



## Entrepreneurial University Perspective: Tracking Labor Force Capacity to Support Industrialization Processes in the Emerging Markets, Evidence from Kazakhstan Data

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### Abstract

Industrialization is considered as main engine of growth in economic development of the most emerging markets. This is especially true for Central Asian transitional countries as Kazakhstan, which obtained independence from the Soviet Union in 1991. For enhancing country's competitiveness potential, Kazakhstan National Program for 2010-2014 aimed to accelerate industrial-innovative development of the country. While many papers published about the importance of industrialization activities in Kazakhstan, few have focused on examining the current capacity of labor market to meet the industry demand. Main aim of this paper was to investigate if current manpower is adequate to maintain the planned rate of growth in the country. Higher level of economic production led to higher demand of engineering labor force. High demand with low frequency supply created an imbalance in the labor market that resulted what we see as shortage of technically skilled labor. Low frequency of supply is influenced by such factors as high engineers' outflow rate, low students' enrolment and graduation rates, and lack of practical skills of the graduates hired.

**Keywords:** Kazakhstan, Emerging Markets, Industrialization, Labor Market



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# Entrepreneurial University Perspective: Tracking Labor Force Capacity to Support Industrialization Processes in the Emerging Markets, Evidence from Kazakhstan Data

Dilara Orynbassarova

## 1. Introduction

Industrialization is a period of the economic change that transforms society from the agricultural to industrial one (Sullivan and Sheffrin, 2003). The emerging markets are usually considered to be in a transitional phase that undergoes a rapid industrialization process and an economic growth (Emfunds, 2014). This is especially true for countries in an economic transition as Kazakhstan. Kazakhstan has become known to leading world economies as an emerging market having high potential for growth (EPMG, 2014). This country in transition has a number of advantages compared to the other emerging economies being resource-rich and having third-largest oil reserves of any country in the world (Tatibekov, Adams, Prochaska, 2004). Kazakhstan was ranked the 50<sup>th</sup> place among 144 with an average score of 4.4 out of 7.0 in Global Competitiveness Report (GCR) of the World Economic Forum 2013-2014 (Palata, 2014). In order to increase further economy's competitiveness, one of the main aims of Kazakhstan National Program for 2010-2014 included acceleration of country's industrial-innovative development (Zhunussova, 2014). Literature analysis reveals that, industrialization of the manufacturing processes is often considered as the potential source of new employment in the emerging markets (Skeath, 1993, Squicciarini, Voigtländer, 2014). Little has been published about assessing the labor market capacity to support industrialization process in Kazakhstan. Main aim of this study was to examine the current labor force dynamics to meet industrialization demand in Kazakhstan, the labor supply side and factors influencing it.

Section 2 reviews theories drawing close correlation between the industrialization and the higher demand for technically skilled manpower; Section 3 analyzes how industrial expansion in the country led to higher engineers demand and discusses low frequency supply factors. Section 4 concludes.

## 2. Theoretical background

An emerging market economy describes "a nation's economy that is progressing toward becoming more advanced, usually by means of rapid growth and industrialization" (IA Dictionary, 2001). Literature review draws close correlation between the industrialization, economic growth, and the higher demand for skilled manpower. Industrialization triggers economic growth and keeps the labour productivity to be higher in an industrial sector resulting in higher income compared to agricultural one (Bineswaree, *et al*, 2013). The productivity growth rate in the manufacturing sector depends on the positive growth of output. Theoretical model developed by Skeath (1993) defines industrialization as a dominant firm's expansion into production of an increasing number of goods, where firms' profit maximizing behavior leads to expansion by creating greater employment opportunities in the manufacturing sector. Same per Kasanda (2005), employment opportunity in the manufacturing sector rises as an expansion occurs. Squicciarini and Voigtländer (2014) argue that, human capital is one of the strongest predictors of the economic development. Thus economic development triggers the expansion of production, which in turn increases the scope for skill and learning. The economic theorist W.W. Rostow claimed that, the manufacturing industries in traditional society had a tendency to grow but had always been limited by an inadequate scientific and technical knowledge resulted in low labor productivity (Kasanda, 2005).

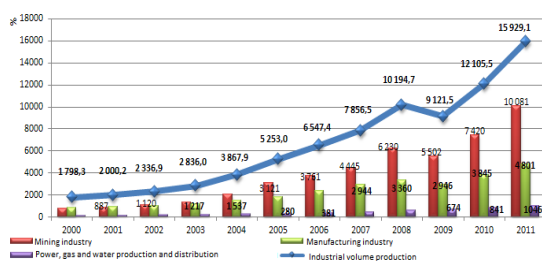
A considerable amount of an ambiguity about the labor dynamics exists within the industrialization process in Kazakhstan today. Critical review of local sources indicates absence of accurate statistics on an adequacy of manpower capacity to maintain the planned rate of growth. The purpose of next section is to examine the labor dynamics in frame of industrialization process in Kazakhstan by finding out a) if the industrial expansion in country has led to the higher labor demand, and if the required technically skilled labor is sufficiently supplied. In order to identify supply side frequency, the following factors were determined as important for observation: a) the pattern of enrollment rates by students to engineering specialty, b) the graduation rate of engineering specialists in post-secondary programs, c) the quality of graduate technical students entering the job market and d) the technical specialists enrolment stimulation by the universities and compensation rates by the employers.

