

**NATIONAL
COMPETITIVENESS
REPORT
OF ARMENIA
2019**

THE
FUTURE
OF
JOB'S
IN **ARMENIA**

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The Future of Jobs in Armenia

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This Report provides a comprehensive analysis on Armenia's economic performance and competitiveness from the perspective of the trends and structural changes of employment in Armenia. The Report analyzes and addresses job market challenges, shifts and opportunities in Armenia and proposes a reform agenda for workforce development to tackle the problems and capture strategic opportunities. It aims to foster in-depth dialogue between private and public sector representatives to form an agenda for building a competitive workforce and ensuring a high level of employment in the country.

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INTRODUCTION

Labor markets are undergoing structural transformations globally and locally. Economic, socio-demographic, technological, and environmental drivers are changing the demand and requirements of businesses. Consequently, unique opportunities are being created for developing economies to boost their economic growth and catch up with advanced ones. These opportunities can be much wider for Armenia after radical political shifts in 2018 dubbed as “Velvet Revolution”. However, strong challenges also emerge such as threat of job destruction, workforce market imbalance, skillset mismatch, and so forth. It is crucial that Armenia addresses those challenges in order to build a competitive workforce, maintain high levels of employment, and enable sustainable economic growth.

Job creation is a fundamental challenge for the Armenian economy. The current unemployment rate in the country is at 20.4%. Social polarization is also a major problem, as around 30% of the population is considered poor, while the Gini coefficient is at 37.5%. The mismatch of education system outputs with the current needs of employment and demographic changes (negative migration balance has been at on average 24,000 people per year for the 2011-2017 period) reflect the depth of the challenge. No other economic priority is more important than to build a competitive workforce and ensure a high level of employment.

This priority must be realized in the context of strong trends and deep structural transformations unfolding globally. These structural transformations threaten to destroy more jobs in the future due to automation, productivity growth, and industrial structure shifts. The needs of the labor market and employers are changing in Armenia in parallel with the transforming world economy. This creates a significant mismatch in the skills that employers require. Without strategic foresight on key patterns of economic change and consequent changes in workforce requirements, the educational system will be unable to adequately adapt. Hence, there is an acute need for thorough analysis, strategic foresight, and discourse to assess employment challenges and understand the necessary systemic and institutional changes.

First, we analyze the historical performance of Armenia’s economy. The dynamics of human resources and structural changes of employment in Armenia are analyzed to compare the trends with international ones and understand gaps to be addressed. Then, the employment demand assessment and macroeconomic modeling for growth scenarios are developed to identify the country’s job creation potential within baseline, accelerated, and disruptive scenarios. Future workforce demands and skill requirements are assessed through focus group discussions at the sectoral level as well as enterprise survey analysis. Comprehensive supply-side and demand-side analyses as well as insights from labor market participants identify areas for improvement and challenges Armenia will face. Finally, we provide our views on the national strategic agenda of Armenia’s workforce development and educational system reforms, key principles of strategy making, and a portfolio of initiatives for consideration by policy makers, businesses, academic institutions, and other key stakeholders.

Education system efficiency, governance, and financing issues have not been researched for the purposes of this report. Similarly, the economic growth agenda and policy remarks are not discussed within the Accelerated Growth scenario and Armenia’s workforce development agenda. Those topics require thorough analysis and strategic foresight to assess economic and institutional challenges and understand the required changes enabling Armenia’s sustainable economic growth.

EXECUTIVE SUMMARY

Job Market in Armenia

In the context of increasing inequality of income and wealth distribution, sustainable and inclusive economic growth is critical for many countries. Expansion of employment as well as enhanced competitiveness are required to support achieving faster and inclusive economic growth in Armenia. Armenia's economically active population as well as its labor resources have been declining during the past decade. As a result, employment level in Armenia has been negatively impacted. Besides the decreasing demographic trends, almost half of the economically active as well as inactive population does not have any type of professional education. Armenia's NEET rate—the share of young people aged 15-24 neither in employment nor in education and training—is worryingly high. Currently, a large part of Armenia's total human capital does not participate in value creation activities, which is hampering economic growth. Approximately 560,000 “potentially employable” people did not contribute to economic value creation processes in 2017, resulting in about 55% less GVA creation when compared with Armenia's potential.

Although during the analyzed period Armenia moved from the lower-middle-income group of countries to the upper-middle-income group, the pace of economic development was not high enough to address the critical challenges of unemployment, migration, and economic inclusion and integrity. The country's economic development will depend on robust, diversified economic growth coupled with a highly skilled labor force contributing to value creation activities. Job creation—achieved under pressure while productivity continually increases across all sectors—is complicated. Armenia's economic development agenda should also address the external factors influencing the country's sustainable and inclusive development. The economic structure of the world economy is transforming rapidly, the future needs of labor markets are changing fast but largely uncertain. Economic, socio-demographic, technological, and environmental drivers contribute to the rapidly changing needs of employers.

Employment Demand Assessment and Growth Scenarios

Due to faster growth of the labor productivity the GDP growth rate has not been enough to prevent employment contraction in the country. During the analyzed period (2011-2017) the employment number decreased by 163,000 in Armenia. Higher rate of GDP growth should be targeted to both achieve the desired level of productivity and solve the critical job creation challenge in the country.

Three scenarios of economic development and job creation are modelled and discussed in this Report: Baseline Growth, Accelerated Growth, and Disruptive Growth. In the Baseline Growth scenario, economic growth will follow the logic of long-term productivity convergence between developing and developed economies. The economic growth pattern in the Accelerated Growth scenario is assumed to correspond with the growth rates of recent high-growth episodes of comparable economies. Due to high uncertainty, the Disruptive Growth scenario is not modelled but rather described through insights on the possible consequences of rapid technological advancements that might disrupt entire industries and job markets.

Based on labor productivity and per capita income convergence theory, the Baseline Growth scenario, which assumes economic inertia, does not envision significant new job creation in Armenia. Cumulatively, the net gain in employment in the country will only amount to about 20,000 new jobs by 2030, leaving the unemployment challenge largely unaddressed.

The Accelerated Growth scenario will lead to the elimination of structural unemployment and the level of unemployment falling to a natural level within a decade. For this to occur, a constant annual GDP growth rate of at least 7–7.5% is needed. Assuming that labor productivity also increases, that growth in GDP will result in the creation of about 540,000 jobs in Armenia by 2030. Both scenarios anticipate economic structural transformation. The manufacturing and services sectors will be the key driving sectors for accelerated economic growth in Armenia. The number of jobs is forecasted to decline in the agriculture and mining sectors. More jobs are anticipated in the services, manufacturing, and construction sectors.

Massive job cuts are among the risks in the Disruptive Growth scenario. Tasks traditionally performed by humans are increasingly being completed by rapidly advancing artificial intelligence and robotics, raising concerns about the future of jobs. The Disruptive Growth scenario assumes a situation where technologies radically disrupt the job market, leading to massive unemployment. In the foreseeable future, certain tasks will most probably be automated leading to human-machine augmentation. Heavy investment in human capital will be a key differentiator for winning countries to support people in enhancing agility and adapting to future job requirements. The ongoing discourse and small-scale pilot programs are important to prepare societies for future developments.

Future Workforce and Skill Requirements

Labor supply will depend on growth scenarios. According to the Baseline Growth scenario, labor force supply will not change significantly compared to 2017, while the Accelerated Growth scenario may lead to a 20% increase in labor force supply by 2030 (assuming zero net migration).

Focus group discussions and an enterprise survey conducted in Armenia indicate that more than half of the surveyed companies are expecting to integrate big data, digital trade, and cloud computing tools in their operations during the next five years. On average, the surveyed companies project that about 45% of tasks will be performed using machines by 2024, which is even higher than the world average projection published by the World Economic Forum. Insights gained from employers and students revealed significant gaps between the skillsets of graduates and employer demands in the labor market. New graduates usually lack practical and soft skills when entering the labor market. Emerging services and products require new skillsets and qualifications such as communication skills, creativity and innovativeness, analytical thinking, and strategic planning, all of which are poorly provided by educational institutions in Armenia.

New entrants into Armenia's workforce will comprise only 27% of the workforce by 2030. The largest segment of the workforce in the country will be people who have already completed their formal education cycle. Those workers will require upskilling and reskilling to meet the requirements of the future of jobs. Greater investment in Armenia's education sector is crucial in order to meet the transforming demands of jobs, ensure inclusiveness, and raise the quality of education to prepare people for the future of jobs.

Workforce Development Agenda of Armenia

As a result of global transformations in economic structure and technological advancements, job requirements are changing very fast, and the uncertainty of future employment needs is increasing. A distinct value proposition in terms of human capital will help Armenia stand out globally in competition for talent and investments. The ability to continually and quickly adapt to the changes will largely depend on the potential to quickly acquire new knowledge, skills, and competencies. *Armenia should strive to become a country of fast learners, and this vision will drive the country through the evolving global uncertainties.* Strong meta skills, such as languages, mathematics, and critical thinking, are essential to enable quick adaptation and fast learning. The concepts of lifelong and experiential learning should be incorporated into Armenia's educational system reform agenda to enable continuous learning closely in line with industry requirements and needs. Modularity, mobility, and integration are all vital to ensure the agility of the educational system, optimize the main educational cycles, and make the transition from education to market faster to meet the rapidly changing labor market needs. Inclusiveness of education is suggested as another principle for designing and prioritizing strategic initiatives and actions. Ensuring inclusiveness will mean that everyone has affordable access to education and skills development throughout life, regardless of their background.

Given the complexity of the learning systems and job markets, unprecedented speeds, and wide lags in time between initiatives and their effects, traditional rigid, top-down approaches in workforce development are ineffective. Instead, evolutionary approaches based on constant experimentation, creating a diversity of approaches through pilot programs, testing, learning and modifications based on incremental advancement of knowledge, will be essential. A universal algorithm of evolution—"Create variety – select – replicate"—can benefit public policy as well as public-private partnership-based initiatives in workforce development and lifelong education. In order to put the approach into practice, a proposed two-level funding scheme will address the stages of idea generation and experimentation of various innovative educational initiatives (which can be called the Educational Experimentation Fund) and scale up and disseminate the most successful initiatives (which can be called the Educational Scale Up Fund).

A continuous learning pathway model indicates that people in the future will always keep moving through the "*education enrollment – learning – finding a job and working*" cycle. Based on this assumption the Report suggests 25 options for strategic initiatives that the public and private sectors in Armenia can undertake. These options are grouped into two action categories: (1) making the learning ecosystem relevant, agile, and efficient and (2) increasing the effectiveness of career guidance and job matchmaking, inclusiveness, and motivation. To strengthen the proposed initiatives international best practices are analyzed and best case scenarios are presented.

Everyone has a talent. The learning system's mission, which is in line with the demand of the economy, is to nurture that talent so that everyone has the ability to participate in value creation in Armenia and live a fulfilling life.

CHAPTER 1

ECONOMIC PERFORMANCE AND JOB MARKET IN ARMENIA



1.1 INCLUSIVE GROWTH IMPERATIVE

The inclusive growth concept became a dominant approach in the development strategies of many countries. Armenia's latest government program also proclaims it as an overarching economic policy goal.

Achieving inclusive growth assumes expansion of employment, which requires enhanced competitiveness to support faster economic growth.

At the level of both academic discourse and policy design, there is wide consensus that in the context of increasing inequality of income and wealth distribution, and ensuring intergenerational equity and sustainability, the inclusiveness of future growth is becoming critical.

In his seminal work Thomas Piketty (2014)¹ showed that the positive trends towards decreasing inequality in the period between 1930 and 1975 have been reversed globally, and the world today is returning toward "patrimonial capitalism", in which much of the economy is dominated by inherited wealth leading to greater inequalities.

According to Piketty, when the rate of economic growth is low, then wealth tends to accumulate more quickly from return on capital than from labor and tends to accumulate more among the top 10% and 1% earners, thereby increasing inequality. In addition, numerous studies show that the labor share of income has a declining trend around the world resulting in a decrease of the proportion of economic value added allocated to wages.² As a result, if such structural characteristics of the world economy are not changed, faster economic growth and more equitable distribution are necessary (but not sufficient) to build more inclusive economies.

Thus, inclusiveness of growth will be one of the key challenges for countries: the economic system's ability to ensure a wider participation of the population in value creation and value capturing. This primarily depends on the pace and pattern of economic growth, which in turn depend on the competitiveness of the country.

The inequalities of income, education, training opportunities, and health tend to feed each other and reduce productivity and growth perspectives of the country. The Organization for Economic Co-operation and Development (OECD) determined that rising inequality limits the ability of the bottom 40% to invest in knowledge and skill-building, undermining potential productivity and employability and, hence, increasing inequality.³

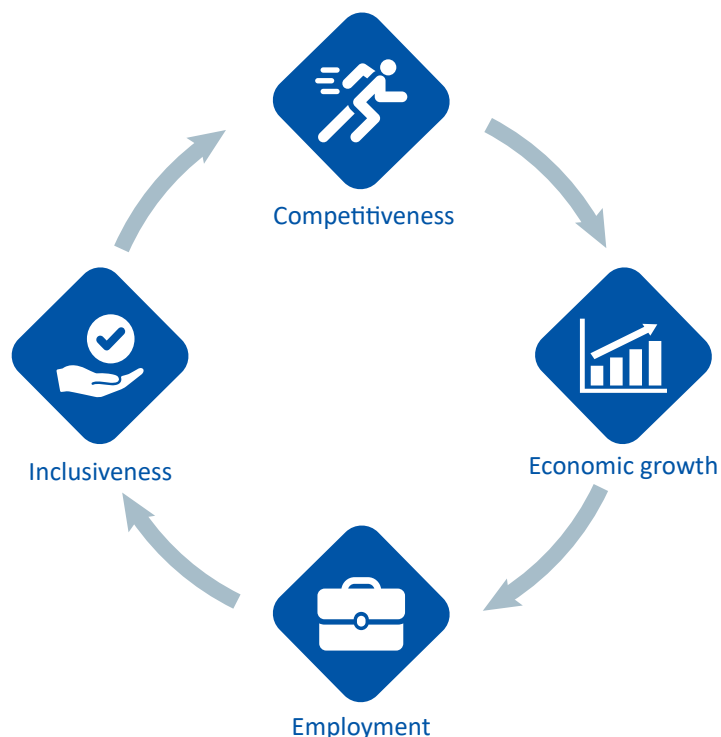
These interdependencies represent a strong positive reinforcing loop: the country needs to boost the competitiveness of the economy to accelerate the pace of growth and job creation. As a result, the country will reach a higher level of labor participation and inclusiveness. In its turn, inclusiveness expands growth potential through increased opportunities for greatly improving human capital.

1 Thomas Piketty, 2014, "Capital in the Twenty-First Century"

2 World Economic Forum, 2017, "The Inclusive Growth and Development Report 2017"

3 OECD, 2018, "The Productivity-Inclusiveness Nexus" OECD Publishing, Paris

Chart 1-1. Competitiveness-Growth-Employment-Inclusiveness Reinforcing Loop



Source: EV Consulting

This report focuses on the employment development perspectives in Armenia under different economic growth scenarios as a cornerstone factor of inclusivity and sustainability of economic development. It analyzes the quantitative and qualitative aspects of the workforce demand and supply pattern. The following section will present an overview of Armenia’s performance in competitiveness, economic growth, and inclusiveness. The employment will be thoroughly analyzed in the following chapters of the report.

Armenia was ranked 45th out of 74 emerging economies in the Inclusive Development Index.

Despite wide usage of the inclusive development concept, some frameworks offer a comprehensive measurement that captures the different aspects of the inclusive growth pattern across countries. We will be relying on the Inclusive Growth and Development Report by the World Economic Forum (WEF), which was last published in 2018.

It presents the Inclusive Development Index, which is built on three aggregated pillars of inclusive development: growth and development (economic growth power), inclusion (social inclusion and wealth distribution), and intergenerational equity and sustainability.

The Inclusive Growth and Development Report approaches the developed world and emerging countries separately. Among the advanced economies the top three countries with the highest scores of Inclusive Development Index are Norway (6.08), Iceland (6.07), and Luxemburg (6.07). Lithuania (4.86) is heading the list among developing economies.

Table 1-1. Armenia’s Ranking in the Inclusive Development Index, 2018

Indicator’s name	Level	Indicator’s name	5-year trend
Growth and Development pillar			
GDP per capita, \$	3,925	GDP per capita growth, %	3.1
Labor Productivity, \$	18,877	Labor Productivity growth, %	2.1
Healthy Life Expectancy, years	66.9	Healthy Life Expectancy trend, years	2.6
Employment, %	52.9	Employment trend, %	1.0
Inclusion pillar			
Net Income Gini	36.0	Net Income Gini trend	0.5
Poverty Rate, %	13.5*	Poverty Rate, %	-7.6
Wealth Gini	58.3	Wealth Gini trend	-5.6
Median Income, \$	5.7	Median Income trend, \$	1.0
Intergenerational Equity and Sustainability pillar			
Adjusted Net Savings, %	3.7	Adjusted Net Savings trend, %	-3.5
Carbon intensity, kg per \$ of GDP	899.3	Carbon intensity trend, kg per \$ of GDP	3.0
Public debt, %	51.8	Public debt trend, %	15.3
Dependency ratio, %	44.9	Dependency ratio trend, %	1.5

Source: WEF, *The Inclusive Development Index, 2018, Summary and Data Highlights*.

* The difference of the poverty rate used in IDI with the national official data is due to calculation methodology. IDI used Poverty headcount ratio at \$3.20 a day (2011 PPP) for 2015. The Poverty headcount ratio at national poverty lines was 29.8% for the same year.

Note: The color indicates the quantile in which the country is included.



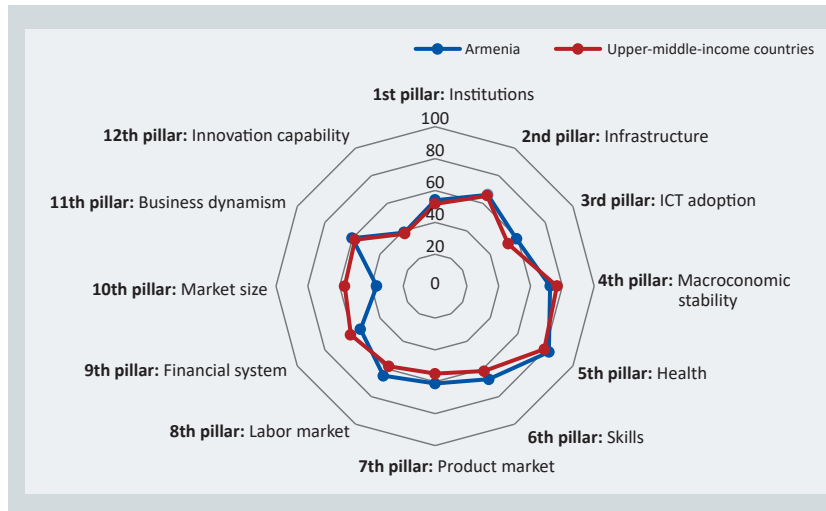
According to the 2018 Inclusive Development Index, Armenia ranked 45th out of 74 emerging economies with a score of 3.66 out of a maximum of 7. Armenia performed moderately in the growth and development and inclusion pillars but recorded low results in the intergenerational equity and sustainability pillar. Moreover, the five-year trend for all four indicators of this pillar is not encouraging. The employment rate and labor productivity are key challenges for enhancing the growth power of the Armenian economy.

In 2018, Armenia received its highest ranking in the Global Competitiveness Index but still underperforms its regional peers.

Armenia ranked 70th among 140 countries in the Global Competitiveness Report 2018—the highest result achieved since 2005 when Armenia was first included in the competitiveness assessment. Armenia’s position had a declining trend until 2010 when it received its historically lowest ranking—98th among 139 countries. Starting in 2010 Armenia was on track for improvement. The labor productivity measured as GDP per employed person has also improved significantly, increasing on average 5.7% annually.

Armenia’s scores for pillars of GCI are similar to the average of upper-middle-income countries except for market size because of the country’s small size and its economy. Armenia gained the highest rank in the labor market pillar—33th among 140 countries—due to its liberal regime of labor market regulations, including hiring and firing practices of foreign labor.

Graph 1-2. Armenia vs. Upper-Middle-Income Countries in the GCI, 2018



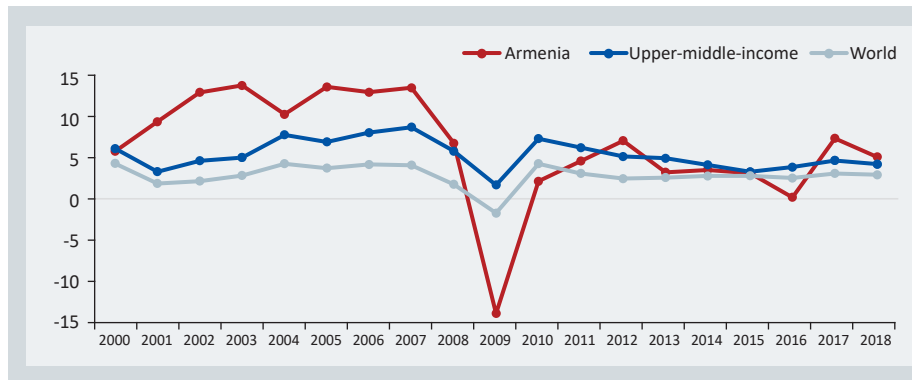
Source: WEF, Global Competitiveness Report 2018

The pace of recovery of Armenia's GDP has been volatile after a sharp drop during the recent global economic crisis.

Armenia's GDP growth dynamic was volatile after a sharp drop in 2009. In general, the group of upper-middle-income economies (which includes Armenia) and the overall world experienced high growth in the 2000s, which slowed down after the global financial crisis. The Armenian economy recovered with a significantly lower pace of GDP

growth—4.1% annually—which is notably lower than the average growth rate of the upper-middle-income group (5%).

Graph 1-3. GDP Growth Dynamics: Armenia, Upper-Middle-Income Countries and the World, 1999-2018



Source: WDI online database

The slowdown of GDP growth—to a level lower than productivity growth—creates a significant social challenge for Armenia, a country with high unemployment and poverty.

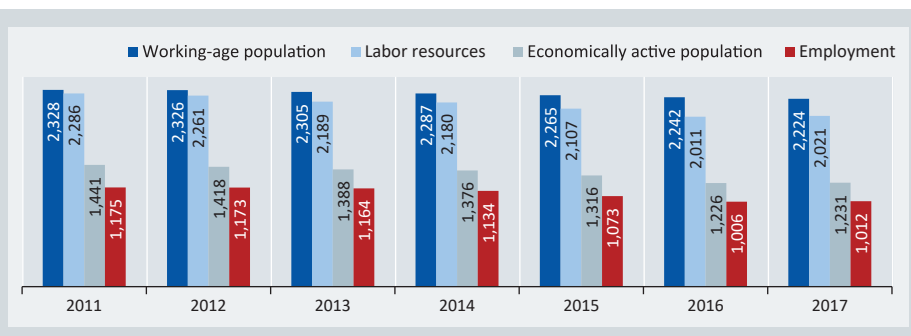
In summary, inclusive growth requires robust and diversified economic growth, which needs to be fueled by a highly skilled labor force, to ensure wider participation of the economic active population in value creation.

1.2 THE DYNAMICS OF HUMAN RESOURCES AND STRUCTURAL CHANGES OF EMPLOYMENT IN ARMENIA

The general population decline and the rise in temporary migrants—those who are away from their households for more than three months—resulted in the reduction of labor resources⁴ in Armenia during the 2011-2017 period. During the observed period, the share of labor resources in the working-age population⁵ has decreased by seven percentage points reaching 91% in 2017. The decline is mainly due to the increasing number of migrant workers from Armenia.

Labor resources in Armenia have declined by 265,000 during 2011-2017.

Graph 1-4. Dynamics of Working-age Population Structure in Armenia, in Thousands of People, 2011-2017



Source: Statistical Committee of the Republic of Armenia

Armenia's economic activity rate and labor resources are both decreasing. The economic activity rate reached 61% in 2017 compared with 63%⁶ in 2011. The main reason behind the decline is the reduction of the economically active population in the labor force, which can be explained by slow economic growth, continuous emigration, reduction of foreign direct investment, and other unfavorable macroeconomic conditions. Despite the decreasing trend, the economic activity rate in Armenia is quite high compared with peer upper-middle-income countries and is rather close to the average rate of high-income economies.⁷

Armenia's economically active population has declined by 16% during 2011-2017.

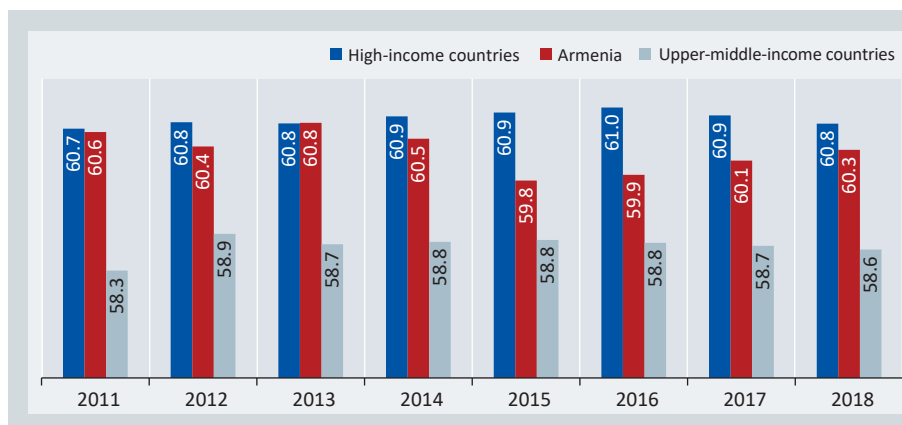
4 According to the Statistical Committee of the Republic of Armenia, labor resources include the population of persons aged 15-75 except temporary migrants (absent for more than three months).

5 Persons aged 15-75.

6 The methodologies of the Statistical Committee of the Republic of Armenia and the World Bank on economic activity differ, due to the ways in which labor resources are calculated. The Statistical Committee of the Republic of Armenia counts the labor resources among the population aged 15-75, while the World Bank does calculations among the population over the age of 15.

7 World Bank, World Development Indicators Database

Graph 1-5: Dynamics and Benchmarking of Economic Activity Rate in Armenia, in %, 2011-2017



Source: Statistical Committee of the Republic of Armenia, World Bank, World Development Indicators (WB WDI)

The decline in labor resources and the decrease in the economic activity rate resulted in the decrease of the economically active population by about 16%. Consequently, the employment levels and unemployment rates in Armenia were negatively affected.

During the observed period the economic activity rate among women decreased as well. Their share in the economically active population declined from 49% in 2011 to 47% in 2017, while the number of housekeepers (persons engaged in family duties) increased.

Almost half of Armenia's economically active population does not have any type of professional education.

During 2011-2017, the share of people with tertiary education in the economically active population increased mainly due to the reduction of people with preliminary and middle vocational educations. The share of the population with a general education remained stable for the observed period, at roughly 50% of the economically active population.

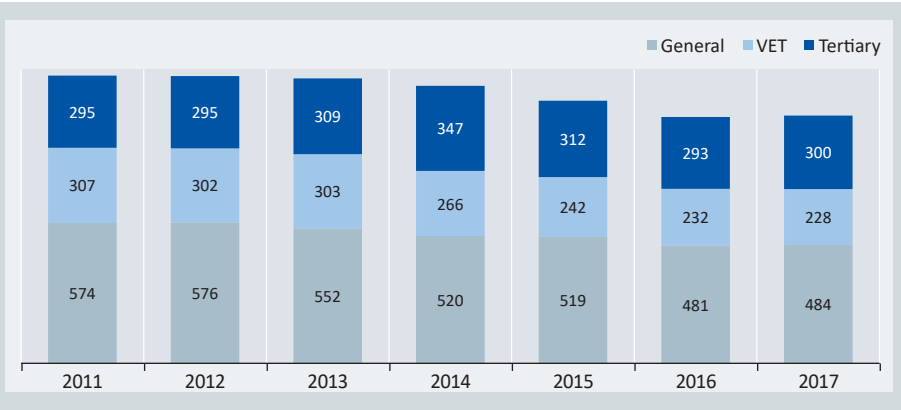
As the declining paces for both labor resources and employment were quite close to each other, the employment rate recorded only a minor decline of one percentage point during 2011-2017. Nonetheless, the number of employed persons has declined by 163,000 during 2011-2017.

The gender distribution of employment remained stable during 2011-2017, with 48% of women and 52% of men.

Employment numbers have declined by 163,000 people during 2011-2017, and the majority of those people have a general education.

The employed population with a general education decreased from 574,000 in 2011 to 484,000 in 2017. This decline is mainly due to the overall reduction in employment in the agriculture sector, where 75% of workers have a general education. The number of workers with vocational education and training (VET) decreased by 80,000 from 2011-2017.

Graph 1-6: Employment Distribution by Education, 2011-2017, in Thousands of People

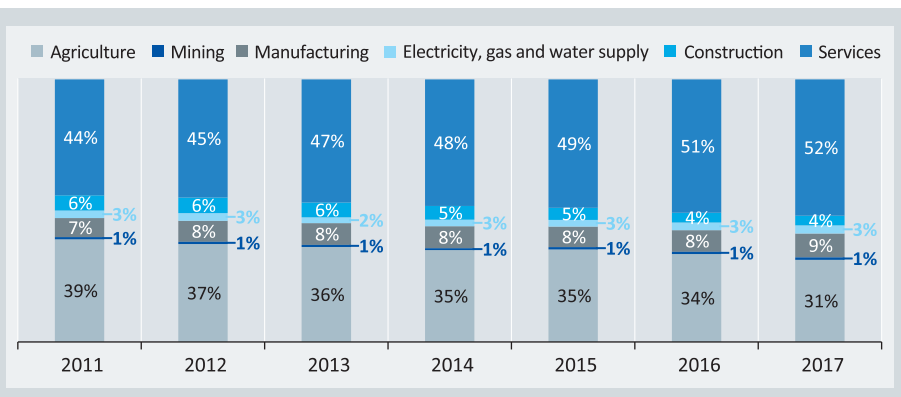


Source: Statistical Committee of the Republic of Armenia

The services sector has the largest share of employment. It was constantly growing largely at the expense of the agriculture sector. Though the number of jobs in services remained the same, the number of employees in agriculture contracted by 140,000, or about 30%, between 2011-2017.

The share of services in employment has increased significantly, largely at the expense of the agriculture sector.

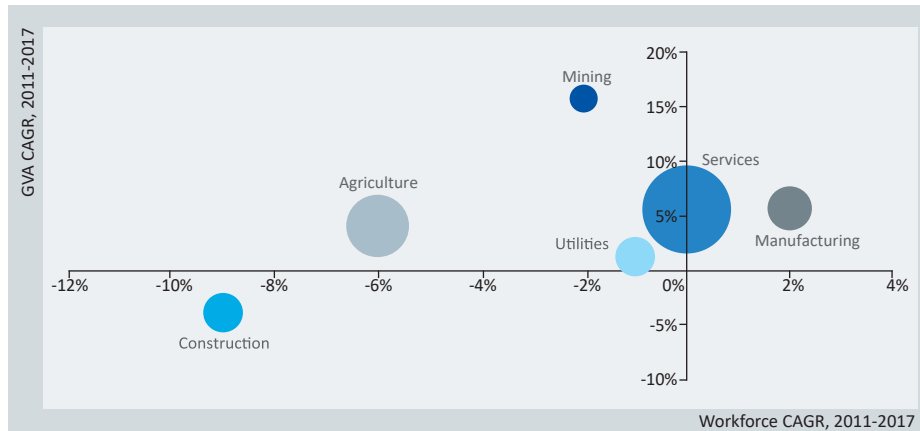
Graph 1-7: Distribution of Employment by Sector, 2011-2017



Source: Statistical Committee of the Republic of Armenia

Employment has also been declining in mining and quarrying and utilities sectors by 2% and 1% annual rates, respectively, despite the growth of sectoral value added. Due to the contraction, the construction sector has recorded the largest cut in jobs. The only sector with an increasing employment trend during the observed period is manufacturing; however, the share of manufacturing in total employment is only 9%.

