an average of 27%
- 2 Master's degrees increase women's earnings by 61% and men's earnings by 58%, but men still earn 20% more
- 3 The income gap between men and women widens over time to 26% for bachelor's degree graduates and 34% for master's degree graduates
- 4 Female graduates' job preferences are the same as those of their male counterparts, but incomes can vary significantly. The information, science and technology, and finance sectors have the largest income gaps between men and women, reaching as high as 33%

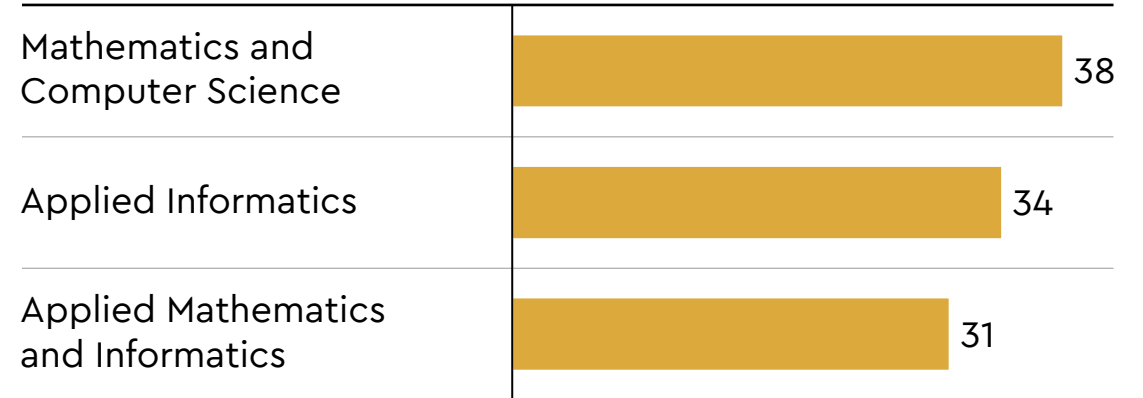


The proportion of women among IT students ranges from 20% in Software Engineering to 38% in Mathematics and Computer Science

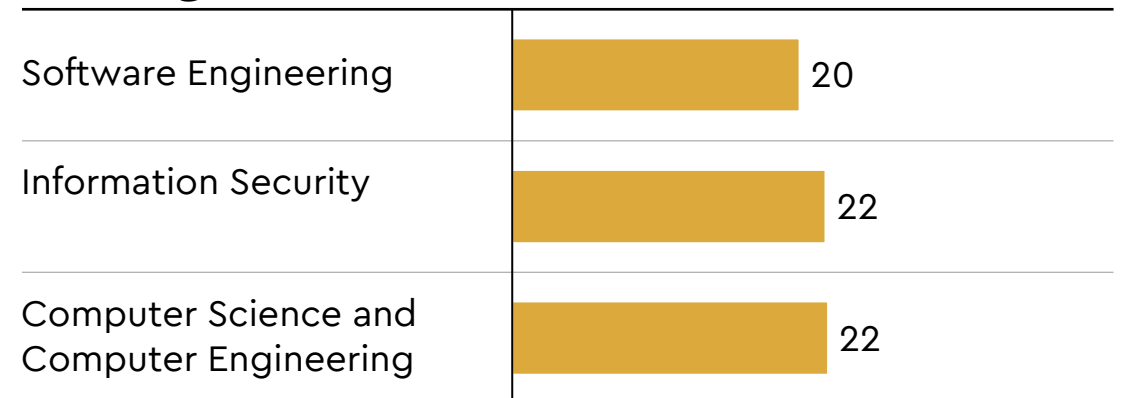
Distribution of female graduates in bachelor's and specialist's programs in 2022, people