## 3. Discussion and Implications

### *Higher level of economic production and the demand for the engineers*

Competitive labor market theory assumes that, the firm's demand for labor is a derived demand which is

derived from the demand for the firm's output (Squicciarini and Voigtländer, 2014). As part of the industrialization process, 177.8 billion USD were invested to Kazakhstan in 2005-2013, and 96.6 billion of them over the past 4 years (2010-2014) were invested during the implementation of the National Program (Westfal, 2014). The production output of the manufacturing industry has grown by 43% in 2014 compared to 2012 (State program of industrial innovative development for 2015-2019, 2014). Figure 1 below indicates real sector of the economy, the positive growing trend of the industry, and the highest values of production in 2011. One can observe growth in an industrial production during the whole period of 2000-2011, including the crisis in 2009 when Kazakhstan experienced decline in the mining and quarrying industry.



**Fig 1. Dynamics of industrial production and industrial sectors for 2000-2011.**

**Source:** Statistical Agency of RK

The review in the previous section indicated close correlation between the industrial expansion and the higher demand for the skilled labor. In an increasingly international world in which rapidly changing technologies are radically transforming work styles, the technically trained workforce is of critical importance (White, 1984). The engineering manpower is the backbone of any manufacturing enterprise as the quality and timing of production directly depends on the availability of these skilled professionals (Antonova, 2010). National Classification of occupations contains more than 160 items belonging to the engineering profession (Kazakhstan Zarplat Database, 2015). The adequacy of this workforce is essential in assuring that competitive position of the economy is maintained. According to the case study conducted by “El Kanaty” country’s public fund in 2014, the current labor market is experiencing a sharp deficit of the technically skilled manpower. The study involved 2000 corporate executives, recruiters and entrepreneurs from all 16 regions of Kazakhstan (Capital, 2014). According to Kazakhstan employers, engineers (13.8%) were the most demanded specialties in the market in 2014, followed by the doctors (12.8%), teachers (10.1%), IT specialists

(7.4%), construction (6.4%) and marketing specialists (6.2%) (Capital, 2014). The basic cause for increased demand for engineers is clear: the demand for engineers fluctuates with rather high frequency, responding to economic conditions that seem to grow rapidly in the country. At same time, another aspect important to note is the mining industry’s ¼ of workforce in 2013, which was represented by employees aged 50 years and older close to retirement in few years (Prime minister web source, 2014). Thus analysis indicates that, on the demand side, the labor market conditions are driven by the industrial expansion and the replacement requirements. Higher level of economic production led to higher demand of engineers labor force. The purpose of next subsection is to assess if engineering manpower is adequately supplied to meet the industry demand.

**Low frequency of supply**

According to the data on employment distribution by sectors, the total number of the employed in the industry sector represented the lowest amount (19.5%) of total employed population in the country in a period of 2008-2012 (with main portion of the employed lying in the services and trade (54.9%), agriculture and forestry (25,6%) (Kozhakhmetova, 2013). Low employment distribution of technically skilled labor in country’s labor market is also accompanied by high outflow rate of the engineers to foreign countries. According to the official data, following number of specialists left the country in a period of 2009-2010: technical - 9428, economic – 4772, pedagogical – 3923, architecture and construction - 1 891, medical – 1854, law - 1319; agriculture -1035; other fields – 8866 (Atabayev, 2012). Table 1 below indicates an alarming trend for Kazakhstan’s labor market, where availability of engineers and scientists has decreased almost twofold during the period of 2009 -2012.

**Table 1: Kazakhstan's position on the factor of "Innovation"**

Evaluating Criteria	2009-2010 (among 133 countries) Position	2010-2011 (among 139 countries) Position	2011-2012 (among 142 countries) Position
By availability of scientists and engineers	74	91	106

**Source:** Tattieva and Birukov (2013)

**Low number of graduates graduating technical universities**

Kazakhstan educational system does not function adequately to produce the supply of engineers to meet the industry demand. The logic is that, there is an insufficient number of university graduates to satisfy the

demand side and the employer's requirement. The graduation rate of technically skilled specialist is low. For example, 196.7 thousand bachelor graduates entered the labor market in 2009, however the significant proportion (33%) of the total number of these specialists were majoring in social sciences and business, teaching profession (21.4%), technical sciences and technology (16.5%) and human sciences specialty (13.4%) (Sarybassova, 2009). Logically, the university graduation rate is a dependable variable to the university enrolment rate. It was also worth studying the data on students' enrolment rates to technical specializations.