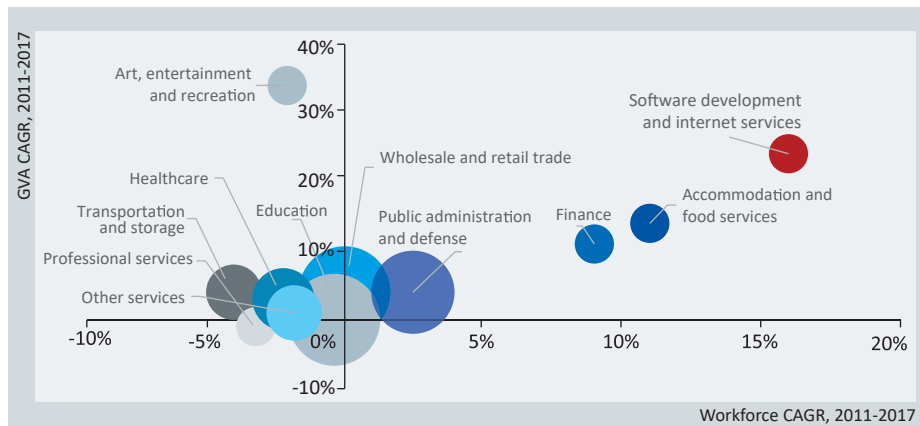
Graph 1-8: Growth of Armenian Workforce and GVA by Sector, 2011-2017



Source: Statistical Committee of the Republic of Armenia
 Note: Bubble size indicates the sector's share in total employment.

Among services, software development and Internet services are the fastest growing in terms of jobs. The employment rate increased 16% annually during 2011-2017, while sector revenues grew 4.5 times. A significant increase in employment was recorded for accommodation and food services and financial and insurance subsectors, at 11% and 9%, respectively, followed by public administration and defense. The wholesale and retail as well as education subsectors are the largest employers within the services sector where employment remained stable. Despite the upward trend of GVA, the remaining subsectors of services have experienced loss of jobs by 2-5% annually.

Graph 1-9: Growth of Armenian Workforce and GVA by Subsectors of Services, 2011-2017



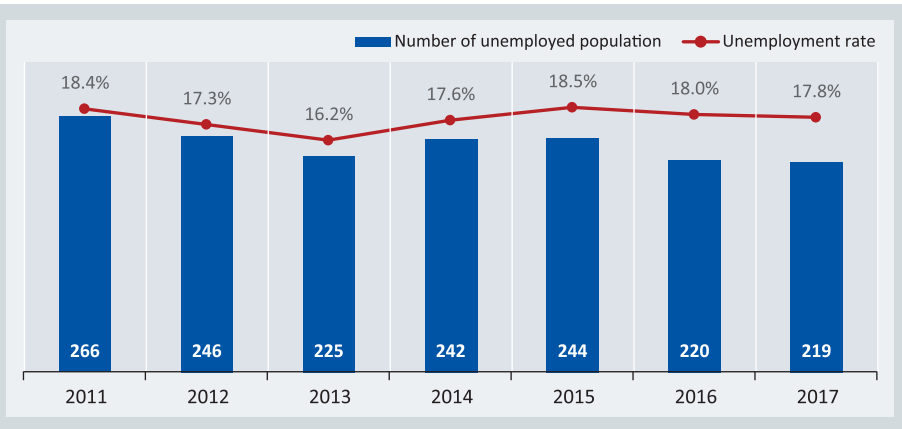
Source: Statistical Committee of the Republic of Armenia
 Note: Due to the huge discrepancy between the data of the IT sector published by the Statistical Committee and estimates by Enterprise Incubator Foundation (EIF), the data for software development and Internet services is taken from "Armenian ICT Sector 2018" report (EIF). Due to the lack of GVA data, the change of total revenue is used for this sector.

During the post crisis period, Armenia went through structural changes, as the crisis hit mostly the non-tradable sectors such as the construction sector (a decline of 41.6%). Those changes impacted employment as well. Workers from non-tradable sectors started to enter tradable sectors, where along with productivity growth the salary levels were increasing as well. An average level of salaries in each sector has different paces of increase as the change of productivity varies from sector to sector. The tradability of the sector also significantly influences productivity as well as average salary increases.

During 2011-2017 the unemployment rate decreased by only 0.6 percentage points reaching the level of 17.8% in 2017. Even this slim reduction was due to the decline of the economically active population rather than increased employment. In 2018, the unemployment level was 20.4% but due to the change in the calculation methodology it is not comparable with the previous period.⁸

Armenia's unemployment rate remains high.

Graph 1-10: Dynamics of Armenia's Unemployed Population, in Thousands of People, and Unemployment Rate, 2011-2017



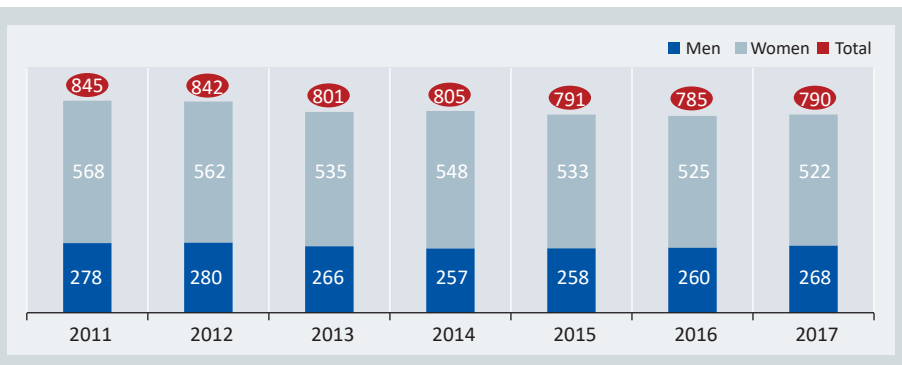
Source: Statistical Committee of the Republic of Armenia

The gender structure of the unemployed population has significantly changed from 2011 to 2017. Currently, the majority of the unemployed are men, and its share reached 53% in 2017, up from 48% in 2011. During the same period, the share of those having higher education among the unemployed increased from 27% to 30%. On the other side, the share of the VET unemployed decreased by 5 percentage points down to 29% of the total unemployed. The main part of the unemployed population (46%) has a general education, and they face difficulties in meeting the requirements of the labor market.

Two out of three economically inactive people are women with a general education.

The 6.5% decline in the economically inactive population was also due to the reduction of labor resources.

Graph 1-11: Armenia's Economically Inactive Population, in Thousands of People, 2011-2017



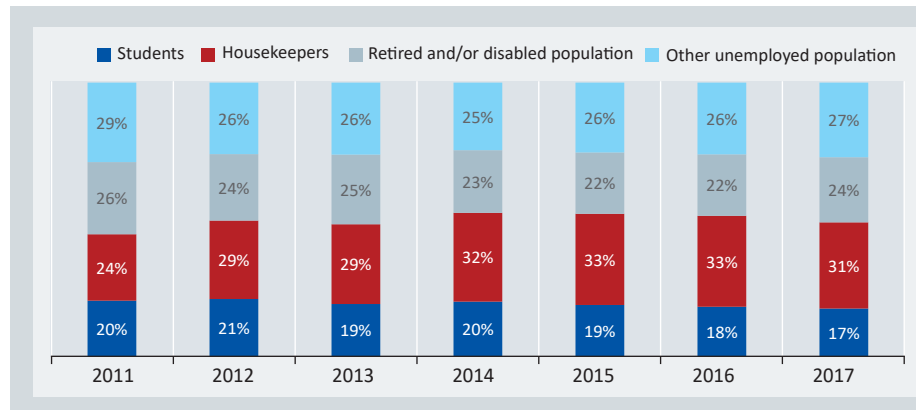
Source: Statistical Committee of the Republic of Armenia

⁸ Statistical Committee of the Republic of Armenia, 2019, "Socio-Economic Situation of RA, January-March 2019"

The vast majority of the economically inactive population (66%) are women, which has not changed since 2011. Meanwhile, 63% of that segment does not have a professional education.

Within the economically inactive population, the share of housekeepers has increased by 7 percentage points where 99% are women.

Graph 1-12: Distribution of Economically Inactive Population in Armenia, in %, 2011-2017

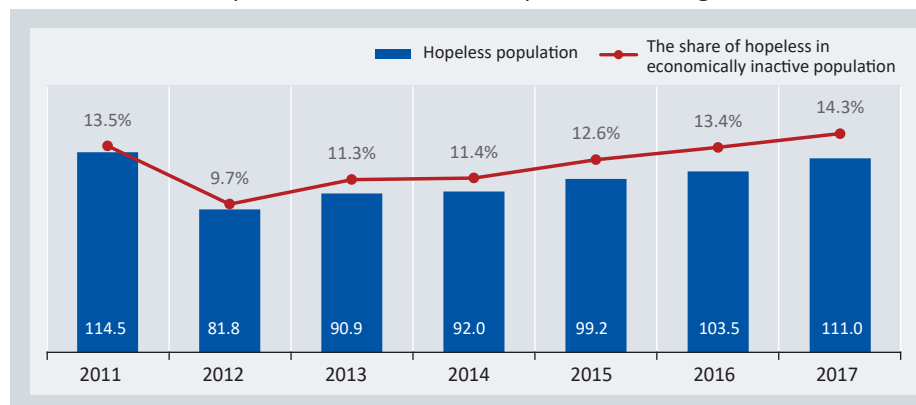


Source: Statistical Committee of the Republic of Armenia

In 2017, 111,000 people among the economically inactive population were classified as “hopeless”.

Another important cluster of unemployed population is those classified as “hopeless”. These are people who lost hope of getting a job and stopped searching for employment.

Graph 1-13: Dynamics of the Economically Inactive Population of Armenia Classified as “Hopeless”, in Thousands of People and Percentage Share, 2011-2017

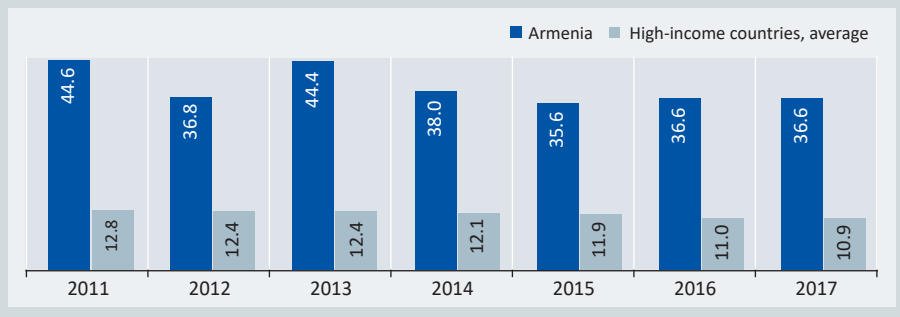


Source: Statistical Committee of the Republic of Armenia

The share of youth not in education, employment, or training (NEET) among the economically inactive population in Armenia is among the highest in the world. This indicator for Armenia is almost three times higher than the level of high-income economies classified based on OECD and World Bank methodology. Despite

the difference in calculation methodologies,⁹ the NEET rate is worryingly high for Armenia. The decreasing trend during 2011-2015 has stopped in the last 3 years.

Graph 1-14: Share of Youth Not in Education, Employment, or Training Among People Aged 15-24, by %, 2011-2017



Source: International Labor Organization (ILO)

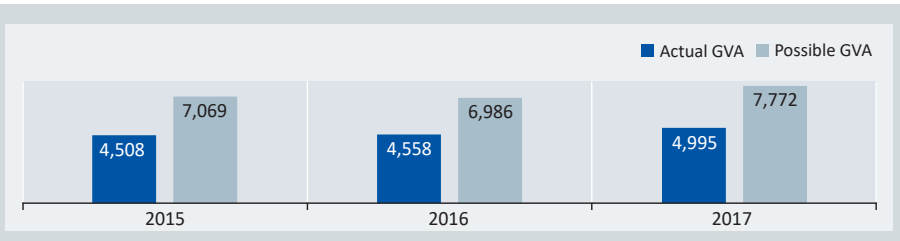
Parts of the economically active population (unemployed), the economically inactive population (“hopeless”), and working migrants are not engaged in economic value creation in Armenia.

Approximately 560,000 “potentially employable” people were out of economic value creation processes resulting in about 55% less GVA created compared to potential.

According to official statistics, every year about 220,000-250,000 people qualify as working migrants, the overwhelming majority of which travel to Russia. When adding the number of unemployed and “hopeless” people to figure, the unused potential of workforce numbered over 560,000 people in 2017. This number represented 55% of employment in 2017. To better understand the consequences of the unused workforce for the economy, the potential value of GVA is calculated, assuming that the economic structure and productivity per employee are unchanged.

When comparing the actual and possible values of GVA (assuming full employment of the entire working age population), it is obvious that during the last three years Armenia created on average 55% less GVA than it could have.

Graph 1-15: Comparison of Actual and Potential GVA Creation in Armenia, in Billions AMD



Source: Statistical Committee of the Republic of Armenia, EV Consulting analysis

Although during the analyzed period Armenia moved from the lower-middle-income group of countries to the upper-middle-income group, the pace of economic development was not high enough to address critical challenges of unemployment,

⁹ In Armenia, this indicator is calculated among the population aged 15-29, while International Labor Organization (ILO) does calculations among the population aged 15-24.

migration, and economic inclusion.

The total population, economically active population, and overall employment rates are decreasing. Employment share in the agriculture sector is the highest compared with other sectors. In the observed period, the migration level reached considerably higher levels and the number of temporary migrants increased.

The period of 2011-2017 were years of moderate economic growth and an increase in high productivity coupled with a continuous decline in population. Faster economic growth is required which Armenia can hope to achieve after radical political and economic changes in 2018 that may open up new opportunities. In the coming years, Armenia's job creation challenge will vitally need to be addressed under the pressure of the same factors to yield productivity increases across all sectors.

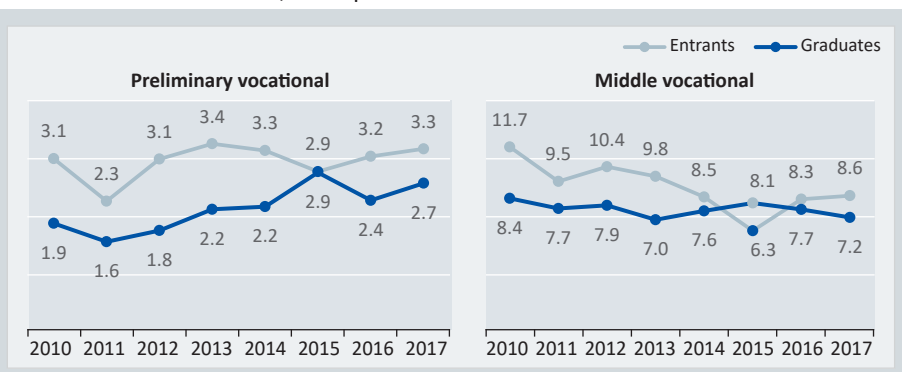
1.3 PROFESSIONAL EDUCATION IN ARMENIA

Armenians have always placed high value on education. This can be explained by a number of reasons, such as social status, common norms of society, the belief that an education can provide opportunities for well-paid jobs, and so on.

After graduating lower secondary school, teenagers may choose to enter either high school or preliminary or middle vocational schools. On average, 20% of lower secondary school graduates go to middle vocational schools and 8% choose preliminary vocational education. Most lower secondary school graduates attend high school, while only 13% of them drop out. Nevertheless, after 2018, according to the Law on Education, all lower secondary school graduates must continue their education either in high school or in preliminary or middle vocational schools. The interest in preliminary and middle vocational schools among high school graduates is a little bit lower compared with grade school graduates, at 6% and 12%, respectively. The overall dropout rate in preliminary vocational schools is over 1.2 times higher than in middle vocational schools.

Around 9,500-10,500 people with a VET education enter the labor market annually.

Graph 1-16: Dynamics of Graduates of Preliminary and Middle Vocational Schools in Armenia, 1000 persons



Source: Statistical Committee of the Republic of Armenia

Due to unavailable enrollment statistics for VET education, the ratio of VET graduates to tertiary graduates is used for benchmark analysis. Thus, the average ratio for 2016-2017 was 0.63¹⁰ in EU28 while in Armenia it stands at 0.41. In some countries, the number of VET graduates even exceeds the number of tertiary graduates (Finland, Romania and North Macedonia).

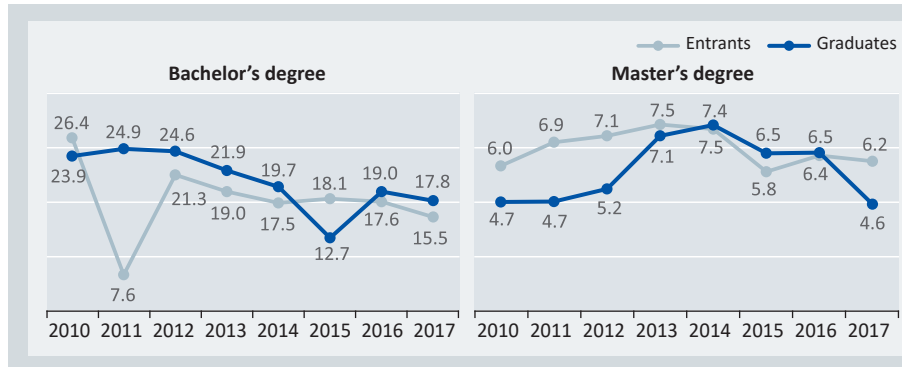
The tertiary enrollment rate in Armenia in 2017 was at 52.2% and is equal to the group average of upper-middle-income countries. However, there is a significant gap with advanced economies (OECD average 74.4%) and the Baltic Countries (74.3%), Russia (81.8%), Belarus (87%), and Ukraine (83%). Georgia recorded notable improvement in this indicator from 31 to 57 during 2011-2017.

The level of tertiary enrollment in Armenia is low compared to both advanced economies and peers in the Eurasian Economic Union.

10 Eurostat Online Database, <https://ec.europa.eu/eurostat/data/database>

According to the Statistical Committee of Armenia, about three quarters of high school graduates go to higher education institutions, where the dropout rate is 12% on average. In Europe during 2005-2011 the completion rate in higher education was about 60% on average. The completion rate in different European countries varied from 39% to 84%.¹¹ Compared with these indicators, the tertiary completion rate in Armenia is quite high, which can be explained by the commercial interest of higher educational institutions in keeping students as their main source of revenues are tuition fees.

Graph 1-17: Dynamics of Higher Educational Institutions in Armenia, 1000 persons



Source: Statistical Committee of the Republic of Armenia

The sharp drop in 2011 was due to the education reform and transition to a 12-year educational system in schools. These graduates pursued Master's degrees in 2015, where the number dropped again. The gradual decline of entrants is connected to the decreasing population.

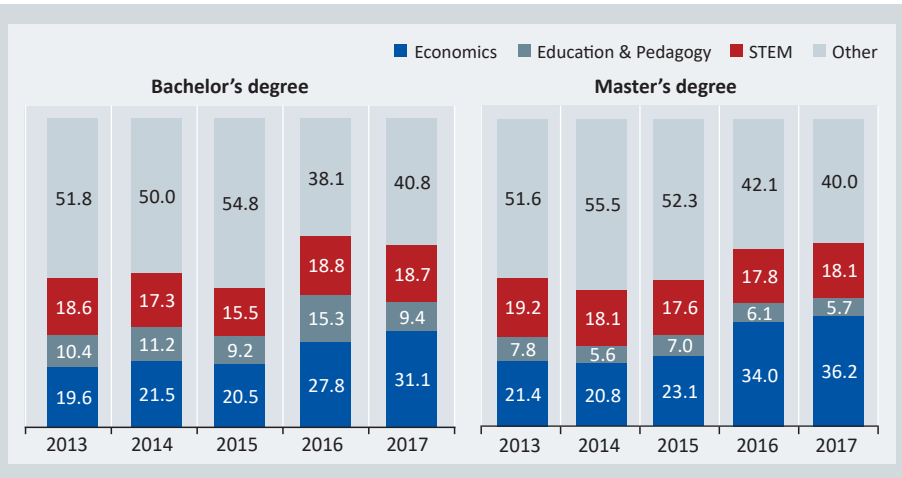
Despite the fast-growing employment opportunities in ICT, the share of STEM is relatively low compared with benchmark countries.

The most preferred specializations are in humanities, economics, and education and pedagogy. The interest in STEM (science, technology, engineering, mathematics) has remained at the same average level of about 19% of the total number of graduates from Bachelor's programs.¹²

11 European Commission, 2013, "Dropout and completion in Higher Education in Europe: Main Report"

12 Due to the change in classification of education fields beginning 2016, the distribution of groups can be slightly different.

Graph 1-18: Distribution of Graduates by Specialization Group in Bachelor’s and Master’s Degree Programs

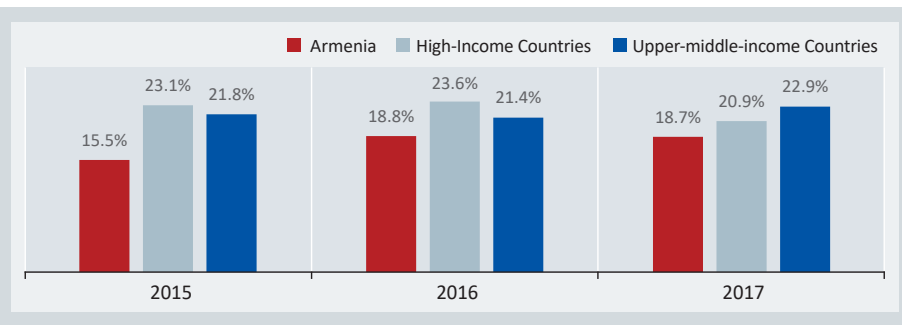


Source: Statistical Committee of the Republic of Armenia

In recent years the share of students pursuing Bachelor’s degrees in economics has increased more than one and half time, and the same picture is in Master’s degrees in economics. On the other hand, the share of education and pedagogy graduates decreased both among Bachelor’s and Master’s degree students.

The development of Armenia’s financial sector has led to the expansion of new services, such as insurance, pension funds, leasing, and others. This might have signaled an interest in social and behavioral sciences and finance, banking, and insurance. Nevertheless, the supply of labor in the financial sector exceeds the demand, as the market does not grow that fast. As a result, a large number of degree-holding specialists are unemployed when other fields of the economy face unmet workforce demands. The balance requires a decrease in the number of entrants to specializations with shrinking demand. For example, the number of students pursuing Bachelor’s degrees in education and pedagogy slipped from 3500 in 2009 to 1200 in 2017.

Graph 1-19: STEM Share Among University Graduates



Source: Statistical Committee of the Republic of Armenia, UNESCO Statistics

The growing demand for specialists in software engineering, mathematics, and science is driven by the fast growth in the IT sector and the demand for IT specialists in other sectors. The fourth industrial revolution has overtaken the world and Armenia is not excluded. Fast-growing channels of information tie different markets together

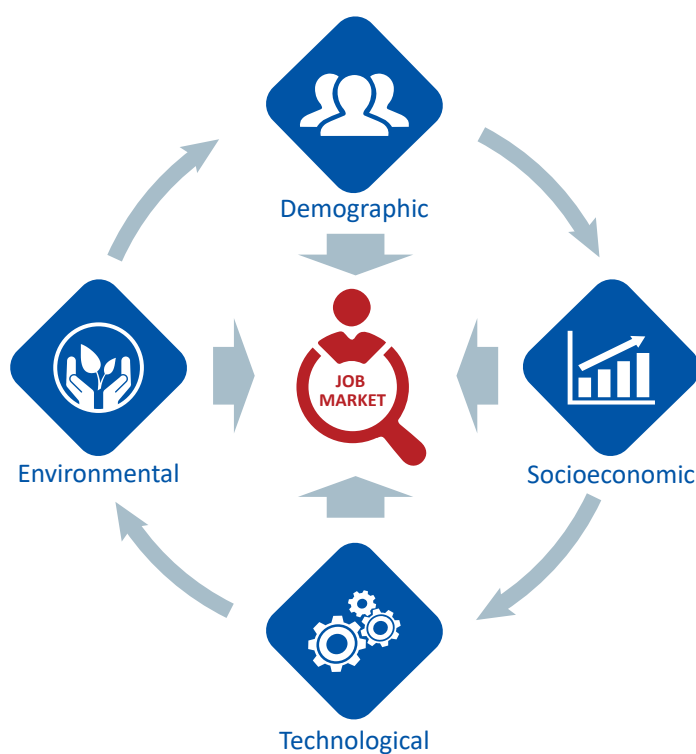
despite distance and time. Local companies connect with international markets and wide opportunities are created for them. Although interest in STEM is increasing, Armenia is still lagging behind the targeted country group averages. The industry is expecting more graduates in STEM to meet the growing demands or more specialists to enter the IT sector. An imbalance in this field will require a significant structural change in education.

1.4 GLOBAL OVERVIEW OF STRUCTURAL CHANGES IN THE JOB MARKET

1.4.1 Global Trends Driving Job Market Transformations

The global job market is undergoing structural transformations. Economic, socio-demographic, technological, and environmental drivers are changing the demand and requirements of the labor market. Transformations in the job market create unique opportunities, particularly for developing countries, for development as well as challenges such as job destruction, potential workforce shortage, unemployment risks, skillset mismatch, and so forth. Addressing those challenges is critical for building a strong and employable workforce, maintaining high levels of employment, and enabling sustainable economic growth.

Graph 1-20. Drivers of Change in Job Markets



Demographic changes

Demographic changes are poised to significantly transform the structure of employment globally in the future. An aging population in advanced economies, the increase of the working-age population in emerging economies, particularly in Asia and Africa, increasing migration flows, and increasing women's engagement in the labor market are among the main demographic drivers of change influencing labor market transformations.

Aging societies in advanced economies and young populations in low and middle-income economies are going to change the overall picture of the world's workforce.

The number of people aged 65 and older is estimated to grow from 655 million in 2017 to about 1.5 billion in 2050, representing about 16% of global population.¹³ According to the World Bank, the number of the population aged 0-14 is decreasing in high and upper-middle-income economies. Most of the working age population—about 62%—will be from low income and lower middle-income economies by 2050,¹⁴ and they will require high-quality education, reskilling, and upskilling to be prepared for the labor market.

The employment rate of women is increasing, particularly in advanced economies. Currently, they account for about 48.5% of total employment in the world. Women do about 75% of unpaid work globally. With a zero gender gap in the labor-force participation rate, hours worked, and representation within each sector, the world annual GDP could add up by \$28 trillion in 2025.¹⁵

The increase in economic power of emerging markets and continuing globalization and urbanization throughout the world are influencing labor market transformations globally.

The aging population will increase the importance and expenditure on healthcare, social, and personal services. A range of occupations will be in significant demand, such as doctors, nurses, health technicians, personal care aides, and so forth. Globally, between 80 and 130 million jobs are expected to be created in healthcare and related sectors by 2030.

Socioeconomic drivers

Globalization is transforming the way businesses and economies are interconnected globally.

Increasing international trade flows and advancements in information and communication technologies (ICT) support the removal of trade barriers between countries. Companies have more opportunities regarding the choice of production and operation locations.

Offshoring and services outsourcing are increasingly impacted by globalization and technological advancements. Exports of goods and services have almost doubled and even tripled in low and middle-income economies since the 1970s, reaching a 24% share of GDP in 2016. The volume of the world merchandise trade used to grow 1.5 times or even two times faster than the world GDP. Nevertheless, since 2012 trade has been growing at a similar or slower rate as the world GDP, and the tendency is inclined to continue in the coming years.

Even though the growth rate of trade volume in the world is not as rapid as it was after the Second World War, it is still going to be a major change driver for economies and countries, having its impact on the employment and labor market transformations globally.

Rapid urbanization is another influencer on the transformations of the job market. The urban population increased by 25% during the past 10 years. The UN projects that by 2050 the urbanization rate in most countries will be greater than 50%, and approximately 6.68 billion people will live in urban areas.¹⁶ Economies should consider employability as well as education of the rapidly increasing urban population who move from rural areas to cities. The concepts of smart cities and technological

13 UN, "World Population Prospects: The 2017 Revision"

14 World Bank, World Development Indicators Database

15 McKinsey Global Institute, 2017, "Power of Parity"

16 UN, 2018, "World Urbanization Prospects"

innovations in urban areas are emerging as a result of global urbanization, which means there will be high demand for new skillset development.

Emerging markets may dominate the top 10 economies in the world in 2050 with GDP at PPPs. Global economic growth is continuing in the world driven mainly by emerging economies. It is estimated that the world economy may more than double in size by 2050, while the top emerging economies that currently generate about 35% of global GDP will increase their share to approximately 50%. China, India, Indonesia, and Brazil are among the countries with potential to lead the world's top 10 economies in 2050.¹⁷ Vietnam, India, and Bangladesh are predicted to be the world's fastest growing economies. Asia is projected to have 66% of the global middle class and 59% of middle-class consumption by 2030.¹⁸ Increased access to high-quality education and leveling up skills provide great opportunities for emerging economies to cover the workforce shortages that the world will face in the near future.

Technological drivers

Technologies are changing the nature of work worldwide. Disruptive technologies and automation create new skills demand and set new requirements for educational institutions. Innovative technological solutions result in higher productivity, efficiency, safety, and convenience, but they also impact jobs, skills, wages, and the nature of work.

The expansion of the fourth industrial revolution and mass adaptation of disruptive technologies by companies are drastically changing the nature of work and employment requirements.

Automation is changing the labor market and types of works globally. Research on 46 countries representing 80% of the global economy conducted by McKinsey Global Institute¹⁹ reveals that on average, 50% of current work activities will be automatable within the coming decade. Consequently, about 14% of the global workforce will likely need to be reskilled or upskilled and change their occupation by 2030.

About 60% of all occupations have at least 30% of activities that are automatable, while about 5% of all occupations can be entirely automated. With the advancement of Big Data, Artificial Intelligence, the Internet of Things, robotics, and increasing computing-power, non-routine tasks may also be automatable in the near future. Advanced economies have the strongest incentives to automate due to higher labor costs. Automation will impact all job categories, regardless of the share of automation.

Disruptive technologies are uncovering new opportunities and have potential to fundamentally transform the world economy. Technological innovations are powerful engines of economic growth, which was discussed in detail in National Competitiveness Report of Armenia 2017 (ACR 2017).

Disruptive technologies are changing, challenging, or undermining existing markets, firms, and other social structures. The impact of disruptive technologies is already felt in many aspects of our lives. They changed the way businesses operate, governments govern, and societies behave.

Artificial Intelligence, robotics and drones (UAVs), Blockchain technologies, next-generation genomics, synthetic biology, quantum computing, cloud technology

17 PwC, 2017, "The Long View: How will the global economic order change by 2050"

18 World Economic Forum, 2016, "The Future of Jobs Report 2016"

19 McKinsey Global Institute, 2017, "Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation"

and big data, the Internet of Things, and 3D printing/distributed manufacturing are disruptive technologies with the largest impact potential.

In ACR 2017 we identified four major channels of impact of disruptive technologies:

- Creation of new or significantly enhanced products that solve existing or emerging business or human problems;
- Radical shake up of the level and structure of business costs including operational and transaction costs;
- Enhancement of human capabilities;
- Emergence of new organizational forms, based on new business models and cultures.

Along with replacing jobs, technological advancement facilitates creation of new jobs in different industries. About 30% of the jobs created in the United States during the past 25 years were jobs that didn't exist before.²⁰ For example, disruptive solutions for Internet facilities, communication, and teleconferencing enable many workers to do their jobs regardless of their location. Those solutions enable people to remotely participate in the job market and generate income from their home towns.

Gig and freelancing economies are also shaping the future of the job market. A gig covers temporary work engagement and payment for a specific job done within the given task or project. The gig economy concept covers the following three main components:²¹

- Task- or project-based independent workers who are paid for the work done as opposed to workers receiving salaries or hourly wages;
- Consumers who are seeking specific services such as a ride from one place to another, or delivery or shipment from one place to another;
- Companies who provide technological solutions to directly connect consumers with workers (such as on-demand taxis, food delivery, renting services, etc.).

The expansion of gig and freelance economies is full of challenges for countries and traditional job markets. Countries still do not have well-developed regulations for such work activities, and work in the gig economy is still largely undefined and uncategorized. The following changes are expected to happen as a result of further expansion of gig economies in the world:

- Shifting mindset of work: traditional systems of work may transform to more flexible, free work styles in which many gig economy workers outperform traditional work standards.
- Potential future workforce regulations and policies: countries will develop new kinds of regulations and work policies.

Environmental drivers

Environmental changes are among the driving forces of new knowledge and job creation in the world.

Climate change, depletion of natural resources, and the push to transition to a greener economy are the environmental drivers transforming the labor market. Over-exploitation of natural resources and raw materials, global warming, and the continuous deterioration of the ecosystem are forcing scientists to innovate for alternative solutions and resources. Renewable energy, genomics,

waste recycling, and green economy solutions are the results of those innovations to

20 McKinsey Global Institute, 2017, "Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation"

21 NACo Countries Futures Lab, 2017, "The Future of Work: The Rise of the Gig Economy"

protect the planet and support inclusive economic growth.