Top three IT fields with the highest proportion of female graduates in 2022, %



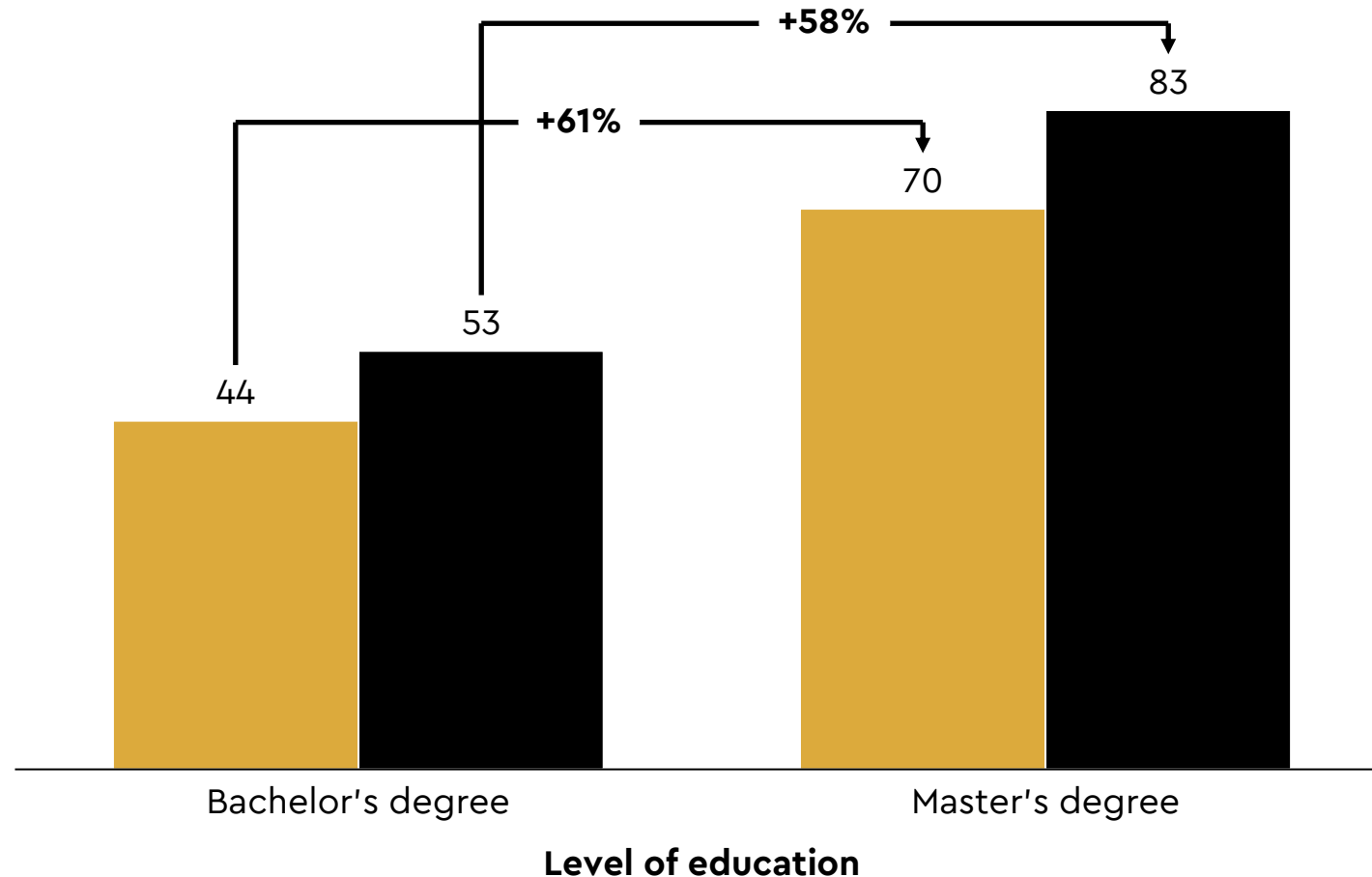
Top three IT fields with the lowest proportion of female graduates in 2022, %



Master's degrees increase women's earnings by 61% and men's earnings by 58%, but men still earn 20% more