Renewable energy, energy efficiency, pollution management and control, waste collection and recycling, and organic farming are some of the key sources of new job creation as a result of environmental drivers of change.

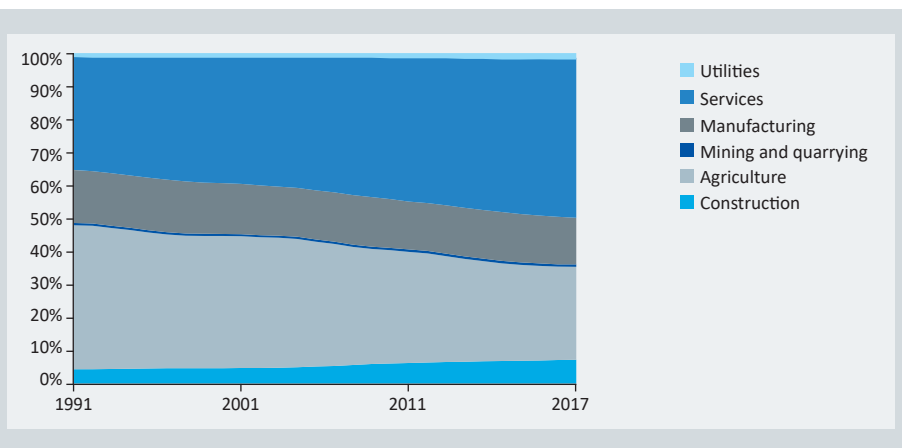
1.4.2 Forecasts and Assumptions on the State of the Future Job Market

Structural transformations of employment are widely discussed by researchers and economists globally.

The share of employment in the agriculture sector is decreasing worldwide, while the service and construction sectors are increasing. During 1991-2017, about 67 million workers left the agriculture sector and about 825 million jobs were created in the service sector.

The global employment structure is undergoing transformations at sectoral levels with significant increases in services at the expense of agriculture.

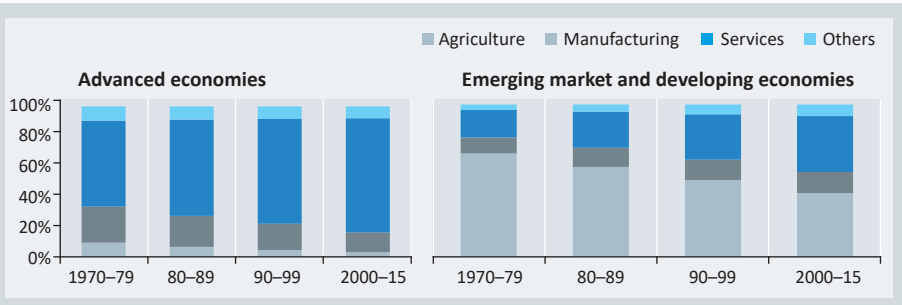
Graph 1-21: Structural Changes in Employment by Economic Activity, Share of Total Employment by Sector, Globally



Source: ILO estimates

The total manufacturing jobs and output has been moderately stable in the world during the recent decades, though the trends in developed, emerging, and developing economies are quite different.

Graph 1-22. Sectoral Employment Dynamics in Country Groups by Level of Development Per Decade



Source: IMF, World Economic Outlook, April 2018

Manufacturing employment is gradually shifting towards developing economies, where labor costs are lower (although recently the trend has slowed down due to rising costs, particularly in China). The share of jobs in the manufacturing sector has consistently declined in advanced economies during the last few decades. After the 1970s it dropped by about 12.5 percentage points reaching the share of developing economies (~10%). While the number of people employed is declining, total manufacturing sector output is stable in countries with advanced economies as a result of increasing labor productivity. The same declining tendency cannot be observed in emerging and developing economies where the median change of manufacturing employment and output is close to zero.

The manufacturing sector is important for driving growth for an economy. Economic research studies show that countries that significantly reduced the gap with advanced economies since the 1960s experienced strong expansion of manufacturing employment and exports.

Unlike manufacturing, the service sector is expanding both in developing and developed economies. The share of employment in the global service sector has increased by about 16 percentage points since the 1970s and is currently about 52% in the world. This increase in advanced economies is a result of the declining employment share in manufacturing, while in developing economies workers might migrate from agriculture sector directly to services. Continuous advancement of technologies, ICT solutions, and disruptive technologies are boosting productivity in the service industries even further.

Changing skillset requirements

Skillset and qualifications requirements of employment and labor market is transforming globally and locally.

Skill requirements for employment are changing along with job market transformations and the technological revolution. Reskilling and upskilling for workers become a necessity with employment shifts from the industry or agriculture sectors to the service sector. The fraction of tasks performed by humans instead of machines is declining rapidly. The Global

Future of Jobs survey conducted by the WEF revealed that at least 54% of all current employees around the globe will require reskilling or upskilling to meet employment requirements. Analytical thinking, innovation, and active learning and learning strategies are among the highly demanded skills. Technological skills are sharply increasing, which is an indicator of rapid technological adoption by companies. Soft skills such as critical thinking, creativity, negotiation and communication, innovation, emotional intelligence, and leadership increase their value significantly as “human” skills.

Table 1-2: Top-Ten Skills in Demand Globally, Current Year vs. 2024

📉 Today, 2018/2019	📈 Trending, 2024	📉 Declining, 2024
<ul style="list-style-type: none"> • Analytical thinking and innovation • Complex problem-solving • Critical thinking and analysis • Active learning and learning strategies • Creativity, originality, and initiative • Attention to detail, trustworthiness • Emotional intelligence • Reasoning, problem-solving, and ideation • Leadership and social influence • Coordination and time management 	<ul style="list-style-type: none"> • Analytical thinking and innovation • Active learning and learning strategies • Creativity, originality, and initiative • Technology design and programming • Critical thinking and analysis • Complex problem-solving • Leadership and social influence • Emotional intelligence • Reasoning, problem-solving, and ideation • Systems analysis and evaluation 	<ul style="list-style-type: none"> • Manual dexterity, endurance, and precision • Memory, verbal, auditory, and spatial abilities • Management of financial and material resources • Technology installation and maintenance • Reading, writing, mathematics, and active listening • Management of personnel • Quality control and safety awareness • Coordination and time management • Visual, auditory, and speech abilities • Technology use, monitoring, and control

Source: *The Future of Jobs Survey 2018, World Economic Forum*

The McKinsey Global Institute estimates that between 60 million and 375 million individuals around the world may need to transition to new occupational categories by 2030, in the event of midpoint or early automation adoption. Nearly all jobs will involve a shifting mix of tasks and activities that will require reskilling or upskilling.

CONCLUSION

Taking moderate economic growth, an increase in labor productivity, and the continuous population decline into consideration, Armenia should address the job creation challenge of increasing productivity across all sectors. Currently, a large part of Armenia’s total human capital does not participate in value creation activities, which hampers economic growth. Economic growth depends on robust and diversified economic development as well as a highly skilled labor force that contributes to value creation activities. External factors also influence the country’s sustainable and inclusive development. The economic structure of the world economy is transforming rapidly, while the fast-changing, unclear future needs of the labor market are increasing. Economic, socio-demographic, technological, and environmental drivers contribute to the changing needs of employers. As a result, unique opportunities will be created for Armenia to catch up with advanced world economies. Strategic foresight is required to develop Armenia’s economy and educational system so that the country can adequately adapt to economic and labor market transformations, thereby enabling sustainable and inclusive economic growth.

CHAPTER 2

EMPLOYMENT DEMAND ASSESSMENT AND GROWTH SCENARIOS



Job creation is a fundamental challenge for Armenia. The historic pace of economic growth has not been enough to maintain the job creation process considering the high labor productivity²² growth rate. From 2011 to 2017, the compound annual growth rate (CAGR) of GDP was 4.1% in Armenia while the CAGR of labor productivity for the same period was 6.8%. Consequently, the employment number in the country decreased from 1.17 million to 1.01 million since 2011, resulting in a reduction of 163,000 jobs in Armenia. In 2018 the GDP growth rate was 5.2%.

Due to the faster pace of growth of labor productivity, the historical GDP growth rate has not been enough to prevent employment contraction.

Graph 2-1: Labor Productivity, Employment, and GDP Historical Relationship



Source: Statistical Committee of the Republic of Armenia, EV Consulting analysis

Higher rate of GDP growth should be targeted to address high levels of unemployment and poverty in the country. The assessment of the growth potential of labor productivity and GDP for Armenia serves as a basis for developing growth scenarios of employment demand and speed of job creation in the economy.

All economies in the world are undergoing structural transformations. The share of the service sector is growing in the world, while the share of the agriculture sector is declining. The manufacturing sector output and employment are increasing in emerging economies. Employment is shifting from the agriculture sector to the manufacturing or service sectors.

To understand the job growth opportunities at each sector of the economy, the job creation potential is examined for each of them.

The structural transformations of the world economy were exhibited in the “Global Overview of Structural Changes in Job Market” section in Chapter 1. In the long run, Armenia is expected to follow the global structural transformations of the job market. Understanding the job growth potential at the sector level is critical for gauging employment opportunities in the economy both globally and locally.

A bottom-up approach was used to create job growth scenarios in the Armenian economy through 2030 to examine each sector individually. Three main scenarios were developed based on a set of key assumptions: Baseline, Accelerated, and Disruptive Growth scenarios.

The **Baseline Growth** scenario (an **inertia-driven** development pathway following the trajectory of the past performance and global trends) was developed after considering the current economic and employment trends both globally and in Armenia. No major structural changes, radical policy shifts, or internal and external shocks are assumed up until 2030 within the Baseline Growth scenario.

22 Labor productivity is calculated as Gross Value Added per employee.

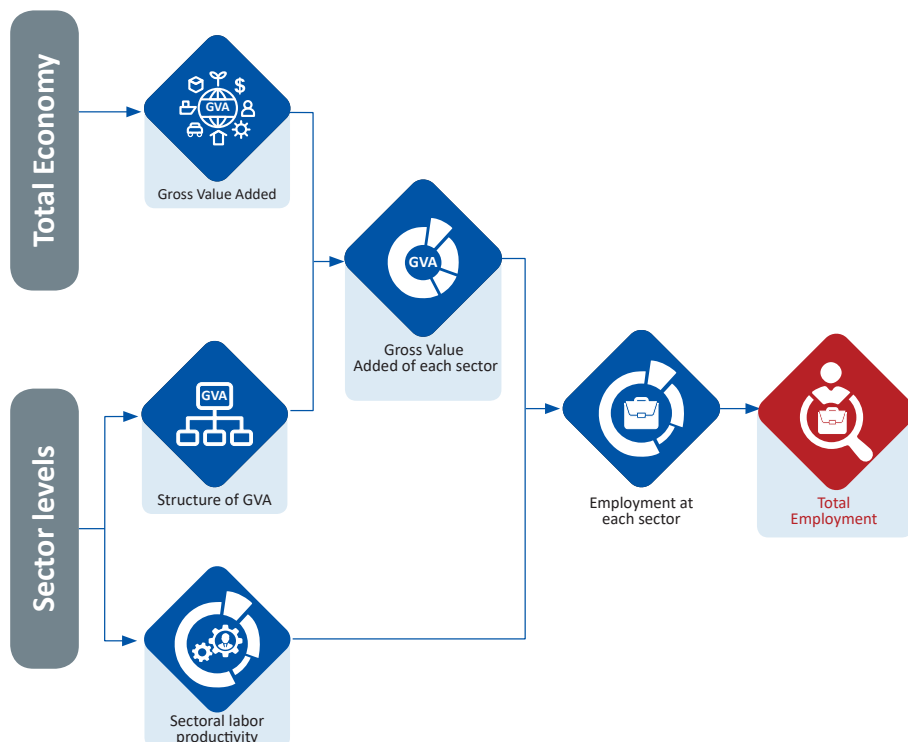
The Baseline Growth scenario is based on historical trend analysis and economic convergence theory. A consistent set of studies found empirical evidence that countries tend to converge with their GDP per income and labor productivity levels in the long run. Countries with a lower base of income levels converge faster to catch up with those with rich income levels. The phenomenon is widely discussed among economists and is a base for a number of macroeconomic estimations and projections of economic growth (See Insert 2.1). While there is no assurance that the convergence may hold in the future, given the fast development of new technologies and subsequent structural changes, the approach may provide a useful exercise in profiling the economy under specific assumptions.

The **Accelerated Growth** scenario envisions a change in the Armenian economy's growth trajectory during the next decade. The growth will be driven by successful systemic reforms, improvements in the business environment facilitating business activity, and investments in Armenia. Consequently, the Accelerated Growth scenario assumes a higher GDP growth rate in the country as well as faster job creation and higher employment by 2030.

The **Disruptive Growth** scenario describes key consequences of rapid technological advancements that disrupt entire industries and economic activities. As the level of uncertainty is non-measurable the Disruptive Growth scenario is based on qualitative analysis and assumptions rather than numeric predictions.

Graph 2-2 summarizes the logic of the scenarios' development and the relationship between input and output factors. Employment is modeled as an output indicator based on GDP and labor productivity estimates.

Graph 2-2. The Logic of Job Growth Modeling



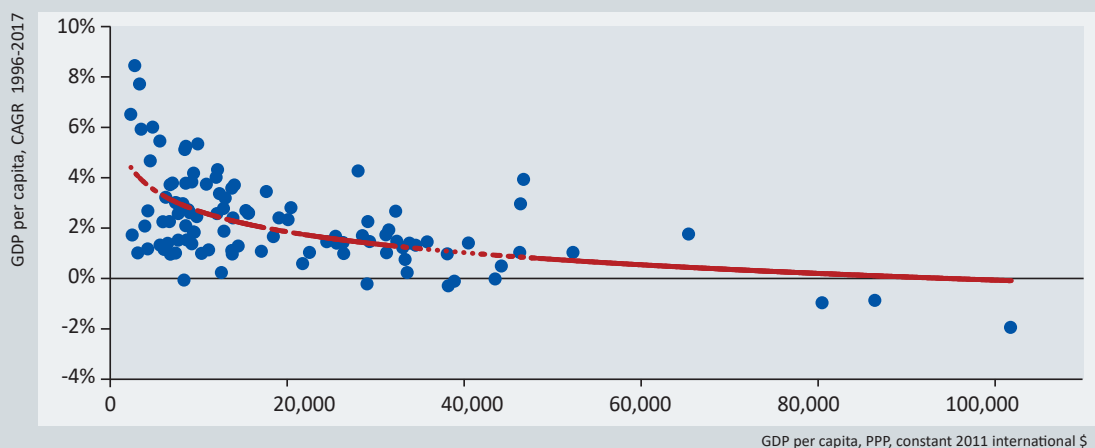
Source: EV Consulting

INSERT 2.1: LABOR PRODUCTIVITY CONVERGENCE

The concept of convergence is very popular in studies on economic growth and competitiveness, particularly within neoclassical growth theories. Theories assume that poor countries grow faster than rich ones, and there are at least three basic assumptions for this phenomenon. The Solow growth model shows that countries tend to converge to their steady state levels in the long run. Consequently, as poor countries are relatively far from their steady state levels, they are expected to grow faster to catch up with rich ones. Return on capital is lower in rich countries, and there are incentives for capital flows from rich to poor countries, supporting their convergence and gap reduction with rich ones. Another reason supporting convergence theory is connected to the lags in the diffusion of knowledge and technologies, as countries do not always employ the best available technologies. Competition, learning experience, and knowledge sharing, particularly in tradable industries, enable poor countries to grow faster and strive to reach their potential.

The graph below indicates that poor countries with lower GDPs per capita in the base year have high GDP per capita growth rates compared with advanced and developed economies.

Graph I2-1-1: GDP per Capita PPP (Constant 2011, International Dollar) and CAGR, 1996-2017 by Country



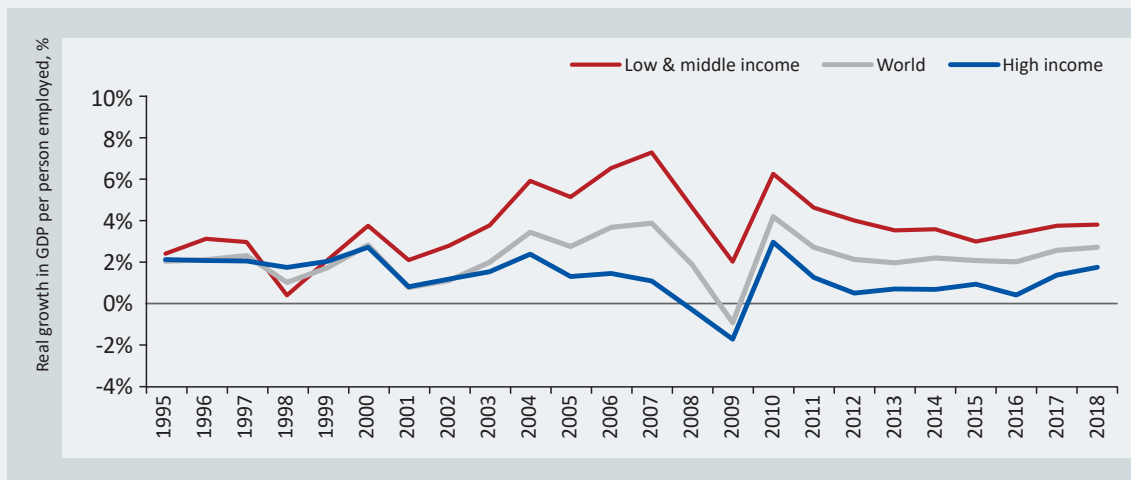
Source: WDI

Labor productivity convergence assumes reduction of disparities or catch-up with rich countries in productivity. Theory suggests two types of labor productivity convergence: unconditional convergence (σ -convergence) and conditional convergence (β -convergence). Unconditional convergence assumes a decline of disparities among labor productivities across countries, thus convergence to a common steady state level. With conditional convergence, the assumption is weaker and each country approaches its own steady state level. The baseline assumption of the conditional convergence is that industries that are further away from their steady state levels have faster growing productivities.

The phenomenon of labor productivity convergence was described in the National Competitiveness Report of Armenia 2013-2014, (EV Consulting, 2014).²³ Low and middle-income economies outperform with their pace of growth of labor productivity compared with productivity growth rates of the world average and higher income economies.

23 EV Consulting, 2014, "National Competitiveness Report of Armenia—Growth Imperative and Constraints 2013-2014"

Graph I2-1-2: Growth in GDP per Person Employed



Source: WDI

In this context, the extension of the neoclassical economic growth model developed by Barro and Sala-i-Martin (1995) is considered. The focus of the cross-country regression analysis is the conditional convergence, and it considers the relationship of productivity growth on an initial level of productivity.

International Monetary Fund (IMF) in their World Economic Outlook, 2019 report addressed the labor productivity convergence theory for nine economic sectors, finding evidence of convergence toward the frontier economy (US). Unconditional convergence is found for manufacturing as well as several non-manufacturing sectors such as trade and accommodation, transport and communication, and financial and business activities. There is no unconditional convergence found in the agriculture sector. In the service sector, the convergence speed has accelerated since the 1990s or early 2000s.

According to research by Dani Rodrik (2013),²⁴ proven unconditional convergence is occurring in the manufacturing sector. Based on the findings, the bottom percentile of the countries in the sample with considerably lower productivity levels experience a convergence in their labor productivity growth of 6.7% annually.

The same approach was also applied to show that unconditional convergence is occurring in the service sector.²⁵ Countries with lower productivity levels in the service sector are converging in their labor productivity growth of 9.8% annually. The speed of convergence in the service sector is considerably faster than in the manufacturing sector.

Tahir Mahmood (2012) explored labor productivity convergence theory for 52 industries in European countries.²⁶ The findings of the research once again proved the convergence of labor productivity in disaggregated levels of the economy. The existence of conditional convergence was found for almost all industries in primary and service sectors as well as in manufacturing. The findings show that the convergence speed is highest in capital-intensive industries. Some of the fastest converging industries are fishing, oil refining, and nuclear fuel manufacturing. Food processing, agriculture, drink, and tobacco are among the slowest converging industries.

24 Dani Rodrik, 2013, "Unconditional Convergence in Manufacturing"

25 Bisrat Kinfemichael and A.K.M. Mahub Morshed, 2019, "Unconditional Convergence of Labor Productivity in the Service Sector"

26 Tahir Mahmood, 2012, "Labour Productivity Convergence in 52 Industries: A Panel Data Analysis of Some European Countries"

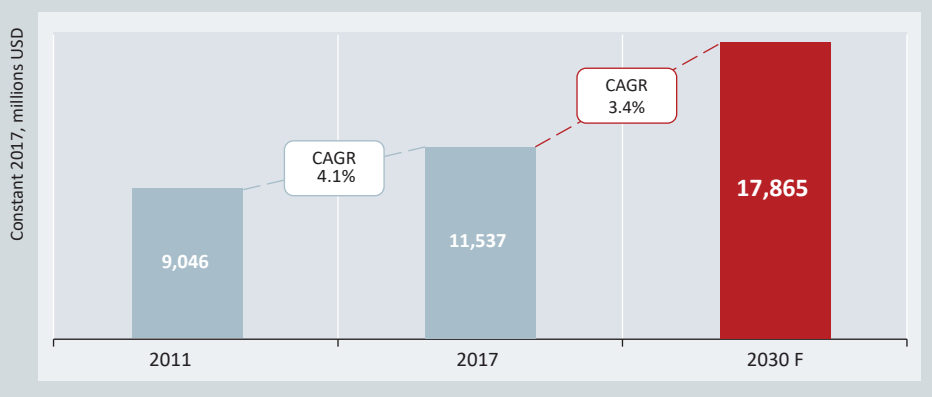
2.1 JOB GROWTH POTENTIAL IN ARMENIA IN THE BASELINE (INERTIA-DRIVEN) GROWTH SCENARIO

Historically, Armenia's GDP had an increasing trend but with a decreasing pace of growth in the long run. The CAGR for the period of 2000-2017 was 6.4%, which decreased to 4.1% for the period of 2011-2017. Considering the historical growth patterns and global convergence trends of upper middle and higher income economies, Armenia's GDP level is estimated for the Baseline Growth scenario through 2030.

The Baseline Growth scenario assumes the GDP growth in Armenia at a historical pace.

GDP per capita and population projections²⁷ are used to estimate Gross Value Added (GVA) for Armenia in 2030. Romer²⁸ (1996) developed a convergence model of income per capita, which is a base for GDP per capita estimations in the model. GDP of Armenia in 2030 was estimated using GDP per capita and population forecasts. GVA was derived from GDP by considering that the share of net taxes on products will remain at the level of 10% based on historical values and trends. Assuming that this difference will remain at the same average level in the future, the GVA is estimated for 2030.

Graph 2-3: Projection of Gross Domestic Product in the Baseline Growth Scenario



Source: Statistical Committee of the Republic of Armenia, EV Consulting analysis

Labor productivity²⁹ in Armenia has been increasing since the 2000s with an annual growth rate of 5% on average.

Though the growth pace of labor productivity in Armenia accelerated after 2011 reaching 6.8%, in the long run a slowdown in growth rate is expected due to the “higher base” effect.

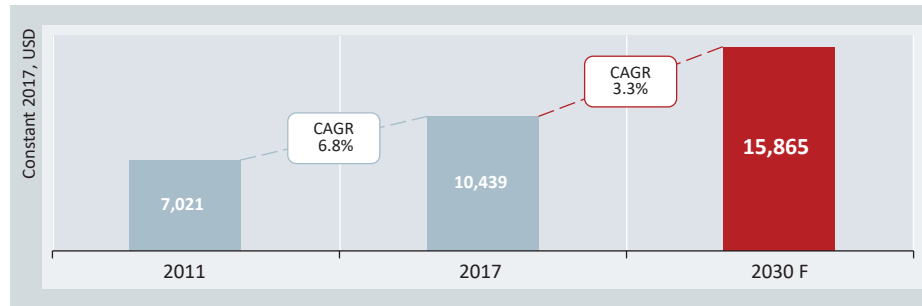
The growth rate of labor productivity is expected to slow down.

27 Details on population estimates are provided in Chapter 3.

28 David Romer, 1996, “Advanced Macroeconomics”

29 In this report GVA per employee is used for measuring labor productivity.

Graph 2-4: Labor Productivity Estimate in Baseline Growth Scenario



Source: Statistical Committee of the Republic of Armenia, EV Consulting analysis

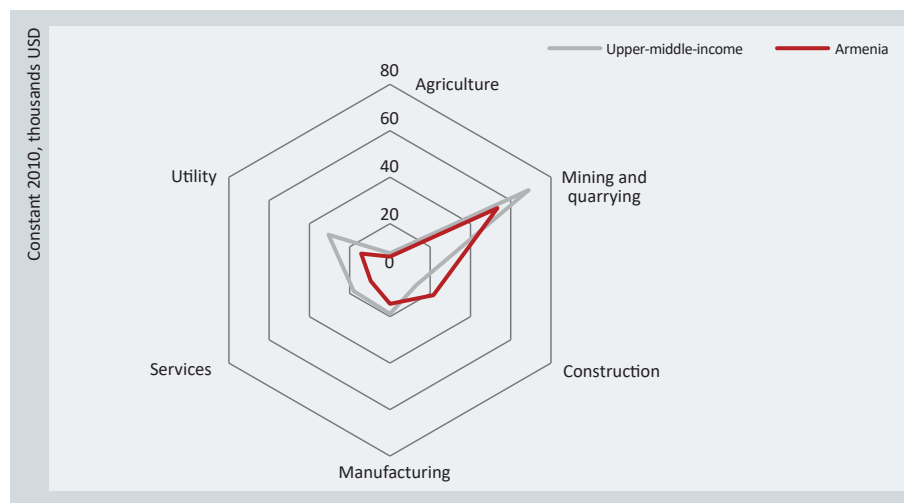
The cross-country productivity convergence analysis indicates that labor productivity will continue to increase but with a lower pace in the Baseline Growth scenario considering no major changes in the economic dynamics. For the projection period of 2017-2030, on average a 3.3% annually increase of labor productivity is estimated for Armenia.

Armenia outperforms upper-middle-income economies with labor productivity in the construction sector, while service and industry sectors are still far behind.

In general, Armenia’s labor productivity at the sector level is comparable with the median level of upper-middle-income economies. Armenia outperforms only in the construction sector, while in other industries it is behind the median level of the country group. Utility, mining and quarrying, and service sectors are the ones with the largest productivity gaps compared with upper-middle-income medians. On average, the agriculture

and manufacturing sectors have nearly the same level of labor productivity as upper-middle-income economies.

Graph 2-5: Productivity Gap Analysis: 2017 Labor Productivity Levels³⁰

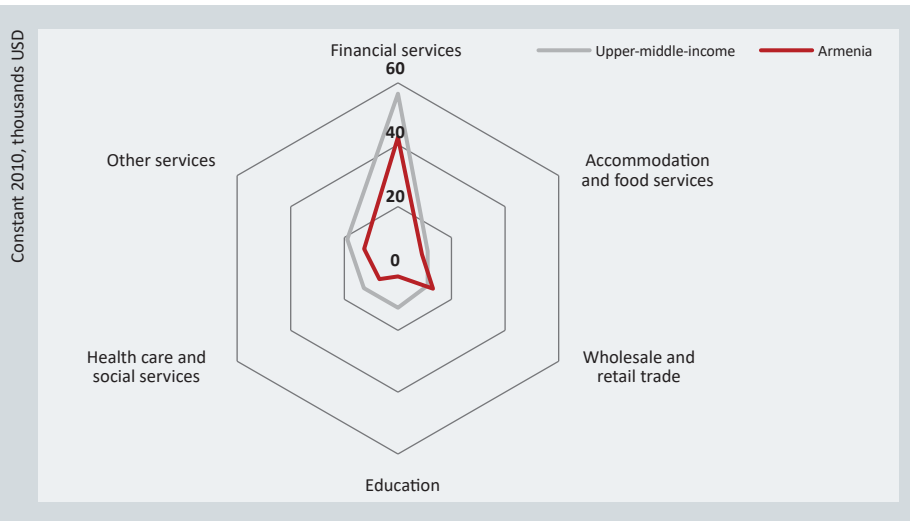


Source: Statistical Committee of the Republic of Armenia, WDI, UNSD, ILO, EV Consulting analysis

The biggest gaps in labor productivity within the service sector compared with the average levels of upper-middle-income economies are in financial and insurance services and education subsectors. Armenia outperforms upper-middle-income economies in labor productivity in the wholesale and retail trade subsector.

³⁰ Comparisons are made with median levels of labor productivity of upper-middle-income economies in all spider graphs.

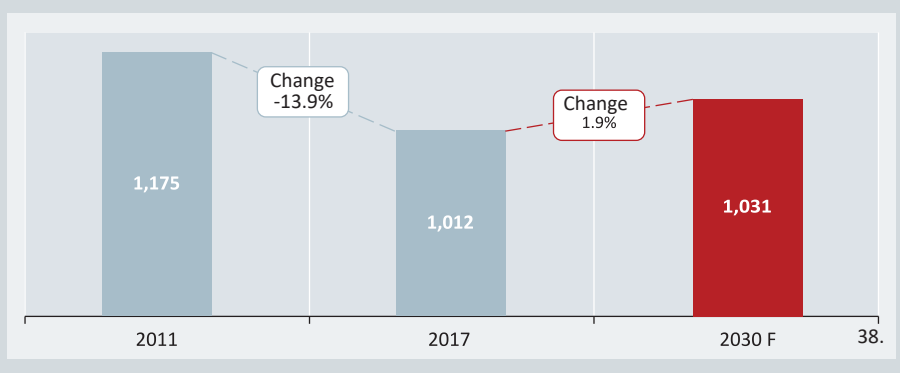
Graph 2-6: Productivity Gap Analysis: 2017 Labor Productivity Levels within Subsectors of Services



Source: Statistical Committee of the Republic of Armenia, WDI, UNSD, ILO, EV Consulting analysis

The estimated average growth of GVA and productivity will result in a slight change of employment in Armenia for 2030 in the Baseline Growth scenario.

Graph 2-7: Estimate of Number of Jobs in Baseline Growth Scenario, in Thousands



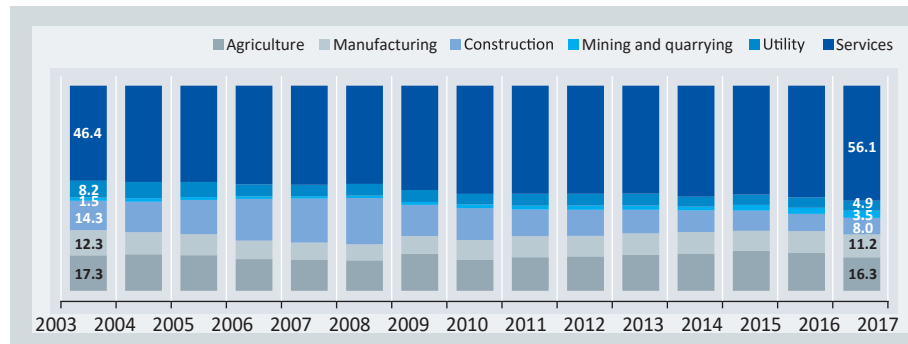
Source: Statistical Committee of the Republic of Armenia, EV Consulting analysis

In the Baseline Growth scenario, the number of jobs in Armenia will not change significantly compared with employment numbers in 2017. The number of employed people in the country will increase by only 0.1% per annum, creating about 19,164 new jobs by 2030. However, issues with unemployment and job creation will not be resolved by 2030.

Job creation will remain one of Armenia's main challenges in the Baseline Growth scenario.

To estimate the shifts in Armenia's GVA structure, historical trends are analyzed for the period of 2003-2017. Armenia's GVA structure is estimated in the Baseline Growth scenario for 2030 by considering the tendencies for historical trends and global structural transformations, and a continuation of historical trends is assumed. Each sector's share has been benchmarked with upper-middle and high-income economies to validate the estimation results.

Graph 2-8: GVA Structure in Armenia, % of Share



Source: Statistical Committee of the Republic of Armenia

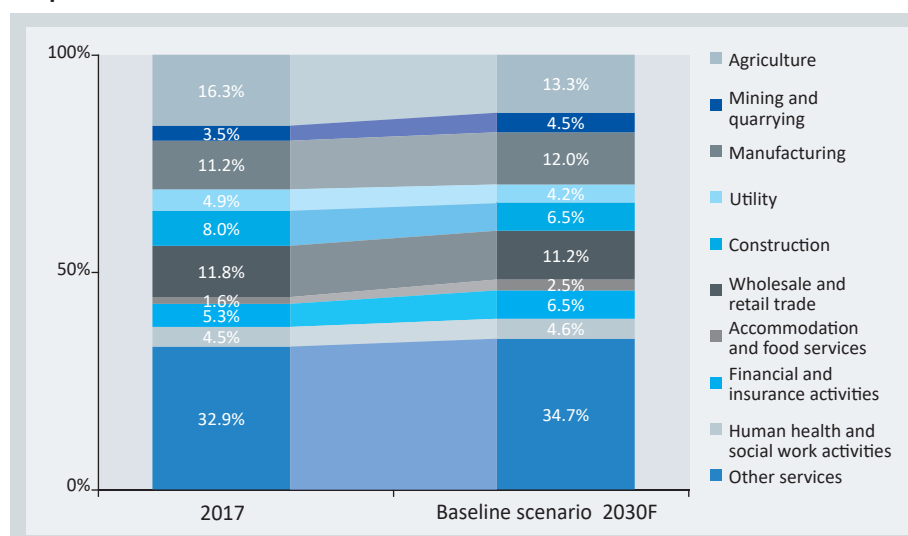
The share of the services sector is rapidly growing in Armenia, while shares of construction, utility, and agriculture sectors are decreasing.

Compared with 2003, the share of the service sector in GVA increased by 9.7 percentage points, reaching 56.1% in 2017. The manufacturing sector, after a drop of its share in GVA during the 2007-2009 financial crisis, is recovering. Since 2011, the share of manufacturing value added in GVA increased by about 1 percentage point and is expected to continue its positive trend.

The construction sector's share in GVA peaked in 2009 as a result of the construction boom during the pre-crisis period, when the Armenian economy recorded double-digit growth. The sector's share shrank after the financial crisis and continues to drop, falling to 8.0% in GVA in 2017.

The agriculture sector had a mixed performance, but its share will have a declining trend in the long run, though not as sharply as in other countries. An annual growth rate of 11% in labor productivity and a 6% annual reduction in employment in the agriculture sector confirm that structural changes in the sector will follow global trends.

Graph 2-9: Estimation of Gross Value Added Structure



Source: Statistical Committee of the Republic of Armenia, EV Consulting analysis

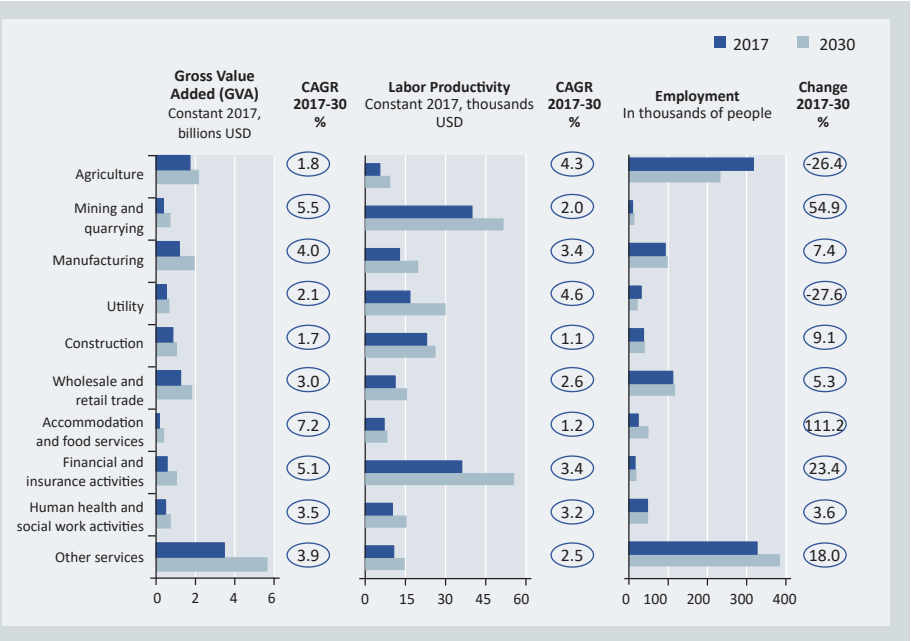
Major changes in GVA structure are expected occur in the services, agriculture, and construction sectors. The services sector's share in GVA is expected to increase by 3.5 percentage points in 2030, while a decrease of about 3 percentage points is anticipated

for the agriculture sector’s GVA share. The construction sector’s share in GVA is forecasted to decline by 1.5 percentage points.

The Baseline Scenario assumes a slowdown in the pace of GVA expansion for almost all major sectors of the economy compared with historical performance, except for the construction sector which will continue to recover from its continuous decline. A significant decrease in GVA growth rates is anticipated for the agriculture and mining and quarrying sectors as well as for some subsectors of services, such as financial and insurance activities and accommodation and food services. Although the pace of growth of GVA for services is projected to decrease from 2017 to 2030, they will remain being fast-growing sectors compared with the economy average growth rate.

In the Baseline Growth scenario, despite the lack of job creation, significant structural changes in employment are anticipated.

Graph 2-10: Projected Levels of GVA, Labor Productivity, and Employment in Armenia



Source: Statistical Committee of the Republic of Armenia, EV Consulting analysis

The performance of labor productivity in mining and quarrying and agriculture sectors in 2011-2017 was strong, with annual growth rates of 18.0% and 10.7%, respectively. The financial sector had the lowest historical growth rate of labor productivity in Armenia for the period of 2011-2017, though with absolute values it has the highest level of labor productivity compared with other sectors (except for IT, which is analyzed separately due to methodological reasons). With the exception of financial and insurance activities, the remaining services subsectors historically recorded moderate and high growth rates of labor productivity. Labor productivity in construction has been growing since 2011 with 6.3% CAGR mainly due to reduced employment in this sector. Compared to 2011 the number of employees in construction have declined by 45%, which resulted in an increase in labor productivity in the sector. Projections for 2017-2030 foresee a significant decline in the growth rate of labor productivity in construction.

Based on the Baseline Growth scenario, the agriculture and utility sectors are expected to have the fastest growing productivity levels in Armenia for the forecasted period, above 4% annually. Estimations assume on average doubled labor productivity levels in those

sectors by 2030. The annual pace of productivity growth will be comparably slower in construction and accommodation and food services, at 1.1% and 1.2%, respectively.

The Baseline Growth scenario only assumes a cumulative 1.9% increase of total employment in the economy. The main changes in job creation are expected to take place in the agriculture and service sectors. Around 26% of all employed people in agriculture in Armenia—about 84,000—will lose their jobs by 2030. However, 96,000 more jobs will be created in the service sector by 2030, which will increase total employment in the sector by 18%.

The Baseline Growth scenario, which assumes sustaining historical trends and the convergence pace, does not envision significant new job creation in Armenia.

2.2 JOB GROWTH POTENTIAL IN ARMENIA IN THE ACCELERATED GROWTH SCENARIO

The Accelerated Growth scenario will see the curse of the historical trend break, a change in underlying driving forces, and significantly higher growth rates. For the purposes of targeting GVA and labor productivity growth rates under the Accelerated Growth scenario, we benchmarked the upper-middle and high-income economies that could manage to sustain high growth rates since 2000. The benchmark group includes countries that recorded a minimum annual real GDP growth rate of 6.5-7% for at least five consecutive years. Those countries had labor productivity growth of 5-5.5% on average. The time periods were chosen in order to minimize the impact of global structural factors and increase the relevancy of comparative analysis.

At least 7-7.5% of annual GDP growth is needed to accelerate job creation in Armenia.

Table 2-1: Benchmark Countries with Latest Highest Growth Episodes³¹

Country	High growth period	GDP growth rate (CAGR)	Labor Productivity period start	Labor Productivity period end	Labor productivity growth rate (CAGR)	Employment change, %
Belarus	2000 - 2011	7.2%	6,406.06	11,135	5.2%	13.8%
Bulgaria	2002 - 2007	6.6%	11,136	12,643	2.6%	16.9%
China	2000 - 2017	9.3%	3,157	13,236	8.8%	6.3%
Georgia	2002 - 2012	6.6%	3,135	6,209	7.1%	-7.6%
India	2003 - 2017	7.0%	2,304	4,909	5.6%	18.6%
Latvia	2000 - 2007	9.0%	16,087	24,858	6.4%	13.2%
Lithuania	2001 - 2007	8.3%	18,022	25,808	6.2%	6.7%
Mongolia	2003 - 2014	9.0%	4,577	8,401	5.7%	27.0%
Nigeria	2002 - 2014	6.8%	5,237	8,612	4.2%	35.4%
Panama	2004 - 2015	7.5%	13,327	22,683	5.0%	29.4%
Peru	2005 - 2013	6.6%	7,482	9,743	3.4%	26.5%
Russia	2000 - 2007	6.8%	12,985	18,209	4.9%	8.5%
Zambia	2003 - 2013	7.6%	2,797	4,024	3.7%	38.1%
Average	13 years	7.6%			5.3%	17.9%

Source: UNSD and ILO modeled estimates

31 Benchmark analysis does not include countries with lower initial level of labor productivity (less than 1,000 USD).

INSERT 2-2: WHAT HAVE HIGH-GROWTH ECONOMIES DONE DIFFERENTLY?

In order to understand the key patterns and correlated factors of high-growth economies we studied countries that recorded a minimum annual real GDP growth rate of 6.5–7% for at least five consecutive years since 2000. Thirteen of those countries are upper-middle-income economies that have very diverse economic performances and markets as well as geopolitical situations. We studied nine countries in order to benchmark and compare the high-growth driving factors with the current situation in Armenia.³² Factors such as country size, population, and economic structure were considered in compiling the list of countries. China and India were dropped from the list due to their very large populations. Nigeria and Russia, being highly oil-dependent economies, were also dropped from the list of benchmark economies.

Three time periods were studied in order to see the overall picture of high-growth economies: the whole period of 2000 to 2017, the accelerated growth period of those economies, and the last five years for each economy. The correlation matrix of 31 socio-economic indicators with GDP identifies the indicators correlated with the pace of economic development in those countries. As a positive interrelation and correlation the value³³ of 0.65 and higher is considered for analysis.

The following table shows the average values of highly correlated indicators in the selected economies and in Armenia during the abovementioned three periods. The average values of those indicators for the world in the entire observation period are also shown.

Table I2-2-1: Indicators highly correlated with GDP							
	High-growth countries			World	Armenia		
	During whole period	During high-growth period	Last 5 years	During whole period	During whole period	During high-growth period	Last 5 years
Indicators positively correlated with GDP							
Share of export of goods and services in GDP	46.1%	44.6%	48.9%	28.5%	26.2%	25.2%	31.4%
FDI (% of GDP)	5.9%	7.8%	4.0%	2.9%	5.1%	5.9%	2.7%
Gross capital formation (% of GDP)	29.0%	29.8%	29.6%	24.5%	25.4%	27.1%	20.2%
Construction as a % of GDP	13.9%	13.5%	13.5%	5.3%	14.6%	17.5%	8.9%

Source: WDI

According to the analysis, the following facts characterize high-growth economies:

- Sustained high share of the gross capital formation in GDP (29% compared with 24.5% of the world average);
- Extensive export orientation of the economy (46.1% ratio of exports of goods and services to GDP compared with 28.5% of the world average);
- Significant contribution of FDI (5.9% of GDP compared with 2.9% of the world average);
- High share of construction sector value added in GDP (13.9% compared with 5.3% of the world average).

Thus, the story of high growth is quite similar in its key characteristics across all the studied countries: high capital investment, including construction, export growth, and quicker expansion of the services sector all play a role.

The findings are in line with the ones reported by the World Bank in its Commission on Growth and Development Report from 2008. The world economy is now more open and integrated; thus attaining an annual growth rate of 7% GDP or higher is possible for developing economies based on the findings. High-growth economies rapidly import ideas, technologies, knowledge, and know-how from other countries by attracting more Foreign Direct Investment in particular. Foreign education, which supports the expansion of lasting international networks, also plays a role. Moreover, the open world economy provides opportunities for high-growth economies to expand exports and specialize in new export lines.

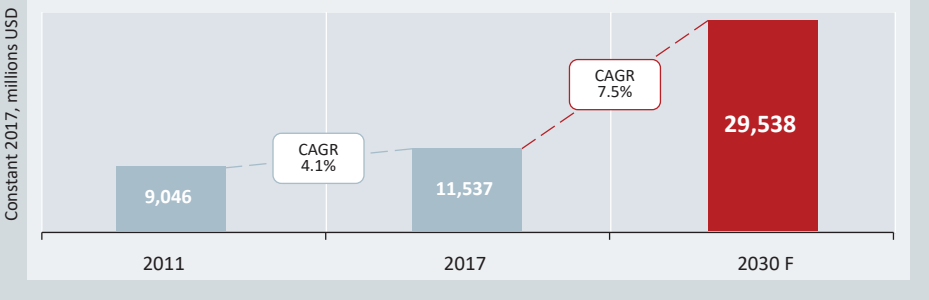
In summary, the macroeconomic undergrowth should be addressed by governmental policies and reforms to enable productivity and increase export potential of a country. When taking into consideration the mixed performance of capital inflows worldwide, an increase in domestic savings, including public savings, is also essential to finance the investment that a high-growth economy requires.

32 Belarus, Bulgaria, Georgia, Latvia, Lithuania, Mongolia, Panama, Peru, and Zambia.

33 The correlation coefficient takes values from the [-1,1] range to show negative and positive interrelations between variables.

Based on the average growth and productivity levels achieved by these countries, the accelerated growth scenario for Armenia can target a 7.5% annual average growth rate of GDP and a 5-5.3% annual average growth rate of labor productivity.

Graph 2-11: Estimate of Gross Domestic Product in Accelerated Growth Scenario



Source: Statistical Committee of the Republic of Armenia, EV Consulting analysis

With such a pace of growth, Armenia’s GDP will increase by almost one and a half times reaching 29.5 billion USD by 2030. Armenia’s GDP per capita will reach 9,700 USD, which is about the average level of GDP per capita of the top-ten upper-middle-income economies.

Accelerated economic growth can also mean catching up productivity and technology/knowledge levels with frontier economies in the upper-middle-income group. Higher growth rates of GDP can be achieved only through faster technological advancement, stronger knowledge diffusion, and larger productivity increases. Hence, higher labor productivity levels are targeted under the Accelerated Growth scenario considering the contribution of historical trends of labor productivity to real GVA changes and targeted GVA levels of the economy.

Accelerated growth of the economy demands a higher labor productivity level than in an inertia growth scenario.

INSERT 2-3: METHODOLOGICAL NOTE ON EMPLOYMENT AND LABOR PRODUCTIVITY CONTRIBUTION TO CHANGE OF REAL GVA

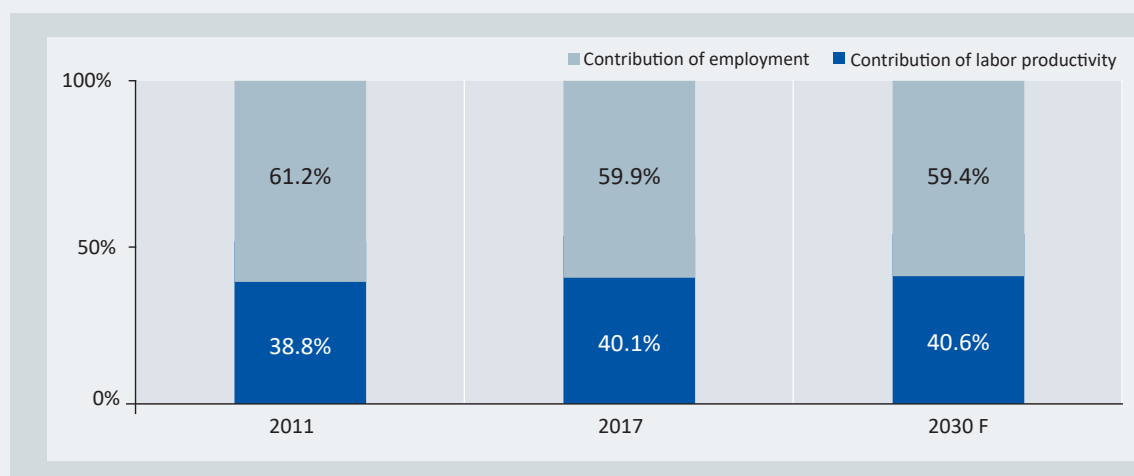
To determine how employment and labor productivity factors influence GVA and its growth, the production function is considered for further analysis. An additive (logarithmic) form of the production function is applied, which approximates the first derivative of the function and thus the contribution of each separate factor on GVA change can be determined.

$$\ln Y = \ln(Y/L) + \ln L \quad (1)$$

where Y is the real GVA output, Y/L is the GVA per employee (labor productivity), and L is the number of employment.

The relationship shows that changes in GVA are composed of changes in productivity levels and employment. In 2017, 40.1% of GVA change in the total economy of Armenia was due to contributions from labor productivity, while 59.9% was due to employment. Compared with 2011, the share of labor productivity contribution is increasing, and this rise is expected to continue until 2030. Based on the current trend, labor productivity will have a share of 40.6% in change in GVA by 2030.

Graph I2-2-1: Contribution to Change in Real GVA, % of Share

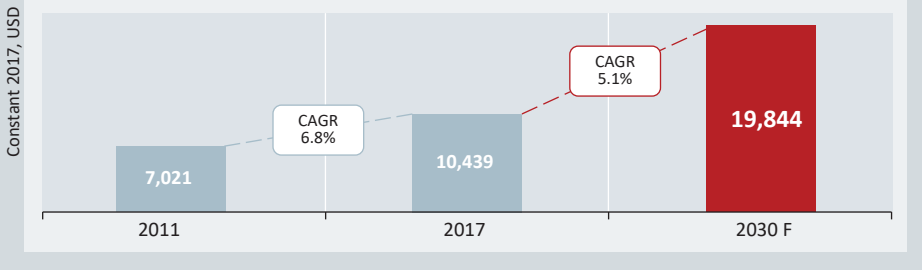


Source: Statistical Committee of the Republic of Armenia, EV Consulting

Employment and labor productivity contribution shares to change in GVA for 2030 is estimated both for total economy and sector levels. Labor productivity CAGRs required for estimating growth in the sectors can be calculated by using the targeted GVA levels for sectors and by considering the historical slight changes in shares of labor productivity and employment contributions.

The targeted growth rates of labor productivity by sector add up to 5.1% of labor productivity CAGR for the total economy, which is in line with the benchmark analysis. With such a pace of growth, Armenia’s labor productivity will reach 19,844 USD increasing by 90% compared with the current 2017 level of labor productivity in the economy.

Graph 2-12: Labor Productivity Estimate for Accelerated Growth Scenario

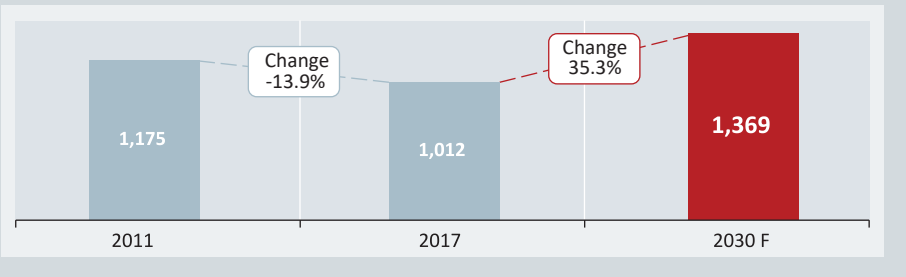


Source: Statistical Committee of the Republic of Armenia, EV Consulting analysis

The Accelerated Growth scenario expects a higher employment rate in Armenia considering the accelerated level of GVA and labor productivity. An annual 7.5% of growth in GDP and 5.1% of growth in labor productivity will result in about 357,500 new jobs in Armenia by 2030, which is about 35% more than in 2017.

The Accelerated Growth scenario expects 35.3% more employment in 2030 than in 2017.

Graph 2-13: Estimate of Number of Jobs in Accelerated Growth Scenario, in Thousands

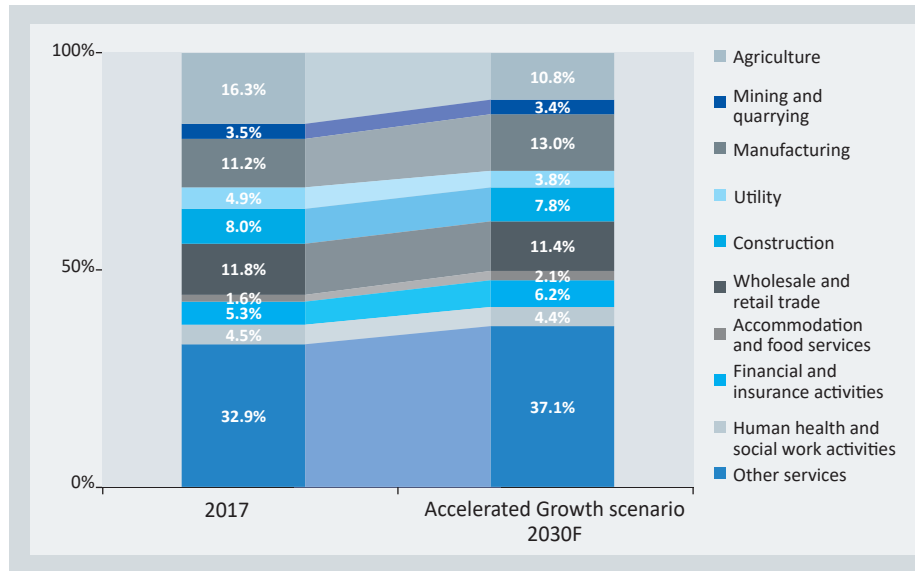


Source: Statistical Committee of the Republic of Armenia, EV Consulting analysis

The logic of the Accelerated Growth scenario assumes convergence of the economy at a faster pace. Armenia’s economic structure is expected to undergo a considerable transformation toward manufacturing and services, thus a more rapid reduction of the agriculture sector’s share in GVA is estimated for the Accelerated Growth scenario. Due to evolving public pressure from environmental considerations and the changes in the policy emphasis, the mining sector is not expected to have a significant boost in GDP share for the forecasted period in the Accelerated Growth scenario. In parallel with the strengthening manufacturing sector, construction is expected to slow down the declining tendency of share in GVA. Services is one of the fastest growing sectors both globally and in Armenia, and it will continue to grow in the Accelerated Growth scenario.

Manufacturing and services will be the key driving sectors for accelerated economic growth in Armenia.

Graph 2-14: Estimation of Gross Value Added structure



Source: Statistical Committee of the Republic of Armenia, EV Consulting

GVA for major sectors of the economy in 2030 is calculated based on Armenia’s targeted GDP growth rate and estimated GVA structure. A significant portion of the increase in GVA will be captured by the manufacturing and services sectors, which is targeted to grow by 8.8% and 8.3% per annum, respectively. Insights from focus group discussions with sector representatives detailed in Insert 2-3 validated the targets of GVA and GVA shares of manufacturing as well as services sectors, which are expected to increase by 3 and 2.5 times, respectively. The mining and quarrying sector will keep growing in the Accelerated Growth scenario, though at a slower pace. A significant increase is estimated for sectors grouped in “Other services”, such as information and communication as well as entertainment and recreation.

The IT industry’s growth and its potential to increase GVA, labor productivity, and employment will be discussed separately in this report.

INSERT 2-4: EXPERT OPINIONS ON THE DEVELOPMENT POTENTIAL OF INDIVIDUAL SECTORS IN ARMENIA

Focus group discussions with sector representatives were conducted for qualitative insights about sector output as well as employment growth trends and potential. All participants expect an increase in output in their sectors during the next 5-10 years, though with different growth perspectives. The speed of growth and increase in value creation is different based on the current sector development level and potential. Factors supporting the increase of sector output are labor productivity, automation and digital tools, new markets, and new products. Political instability and a high volatility of exchange rates as well as import and export regulations are among the top risks preventing economic growth.

Output growth is expected in all sectors, although at very different rates and perspectives.

Food processing

The food processing sector is expected to increase in Armenia in the next 5-10 years. The sector size and value creation is projected to triple during the upcoming 10 years given a lack of external shocks. Armenia's favorable climate creates advantageous conditions for developing the agriculture and food processing industries. These industries have unused potential for increasing growth and value creation in Armenia. External factors influencing the development of manufacturing and food processing sectors are a high volatility of exchange rates, a crisis in the Russian economy, export and import regulations in Armenia, and a lack of investment opportunities. The main export countries of Armenian manufactured products are Russia, other CIS countries, and Europe.

Information and communication

The information and communication sector is one of the fastest growing sectors in Armenia. It has huge potential for continued growth. IT companies are targeting an annual 30-40% increase in revenue assuming an adequate supply of software developers with requisite skills and knowledge.

The main constraints of growth in this sector are human resources, skillset mismatches, the poor quality of the Armenian education system, the slow growth of other sectors in Armenia, and unfavorable regulations for investments in Armenia.

Tourism

The tourism sector is increasing globally and it affects all countries worldwide. The Armenian tourism sector has been growing 11% on average annually during 2011-2017. Assuming no major policy or priority changes happen in Armenia, focus groups representatives expect the same pace of growth in tourism for the upcoming years. In 5-10 years the sector's value added is projected to double but not triple. The number of tourists visiting Armenia can potentially reach 3 million in 3 years. An increase in inbound tourism, higher awareness about Armenia, and the growth of youth tourism will help develop tourism in Armenia. There is huge untapped potential for inbound tourism development.

To help boost the tourism sector, Armenia should also maintain a high quality of services, improve the infrastructure and entertainment centers, create more interesting sights, and attract new tourists in the future. Diverse touristic assets and experiences throughout the country and an improved hotel and services industry outside of Yerevan will motivate international tourists to stay longer in Armenia and will support value creation and sector development.

Financial sector

The financial sector is projected to have a 7-10% annual increase in value added on average in Armenia. Insurance as well as financial market and investment services will be the main sources of sector growth. A lower growth rate in banking, which is considered mature, is expected. In the upcoming years the sector will benefit from contributions to pension funds, which will start being distributed in 2037.

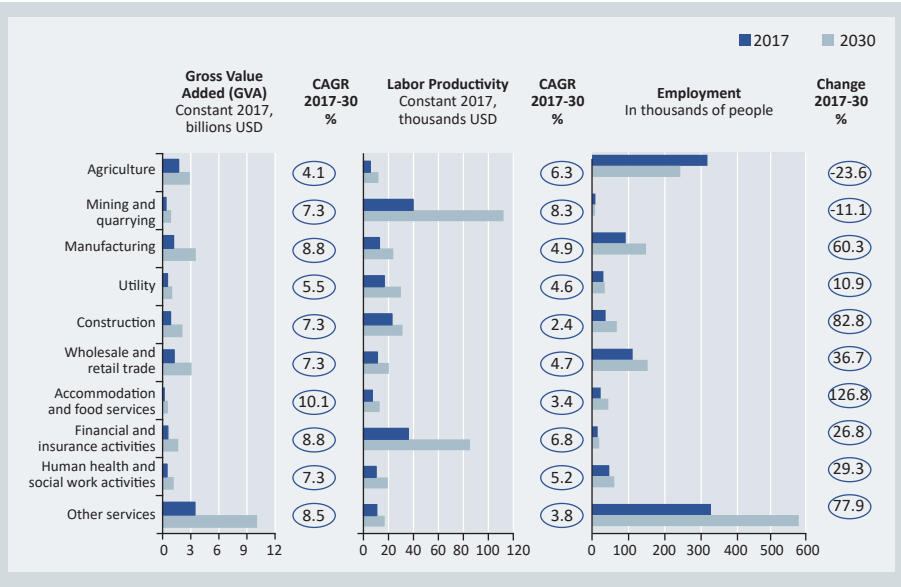
During the next 5-10 years the insurance sector can potentially increase its market size and value creation, at least 5 times, because the market is still new in Armenia, the base is small, and many products will be introduced in the near future to be competitive globally. Future change-making insurance products include:

- Agriculture insurance
- Mandatory health insurance
- Life insurance

Financial market development and a richer investment culture can have major impacts on sector development perspectives. There is untapped potential for growth in capital markets considering the very low number of publicly listed companies in Armenia and investment funds and opportunities.

Downward developments of the financial sector may result mainly from global shocks, recessions, and dramatic changes in exchange rates, although the Central Bank of Armenia has demonstrated competence in stabilizing the market in times of high volatility.

Graph 2-15: Projected Levels of GVA, Labor Productivity, and Employment in Armenia in the Accelerated Growth Scenario



Source: Statistical Committee of the Republic of Armenia, EV Consulting analysis

Sector level labor productivities are estimated based on the methodology described in Insert 2-3³⁴. The fastest growing sectors with labor productivity are agriculture, mining and quarrying, and financial sectors with annual average growth rates of 6.3%, 8.3%, and 6.8%, respectively. The utility sector has the lowest annual growth rate of labor productivity under the Accelerated Growth scenario.

Employment in the agriculture sector is still expected to decline in the Accelerated Growth scenario, with an expected loss of 75,000 jobs by 2030. Only 1,000 jobs are expected to be cut in the mining and quarrying sector for the projected period. Jobs will be created mainly in the services, manufacturing, and construction sectors.

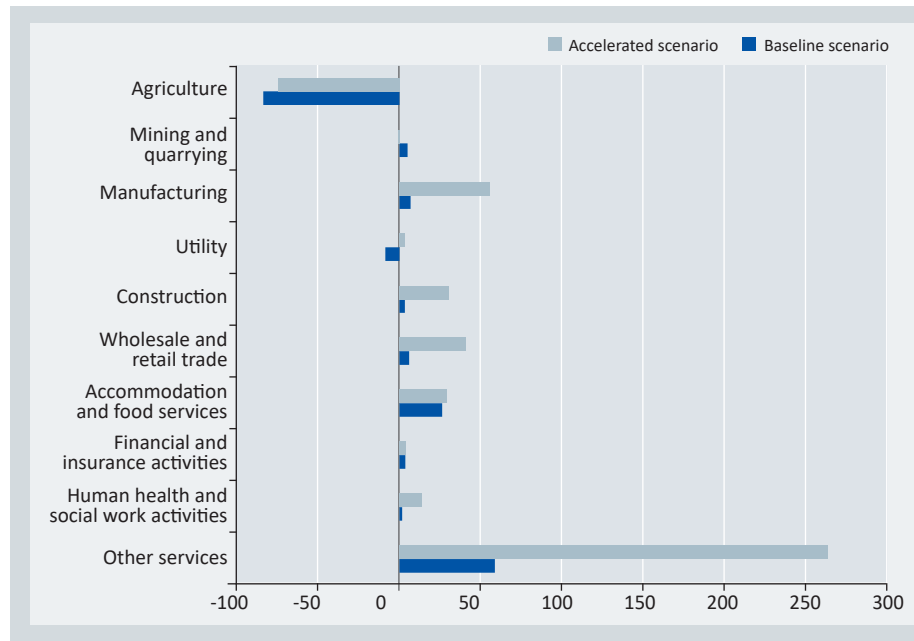
Cumulatively, about 343,400 jobs will be created in the Armenian services sector by 2030 under the Accelerated Growth scenario. The majority of those jobs will be created in sectors grouped as “other services”, which include professional services, public sector and defense, education, information and communication services, arts and entertainment, real estate, and others.

The Accelerated Growth scenario anticipates a greater boost in the manufacturing and services sectors than under the Baseline Growth scenario. An additional increase of about 1.7 percentage points in the services sector’s share in GVA is expected. The manufacturing sector is assumed to be one of the key driving forces of economic growth and transition and is expected to reach 13% in GVA share.

The Accelerated Growth Scenario assumes a substantial expansion and increased sectoral diversification of the job market than the Baseline Growth scenario.

34 In case of agriculture, utilities and food and accommodation sectors the productivity growth rate estimates were adjusted taking into consideration their current levels and historical trends captured in Baseline scenario.