Female Male

Income level one year after graduation¹, RUB thous/mo



37%

of women are employed at graduation from the bachelor's program

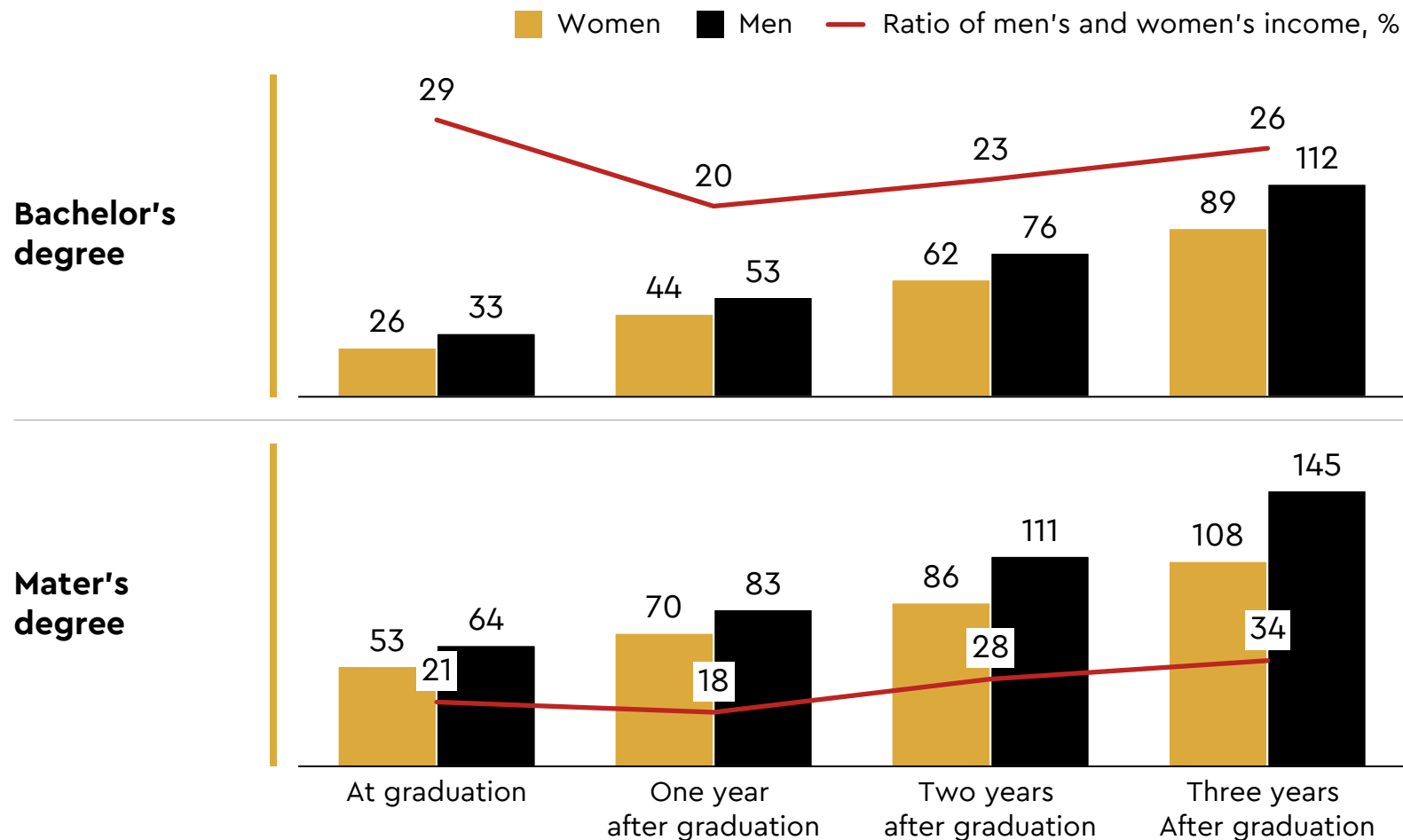
78%

of women are employed at graduation from the master's program

1. Data using the example of ICS programs 09.03.01 and 09.04.01, the 2019 bachelor's and master's graduates; average income, excluding bottom 10% and top 10% by income