Graph 2-16: Change in Job Growth Potential for Both Scenarios, in Thousands Jobs



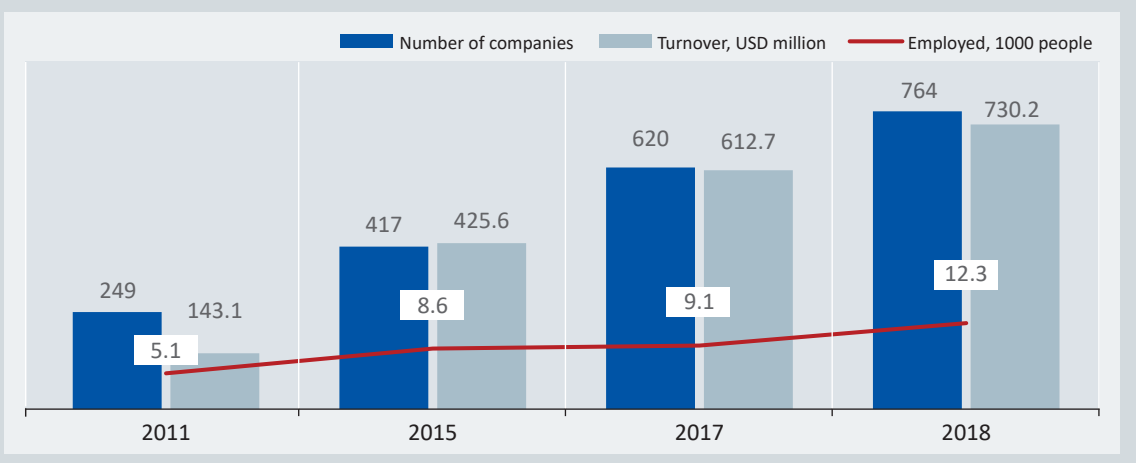
Source: Statistical Committee of the Republic of Armenia, EV Consulting analysis

Under the Accelerated Growth scenario, about 360,000 new jobs will be created compared with only 20,000 jobs under the Baseline Growth scenario. More jobs are expected in manufacturing, construction, and service sectors. Armenia is expected to accelerate STEM-directed industries and increase the number of jobs in the information and communication sector where there is a huge potential for growth and expansion.

INSERT 2-5. PROSPECTS FOR IT SECTOR DEVELOPMENT

The Information Technology (IT) sector was the first to be recognized as a priority sector by the Armenian government back in 2000. The program adopted by the current government in 2019 declared the sector of high technologies as one of the drivers of further economic growth in Armenia.

Graph I2-5-1: IT Sector Performance, 2011-2018



Source: Enterprise Incubator Foundation, ICT Sector in Armenia

Note: Only Programming and IT Consulting have been included in the IT sector.

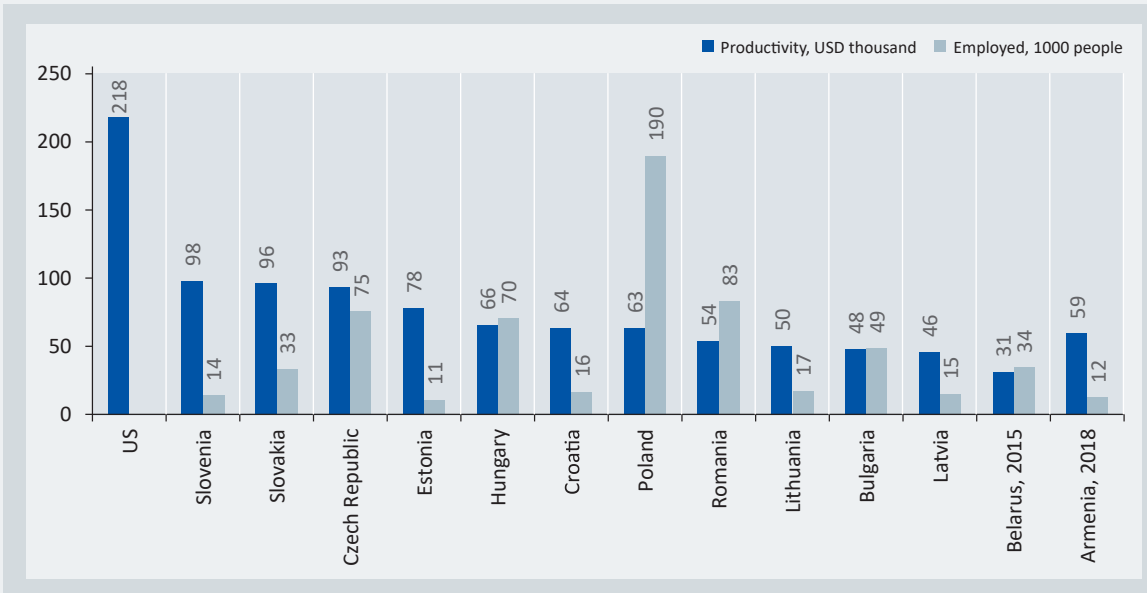
IT is the most rapidly and dynamically developing sector in Armenia with a two-digit growth indicator since 2011 and an annual average growth of 26.2%, reaching 730 million USD in 2018. Sector employment has recorded a trifold increase, reaching 12,300 people in 2018. The sector has also seen qualitative changes—there has been a significant increase in the transition from outsourcing to product development and new sub-branches are emerging. Several companies have attracted investments from leading venture companies and successfully compete in the global market. The achievements in the IT sector enabled the establishment of new adjacent clusters, particularly the growing engineering services sector. According to representatives from leading companies in the sector,³⁵ development prospects of the sector are unlimited, taking into account Armenia’s scale and the rapid growth of the global market. However, the lack of quality specialists limits the sector’s growth. Thus, workforce demand and growth in the sector’s productivity underlie the assessment of the sector’s development potential.

The 2018 productivity indicator per employee in Armenia’s IT sector, which is at around 60,000 USD, is comparable with the productivity levels in eastern European countries.³⁶ Yet comparatively, the productivity level of Armenia’s IT sector is still far behind that of the US, comprising 27% of that country’s productivity level. During the past 10 years the annual growth rate of labor productivity in Armenia’s IT sector was on average 10.1%. Labor productivity in Armenia’s IT sector is expected to continue its convergence trends towards the US and developed economies when considering the structural transformations within the sector and globalization trends. The continuation of historical trends of increasing labor productivity in Armenia assumes 5.4% CAGR for the period of 2018-2030 and labor productivity of about 120,000 USD in 2030.

35 Focus group discussion with representatives of the sector.

36 Eastern European countries with advanced IT sector have been chosen for the benchmarking.

Graph I2-5-2: Labor Productivity (USD) and Number of Employed in the IT Sector, 2016



Source: Enterprise Incubator Foundation, Eurostat, EV Consulting's calculations
 Note: Output per employee has been taken as labor productivity index.

The output volume of the IT sector will depend on the extent to which the education system and the labor market will be able to provide quality specialists for the sector.

If the trend of the past ten years maintains (an annual entry of around 800 employees into the IT sector), then by 2030, there will be a 3.5-time increase in the sector's gross revenue, reaching 2.6 billion USD, while employment will reach 22,000. However, considering the sector's growth opportunities and the ambitions of the private sector, the IT sector can absorb around 2,000 new jobs annually assuming quality specialists are available. A quantitative and qualitative upgrade of graduates from the professional education system, recruitment into the sector through specialized trainings, and the immigration of high-quality specialists would be required. Thus, assuming an annual inflow of 2,000 employees into IT sector, a turnover of 4.3 billion USD and 36,000 employees in 2030 would be expected.

Given the high remuneration in the IT sector and the higher education qualifications of specialists, such growth will have a positive, significant impact on the development of other economic sectors and the emergence of new services.

2.3 DEVELOPING FORESIGHT IN A DISRUPTIVE SCENARIO

Anxiety about a changing workforce led by robots has recently been dominating discussions about the future of jobs. Fast-developing, smart technologies may not only have a positive impact on economies, but can also cause unfavorable changes in the labor market.

The advance of a jobless economy raises concerns about the future of jobs because tasks traditionally performed by humans are now being—or are at risk of being—completed by robots, especially those enabled with artificial intelligence. Robots are widely in use in advanced economies and their numbers are rising quickly. By 2019, 1.4 million new industrial robots will be in operation, raising their total number to 2.6 million around the world.³⁷ Most industrial robots are used in the industrial sector, where the decline in employment in some high-income economies over the last two decades is an established trend. According to a study by Frey and Osborne (2013)³⁸, in the US 47% of “routine” jobs are classified as being at-risk due to automation.

The top disruptive technologies that have already been changing the nature of jobs worldwide are Artificial Intelligence, robotics and drones, Cloud technology, Big Data, and Internet of Things (IoT). Technologies such as Blockchain or 3D printing are also having game-changing impact.³⁹ The trends of 2019 are Web 3.0, Simulation and digital twins, the market of one, edge computing, voice economy, quantum computing, spatial computing (augmented, mixed, and virtual reality), nanotechnology, biotechnology, and next-generation genomics.⁴⁰

Economists and business leaders around the world are divided on this issue. One side of the spectrum believes that disruptive technologies will push humans out of the job market, while the other side believes that these technologies will have a positive impact on the job market by enhancing human productivity. The most extreme, pessimistic view is that disruptive technologies will ruin the labor market and 2 billion jobs—roughly 50% of all jobs worldwide—will disappear by 2030 (Frey and Osborne, 2013). Jobs will go away in every sector that AI, IoT, 3D printing, Blockchain, and other technologies are able to penetrate. Advocates of the positive impact of technologies believe that disruptive technologies will change the nature of jobs, where robots do repetitive tasks while humans are engaged in creative types of work. Gaming, education, health, and entertainment sectors will become the largest sectors with human engagement.

According to McKinsey Global Institute’s predictions, by 2030 between 400 and 800 million jobs will be lost, while the number of new jobs will vary between 555 and 890 million.⁴¹ The WEF predicted that by 2020, in the 15 countries sampled in its report, the number of obsolete jobs will exceed 7 million, while the number of new jobs will reach 2 million.

Massive job cuts are a key risk in a disruptive scenario. However, in the mid-term job augmentation with technology rather than full replacement is more likely.

37 The World Bank, 2019, “World Development Report 2019: The Changing Nature of Work”

38 Carl Benedikt Frey and Michael A. Osborne, 2013, “The Future of Employment: How Susceptible Are Jobs to Computerisation?”

39 EV Consulting, 2017, “National Competitiveness Report of Armenia: Our Role in the Forth Industrial Revolution”

40 Laura Cox and Sarah Finch, 2019, “9 Disruptive Technology Trends For 2019” D/SRUPTION

41 McKinsey Global Institute, 2017, “Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation”

Due to the uncertainty of technological trajectories and the complexity of the global economy, it is nearly impossible to accurately estimate the numbers of jobs lost and created. However, it is relatively easier to spot how technology shapes the demand for skills, at least in short term. For example, current technological developments are giving rise to the gig economy in which organizations hire workers for short-term engagements or project-based contracts.

Demand for three types of skills in the workplace is also being disrupted. First, the demand for non-routine cognitive and socio-behavioral skills seems to be rising around the world. Second, the demand for routine job-specific skills is declining. Finally, payoffs to combinations of different skill types appear to be increasing⁴². All these changes are occurring not only because of job replacement but also due to the changing skill profiles of existing jobs.

Although disruptive technologies demonstrate great promise in revolutionizing the world economy, no evidence shows that this will happen to the fullest extent. While sophisticated algorithms and developments in mobile robots supported by big data now allow many non-routine tasks to be automated, occupations that involve complex perception and manipulation tasks, creative intelligence tasks, and social intelligence tasks are unlikely to be automated over the next decade or two. For instance, the probability of full computerization of a court clerk's duties is very high, while the work of biologists and fashion designers will likely be enhanced rather than fully replaced by AI. The same logic applies to telemarketers and surgeons that require completely different levels of perception and manipulation capabilities. The work of paralegals can be fully replaced (judicial case precedent analysis). A machine can perform medical diagnostic tasks, while a surgeon must decide to perform a surgical intervention (most probably robot-assisted).

Heavy investment in human capital to enhance agility will be a key differentiator for winning countries, but solutions to a massive unemployment scenario are not clear.

Hence, a key trend over the next 10 to 15 years will be job augmentation with automation rather than full replacement. Moreover, jobs requiring social interaction and human empathy will still be in demand.

In the short to mid-term period, the impact of technologies may vary from country to country. The capacity to absorb technologies depends on the necessary infrastructure, human capital costs and skills, speed of regulatory changes, and other factors. However, in the long term large-scale convergence seems inevitable.

Just how countries will weather the risks of automation will largely depend on the speed and relevancy of responses from key stakeholders. Smart, timely, and adequate investment in the development of human capital to make the workforce agile and adaptive to potential changes will be a differentiator for any country.

If Armenia wants to be on the winning side, it has to adopt such policies and approaches very quickly. Armenia's opportunity to take advantage of the foreseen changes and push the economy forward in the mid-term period mainly depends upon the readiness and flexibility of the domestic technology ecosystem, a high-quality education system, and strategic actions taken by key stakeholders, including the government.⁴³

Disruptive technologies first hit low-productive and repetitive jobs performed by low-educated and unskilled employees. In order to gain from disruptive technologies and replace job cuts with job opportunities, governments in emerging countries will

42 Carl Benedikt Frey and Michael A. Osborne, 2013, "The Future of Employment: How Susceptible Are Jobs to Computerisation?"

43 The detailed directions of disruptive technologies and their impact on certain sectors of Armenia's economy are discussed in EV Consulting's "National Competitiveness Report of Armenia 2017: Our Role in the Fourth Industrial Revolution".

need to invest in human capital, particularly in early childhood education, to develop higher cognitive skills and enhance social protection.

The fear of massive job cuts due to disruptive technologies facilitated a new discourse on possible solutions to ensure the welfare of an entire population, especially those at risk of being unemployed. Politicians, governments, and researchers are exploring a wide spectrum of approaches. Solutions include universal basic income (UBI), voluntary work credits, a negative income tax rate—also called a “guaranteed basic income”—an expanded earned income tax credit, and taxing robots. UBI, which was piloted in Finland in 2017, is criticized as the costliest measure with blurred perspectives for delivering the anticipated positive results. The efficiency of UBI will increase by targeting groups of the population vulnerable to technological progress and establishing reskilling programs.

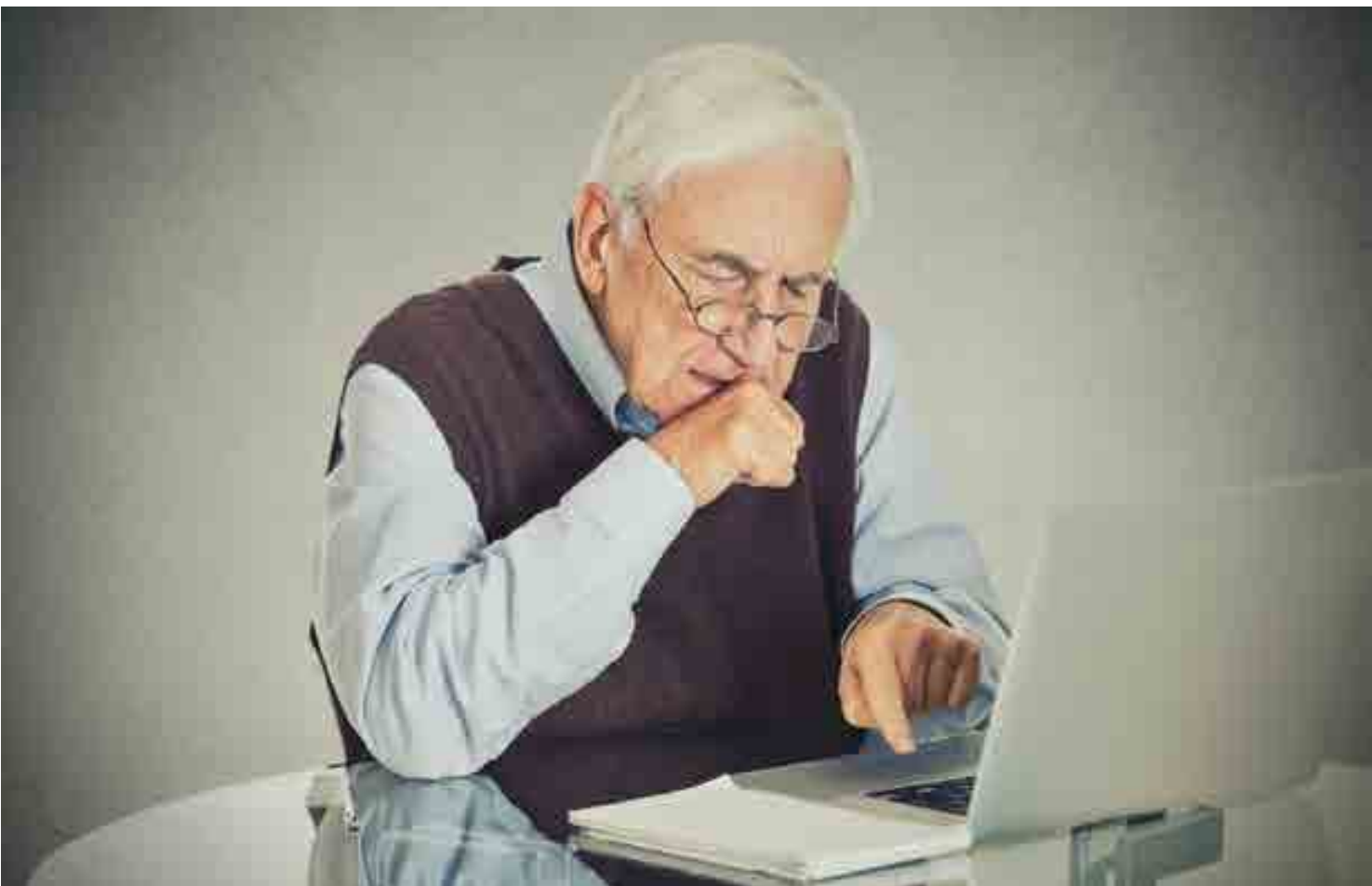
Generally, there is no consensus on which policies may be effective in a scenario where technologies radically disrupt job markets, leading to massive unemployment. The ongoing discourse and small-scale pilot programs are important to prepare societies for future developments.

CONCLUSION

Job creation is a fundamental challenge for Armenia, especially when comparing the historical growth rates of labor productivity and GDP. Armenia’s economic growth rate has not been high enough to prevent employment contraction. Based on labor productivity and per capita income level convergence theory, the scenario that assumes economic inertia does not envision significant new job creation in Armenia. The Accelerated Growth scenario will lead to the level of unemployment falling to a natural level within a decade. Both scenarios anticipate economic structural transformation. The number of jobs is forecasted to decline in the agriculture and mining sectors. More jobs are anticipated in the services, manufacturing, and construction sectors. The Disruptive Growth scenario assumes a situation where technologies radically disrupt the job market, leading to massive unemployment. In the short to mid-term period, the impact of technologies on growth may vary from country to country, but in the long term large-scale convergence seems inevitable. The ongoing discourse and small-scale pilot programs are important to prepare societies for future developments.

CHAPTER 3

FUTURE WORKFORCE AND SKILL REQUIREMENTS



3.1 LABOR FORCE SUPPLY FORECAST

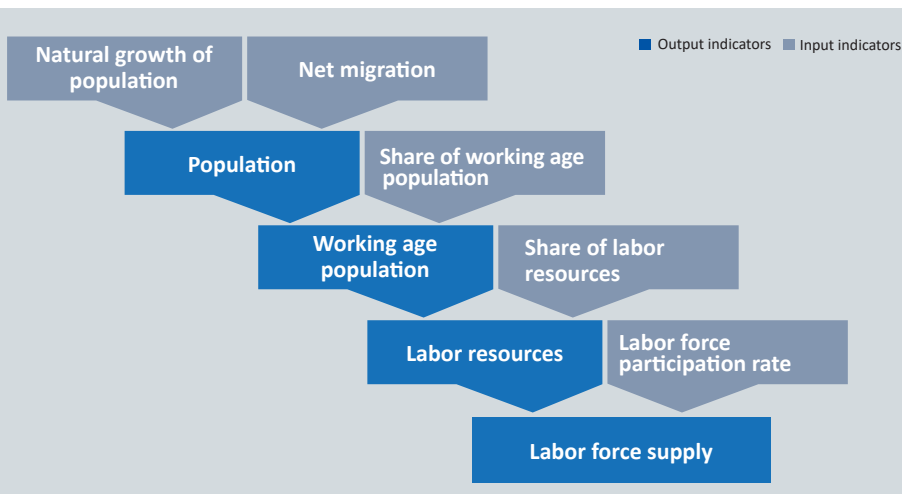
The assumptions of the labor force supply forecast are based on the economic impulses deriving from scenarios of economic development. Since within the forecasted timeframe the natural growth change in population will not affect the labor market (those who are born in 2019 will enter the labor market in at least 16 years), the calculations are based on assessments of the current population, working-age population, employment structure, and migration trends. In general, it has been assumed that a positive feedback loop exists between economic growth and demographics. Rapid and long-term economic growth will lead to positive changes in the demographic dynamics, particularly migration and birth rates, while demographic changes will lead to increased total demand and stronger economic growth. Henceforth, labor supply forecasts will be considered for two given scenarios of economic growth.

The economically active population number is considered as the quantitative indicator of labor force supply. This number is based on the calculated labor resources and on the estimates of the economic activity rate. The qualitative indicators are enrollment and graduation levels at different stages of education.

Table 3-1: Key Assumptions for Labor Force Supply Estimates

Baseline Growth Scenario	Accelerated Growth Scenario
<ul style="list-style-type: none"> – Natural inertia growth of population – Migration balance keeping the trend of 2011-2017 period – The share of people within the working age population who are absent from the household for three or more months, maintaining the historical average rate – The inertial growth of economic activity on par with the rate of 2011-2017 period 	<ul style="list-style-type: none"> – For the forecasted birth rate, the highest fertility rate registered from 2011 to 2017 was applied – Death rate in 2017 – Migration balance at zero – The share of people within the working age population who are absent from the household for three or more months, decreasing by 0.55% per annum – Economic activity rate acceleration by 0.5% annually

Graph 3-1: Logical Framework for Labor Supply Forecast



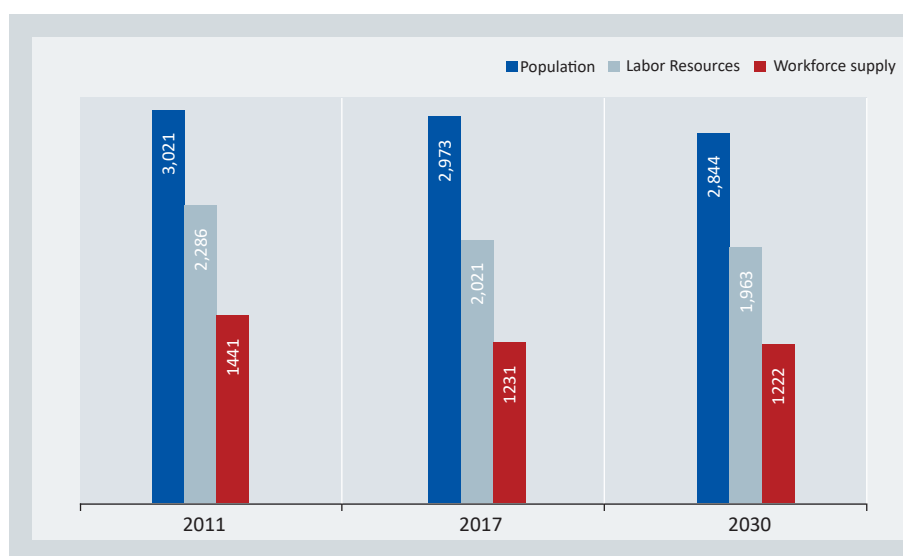
Source: EV Consulting

3.1.1 Estimate of Workforce Supply and Employment in the Baseline Growth Scenario

In 2030, according to the Baseline Growth scenario, the labor force supply will be nearly the same as in 2017.

Since Armenia's declaration of independence in 1991, the population has constantly declined. During 2011-2017, the population decreased by about 49,000, which was primarily driven by the negative migration balance (158,800 people permanently left the country in the mentioned period). In the Baseline Growth scenario, by 2030 the population of the country is estimated to be 2,843,000, decreasing by 4.3% as compared to 2017. The forecast is based on the 2017 birth rate. Mortality and migration balances are calculated at the historic pace of 2011-2017.

Graph 3-2: Forecast of Population, Labor Resources and Workforce Forecast by Baseline Growth Scenario, in Thousands of People



Source: Statistical Committee of the Republic of Armenia, EV Consulting analysis

In 2017, the share of labor resources in the working-age population⁴⁴ was 91%. According to the Baseline Growth scenario, in 2018-2030 the share of labor resources in the working-age population will fluctuate around 92%, growing by 0.2% annually, equal to the historical compounded annual growth rate of 2011-2017. Thus, the number of labor resources in Armenia will amount to 1,963,000 in 2030, which will be 58,000 less than in 2017.

In 2011-2017, Armenia's level of economic activity in the population nearly stayed unchanged, on average at 62%. Although the level of economic activity has shown a slight decline in the observed period,⁴⁵ it is assumed that in the Baseline Growth scenario it will retain its historic average for the whole forecasted period and will rise up to 62.3% by 2030. Thus, in 2030 the labor supply in the economy will amount to 1,222,000 people.

In 2030, the labor force demand is estimated at about 1,031,000 assuming only 1.9% job growth compared with 2017. This means that, for a workforce supply of 1.2

44 Working-age population is considered 15-75 years old population.

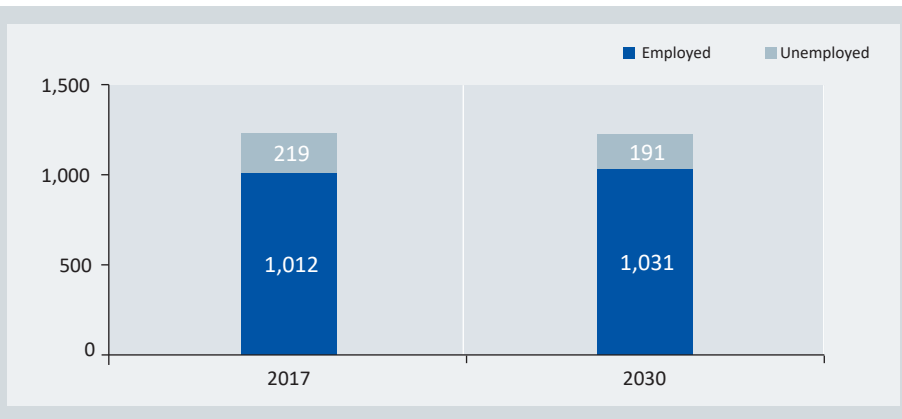
45 The economic activity rate declined by 0.06% annually during 2011-2017.

million, the number of unemployed will be 191,000 in 2030 and the unemployment rate will decrease from 17.8% to 15.7%.

Although a significant increase in jobs is not anticipated in the Baseline Growth scenario, changes in the structure of employment will still be noticeable. When considering historical trends and calculating growth rates of each sector, the largest change—an 8.4 percentage point increase—will be seen in the service sector by 2030. The share of other sectors will decline slightly⁴⁶, particularly in agriculture, construction, and utilities⁴⁷.

In the Baseline Growth scenario, a high level of unemployment will still be prevalent in Armenia.

Graph 3-3: Structure of the Economically Active Population in the Baseline Growth scenario, in Thousands of People



Source: Statistical Committee of the Republic of Armenia, EV Consulting analysis

3.1.2 Estimate of Workforce Supply and Employment in the Accelerated Growth Scenario

In the given Accelerated Growth scenario, it is assumed that substantial positive shifts in the economy will also lead to the improvement of demographic indicators. Estimates of the population’s natural growth forecasts are based on the birth rates of 2014, which were the highest in the observed period, and the mortality rates for each age category were based on 2017 levels.

The key assumption in this scenario is associated with the migration balance, which has the greatest impact on the dynamics of population and labor resources. For the purposes of this scenario, a zero balance of migration and increased job creation were assumed.⁴⁸

According to the Accelerated Growth scenario, the labor force supply will increase by 20% in 2030 compared with 2017.

After taking these assumptions into consideration, it was estimated that in 2030 the population of Armenia would increase to 3,055,000. Moreover, in 2028, it would reach its maximum, after which it would start to decrease,

⁴⁶ More detailed observations about the economic structure using the Baseline Growth scenario are found in Chapter 2.

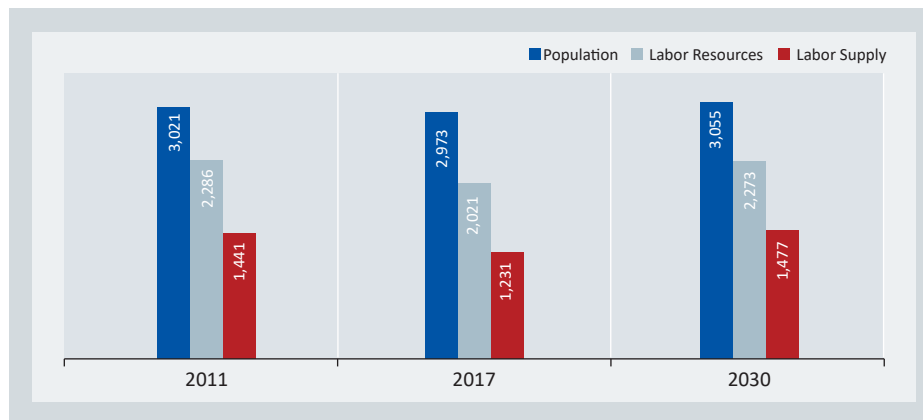
⁴⁷ Utility sector includes electricity, gas, steam and air conditioning supply, water supply, sewerage, waste management and remediation activities.

⁴⁸ Zero migration balance means that the number of emigrants and immigrants per year would be similar.

as deaths would begin to exceed births. This is largely explained by the fact that the number of reproductive-aged women will have declined significantly.

It is also assumed that the number of people living outside the country for three or more months—mainly migrant workers—will decrease by 0.6% annually. The labor resources in 2030 will constitute 97.6% of the working-age population, which is close to the average rate of 2011-2012. On the other hand, the Accelerated Growth scenario assumes a higher level of economic activity than the Baseline Growth scenario. To achieve this, it has been assumed that the level of economic activity will increase 0.5% annually, reaching 65% in 2030.

Graph 3-4: Forecast of Population, Labor Resources and Labor Supply Forecasts in Accelerated Growth Scenario, in Thousands of People

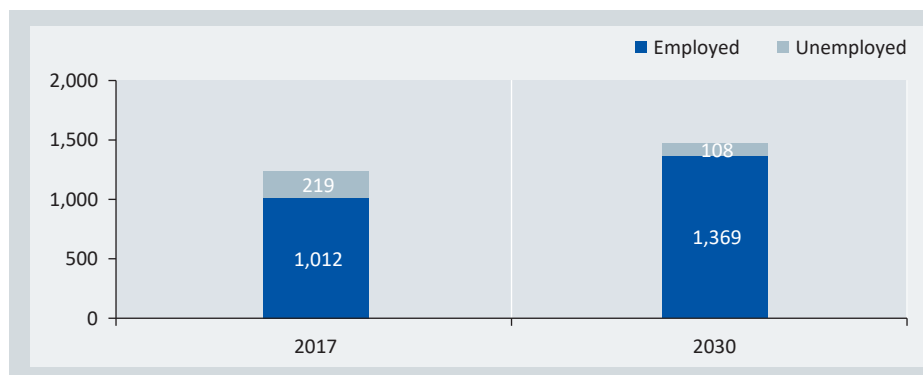


Source: Statistical Committee of the Republic of Armenia, EV Consulting analysis

In the Accelerated Growth scenario, Armenia's unemployment rate in 2030 would be reduced to a natural level.

The higher pace of job creation in the Accelerated Growth scenario will increase the labor supply, and thus the unemployment rate will fall significantly down to 7.3%, bringing it closer to the natural unemployment rate.

Graph 3-5: Structure of the Economically Active Population in the Accelerated Growth Scenario, in Thousands of People



Source: Statistical Committee of the Republic of Armenia, EV Consulting analysis

In this scenario, in parallel with the significant quantitative growth of jobs, significant changes are also expected in the structure of employment in different sectors of the economy.

Accelerated economic growth will notably increase the number of employment in the manufacturing sector compared with the Baseline Growth scenario. The CAGR of the number of employees in this sector during the forecast period will be 4.9%. The high growth of the total economy will nurture the demand for construction where growth will also be noticeable. Significant growth will be recorded in the service sector with a CAGR of 4.2%. However, despite the increase in productivity in agriculture, employment in the sector will decrease.

Although employment in other industries is also expected to increase, their share in total employment will decrease.⁴⁹ Such structural changes will bring Armenia's employment structure closer to the structure of the economies of Eastern Europe.

3.1.3 Assessment of Labor Supply According to Educational Attainment

The integration of Armenia's educational system into the European Education Area is the cornerstone of the reforms and development strategy of professional education in Armenia. The country has been a full member of the Bologna Process and the European Higher Education Area (EHEA) since 2005. In 2019, the new Armenian government reconfirmed the implementation of EHEA directions and principles in the future reforms of professional education.⁵⁰

The competitiveness of the economy highly depends on the quality of the workforce. Thus, countries strive to increase the enrollment rate in professional education. The educational statistics show the increasing trend of enrollment in professional education globally during the past decade with the EU28 leading the race as a region. From this perspective, EU28 countries were considered as a benchmark for the assessment and forecasting of the workforce in terms of educational attainment levels.

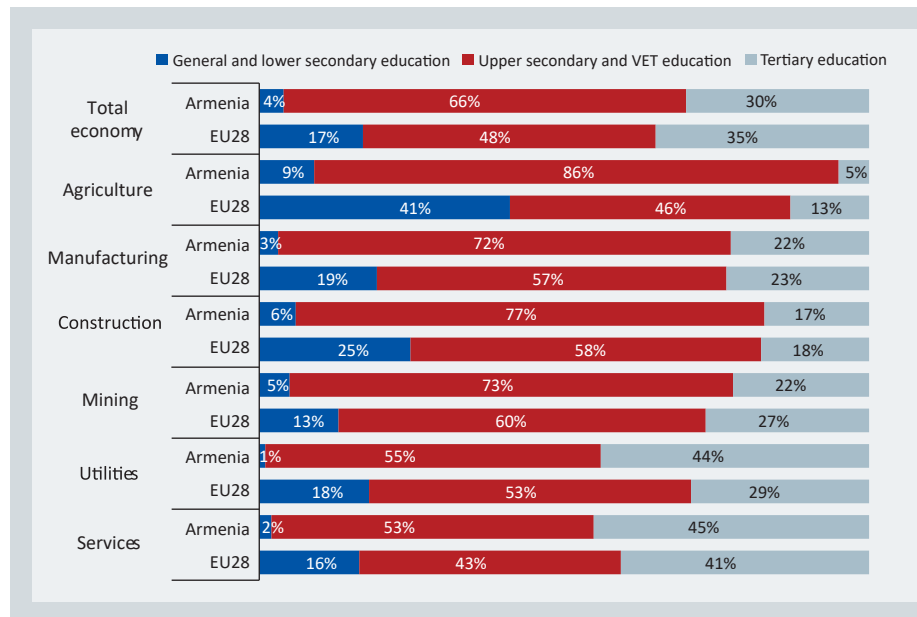
Armenia's major gap is in the share of workforce with a VET education.

The comparison of the workforce structure in Armenia by education level with those of EU28 country averages revealed no significant deviations in the share of workforce with higher education. One in three people has a tertiary education in Armenia, which is comparable to EU28 country levels. Moreover, in some sectors the share of higher education holders is higher than it is in Europe, particularly in utilities and services.

49 More detailed observations about the economic structure in the Inertia Growth scenario are found in Chapter 2.

50 The Program of the Government of the Republic of Armenia, 2019

Graph 3-6: Employment Distribution by Educational Attainment Level by Sector

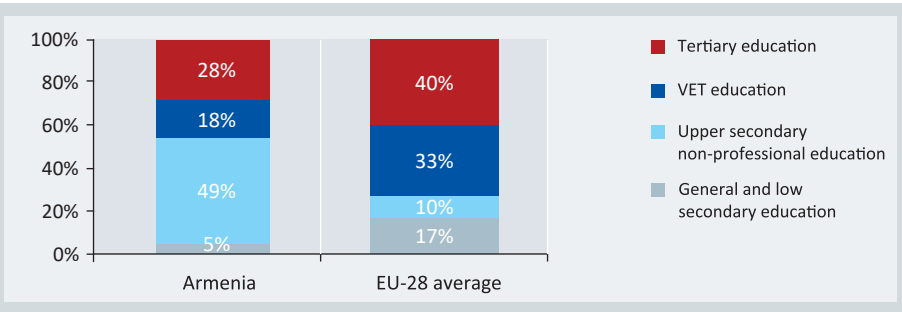


Source: Statistical Committee of the Republic of Armenia, Eurostat, 2017

Note: General and lower secondary education includes “Less than primary, primary, and lower secondary education (levels 0-2)”, “Upper secondary and post-secondary non-tertiary education (levels 3 and 4)”, and Tertiary education - Levels 5-8.

The largest group is the workforce with upper secondary and VET education, but the statistics do not separate between those with upper secondary general education and those with professional education (VET) in EU28 countries. This type of distribution exists only for the 30-34 age group population in the EU28. This age group represents new entrants in the workforce and reveals recent trends in the job market from the supply side. Generally, for this age group the entire educational cycle is closed and they are ready to enter the job market.

Graph 3-7: Educational Attainment Among the 30-34 Age Group in Armenia, 2017



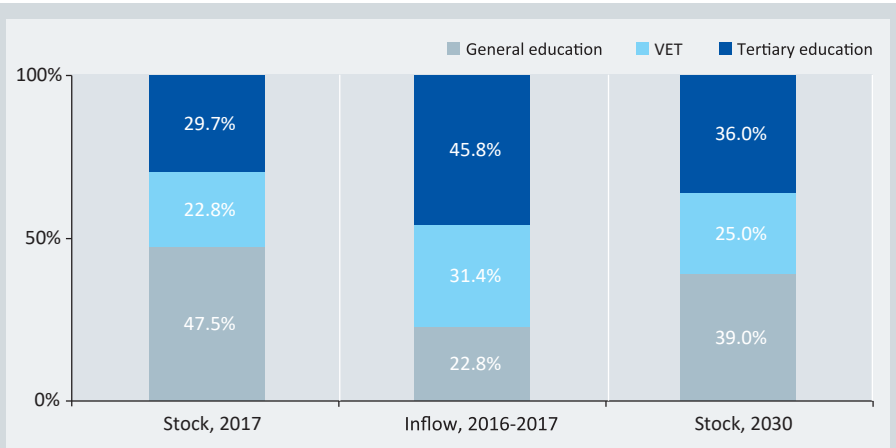
Source: Statistical Committee of the Republic of Armenia, Eurostat, 2017

The major difference between Armenia and the EU28 is the share of population with professional education (VET and tertiary), which is 46% and 73%, respectively. The gap is significantly larger for the population with VET education. It is worth noting that about half of Armenia’s population in the 30-34 age group graduated from high school without any professional education, while this number is only 10% in EU-28 countries. The largest segment of this group is found mainly in rural areas, where students do not receive professional education after graduating high school. This trend is explained by limited accessibility and affordability.

If the educational distribution of new entrants maintains the historical average rates, the overall education level of the labor force will improve by 2030, as the share of the workforce with professional education will increase from 52.5% to 61% taking into account the baseline scenario of the workforce supply.

The new entrants into the labor market will improve the structure of the workforce in terms of educational attainment levels.

Graph 3-8: Distribution Workforce by Education Attainment Level in Armenia



Source: Statistical Committee of the Republic of Armenia, EV Consulting

Note: General education includes graduates of primary, low secondary, and upper secondary general education. It does not include children who did not receive primary and low secondary stages of education, as those statistics are not reliable. The secondary school enrollment in Armenia is about 90% (2016-2017), but that might be the result of emigration. In other words, the share of new market entrants without professional education may actually be higher.

Convergence with the structure of the new workforce by educational level of advanced economies would require Armenia to improve enrollments in higher and VET education.

In general, the competitiveness of the workforce and the economy depends on the quality of workforce. Thus, a higher share of workers with a professional education will mean a higher qualified workforce. The Accelerated Growth scenario assumes that Armenia's distribution of new entrants into the job market by education attainment level will converge with those of EU28 countries in about 10 years. It accounts for an increase in the share of graduates with higher education and professional upper secondary education among the youth.

In the EU28 the enrollment ratio is higher than in Armenia, but the completion rate is lower. Thus, on average, in the EU28 75% of lower secondary graduates continue their education in higher educational institutions, while the completion rate is 70%. Thus, only 53% of lower secondary graduates eventually receive a higher education diploma in EU28. In Armenia, these same rates are 52% and 88%, respectively, resulting in a graduation rate of 46%. In the Accelerated Growth scenario, on average 54% of lower secondary graduates will become certificated professionals with a higher education. The VET-tertiary education ratio was targeted to estimate the number of VET graduates. This ratio in EU28 countries is 0.63 on average,⁵¹ while in Armenia it is only 0.41.⁵² Thus, the average ratio of 0.62 was considered for Armenia for the entire forecast period. These goals can be attained through improvement in following indicators:

- Increasing the enrollment rate in upper secondary education to 73%;
- Keeping the enrollment rate in higher education among upper secondary graduates at its highest level of 2011-2017 period, which is 83%;
- Raising the completion rate in higher education to 90% and retaining the historical completion rate of VET education.

Despite these changes, the distribution of the workforce by educational attainment level in the Accelerated Growth scenario will be similar to that of the Baseline Growth scenario by 2030, as it assumes that the number of people exiting the current workforce will be lower compared with the Baseline Scenario due to reduced migration. As a result, the labor supply will be 20% higher in the Accelerated Growth scenario in 2030. Thus, changes in the labor supply structure stimulated by new entrants will have a lower impact on the total workforce structure, as their share in the total workforce will be smaller compared with the Baseline Scenario.

By 2030, only 27% of the workforce will be composed of new entrants, while the largest segment will be those who have already completed the formal educational cycle. In order to match the requirements of the constantly changing job market, Armenia needs to have a dedicated national program for upskilling and reskilling the current workforce while also implementing reforms in the educational system. In both the Baseline and Accelerated Growth scenarios, a big shift of the workforce from the agriculture sector to the services sector is expected, which means that thousands of employees are to be reskilled and upskilled in order to meet the job requirements.

51 Eurostat Online Database, Graduates by education level, <https://ec.europa.eu/eurostat/web/lfs/data/database>

52 Statistical Committee of the Republic of Armenia.

3.2 EMERGING TRENDS IN EMPLOYMENT REQUIREMENTS AND NEEDS

Employment requirements and needs are changing with an unprecedented pace along with the structural transformations undergone globally. Under the influence of disruptive technologies as well as economic, demographic, and political drivers of change, job markets in the nearest future can be transformed in ways unseen in human history. These transformations may open potential for new opportunities, improved quality of life, and better jobs and living conditions. On the downside, there is a high risk of unemployment, skillset gaps, broader polarization, and inequality.

To gauge the pulse of job markets, obtain insight on emerging needs, and compare local with global trends, we conducted an enterprise survey in Armenia congruent with the sampling and methodology used by the WEF in their recent study on the future of jobs.⁵³ The survey focuses on three main themes: strategic development plans of the companies, technological transformations, and skillset requirements of the workforce. It aims to shed light on the understanding and intentions of companies that shape workforce demands across different industry sectors. Special attention is paid to technological breakthroughs in understanding their potential for creating and disrupting jobs.

The results were compared with global trends and insights provided in the WEF report “The Future of Jobs 2018”. The comparisons allow us to understand the trend differences and similarities between Armenia and the world.

The participating companies representing almost all sectors of the economy foresee revenue growth looking five years ahead. The picture is slightly different in terms of job creation perspectives. Comparatively, fewer companies are confident that they will see employment increases and growing revenue perspectives during the forthcoming five-year period.

Companies are more confident about the growth of revenues than the creation of new jobs looking five years ahead.

⁵³ The future of jobs survey was conducted with leaders in different sectors in Armenia who are top executives or chief financial, innovation, or strategic officers. In total, 86 companies in Armenia participated in the survey. The survey covers all major sectors based on NACE letter level classification.

INSERT 3.1: FORESIGHT ON FUTURE EMPLOYMENT IN SELECTED BUSINESS SECTORS⁵⁴

Automation and disruptive technologies integration in businesses are transforming employment in all sectors through job destruction and creation, new occupations, and employment shifts across sectors.

Disruptive technologies, automation, and digitization are going to drastically change employment in Armenia as well. Occupations and job types are already undergoing transformations in financial and insurance services, manufacturing, and tourism sectors. New skills are anticipated to organize and manage the automation processes required in all other sectors.

Information and communications

Automation and disruptive technologies integration in businesses are expected to have significant impact on companies operating in the IT sector. While those companies are the main implementers of automation and technological integration for other sectors, some operational tasks in IT are expected to be performed by machines and algorithms rather than employees in five to 10 years. Among those tasks are identifying and evaluating job-relevant information, 60% of which will be implemented by machines in five to 10 years, information and data processing (60%), and coordinating, developing, and managing (50%).

A wide scope of automation and technological integration exists in all sectors of Armenia as IT industry companies evaluate. As revealed in focus group discussions, IT sector companies see themselves as main implementers of those automations and technological integration and are ready to meet the challenges and work towards the overall technological transformation of the country.

Manufacturing and food processing

Manufacturing and food processing sectors are undergoing rapid automation in Armenia. Many of the production processes are subject to automation and, consequently, employment reduction is anticipated in this sector. Focus group representatives claim that employment reduction will help to increase the efficiency of their value creation and give opportunity to increase salaries in the sector by up to 20%. However, labor resources are not well distributed and utilized in Armenia's manufacturing sector, particularly in high seasons.

New demanded roles are emerging in Armenia's food processing sector, such as production line operators, mechanical controllers, and engineers. Companies face difficulties in filling those positions due to lack of experience and required skills. Most of the time international experts are engaged to monitor production and fill the open positions.

Tourism

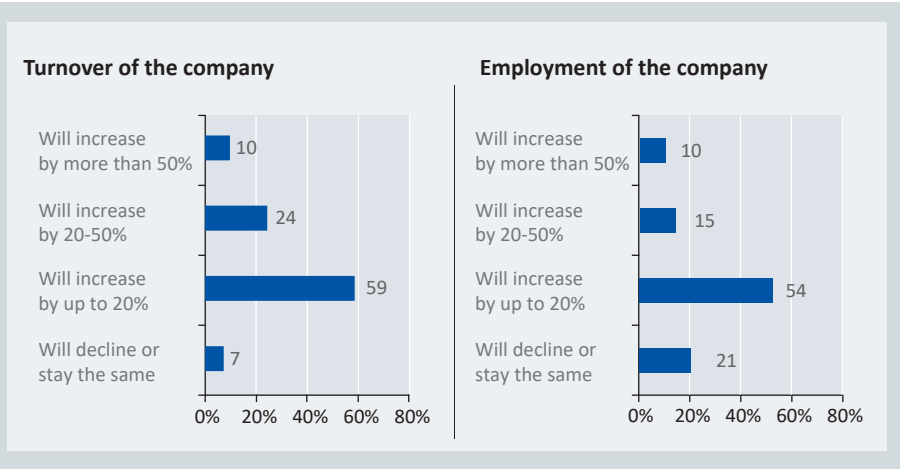
International trends in the tourism sector indicate that the number of reservation agents, receptionists, and tour agents are going to decline in the sector worldwide. Armenia is following the international trends. Nowadays, more international tourists visiting Armenia are planning their travels without tour agencies to help them.

Financial sector

Roles and occupations are undergoing transformations in the financial sector as well. The headcount of front-desk workers, such as tellers, are expected to be reduced significantly during the upcoming years—they represent about 40% of total banking sector employment. Overall, 10-15% of employment reduction is expected in the banking system mainly driven by the reduction of customer service roles. On the other hand, employment in the insurance and non-banking financial sectors is not expected to change significantly as new products and services requiring new skillsets are being introduced continuously. The number of created jobs is expected to balance the destruction of jobs in the upcoming 10 years in this segment of financial markets.

54 Insights are obtained from the focus group discussions with the executives of the companies and sector experts.

Graph 3-9: Projections on Turnover and Employment in Armenia Looking 5 Years Ahead



Source: EV Consulting, *The Future of Jobs Survey in Armenia*

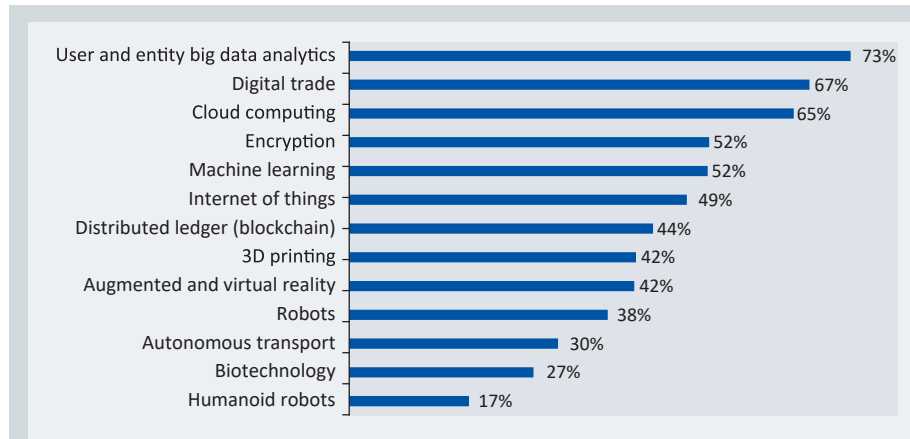
About 60% of the surveyed companies project an increase in turnover by up to 20% during the next five years. Approximately 21% of the respondents believe that the number of employees in their companies will decrease or remain the same during that same period. Whereas 34% of the respondents foresee an increase in employee turnover of more than 20% by 2024, only 25% of the respondents forecast an employment increase of more than 20% in the next five years.

Trends identified in Armenia as a result of the enterprise survey are in line with global trends. High-speed mobile Internet, artificial intelligence, adoption of big data analytics, and cloud technology remain among the top factors positively affecting the growth of businesses both globally and in Armenia. However, factors negatively affecting business growth are increasing protectionism, cyber threats, shifts in government policies, and the effects of climate change.

Armenian businesses perceive the technological trends as being in line with international business but remain uncertain as to how to fully exploit the opportunities.

Big data analytics, cloud computing, and digital trade are trending globally, and companies in Armenia value the importance of those technologies and see their adoption within their business strategies in the future.

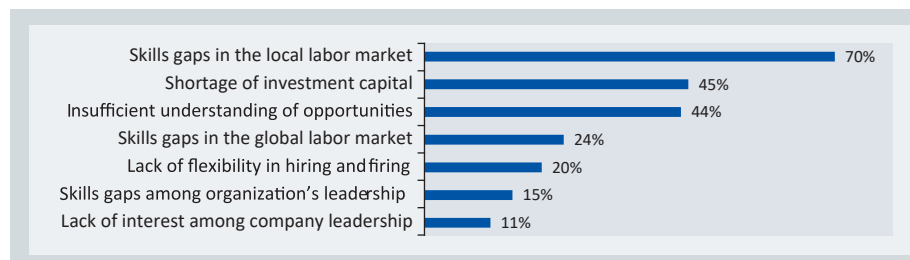
Graph 3-10. Technologies by Proportion of Armenian Companies Likely to be Adopted by 2024



Source: EV Consulting, *The Future of Jobs Survey in Armenia*

By 2024, according to the strategic plans of companies in Armenia, 73% of respondents are likely or very likely to introduce some type of big data analytics in their company. Similarly, a large proportion of companies—more than 50%—are very likely or likely to adopt digital trade, cloud computing, encryption, and machine learning technologies in the upcoming five years. Humanoid robots, biotechnology, and autonomous transport are less expected to be adopted by 2024.

Graph 3-11: Projected Barriers to Introducing New Technologies in Armenia, by %



Source: EV Consulting, *The Future of Jobs Survey in Armenia*

In order to turn the technological and labor market transformation into new opportunities, and harness all the potential of growth and development, companies should formulate a comprehensive workforce development strategy to meet the changing requirements of the labor market and always be ready to adjust and transform the strategy accordingly.

Introducing new technologies is full of challenges and barriers for management. Skillset gaps are one of the major difficulties organizations face while introducing new technologies as 70% of respondents said.

All those transformations of the markets and the Fourth Industrial Revolution raise uncertainty in the world regarding future skills, jobs, and opportunities. Consequently, about 44% of companies mentioned that insufficient understanding of opportunities is challenging while introducing new technologies to the firms. This factor needs special attention as the future becomes less predictable and the environment more complex. Equipping leaders with timely insights, analytics, and exposure to new technologies so that they better understand new opportunities can be strong leverage points for transformation. A shortage of investment capital and skills gaps in the global labor market are among the barriers.

The survey respondents mentioned the need for internal and external support in managing the transition and technological as well as skills transformations.

Professional services firms, international educational institutions, and specialized internal departments are considered top sources of support. Only 45% of the respondents are likely to look for help at local educational institutions in managing the transition, which is a relatively low percentage compared to all other sources of help. The education system requires fundamental reforms to be able to provide all the required upskilling, reskilling, and educational programs expected by the labor market during the transitional period of the Fourth Industrial Revolution.

New roles and occupations are emerging in the global market, while some are becoming redundant and will disappear.

New jobs and professions are emerging, transforming the current ones or totally replacing them as a result of the technological revolution, socioeconomic conditions, demographic and environmental changes, and geopolitical factors. Some occupations and roles are projected to become redundant and will disappear during the upcoming five to ten years.

More than half of today’s core jobs and roles are going to remain stable while emerging roles across all industries are projected to increase its share in employment from 16% to 27% globally as reported by the WEF. The global future of jobs survey revealed about 0.98 million cut jobs and 1.74 million created jobs in large firms by 2022.

The future of jobs survey in Armenia revealed the trends and expected transformations regarding the key roles in the companies in Armenia. Some stable roles will be important in six to seven years, while others are expected to become redundant.

Survey respondents mentioned financial and investment advisors, software and application developers and analysts, and sales and marketing professionals as being key roles that will remain stable in the future. The mentioned emerging roles include data analysts, software and application developers, and advertising and public relations specialists. Projected redundant roles include data entry clerks, bookkeeping and payroll clerks, accountants, and auditors, which perform mainly repetitive and automatable tasks.

Table 3-2: Stable, New, and Redundant Roles in Armenia by 2024, All Industries

Stable Roles	New Roles	Redundant Roles
Financial and Investment Advisors	Data Analysts	Data Entry Clerks
Software and Application Developers and Analysts	Software and Application Developers and Analysts	Accounting, Bookkeeping, and Payroll Clerks
Sales and Marketing Professionals	Advertising and Public Relations	Accountants and Auditors
Financial Analysts	Robotics Engineers	Drivers
Advertising and Public Relations	Telecommunications and Broadcasting Technicians	Architects and Surveyors
Business Services and Administration Managers	Sales and Marketing Professionals	Civil Engineers
Managing Directors and Chief Executives	Database and Network Professionals	
Industrial and Production Engineers		

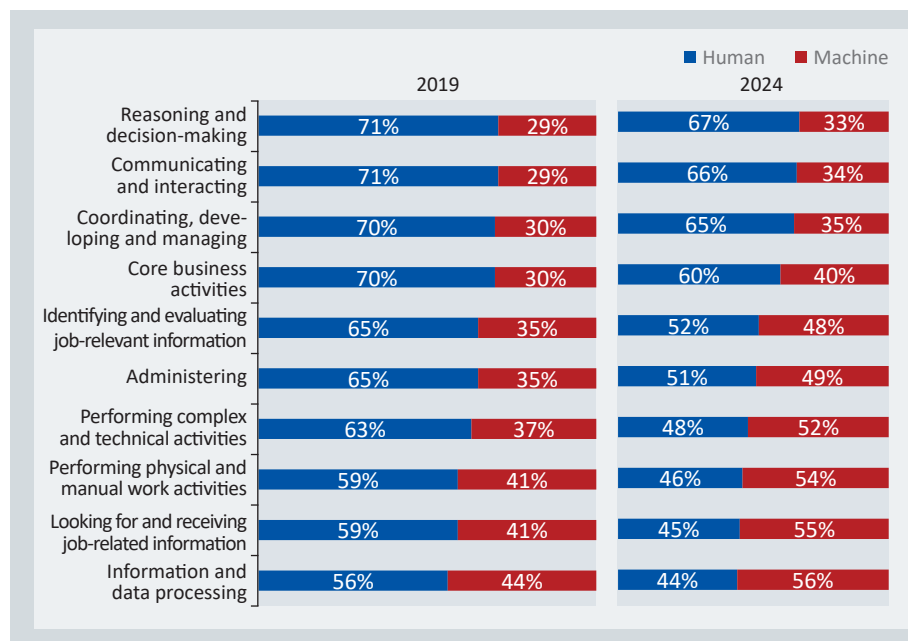
Source: EV Consulting, The Future of Jobs Survey in Armenia

The trends in Armenia coincide with global trends. “The Future of Jobs 2018” report prepared by the WEF shows the roles of data analysts and scientists, software and application developers, e-commerce and social media specialists as being emerging roles. Data entry clerks, accounting and payroll clerks, administrative secretaries, auditors, and bank tellers are forecasted to decline in the future. Stable roles include managing directors and chief executives, general and operations managers, and software and application developers and analysts.

Armenian companies project that, on average, 45% of tasks can be performed using machines by 2024.

Even the tasks that are considered to be inherently human—communication and interaction, coordination, management and advising, and reasoning and decision-making are expected to be partially, automated in near future.

Graph 3-12: Ratio of Human-machine Working Hours Assessment by Armenian Businesses



Source: EV Consulting, The Future of Jobs Survey in Armenia

Disruptive technologies and outsourcing of tasks will be key reasons for jobs and roles to become redundant.

Automation is considered one of the drivers of change resulting in job destruction and the increase in the machine-to-human work hour ratio in the world. Changes in employment types are expected globally. About 50% of companies surveyed indicate that they expect a reduction of full-time workers by 2024 as a result of automation. However, automation is also projected to create new jobs in enterprises.

To integrate technologies into business processes, companies require work deconstruction into discrete elements to understand the potential of automation and technological usage in each of them and find optimal solutions. The transition process will be different from industry to industry due to conditions and relevant technologies. Consequently, emerging and declining jobs may differ according to the sector or industry.

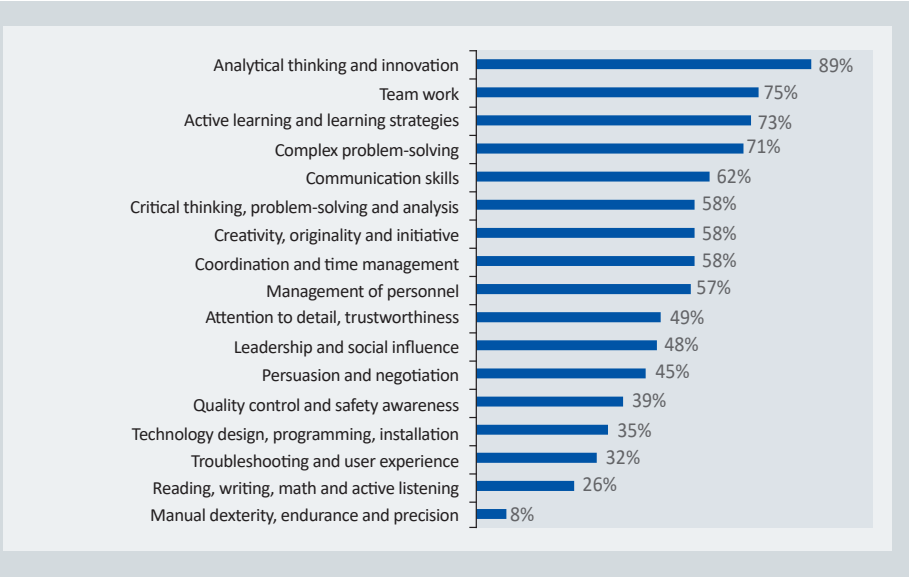
Jobs are becoming redundant as a result of various factors connected to advancements

in AI, automation, and outsourcing. Companies aim to increase their efficiency and productivity, and thus they search for optimized coordination and implementation of tasks. About 40% of the survey respondents consider that certain roles can be partially performed by machines and robots. About 38% of respondents believe that it is more efficient to outsource some of the operational roles to third parties. Although companies think that automation and disruptive technologies will drastically change the roles and tasks currently performed internally, only 15% in Armenia think that some roles can be fully performed by AI, robots, or other technologies.

Different skills will be required to accomplish core roles in the future.

Workforce requirements and skills demands are changing in the labor market globally. Employees require reskilling and upskilling to match employment requirements. About 66% of the survey respondents stated that coordinating, managing, decision-making and advising, and information and data processing are among the core tasks to be accomplished by key roles. More than 70% of respondents consider analytical thinking and innovation, teamwork, active learning, strategic thinking, and complex problem solving to be the key skills required to accomplish core tasks.

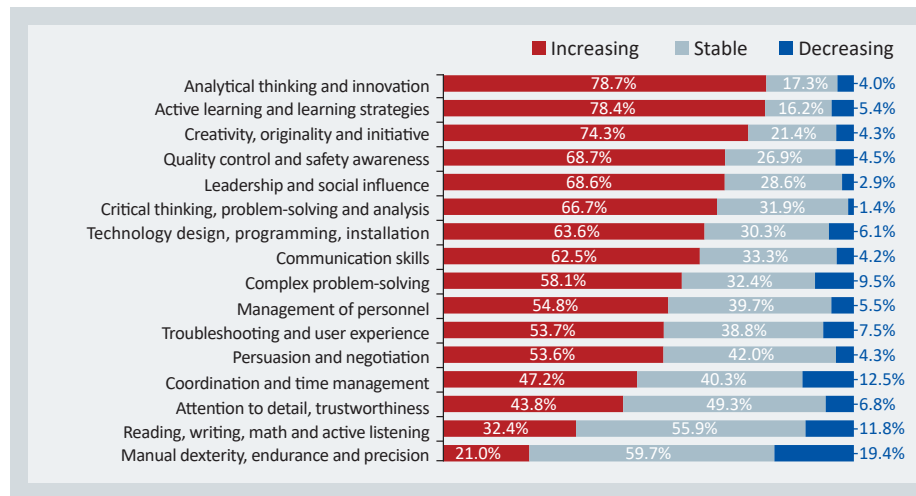
Graph 3-13: Core Skills Needed for Employees in Key Roles in Armenia, %



Source: EV Consulting, *The Future of Jobs Survey in Armenia*

In Armenia there is an increasing demand for soft skills such as innovative and creative thinking, active learning, originality, leadership and social influence, critical thinking, and problem solving skills. Coordination and time management as well as manual dexterity, endurance and precision, reading, writing, and active listening skills are the top skills projected to decrease by 2024.

Graph 3-14: Changes in the Demand of Core Skills in Key Roles in Armenia by 2024, %



Source: EV Consulting, *The Future of Jobs Survey in Armenia*

Globally about 58% of the skills required to accomplish core tasks are considered stable skills, as reported in the WEF’s “The Future of Jobs”. The remaining 42% of the core skills are undergoing shifts and are expected to change in the near future.

INSERT 3.2: FORESIGHT ON FUTURE SKILL REQUIREMENTS IN SELECTED BUSINESS SECTORS

Armenia's education system needs to be upgraded to handle all required skillsets and qualifications of the labor market.

All sector representatives and focus group discussion participants state that graduates of higher education institutions do not have the appropriate skillsets to enter the labor market. Respondents mentioned the low quality of higher education, lack of relevant skills, and absence of soft skills and practical knowledge among graduates.

The VET education system in Armenia is underdeveloped and largely fails to equip Armenians with demanded skills, although the potential demand for employees with skills and knowledge requiring VET is quite high, particularly in tourism and manufacturing sectors. Information and communication as well as financial and insurance sector representatives state that some roles can be performed by VET graduates, but as a result of a lack of supply, those jobs are mostly filled by graduates of higher education institutions.

Companies are seeking employees with well-enhanced soft skills—such as communication, negotiation, strategic learning, and creativity and innovation—that can quickly and efficiently build professional skills and participate in value creation for the company. Apart from soft skills, the workforce should also have a high level of knowledge in fundamental and meta skills such as mathematics, languages, and basic science. Companies state that Armenian higher education institutions largely fail to provide the required skillsets, and the curricula are more theoretic and non-practical.

Technology is evolving very fast, and jobs and professions are changing rapidly. Company executives point out that educational programs in Armenia are too long and cannot provide the flexibility and high level of adoption to catch up with the changes in demand. Even in the IT sector, companies are unable to predict the demanded specializations and skills for the upcoming years. Thus, universities should always research and closely communicate with the industry to understand the latest trends and demands and make the appropriate changes in their curricula. Long, bureaucratic processes of introducing new educational programs as well as lengthy educational cycles may result in the irrelevancy of those programs, as the demand and employment requirements are changing much faster than the education system is able to react.

Employees will need reskilling and upskilling to be able to adapt to labor market transformations unfolding globally.

Companies will also need to change their organizational strategies to stay competitive. Both employees and employers should value workforce trainings and reskilling as crucial factors for their strategic capacity. Graph 3-15 represents the portion of employees in the surveyed companies that reskilled during the past 12 months prior to the survey and the portion of employees that require reskilling in Armenia.