The income gap between men and women widens over time to 26% for bachelor's degree graduates and 34% for master's degree graduates

Income level¹, RUB thous/mo



The income gap at the master's level is growing faster than at the bachelor's level

The income gap between men and women decreases during the first year after graduation but increases thereafter

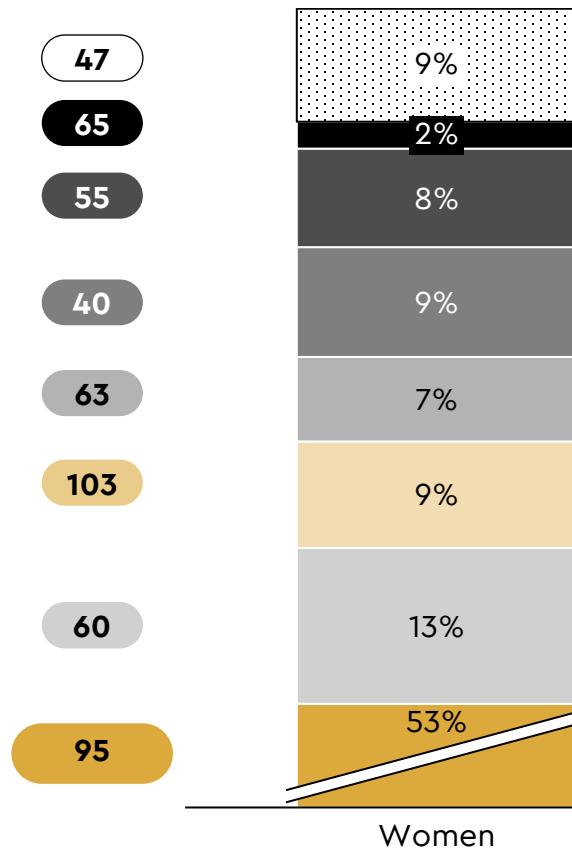
Women at graduation from a master's program have income comparable to that of men one year after graduation from a bachelor's program

1. Data using the example of ICS programs 09.03.01 and 09.04.01, the 2019 bachelor's and master's graduates; average income, excluding bottom 10% and top 10% by income

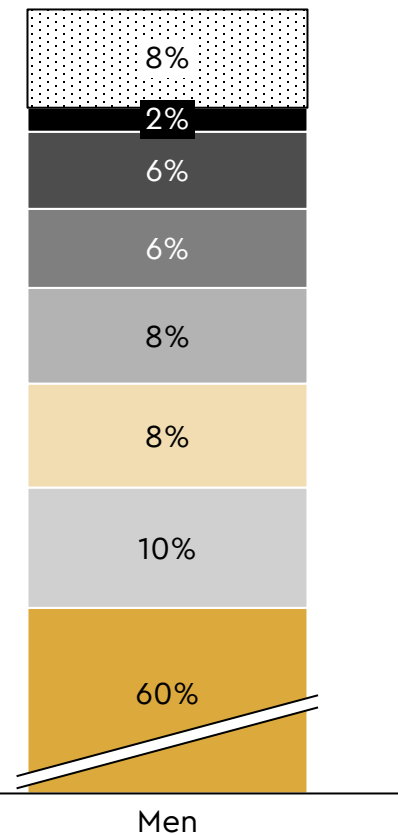
Female graduates' job preferences are the same as those of their male counterparts, but incomes can vary significantly by as much as 33%

Employment by sector¹, %

Women's income, RUB thous



Men's income, RUB thous



Sector

- Information and communications
- Science and technology
- Finance and insurance
- Manufacturing industries
- Education
- Vehicle sales and repair
- Transportation and storage
- Others