Graph 3-15: Portions of Employees Being Reskilled and Requiring Re-skilling in Armenia, %



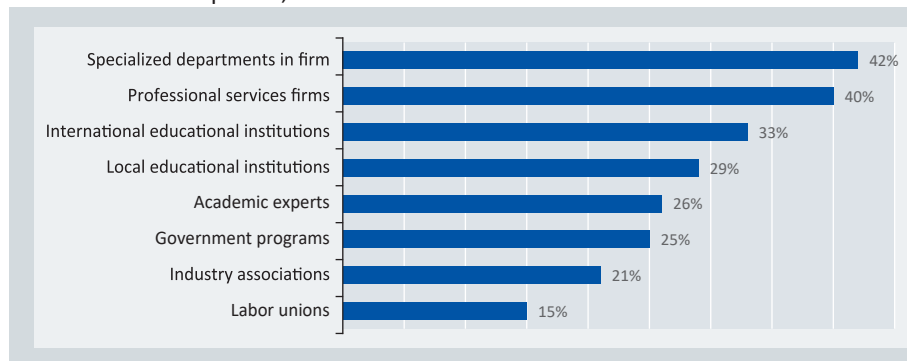
Source: EV Consulting, *The Future of Jobs Survey in Armenia*

The share of companies that plan to put effort into reskilling their employees is expected to rise compared with the current practice. Only 34% of companies in Armenia have reskilled more than 30% of their employees during the past 12 months prior to the survey. Currently more than 90% of organizations surveyed think that at least 30% of their workers will require reskilling in the future.

Companies are more likely to rely on internal departments or other professional service providers rather than local educational institutions to reskill their employees.

Companies are willing to take the necessary actions to handle the shifting skills requirements of the labor market. On average, four out of five companies prefer retraining their existing employees, and two out of three companies are ready to outsource some business functions to external contractors or automate them in Armenia. Only 41% of the surveyed companies consider the strategic reduction of staff lacking required skillsets as a likely option.

Graph 3-16: Institutions That Are Being Considered for Reskilling Trainings by Companies, %



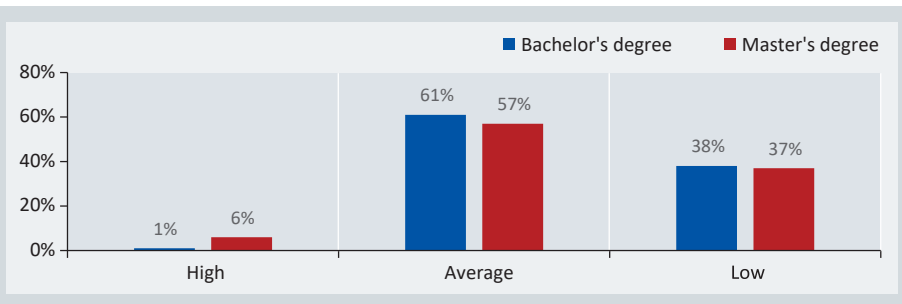
Source: EV Consulting, *The Future of Jobs Survey in Armenia*

The survey respondents stated they are more likely to develop in-house capacities or engage professional service providers to carry out reskilling of employees. The trends in Armenia are in line with global ones indicating the decreasing trust in traditional educational institutions to provide skills and competencies of the future.

Obtaining higher education is still considered important for the future workforce. But the requirements and expectations from them by businesses are changing rapidly. More than 80% of respondents favor the idea that higher education is crucial for the job market, although the learned skills may no longer be practical. The respondents evaluate the quality of education in Armenia as being average or low for both Bachelor's and Master's degree students.

Most of the surveyed companies perceive higher education in Armenia to be low in quality.

Graph 3-17: Perception About the Quality of Higher Education in Armenia, % of Respondents

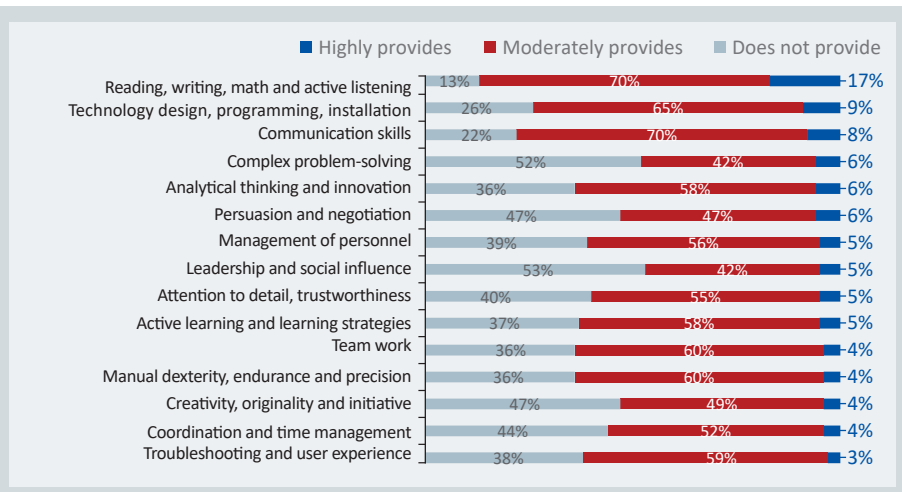


Source: EV Consulting, The Future of Jobs Survey in Armenia

The respondents cite students' lack of practical skills and ill-preparedness for the labor market upon graduation. Fundamental skills required for entering the labor market are provided moderately or not at all. Soft skills such as communication skills, creativity and innovativeness, teamwork, leadership, and social influence are assessed as the top skills that universities fail to provide to students.

Business administration, strategic management, marketing, and computer and information science are among the top demanded programs for employers.

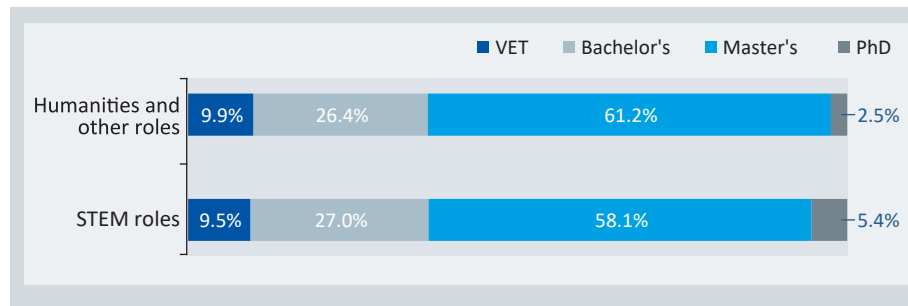
Graph 3-18: Types of Skills that Armenian Universities Provide, %



Source: EV Consulting, The Future of Jobs Survey in Armenia

Most of the companies surveyed want to recruit graduates from business administration Master’s degree programs, followed by strategic management, marketing, computer and information science, and economics. From PhD programs, respondents prefer computer and information science, data science, and quantitative finance. The least preferred programs (both Master’s and PhD) are linguistics, psychology, and environmental science.

Graph 3-19: Education Levels Required for STEM and Non-STEM Key Roles in Companies, %



Source: EV Consulting, *The Future of Jobs Survey in Armenia*

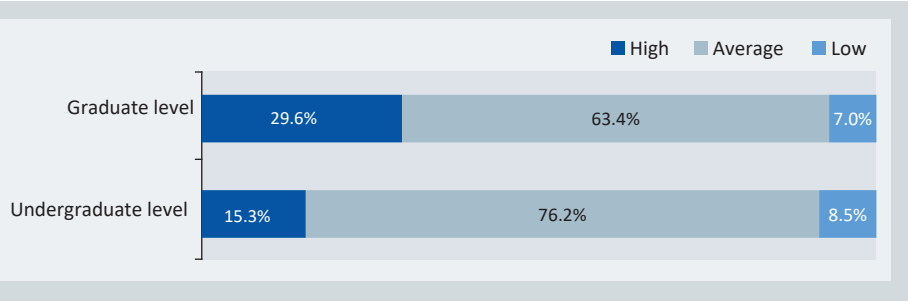
Sixty percent of the surveyed companies believe that—along with all the transformations and key role changes needed in five years’ time—their employees will require a higher education, particularly a Master’s degree, to perform key roles and tasks. About 27% of the surveyed companies think that Bachelor’s level graduates will be able to perform key roles in 2024. The distribution of the education level requirements of STEM and non-STEM graduates for performing key roles are quite similar. However, employees with PhDs are believed to be more suitable for some STEM dimensions and roles.

3.3 STUDENT PERCEPTIONS ABOUT LABOR MARKET REQUIREMENTS AND NEEDED SKILLS

In order to understand how students perceive labor market transformations and signals from employers regarding occupations, skills, and qualifications being demanded, a survey was conducted with students of higher education institutions. About 630 third-year and fourth-year undergraduate degree students were interviewed.⁵⁵

More than half of the surveyed students consider the quality of undergraduate-level education in Armenia as average, while two-thirds of them feel the same about graduate-level education.

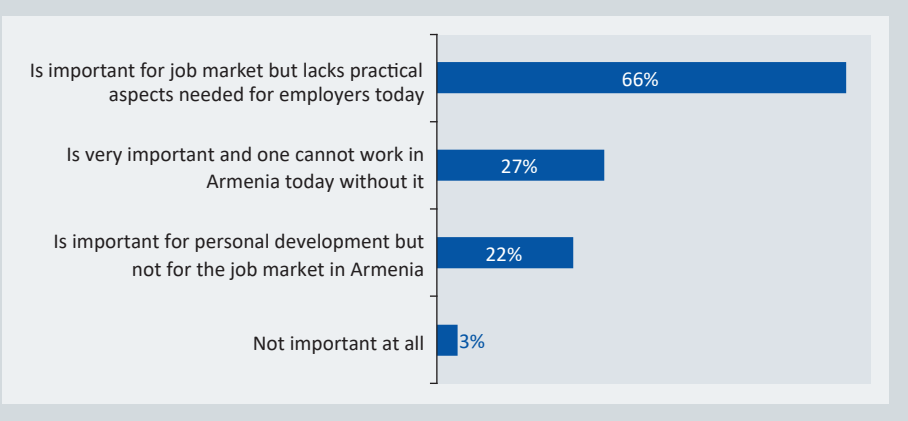
Graph 3-20: Perception of Overall Quality of Higher Education in Armenia



Source: EV Consulting, Student Survey in Armenia

The main reasons for student dissatisfaction with higher educational institutions are obsolete curricula, infrastructure, demotivating environments, and quality of academic staff. About two-thirds of the surveyed students believe that while higher education is important for the job market it fails to provide the practical skills required by the job market.

Graph 3-21: Perception on the Need and Importance of Higher Education in Armenia



Source: EV Consulting, Student Survey in Armenia

Students also prioritize the importance of soft and analytical skills. About two-

⁵⁵ The sample distribution was based on the distribution of higher educational institutions in Armenia.

thirds of the surveyed students consider analytical thinking and innovation as the most important skills for employment in Armenia. They perceive communication, creativity, originality, and initiative as being the top required skills for employment in Armenia.

Graph 3-22: Most Important Skills and Competencies Required for Employment in Armenia According to Students

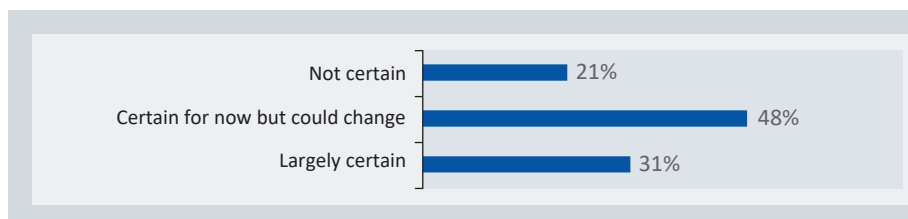


Source: EV Consulting, Student Survey in Armenia

Employers and students have the same perceptions regarding the quality as well as content delivery in higher educational institutions, which confirms the need for upgrading and transforming the educational system to meet the requirements of the job market.

Choosing the right career and professional educational program is an important step for students to consider when examining the rapidly changing job market and employment requirements worldwide. Parents have a significant influence on career choice as 33 percent of the surveyed students revealed. Thus, awareness raising campaigns are required not only for students and also for their parents regarding the changing labor market trends, industry insights, and available specializations. Business and economics as well as STEM disciplines remain popular career options in Armenia for 36% and 24% of surveyed students respectively.

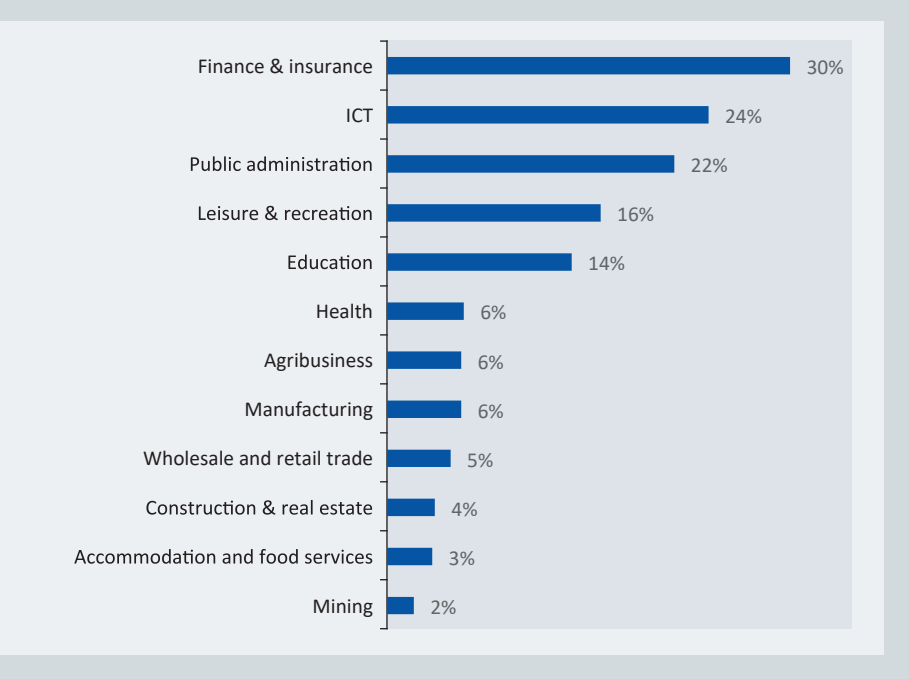
Graph 3-23: How Certain Students Regard Their Chosen Specialization for Graduate Studies



Source: EV Consulting, Student Survey in Armenia

The choice of specialization is not so easy for students. Large share of them are not strongly certain on their choice and consider an option to change it later on if required.

Graph 3-24: Preferred Industries for Career Opportunities by Surveyed Students



Source: EV Consulting, Student Survey in Armenia

Finance and insurance (30%), ICT (24%), and public administration (22%) are top preferred industries for starting a career as the student survey revealed. About 78% of the survey respondents cited personal interests as the main reason for their choice, while 41% cited high-paid salaries.

In 2016, EV Consulting conducted a survey of high school students to determine how they intended to further their education. Only less than 20% equate a higher education with being able to find a good job and earn large amounts of money. Among the surveyed high school students less than 40 percent were well aware of career opportunities within their preferred field of study and specialization.

Graph 3-25: High School Students' Awareness on Career Opportunities in their Preferred Field of Study, %



Source: EV Consulting, High School Student Survey in Armenia, 2016

The both survey results showed that there is a disconnect between what students think they need for professional career development and what is actually expected from them. Most students are not well informed about job opportunities, employment requirements, and transformational trends in Armenia.

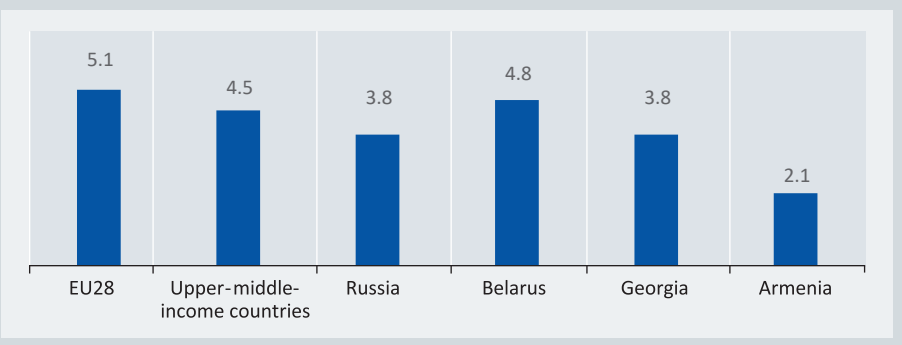
3.4 EDUCATION: ONE OF THE KEY DRIVERS OF ECONOMIC GROWTH

From the perspective of labor force, education can be viewed as the stock of skills, competencies, and other productivity-enhancing characteristics embedded in labor.⁵⁶ The WEF (GCR 2016) identified three ways in which education affects a country's productivity. First, education increases the collective ability of the workforce to carry out tasks more quickly. Second, secondary and tertiary education facilitate the transfer of knowledge about new information, products, and technologies created by others. Third, by increasing creativity, education boosts a country's own capacity to create new knowledge, products, and technologies. Education concerns not only the quantity of schooling—the percentage of the population that completed primary, secondary, or tertiary education—but also the quality. Hanushek and Kimko, for example, find that the quality of schooling (which may be reflected in international examinations) has a significant relationship with economic growth.⁵⁷

Education output largely depends on the inputs (investment in education) and efficiency of the learning ecosystem. Financing for education comes from three main sources: state budget, employers, and individual stakeholders.

Armenia is investing less public money into education: the share of government expenditure in GDP is less than half of the EU28 and upper-middle-income countries. Despite an 11.8% increase in public education expenditure in 2019 Armenia still underperforms its regional peers and comparator countries.

Graph 3-26: Government Expenditure on Education, total (% of GDP), 2010-2015 and Armenia, 2018



Source: WDI line database, *State Budget of Armenia 2018*, Statistical Committee of Armenia.

Though there are no statistics on business investment in education and training, Armenia's low ranking in the "Extent of Staff Training" indicator⁵⁸ of the GCI indicates the private sector's low investment in the development of their employees.

In Armenia, all children are entitled to a free general education. However, professional education is not free. Armenia allocates only 10 percent of government expenditures in education to tertiary education, while EU28 and upper-middle-income countries allocate more than 20 percent. In 2018 only 14.3 percent of enrolled students received free professional education (government financed education) at Armenian

56 Acemoglu, D., 2009, "Introduction to Modern Economic Growth", Princeton, NJ: Princeton University Press

57 Hanushek, E. and D. D. Kimko, 2000, "Schooling, Labor-Force Quality, and the Growth of Nations". *The American Economic Review* 90 (5): 1184–208

58 This indicator shows the extent the companies invest in training and employee development.

universities. The annual tuition fees in major universities ranges from 500 USD to 5,000 USD, depending on the institution and specialization. Many Armenian youth, especially from rural areas, cannot afford the costs of tuition due to socioeconomic challenges. According to one study, one out of four young Armenians cannot continue their education due to lack of finances.⁵⁹ Furthermore, most post-secondary educational institutions rely on revenues generated from tuition fees, which cannot cover all the costs of operations and program development.

Underinvestment in education significantly affects the quality of education at all levels. Teachers play a central role in the delivery of high quality education. Low remuneration makes the education sector an unattractive career choice and challenges educational institutions to attract and retain highly qualified specialists. The average monthly salary in the education sector—about 115,377 AMD—is low compared with salaries earned in other sectors of economy. In comparison, the average monthly salary in education sector is only 64% of the countrywide average monthly salary in Armenia or four times less than the average salary in finance and insurance sector⁶⁰. Limited budgets also prevent educational institutions from modernizing learning and research infrastructures. The comparison of budgets (per enrolled student) of American University of Armenia (AUA) and Yerevan State University makes the financing gap evident. AUA is taken as a benchmark in terms of proper funding (due to the fact that it gets most of funding private sources) and offering competitive salaries to faculty. Yerevan State University is the largest public university in terms of students and funding. The per-student budget⁶¹ of AUA is 5,400 USD compared with 1,200 USD of Yerevan State University⁶². This big difference is an indicator of underfinancing of public universities in Armenia.

Greater investment in Armenia's education sector is crucial to ensure the inclusiveness and raise the quality of education.

59 A. Mkrtichyan, H. Vermishyan and S. Balasanyan, 2016, "Independence Generation Youth Study 2016 – Armenia", Friedrich-Ebert-Stiftung

60 "Socio- Economic Situation of RA, January-May 2019", Statistical Committee of the RA

61 The annual budget divided to number of enrolled students.

62 Planned budget of YSU for 2018 and Report on the AUA Foundation Operation in 2018, <https://www.azdarar.am/announcements/org/131/00505259/>, "http://www.ysu.am"

CONCLUSION

Supply side quantitative and qualitative research of the workforce revealed significant gaps between the skillsets of graduates and employer demands in the labor market. Higher quality education and advanced teaching techniques and methodologies are required to eliminate the lack of practical skills and ill-preparedness for the labor market. Emerging services and products require new skillsets and qualifications such as communication skills, creativity and innovativeness, analytical thinking, and strategic planning, which are not well provided by educational institutions in Armenia. Besides new entrants into the workforce, the largest segment of labor market participants will be those who have already completed the formal education cycle and will require upskilling and reskilling to meet the continuously changing employment demands and be ready for the future of jobs. Targeted educational initiatives are required to address the reskilling and training issues of the current workforce. Focus group discussions and enterprise survey results reconfirm that there is a disconnect between what students learn during their education programs and what the labor market actually demands. Greater investment in Armenia's education sector is crucial to meet the transforming demands of jobs, ensure inclusiveness, and raise the quality of education.

CHAPTER 4

WORKFORCE DEVELOPMENT AGENDA OF ARMENIA



4.1 SUMMARY OF THE DIAGNOSTICS

The Fourth Industrial Revolution may start having a significant impact on the job market in Armenia in the foreseeable future. Both routine jobs and those requiring complex cognitive functions may be affected. Expanding job creation potential and transforming the Armenian workforce to meet continuously evolving skills requirements will be critical challenges to ensure Armenia's inclusive socio-economic development.

This chapter focuses on workforce development from a demand perspective under different economic development scenarios. We have identified several critical gaps and challenges regarding opportunities for developing the job market in Armenia, which are presented below.

Fast changing and unclear future needs

The current wave of technological progress makes the future of jobs more unpredictable than before. According to some experts, 65% of children entering primary school today will end up working in completely new job types that don't yet exist.⁶³ Some jobs that were once considered to have high future prospects, such as tour agents, accounting and payroll clerks, bank tellers, and even software developers, are at risk of partial or even full automation according to some predictions. Armenian companies project that, on average, 45% of tasks can be performed using machines by 2024. The accelerating pace of change and increasing uncertainty are challenging the educational system and threatening to make the specializations gained after schooling irrelevant to the job market. The cycle of professional education, which lasts from a minimum of three years in vocational education and training to six years in tertiary education, are seen by Armenian businesses as relatively long in many professions.

Transformation of economic structure

As discussed in Chapter 2, the structure of employment by economic activity will change significantly regardless of the economic development scenario in Armenia. The number of jobs in the agriculture sector is expected to shrink, which might then be absorbed mainly by services and manufacturing. This absorption capacity will be more extensive in the Accelerated Growth scenario. The massive shifts of employees across sectors will raise the demand for reskilling and upskilling. Currently, Armenia's students and the workforce at large are generally unaware about the specific shifts and trends in employment and are in dire need of up-to-date information.

Content disconnect

Insights gained from the quantitative and qualitative research completed for this study reveal significant gaps between the skillsets of graduates and employer demands. Low-quality vocational and higher education, lack of soft skills and practical knowledge among graduates, and limited investments by companies in workforce development all highlight this disconnect. The educational system fails to equip graduates with soft skills such as communication, creativity and innovativeness, teamwork, leadership, and social influence, which are considered essential for emerging key roles in organizations.

Despite the continued discourse, notable progress in bridging the disconnect

63 World Economic Forum, 2016, "The Future of Jobs Report 2016"

between the educational system and employers has not been recorded due to the lack of proper mechanisms that regularly monitor, analyze, and provide insight into this situation.

Decreasing role of formal education

Globally, the pace of technological progress is diminishing the role that formal education plays on preparing the workforce for the fast-changing task requirements. Employers are increasingly paying less attention to formal degrees and qualifications and are instead placing emphasis on practical knowledge and learning capabilities of job applicants. Online learning resources and certification programs (delivered by educational and non-educational institutions) also provide wide opportunities for upskilling or reskilling to people outside of formal education. It is now all about practical skills: Google, IBM, and Apple no longer require college degrees for new hires.

Underutilization of human capital and talent

According to the estimates shown in Chapter 1.2 of this report, Armenia is not utilizing the talent and capabilities of 560,000 working-age people in value creation. The potential loss is estimated to amount to at least 50% of current GDP. Moreover, one out of three employed people is engaged in agriculture, the sector of the Armenian economy that has the lowest level of productivity. Simultaneously, there is untapped demand for skilled employees in the dynamically growing high-tech sectors. These issues are the result of limited job opportunities due to sluggish economic growth and a lack of necessary skills.

About half of the current workforce and every fifth new entrant into the workforce have not received any professional education. This trend is expected to continue despite the professional qualifications of new entrants into the job market, as they will comprise only 20-25% of the workforce by 2030. In order for Armenia's workforce to be globally competitive, they must be equipped with the essential skills necessary to navigate through a dynamically evolving job market.

Underinvestment in education

Appropriate resources need to be allocated in order to improve and ensure the quality of education in Armenia. The country significantly underperforms in the level of investments made in education through all sources of financing.

4.2 CALL FOR A STRATEGIC TRANSFORMATION AGENDA

Mission

The above-mentioned challenges call for a comprehensive national workforce development agenda aimed at equipping each individual with the knowledge, skills, and attitude necessary to fully realize the workforce's potential and participation in value creating activities. Hence, the agenda's mission can be defined as the following:

To create institutional mechanisms for unleashing and nurturing each individual's talent to participate in building a competitive economy.

This mission will make human talent and potential the ultimate criteria in decision making by policy makers, educators, and business leaders. It recognizes that each individual is endowed with specific talents, and the institutional system of education and employment are tasked with uncovering it and providing opportunities for workers to engage in value-creating activities. The approach to see the workforce as a source of value rather than cost would drive human-centric strategies in the public and private sectors. In economic terms, this would require that the workforce possess a diverse set of demanded traits by businesses globally. Such traits shall help differentiate the Armenian workforce in the competition for high value-add jobs on a global scale.

Vision

Since Armenia's economy is small, the country has no choice other than to become highly integrated into global value chains and have a distinct value proposition in terms of human capital. Historically, learning and education have traditionally been highly regarded values by Armenian societies. The history of the Armenian diaspora also showcases the agility and successful integration of Armenians into diverse ecosystems in different countries. And all these things have been demonstrated through a positive attitude towards quickly adopting knowledge and fast learning. This historical track record is important for the wide societal adoption of fast and continuous learning. If any one trait could be singled out for surviving and thriving in the job market of the future, it would be the ability to continually and quickly adapt, which will depend on the ability to acquire new knowledge, skills, and competencies faster. The speed of learning will be a defining characteristic of winners in the future. It will ensure the adaptability and agility of the Armenian workforce.

We believe that Armenia should strive to become a country of **fast learners**.

Vision for Workforce Development of Armenia: BE A FAST LEARNER

This vision will drive Armenia's response to evolving global uncertainties. Moreover, Armenia will be sharply positioned to attract globally competitive businesses, particularly technology companies. This vision can inspire the launch of a powerful communication campaign spearheaded by government, business, and industry associations to differentiate Armenia as an attractive destination for doing business. The question "Why Armenia?" for investment will have a convincing response if such a vision is implemented comprehensively and effectively.

Principles

In order for Armenians to become fast learners, the following principles for designing and prioritizing strategic initiatives and actions should be adopted.

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- **Meta Skills of Learning.** Fast and efficient learning is possible for someone who has the skills to learn. Yet the skill to learn efficiently is considered to be a meta skill—the skill that enables obtaining other skills. Obtaining knowledge and competencies is only one part of that skill, while another is the ability to “unlearn” outdated knowledge and ways of doing things. The efficiency of any educational process will largely depend on this single meta skill. This skill should be taught and learned as early in the learning path as possible. The most critical time is during elementary school years, during which two disciplines are crucial to learn: language skills (especially in the mother tongue) and math and logic skills. They set a solid base of thinking, reasoning, and communicating upon which further knowledge is built. They both require early build-up. Therefore, this imperative can drive school education reform. In particular, it may imply a strong prioritization of curriculum towards this skill and disciplines and extensive investment in content and development of delivery methods.
 - **Lifelong learning.** Constant learning is a survival guide not only for current and future employees, but for everyone, since change at an accelerating pace will impact people in every walk of life. Lifelong learning, supported by a wide offering of flexible, learning pathways, must become the norm for everyone to stay competitive in the job market. Educational reforms instigated at any level should foster the conviction that any person is a lifelong learner.
 - **Fast to market.** In the future, people will constantly move in and out of the education-job cycle. Optimizing the main educational cycles to make the transition from education to market faster will be a winning proposition. In light of the fact that any single educational component, degree, or module will be just a milestone in a long journey, the fast-to-market principle in combination with lifelong learning will ensure its relevancy without compromising comprehensiveness.
 - **Modularity.** Navigation in complex environments is always a challenge. Modularity is one efficient approach that can be used to help constant learners navigate across programs and institutions in the long-term. This will imply shifting to a modular design of curricula that gives students more flexibility in selecting, sequencing, or spreading out their learning as required.
 - **Mobility and Integration.** Winning strategies in highly dynamic environments always have the components of mobility and integration of diverse elements. In workforce development this means ensuring mobility and integration of many elements of formal and non-formal education through a comprehensive credit recognition and transfer system and by coordinating and embedding modules of different learning programs into each other. These methods will enable shared usage of unique assets of different educational institutions and ease the navigation through different learning pathways.
 - **Experiential learning.** Learning happens within the proper context. The workforce learns more efficiently in a context relevant to the actual work they perform in their workplaces. This requires promoting experiential learning through engagement of all stakeholders (public sector, business, and education) starting from planning a skills development agenda and its execution to monitoring outcomes and implementation of corrective measures in the curricula.
 - **Inclusiveness.** If knowledge and learning are to become differentiators of success in society, then access to both will define the level of fairness and, eventually, stability of societies. Ensuring inclusiveness will mean that everyone has a universal accessibility and affordability of education and skills development throughout life, regardless of their starting points.

Learning System Architecture

Armenia’s national workforce skills development agenda needs to be derived from the overall transformation agenda of the country’s economy and highly aligned with the country’s development path. Otherwise, the country will remain disconnected from the needs and future perspectives of the job market. The overall architecture of the learning system in the country shall correspond to the evolving needs of diverse sectors of the economy.




The modes of generation and absorption of knowledge in society can be used to design a high level logical framework for such architecture. Here we consider knowledge in the broader sense of capturing both subject-specific knowledge and skills required to perform any type of value creation activity.

In general, knowledge generation and absorption processes have three layers:

1. Knowledge creation or co-creation
2. Knowledge absorption, adaptation, and early usage
3. Knowledge popularization and dissemination

The first stage deals primarily with knowledge, some parameters of which are not yet fully known or obtained. The second stage involves relatively recently obtained knowledge that needs local or contextual adaption and learning. The last one deals with old knowledge with many repetitive cycles passed on to new generations of learners. Each of these layers requires a different level of sophistication of the capabilities and actors. The extent of each layer highly depend on the development stage of the economy or a particular sector. The more advanced the economy or sector is, the bigger is its engagement in the process of knowledge creation. Thus, depending on the level of advancement of economic sectors, the transformation agenda will be different, requiring specific strategic initiatives tailored to specific challenges. For example, the future development of IT and other high-tech industries in Armenia highly depends on the emerging capabilities of knowledge creation—i.e., science and innovation capacities—while in food processing and tourism, it is crucial to massively *adapt and absorb* the available technologies.

Chart 4-1. Learning System Architecture

Actors	Knowledge Generation and Absorption Processes	Outputs	Drivers of Sector Transformation
<ul style="list-style-type: none"> • Advanced research centers • Knowledge centers at universities • Private R&D implementers 	 <p>Knowledge creation or cogeneration</p>	<ul style="list-style-type: none"> • Scientists and faculty • Know-how and patents • Scientific output • New technologies 	<ul style="list-style-type: none"> • IT, precision engineering
<ul style="list-style-type: none"> • Universities • Globalized local companies • Professional development programs 	 <p>Knowledge absorption, adaptation, and early usage</p>	<ul style="list-style-type: none"> • Knowledge workers • New products • Adopted and localized technologies 	<ul style="list-style-type: none"> • Export oriented food processing; pharmaceuticals, creative services
<ul style="list-style-type: none"> • Universities • VET • Private sector • Professional development programs 	 <p>Knowledge popularization and dissemination</p>	<ul style="list-style-type: none"> • Skilled workforce • Competitive products and services 	<ul style="list-style-type: none"> • Tourism, agriculture, construction, non-tradable productions and services

Source: EV Consulting framework

Algorithm for Policy Design

Lifelong learning and workforce development are sophisticated sub-components of larger social and economic systems. The constantly evolving industries and changes in employment limit the possibility of implementation of long-term strategic activities that might become obsolete and irrelevant even at the initial phase of their implementation. Moreover, in such complex environments top-down approaches are doomed to fail in most cases and linear approaches are very inefficient.

Policy makers face tough challenges to design and implement policies that work in such complex environments. Fortunately, algorithms of survival found in nature as a result of evolution proved to be also efficient for navigating in similarly complex and adaptive social systems. A universal algorithm of evolution - “Create variety – select – replicate”—applied in complex social systems such as educational or economic systems significantly increases the chance of finding the best solution and reduces the risk of big failures. This algorithm can be applied in workforce development and education policy design and implementation as well. In complex adaptive systems (including education), efficient behavior is found through multiple experiments (many of which fail, but a few succeed), incremental changes (mutations), selection of successful solutions, and efficient copying or replicating mechanism of the solutions throughout the entire system. This would imply a small-step approach at the initial phase, when a large number of experiments or pilot programs are conceived and implemented. Those pilot programs should aim to address the target problem set from different angles to create a variety of solutions. Robust criteria shall then be developed for choosing the best working alternatives or pilots. The survivability of early experiments shall not be decided only by market fit criteria (market demand, cash flow generation potential, financial return), but also through larger social return considerations. Long-term impact shall be taken into account, given that learning systems have many spillover effects as well as social and non-monetary aspects. Once the choice is made, the replication mechanisms shall be triggered to scale up the best solutions throughout the system. Resources shall be committed and mass reproduction mechanisms shall be put in place (one such successful example has been the introduction of Armath engineering labs in schools—there were numerous initiatives and formats of science and engineering school labs in the first phase installed in limited quantities in schools. Then based on the optimal set, affiliated curricula, cost, and other parameters, Armath emerged as the most successful program. In recent years it is being widely adopted across many schools in Armenia). Moreover, performance standards (e.g., educational standards for general and tertiary education) shall be based on the performance parameters of such successful initiatives rather than being conceived theoretically in different governmental offices.

In order to put this approach into practical use some anchor mechanisms are needed. For instance, a two-level funding scheme can be set up to address the stages of idea generation and experimentation of various innovative educational initiatives (which can be called Educational Experimentation Fund) and to scale up and disseminate the most successful initiatives (which can be called Scale Up Fund for Educational Initiatives).

Educational Experimentation Fund

The primary goal of this fund shall be to nurture and support experimentation with as many novel ideas and solutions (e.g., learning content, methods, curricula, delivery mode, organizational setup) as possible in the learning ecosystem. This would trigger bottom-up innovation across the entire learning ecosystem starting from general education and stretching to professional development. Such a breadth or mandate will stimulate individuals to think beyond traditional boundaries and take systemic

approaches. One successful model is the Finnish initiative HundrED. It collected an interesting depository of initiatives across the globe, which can be studied to define the scope and type of initiatives the fund may choose to support.

It is critical to ensure a wider engagement of different stakeholders in the selection process, including formal and non-formal education providers, research organizations and relevant NGOs, and partnerships and consortiums. The fund's support toolset may include experimentation grants and national competitions and awards. Grants can range from 10,000 to 100,000 USD per grant with matching requirements of 0% to 50% depending on specific categories. National competitions and awards for various categories will aim to promote pre-defined priority topics. Around 100 experiments could be enough to reach a critical, diverse mass in order for a few feasible and successful initiatives to emerge. A strong interdisciplinary advisory group of the fund can be set up to help mentor grant recipients to enhance the chances of success. A rigorous assessment framework will also be needed to select the most successful recipients for the next stage of support and funding.

Scale Up Fund for Educational Initiatives

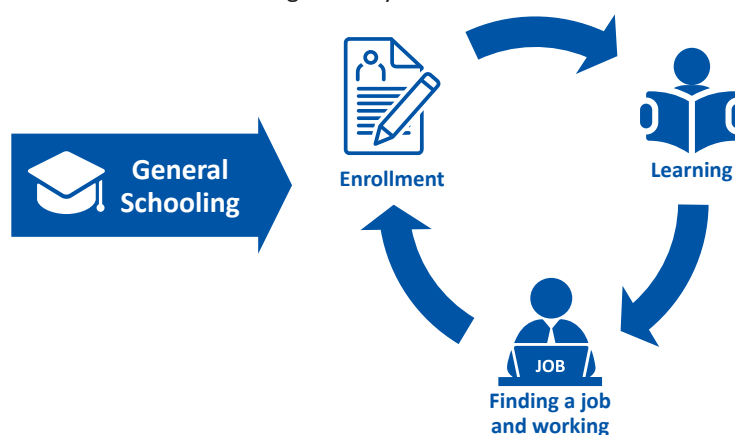
The Educational Scale Up Fund should focus on financing the scale-up of the selected perspective projects leaving the experimentation phase. The funding needs of the projects will significantly vary depending on the scale and coverage of the project. The proper financing of the execution is critical for ensuring tangible results. Investing 5% of annual government expenditures on education in the Scale Up Fund will yield an annual budget of 15 million USD. Given that some initiatives might be commercially viable, public resources can be leveraged and the budget significantly enhanced. The financing of three to five projects annually can be considered a good achievement. The fund's operations shall be tightly linked to a reform agenda and efforts in education, workforce development, and employment support programs, as the scale-up would mean wider adoption of supported projects and solutions in many areas. Reform groups can be formed around each project to advise project owners and provide necessary linkages to reform efforts. Based on the performance of best initiatives, relevant policy standards may be applied across the entire system (including general, tertiary, and professional education, skill development, etc.). The evolving portfolio of such initiatives will form a critical mass of innovative initiatives in four to five years that can gradually transform the system.

4.3 KEY OPTIONS FOR STRATEGIC INITIATIVES

Though this report does not claim to deliver comprehensive and exhaustive solutions for workforce development in Armenia, it aims to provide the framework and options for strategic initiatives based on the analysis of the country's reality, global trends, and best practices. Most of the options presented below can be designed and implemented using the same experimentation approach on a smaller scale, rigorous selection based on success metrics, and full scale-up if deemed successful.

The anticipated disruptive changes in the job market reshape the traditional trajectory of the career pathway that was typically considered a straight road (McKinsey, 2013⁶⁴). The logic of this straight road view is that school graduates decide on the specialization, choose the institution where they learn knowledge and skills specific to the particular fields of study, and then look for a job in their specialization. Later in their careers, they might need to acquire additional knowledge and skills to get promoted. However, the current trends of the job market will make this traditional model obsolete. The straight road will turn into a loop, meaning that the career pathway will include subsequent, sometimes overlapping, episodes of learning and working phases throughout life. In some cases, which may become the norm, to stay employable a person must completely change their field of work, which requires substantial upskilling and reskilling.

Chart 4-2. Continuous Learning Pathway Model



This process is comprised of three sequenced core actions. After passing through the transition from education to work, the first action is to decide where and how to learn to obtain the required skills and knowledge for a desired job. The next steps are acquisition of those skills, and finally getting to work. But the process does not stop here. The changing nature of jobs force people to enter this cycle again and again. There are three groups of people who have different needs but they all should always be engaged in the cycle: the current workforce, unemployed and economically inactive population, and future workforce.

64 McKinsey Center for Government, 2013, "Education to employment: Designing a System That Works"

Armenia's national skills development strategy and policies need to provide guidance on future development perspectives of career opportunities to support informed decision making by all key stakeholders of this process (learners, educators, businesses) and execute strategic initiatives to address key deficiencies and binding constraints. The suggested initiatives are grouped into two major classes addressing the relevance, agility, efficiently and effective guidance, motivation, and inclusiveness of the learning ecosystem in Armenia.

Making the learning ecosystem relevant, agile, and efficient

- **Significantly increase public funding for education.** Government expenditure for education should reach up to 4% of GDP so that notable improvements in remuneration of faculty and infrastructure can be seen.
- **Align workforce development strategy with the general education policy and the long-term country development vision and policies (this shall be in place first).** Such alignment will not assume tightly interlinked and rigidly defined actions. It will mean the synchronization of priorities, experimentation in the same direction, synchronized adjustments in both areas based on learning of experimentation and scale up of mutually reinforcing initiatives in education, workforce development, and economic development.
- **Set up a national skills monitoring system** that is responsible for researching future needs of skills development, monitoring job market development, designing qualifications and standards for occupations in perspective industries, and coordinating actions at the sectoral level:
 - **The State Employment Agency** should periodically and consistently collect, analyze, and disseminate information on labor market trends and provides foresight on development perspectives and requirements of future jobs. Existing labor market studies conducted by the State Employment Agency of Armenia need to be expanded in scope and coverage and complemented with deeper analysis and foresight that also take global developments into account.
 - **Sector skill councils and boards with high-profile participation of representatives of academia, government** (ministries and relevant agencies such as State Employment Agency and VET Development National Center), and the private sector (HR managers, strategic development officers of companies) should be set up. The engagement of representatives from the most advanced and leading companies on those boards is crucial to gain valuable insight on the future of jobs and required skillsets.
 - **Regular implementation of nationwide graduate tracer studies** (at least once every three years) for VET and tertiary graduates should be taken to track their success in job placement and a career path. The studies will provide valuable information on the relevancy of education on the job market and pinpoint key gaps along the way from learning to work.
- **Introduce the lifelong learning concept in formal education.** Universities can become forerunners of the concept by building long-term relationships with enrolled students whereby skill-upgrading opportunities are offered to them after graduation of primary educational cycle.
- **Employ a “foundational knowledge first” approach.** Start with and intensively invest in developing a world class, attractive curriculum and content for foundational knowledge and skills in the Armenian language, foreign languages,

and math in the early years of schooling. This foundational knowledge would provide the basis for learning skills and later for complex skills (e.g., critical thinking, problem solving, communication, team playing) that are sought by employers. In other words, unlock the potential for learning before investing in learning. If these foundational skills are not provided in the early years of schooling, the learning path will be difficult and further investment in education will be less efficient. A mass scale upgrade of the entire curriculum, which may take long time, would require massive resources and years of adaptation and adjustment. Resources would be concentrated on the task of making a breakthrough in foundational knowledge.

- **Adopt a “world class content localization” initiative.** This initiative can start as a public-private partnership. World-class knowledge is becoming increasingly available in digital form due to massive open online courses (MOOCs) and opening platforms of leading universities and centers of knowledge. The challenge is in “translating” the content into locally relevant programs. This can be achieved through developing a cadre of proficient trainers and creating mechanisms of dissemination to augment teaching at local universities and training centers. A shared resources depository can then be developed and shared through online platforms among local knowledge centers. This would help overcome the problems of scarcity and affordability of the best teaching content and educators.
- **Promote international collaboration of universities on designing and delivering educational programs through a dedicated national funding scheme.** Currently, the collaboration programs of Armenian universities are almost exclusively dependent on funding from foreign governments and international programs that are very scarce, selective, and competitive. Armenia needs its own national scheme to support several smaller scale, but diverse and numerous programs to support international collaboration initiatives to close critical gaps within Armenian educational institutions.
- **Leverage digital technologies in learning and teaching to make studying more engaging and expand opportunities in lifelong learning.** This should be supported by initiatives to develop digital skills and capabilities of the general population to guarantee access to a modern digital infrastructure.
- **Introduce joint educational programs or certification courses with leading companies** (e.g., Synopsys, National Instruments, Instigate) in other areas such as agriculture, mining, and manufacturing. This can be achieved through the proactive initiation and brokering of such programs through consortiums of leading companies in each sector, ideally providing seed funding and best practice knowledge sharing.
- **Shift to modular curricula design and flexible, individual-centered learning programs or pathways.** This will also support formal education institutions in expanding their outreach and engaging any person who is interested in upskilling in their educational programs by offering certification courses. A successful example is EVN Wine Academy, which was established jointly by ICARE and Semina Consulting and targets both State Agrarian University students and current employees of companies willing to upgrade their skills.
- **Selectively integrate the professional training programs delivered by training providers into formal education after accreditation.** The priority should be internationally recognized certification programs (especially internationally

recognized certification programs such as ACCA, Microsoft training programs, etc.). This will enrich the learning content with more practical and up-to-date knowledge and skills. For instance, the students should get credit at the university by successfully passing one of the modules of those programs.

- **Optimize the system of VETs.** Shut down low quality, subscale institutions and establish a network of fully upgraded technological VET institutions in selected locations matched with a specific industry (e.g., mining, food processing, agriculture) with a centralized curricula and content development and boarding facilities for students.
- **Fully deploy a credit system in higher education with selected extensions to VET and other formats of professional education.** Modularity is enabled by a credit system. Horizontal and vertical extensions will facilitate both integration and competition. They will also facilitate students' vertical and horizontal mobility and ensure access to best learning resources of different institutions. Credit-based tuition fees will be required to support this process. A system for connecting the credits received in VET institutions to higher educational institutions should be set up so that students can continue their education at higher educational institutions. Vertical integration or consolidation of higher and VET education can facilitate and support the upgrade of VET educational teaching capacities.
- **Develop highly integrated apprenticeships and experiential learning models through collaboration with leading large companies in selected sectors (e.g., dual education, additional apprenticeships, or work-based learning).** Educational institutions should target globalized companies that have access to or else possess advanced knowledge and technologies. Models developed with large companies can be made available to SMEs as "off the shelf" products. From other side, serious game simulation in virtual environments could approximate and in many cases replace apprenticeship practices to help address scarce resources.
- **Establish incubators/accelerators adjacent to universities and technology VET institutions** to develop entrepreneurial skills and promote entrepreneurship and innovation.

INSERT 4-1: INTERNATIONAL BEST PRACTICE ON DEMAND-ORIENTED LEARNING ECOSYSTEMS

International best practice shows that a separate research unit and a labor market and skills observatory that regularly monitors and updates might be an efficient solution to always remain up to date and effectively address employment requirements and skillset gaps.

Estonia established Sector Skills Councils for the country's most important occupational fields. They monitor and analyze future labor market developments and global trends. The councils also cooperate with the Ministry of Education and Research and advise them on the relevance of qualification content and provided skills within the educational programs. The councils also collect information on reskilling and upskilling needs to define the gaps and short program demands in the labor market.

The United Kingdom addressed the issue by creating a National Career Service, which is a centralized repository that provides information about the labor market in the UK. The information is gathered by the UK Commission on Education and Skills and the Sector Skills Councils. As a result, people can find detailed descriptions of job profiles, salaries, required qualifications, industry trends, and educational programs online.

In Singapore, the SkillsFuture initiative promotes skills mastery and lifelong learning in the country. The skills framework provides comprehensive information about sector and employment opportunities, career pathways, occupations and roles, existing and emerging skills, and training programs for skills upgrading and mastery. People are now more prepared to make decisions about career paths and education.

Forecasts are also needed about the development of the total economy and economic sectors to analyze the global and local trends in labor markets and economies and to identify the required skills, qualifications, and technological transformations.

Universities have started to introduce short certificate courses addressing the trending skills and qualifications that people can take for upskilling or reskilling and the number of those courses is only increasing over time.

Ireland has developed a nationwide program called Springboard+, which gives opportunities to upskill or reskill in priority areas. There are more than 280 courses and 9000 places available. Since 2011 over 192 million EUR has been allocated to the program. The courses are selected based on current job market requirements and skills demand and cover a wide range of topics. More attention is paid to the unemployed who are in need of upskilling to re-enter to job market. Other such programs operating in Ireland include eCollege, which provides online courses, and EXPLORE.

In 2015, the United States launched a program called UpSkill America. It allocates funding to workforce skillset development. UpSkill America sponsors on-the-job trainings, supports people who wish to obtain higher education while working, and organizes partnerships between education providers and technology innovators to provide technology-enabled learning.

Singapore has invested about 600 million USD per year over the last five years to provide continual education and trainings. The investments are made within the SkillsFuture program. The aim is to reduce skillset gaps and promote lifelong learning, reskilling, and upskilling activities. Singapore plans to increase government funding for the program to 1 billion USD by 2020.

Many countries like Armenia face the issue of negative social perceptions towards VET educational institutions. International best practice suggests that rebranding and giving a new status to VET institutions may partially solve this issue and give a new breath to them.

In 1992, Singapore made significant investments in technical and vocational education to rebrand and reconstruct the whole infrastructure and its capacities. Currently, the Institute for Technical Education (ITE) has a number of campuses around the country and provides high-quality technical and vocational education. ITE has high-tech facilities and amenities comparable to higher educational institutions, which also eliminates the negative social perceptions towards VET education.

Finland is introducing a new system that allows people to apply their vocational upper secondary qualifications for admission into higher education institutions. This initiative aims to make the learning paths more flexible and make it easier to upgrade their qualification level. Consequently, the transition to the labor market will be easier and faster for those people.

Since 2010, the government of South Korea started transforming the existing vocational educational institutions as Meister schools. Students are encouraged to apply to Meister schools to receive technical and vocational skills, and tuition, room, and board are provided for free. Students can also continue their education in higher educational institutions if they wish to and the credits are transferred accordingly.

As a result of the rapidly changing labor market worldwide, the concepts of lifelong learning and experiential studies have been developed, and the modular educational system is becoming popular globally.

Project-based learning leads to curriculum modularity—a larger occurrence of horizontal and vertical integration of modules along with regular unbundling and rebundling of curriculum. Research shares similar developments with inter-disciplinary accent on trend. Credit systems enable modularity, which is increasingly being applied across higher education institutions in the same country or group of countries moving towards common educational standards such as the Bologna system.

Modular course design makes course curricula flexible. Students are able to combine different modules and subjects as well as design an educational program respective to their preferences and current labor market requirements. Meanwhile, educational institutions still provide their students with the core fundamental skills that are essential for their professional growth and for gaining knowledge in their fields.

International best practices indicate the integration of ICT solutions and digitization of educational systems worldwide. More educational materials are available through the Internet and knowledge distribution has become an easy task for most countries. Educational material available online in the form of books, article, documentaries, and instructional videos should be properly marketed to students. Disruptive technologies, such as ARVR solutions, help to create simulations and teach students in a more illustrative way.

For example, IBM's INNOV8 is a game created to teach students business process management. It stimulates real-world environments to help students understand how business process management affects the business ecosystem. TAFE Sydney Institute uses computer-based marine simulators to teach technical and practical skills to students.

To promote entrepreneurial skills development and nurture the startup movement, an increasing number of educational institutions are establishing business incubators or implementing acceleration programs. They were originally largely focused on IT and high tech, but now more and more new disciplines are covered including agriculture and fashion design. A recent study of more than 150 university incubators and nearly 900 companies revealed that graduates of university-located incubators are more likely to succeed as entrepreneurs.⁶⁵

Some countries have made significant strides in addressing job-skills matching and hiring problems. Career guidance services are now provided in many universities.

In Japan, many companies are cooperating with KOSEN schools, which provide experiential learning opportunities to high school students. Many high school graduates are entering the labor market even before starting college. Schools are communicating with companies to match students with the right job opportunities.

Countries are also developing Public Employment Services (PES) to address unemployment issues. PES target mainly three group of people: those who have difficulties finding jobs, those who cycle between temporary jobs, and those who stayed out of the labor market for a long time and have difficulties reentering. PES offices help match jobseekers with employer needs and requirements.

In Belgium, an IT portal with a scoring system has been introduced by public employment services where jobseekers score their competencies and employers score the required skills for open positions. The portal looks for matches between vacancies and jobseekers once per day. Both sides can also filter their searches by job location, functional profile, and education. Belgium also offers online guidance for highly educated jobseekers aged 25 and younger to help them enter into the labor market. The same tool is used in Germany, where jobseekers can register online and set up their personal profiles and review the vacancies posted.

Other approaches for helping the unemployed find jobs include job-placement coaching and mentoring as well as pilot programs that help the long-term unemployed with reskilling and upskilling as well as finding internships, and apprenticeships.

65 Vernet Lasrado, Stephen Sivo, Cameron Ford, Thomas O'Neal, Ivan Garibay, 2016, "Do graduated university incubator firms benefit from their relationship with university incubators?", *The Journal of Technology Transfer*

Increasing the effectiveness of career guidance and job matchmaking, inclusiveness, and motivation

- **Set up a national career counseling system for school graduates as well as for students and adults** for reskilling and upskilling and create comprehensive online resources. The online resources should include guidelines illustrating career pathways, skills requirements, and certifications for each ladder and learning programs to acquire those skills.
- **Strengthening and capacitating the career guidance at institutions providing professional education.** This should be supported with regularly implemented graduate tracer studies to provide evidence-based guidance to graduates. Some Armenian universities such as the American University of Armenia and French University in Armenia have established properly functioning career guidance capacities.
- **Promoting matchmaking between graduates and employers** through regularly organized events such as career days and fairs and guest lectures of C-level officials of leading companies at educational institutions.
- **Improve the terms of the student loan scheme in Armenia** by increasing the maximum loan amount threshold, the duration of the loan, and the repayment modality. The current maximum student loan amount (2.8 million AMD) is not sufficient enough to cover the tuition fees for the full cycle of higher education (Bachelor's and Master's degree programs), especially for the most demanded specializations. The current loan term of 10 years (including years of schooling) may be tight for repayment in many cases. To ease the repayment terms, payback can be linked to a student's future revenue following the trend of emerging new innovative financing instruments such as Income Contingent Loans.
- **Expand state funding to include reskilling and upskilling of employed people.** Armenia needs to prepare to allocate proper resources to address the expected large-scale transformation of the economic structure and significant changes in the labor market. Currently, the Armenian government spends on average 3.6 million USD for combating unemployment. The government is also active in upskilling and reskilling the unemployed, focusing primarily on socially vulnerable and disadvantaged groups. The technological progress will put also currently employed at risk of losing their jobs. Thus, activities dedicated to the reskilling or upskilling of the employed in the country should be on the policy agenda.
- **Establish an online platform for Public Employment Services (PES) agencies,** where job seekers will have opportunity to create their profile, mention qualification and interests, and score them by priority. Employers can post job openings as well as list requirements and score them by priority. The platform will match scores to find the best matching pairs of jobseekers and employers.
- **Change tax regulations to incentivize private companies to invest in education or staff trainings.** Companies can underwrite the tuition fees for their employees and examination fees for professional certifications and list them as allowable expenses for profit tax calculation purposes (currently, in best case scenario they can be treated as a salary equivalent revenue for the employee and taxed by income tax) The introduction of other tax and financial incentives for apprenticeships and professional trainings conducted by companies can also be considered.
- **Set up and promote national, regional, and local awards** recognizing companies that exhibit distinguishing practices of investing in human capital development.

INSERT 4-2: INTERNATIONAL BEST PRACTICE ON CARRIER GUIDANCE AND JOB MATCHMAKING, INCLUSIVENESS, AND MOTIVATION

Initiatives to make information about job market demands and occupations available to the public are widespread. Some countries, such as Norway, Japan, and Switzerland, started to embed career planning into the school curriculum by introducing career-guidance courses in schools. During classes, teachers discuss various occupations, work hours, wages, and the required knowledge and qualifications for specific jobs.

Globally the issue of inclusiveness of education in countries is as important as economic growth and competitiveness. Many technological solutions are now being developed to make educational materials as well as courses and programs available and affordable for everyone. Governments are developing grants and scholarships to create more opportunities for people to enter their desired educational programs and improve their qualifications. Currently, more businesses and corporations are increasing their contribution to inclusiveness, affordability, and accessibility development.

The United Kingdom created a fund to support its economically vulnerable population, such as young adults out of the education and job market, low-skilled workers, and the unemployed, to obtain new skills and enter the labor market. The Skills Funding Agency is coordinating the whole process.

Some countries completely eliminate tuition fees for tertiary education. Others develop need-based or generic funding mechanisms including student loans and scholarships. Income Contingent Loans (ICLs) are becoming popular worldwide. The repayment of higher education tuition fees is linked to students' future revenue levels. England, Australia, the US, and New Zealand have long-established ICL schemes for higher education. In England, students repay 9% of their income above the predefined repayment threshold of 25,000 GBP and the repayment amount increases linearly along with the income. The interest rate varies from 0% to 3% in England, depending on the income level of the student. A progressive scheme of ICL is functioning in Australia where the repayment rate of 4% to 8% is tied to income. In New Zealand, the loan is interest free for those who stay, but for students who live abroad the interest rate is 4.3%. An ICL scheme in the US sets the threshold for repayment at about 20,000 USD and the interest rate is 4.45%.

Countries at the forefront of innovation in workforce development start experimenting with novel instruments to encourage continuous learning and integrate them into the formal education sector. Singapore has introduced a lifelong learning concept in their universities by providing opportunities for alumni to take courses after their graduation for up to 20 years from the time of admission. The National University of Singapore (NUS) started a program called NUS Lifelong learners, which makes all university programs publicly available for continuing education and training (CET). All NUS alumni can take up to two modules for free over a three-year period.

Professional educational institutions sponsor job fairs, panel discussions with entrepreneurs, company tours and internship programs for new employees, and trainings on résumé and interview preparation to help their students and alumni obtain information about labor market requirements and find jobs matching their interests.

CONCLUDING REMARKS

The future of jobs in Armenia will depend on the trajectory and pace of economic development and the country's ability to equip its citizens with knowledge and skills to navigate in the world of new jobs and increasing uncertainties. Human development, which opens up opportunities for a fulfilling life and talent to thrive, shall become a guiding principle for all development efforts.

The fast changing environment calls for an agile and flexible system for knowledge creation, adoption, and dissemination with an increasing focus on new skillset development. This system should be highly aligned with economic development priorities.

Lifelong learning is forcing everyone to live and work in a constant fast-learning mode. This way of learning must be supported by a relevant, accessible, and affordable supply of opportunities.

The extensive scale and huge number of stakeholders involved in the transformation process requires a well-articulated and broadly shared vision, coherent strategic actions, constant experimentation to find workable solutions, proper resource allocation, and consistent execution.

APPENDICES

Appendix 2-1: Methodological note on macroeconomic modeling of growth scenarios

Macroeconomic modeling of growth scenarios for total economy and sectors is developed based on cross-country panel data regression analysis. In 2019, Armenia is considered an upper-middle-income economy, thus high-income and upper-middle-income economies are considered for benchmarking and measuring the convergence speed of labor productivity and to construct macro estimations of growth scenarios. To understand the growth potential of Armenia's total economy as well as the relationship with labor at separate sector levels, productivity and GDP is considered for further analysis.

To develop job growth scenarios, we have used the classic production function that explains the relationship between labor, productivity, and output:

$$Y = (Y/L) \times L \quad (1)$$

where Y is the total output of the economy, Y/L is labor productivity, and L is the labor input.

The relationship holds for both aggregate as well as disaggregated/industry levels of the economy and helps estimate job creation in economy-wide and industry levels. Assessment of employment demand requires inputs of output and labor productivity assessments, which rely on per capita income and labor productivity convergence theories.

Labor productivity

Using models by Rodrik (2013) and Kinfemichael and Morshed (2019), we empirically tested the existence of conditional convergence at the sectoral level of economies with disaggregated panel data for upper-middle and higher-income economies to estimate labor productivity for the production function.

For each industry the convergence equation of labor productivity is:

$$\Delta \ln Y_{i,t} = \alpha_i + \beta \ln Y_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

Where $\Delta \ln Y_{i,t}$ is the growth rate of labor productivity of country i at time t and $\ln Y_{i,t-1}$ is the initial level of labor productivity. The negative rate of β indicates convergence while the positive coefficient shows divergence of labor productivities across countries.

After estimating the β convergence coefficient, the convergence speed/rate (λ) can be derived in the following way:

$$\lambda = -[(1/T) \times \ln(\beta + 1)] \quad (3)$$

where T denotes the length of the considered time interval (T in this study).

The convergence speed λ can be represented with the following formula when economies approximate their own steady states, denoted by y^* .

$$d\ln(y_t)/dt = \lambda[\ln(y^*) - \ln(y_t)] \quad (4)$$

After rewriting equation 3 shown above we represent the convergence speed in the following way:

$$\ln(y_t) - \ln(y_0) = (1 - e^{-\lambda t})[\ln(y^*) - \ln(y_0)] \quad (5)$$

where y_0 is the initial level of labor productivity.

The simplified version of the convergence speed equation allows for estimation of the half-life (H) number of years required to pass the half-way point to reach the steady state of economy.

$$e^{-\lambda H} = 0.5 \quad \Rightarrow \quad H = \ln(2)/\lambda \quad (6)$$

Output

The following equation can be used to estimate the total economy output in 2030:

$$\text{Output (GDP)} = \text{GDP per capita} \times \text{Population} \quad (7)$$

GDP per capita level of the economy in 2030 is estimated based on the per capita income convergence theory by Baumol (1986), which is similar to the labor productivity convergence concept.

$$\begin{aligned} \ln(\text{GDP per capita}_t) - \ln(\text{GDP per capita}_{t-1}) &= \\ &= \alpha + \beta \ln(\text{GDP per capita}_{t-1}) + \varepsilon \quad (8) \end{aligned}$$

Armenia's population estimates are detailed in Chapter 3 of this report.

Employment demand is estimated based on equation 1 shown above with output and labor productivity as inputs.

Appendix 2-2: Data for empirical analysis

Industry disaggregation of the research is based on the NACE (statistical classification of economic activities in the European Community) code level, which divides the economy into 20 industries. We reduced the number of industries and grouped them together based on data availability on labor productivity: agriculture, mining and quarrying, manufacturing, construction, utility, financial services, accommodation and food services, wholesale and retail trade, health care and social services, and other services. Total economy employment demand is estimated as an aggregated value of the sector level employment demands.

Convergence for labor productivity is tested for upper-middle-income and high-income countries for the 2000–2017 timeframe. Eighteen countries that are highly dependent on oil and gas production, 38 islands, and 11 countries each with a population of less than 500,000 are excluded from the sample. The list of countries is provided below in table A1-1. The countries used for sector level panel analysis are again from the provided country list, but may differ because of data availability issues.

To estimate the labor productivity per sector based on the productivity convergence equation, we collected Gross Value Added per sector from United Nations Statistics Division databases (UNSD) with constant 2010 USD values.

For industries whose preprocessed data with constant 2010 USD is unavailable in UNSD statistics, we did extra data reconfiguration to bring data to 2010 constant USD values by following the same UNSD methodology to have comparable databases for all countries.

Employment data was collected from the International Labor Organization (ILO) modeled estimates for selected disaggregated levels of the economy.

Table A1-1: Countries used for analysis

Country list			
High-income economies		Upper-middle-income economies	
Argentina	Lithuania	Albania	Jordan
Australia	Luxembourg	Armenia	Lebanon
Austria	Macedonia	Belarus	Malaysia
Belgium	Netherlands	Bosnia and Herzegovina	Mexico
Canada	New Zealand	Botswana	Montenegro
Chile	Norway	Brazil	Namibia
Croatia	Panama	Bulgaria	Paraguay
Cyprus	Peru	China	Romania
Czech Republic	Poland	Colombia	Russian Federation
Denmark	Portugal	Costa Rica	Serbia
Estonia	Republic of Korea	Cuba	South Africa
Finland	Singapore	Guatemala	Thailand
France	Slovak Republic	Guyana	Turkey
Germany	Slovenia		
Greece	Spain		
Hungary	Sweden		
Ireland	Switzerland		
Israel	United Kingdom		
Italy	United States		
Japan	Uruguay		
Latvia			

LIST OF ABBREVIATIONS

ACR	National Competitiveness Report of Armenia
AI	Artificial Intelligence
AUA	American University of Armenia
CAGR	Compound Annual Growth Rate
CIS	Commonwealth of Independent States
EHEA	European Higher Education Area
EIF	Enterprise Incubator Foundation
EU	European Union
EU28	European Union consisting of 28 countries
FDI	Foreign Direct Investment
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
GVA	Gross Value Added
ICL	Income Contingent Loan
ICT	Information and Communication Technologies
IDI	Inclusive Development Index
ILO	International Labor Organization
IMF	International Monetary Fund
IoT	Internet of Things
IT	Information Technology
ITE	Institute for Technical Education
NACE	Statistical Classification of Economic Activities in the European Community
NEET	Youth Not in Education, Employment, or Training
NUS	National University of Singapore
OECD	The Organisation for Economic Co-operation and Development
PES	Public Employment Services
PPP	Purchasing Power Parity
STEM	Science, Technology, Engineering and Mathematics
UAV	Unmanned Aerial Vehicle
UBI	Universal Base Income
UN	United Nations
UNSD	United Nations Statistics Division
US	United States
USD	United States Dollar
VET	Vocational Education and Training
WDI	World Development Indicators
WEF	The World Economic Forum

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