The information, science and technology, and finance sectors have the largest income gaps between men and women, reaching as high as 33%

1. Data using the example of ICS programs 09.03.01 and 09.04.01, the 2019 bachelor's and master's graduates; average income, excluding bottom 10% and top 10% by income

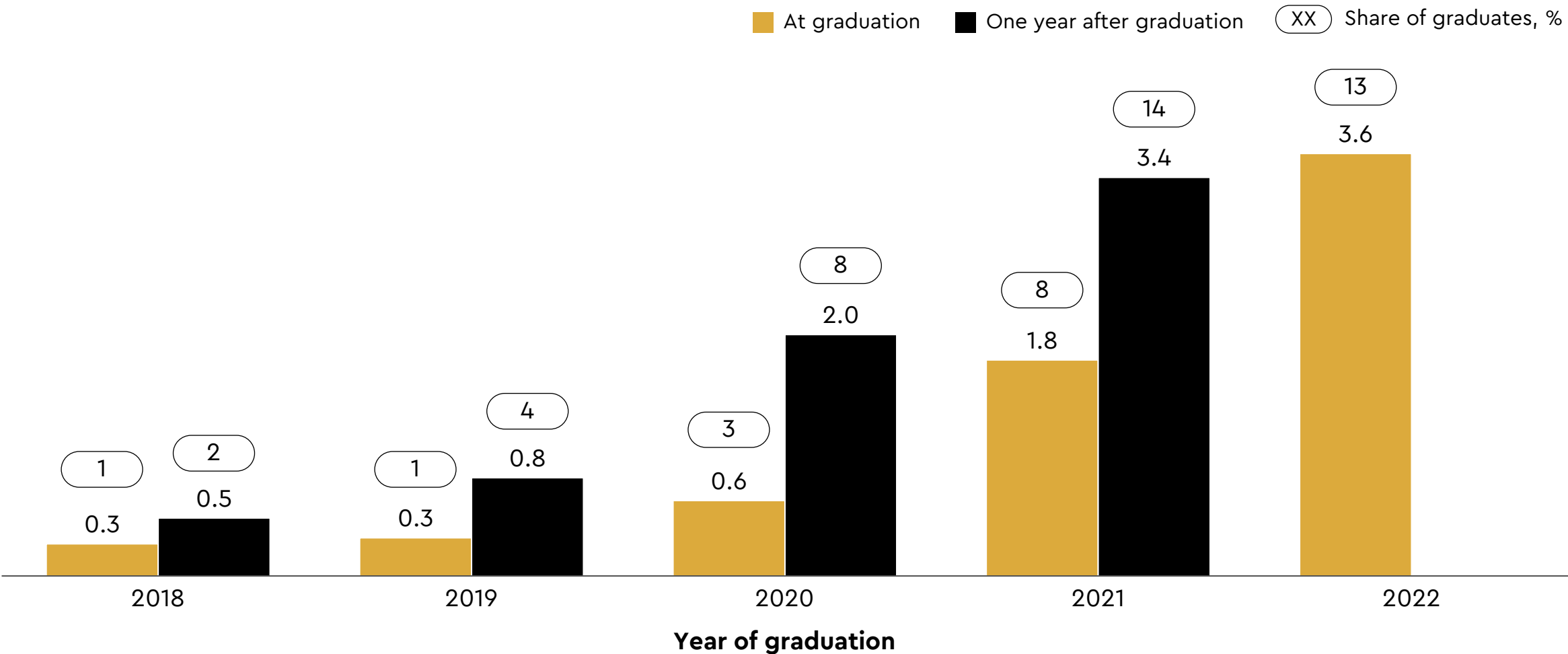
IT graduates are increasingly interested in being self-employed

- 1 More than 13% of IT graduates have the status of self-employed / individual entrepreneur at graduation from university
- 2 The flexible work model, which allows IT graduates to combine self-employment with payroll work, is growing in popularity
- 3 In 2021, the number of IT professionals with the status of self-employed / individual entrepreneur almost doubled



More than 13% of IT graduates have the status of self-employed / individual entrepreneur at graduation from university

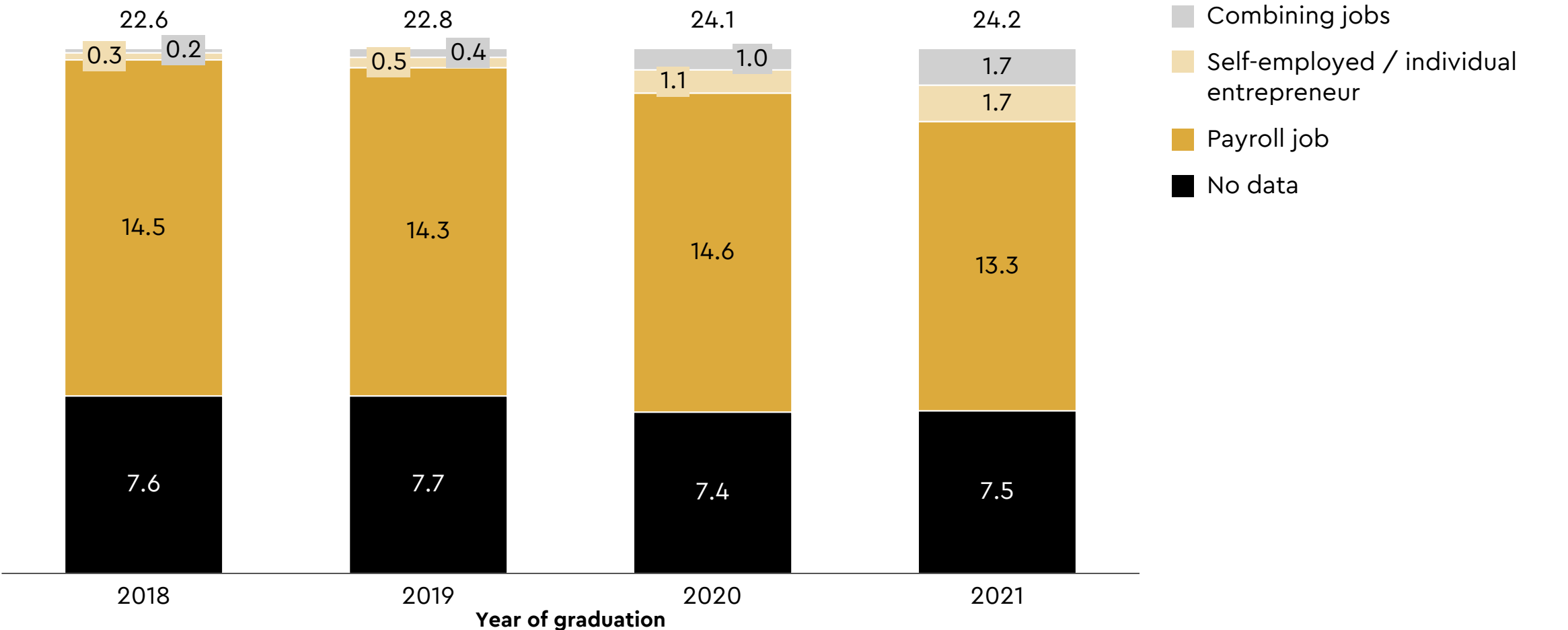
Number of graduates with the status of individual entrepreneur / self-employed, thousand people



The flexible work model, which allows IT graduates to combine self-employment with payroll work, is growing in popularity

Distribution by employment type one year after graduation, thousand people

Employment type

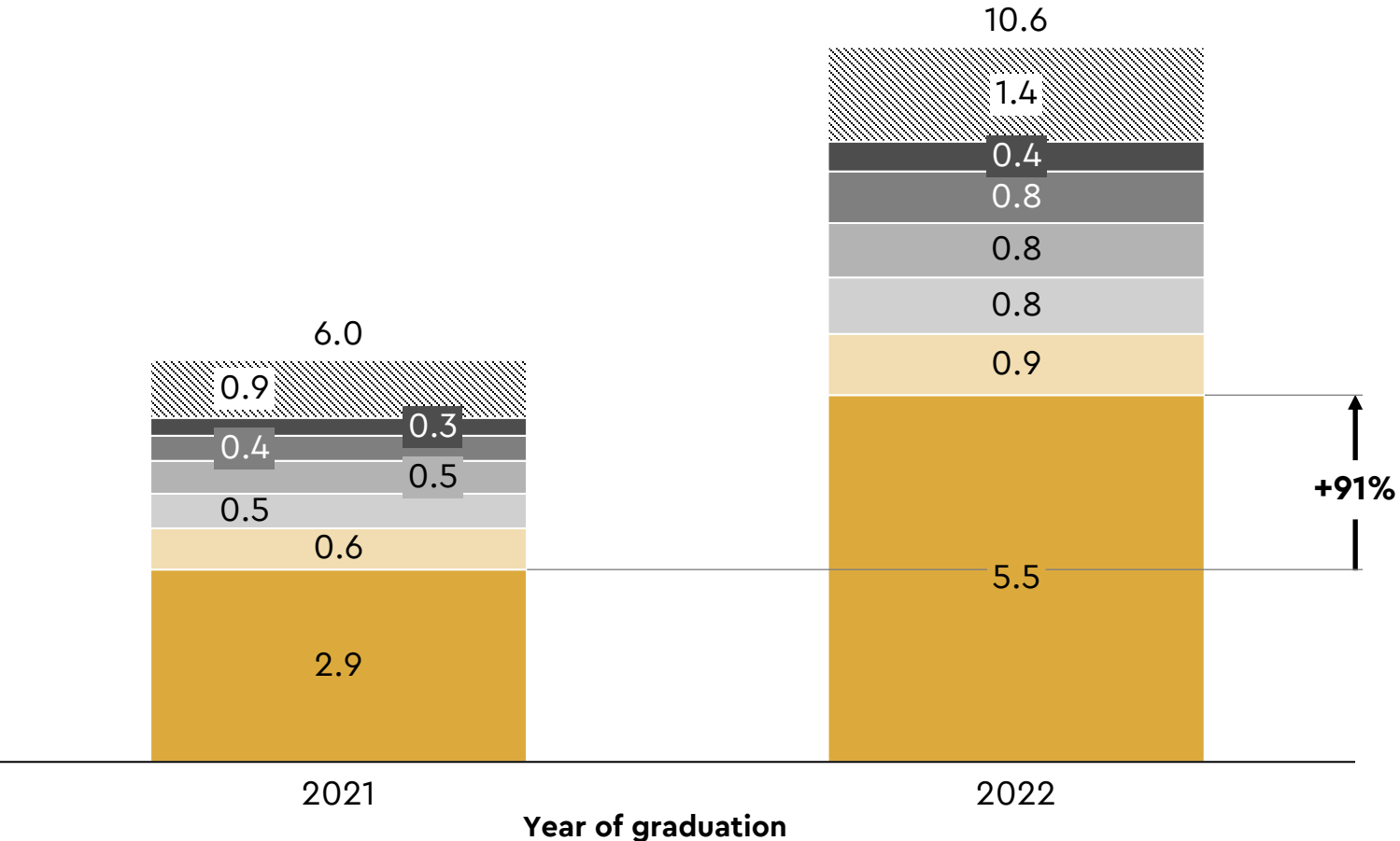


In 2021, the number of IT professionals with the status of self-employed / individual entrepreneur almost doubled

Number of self-employed / individual entrepreneurs, thousand people

Sector

- Others
- Manufacturing industries
- Finance and insurance
- Science and technology
- Vehicle sales and repair
- Education
- Information and communications



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Job Market Demand for IT Graduates

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