#### *Low enrolment rate to technical specializations*

The analysis done by Ministry of Education in 2014 in frame of Strategic Plan for 2014-2018, revealed the highest level of enrollment (41%) in business and law programs, and the lowest at the scientific and technical professions - 24% (MoE, 2014). For comparison, analysis of data for previous years indicates that, as a result of examination testing conducted in 1999 and 2000, international law, psychology, finance and foreign languages were named as the most prestigious professions among school graduates. Competition for the university grant ranged from 10 to 21 people per place for these specialties (Ryzhikova, 2004). Low enrolment rate for technical specializations exist despite the fact that, technical profession is well supported by the government scholarship. Table 2 (sorted from largest to smallest number by the author) clearly indicates that, the highest portions (37.4 %) of grants from the national budget for 2014 - 2015 academic year were allocated to technical professions. The disproportion in training leads to a mismatch of supply and demand in the labor market.

**Table 2:** State educational order for training specialists with higher education in educational institutions, national budget, 2014-2015 academic year

Specialization	Quantity of grants
Engineering and Technology	12,600
Education	5,364
Health and social security (medicine)	4,000
Training of students of preparatory departments of universities	2,530
Agricultural sciences	2,020
Natural Sciences	1,470
Services	950
Social sciences and business	844
Humanitarian sciences	790
Universities of Arts	770
Veterinary science	650
Training of Nazarbayev University students	545
Art	255
Training of students from the Republic of Turkey, other Turkic republics in the International Kazakh-Turkish University named after HA Yasavi	200
Training of foreign nationals under international agreements	178
Law	140
Training of students in the Kazakhstan branch of the Moscow State Lomonosov University	125
Military and security	60
Training of citizens of Afghanistan	54
Reserve	50
Training of students in branch "Voskhod" of Moscow Aviation Institute	45
Training of citizens of Mongolia	25
<b>Total</b>	<b>33,665</b>

**Source:** Ministry of Education, Resolution 2014, № 258

#### *Low training quality of hired graduates*

Tusupbekov and Alimbai (2013) argue that, current bachelors in terms of specific technical training cannot compete with internationally outsourced engineers. Out of 131 universities functioning in the country, 71 are engaged in preparing the technical specialists. According to the employers, 50% of graduates after being hired are usually sent to professional on job re-trainings (Kuldeyev, 2014). According to study conducted by Ryzhikova in 2003, the majority of employer respondents (60.3%) believe that the level of education of graduates in power engineering specialization is lower than that of previous years. Kuldeyev (2014) highlighted the following major weaknesses of higher educational system: **a)** weak material-technical base, the use of an outmoded equipment and machinery during the training courses and **b)** lack or absence of any practical experience provided by the universities to graduates.

To successfully complete international industrial projects, currently government is outsourcing the international engineers. For example, the government has transferred the supervision function over the quality of road construction services to foreign engineers since 2012. The construction of roads in the country since that time is carried out within the basic principles of the International Federation of Engineering Consultants



(FIDIC) (Kursiv, 2013). Local talent finds it difficult in getting employed in the international projects due to lack of practical knowledge aligned with the international standards (Nassimulin, 2014). To note, technical workers' compensation rate is high in Kazakhstan. In economic theory, in a competitive labor market, the wage is determined by the supply of and the demand for workers. A decrease of supply raises the wage, and increases demand. A rise in the worker's productivity, or in the demand for the worker's product, increases the wage and the number of workers employed (Britannica Encyclopedia, 2014). According to Statistical Agency, the technically skilled labor entered the Top 20 highest paid professions list in Kazakhstan in 2012. Kursiv Research data quoted the engineers' average monthly earning as 619500 kzt (3357USD eqv) in 2013 (Zakon data system, 2015). For comparison, same year highest monthly nominal wage of agricultural worker was 86000 kzt (500USD) and the lowest monthly nominal wage of office cleaners was 17000 -23000 kzt (125USD) (Agency of Statistics, 2012).

To sum, data analysis indicates that engineers' labor supply system is reacting with delay to the growth in the economy. Current weak supply of technically skilled labor does not meet the needs of the innovative and technology-based economy, which is characterized by low enrollment rates by students to engineering specialty, low graduation rate of engineering specialists in post-secondary programs and low quality of graduate technical students entering the job market.

#### 4. Conclusion

This paper analyzed and tracked the labor dynamics in frame of industrialization process in Kazakhstan. The industrial expansion in country has led to the higher labor demand. The basic cause for an imbalanced labor dynamic is clear: the demand for engineers fluctuates with higher frequency, responding to growing economic conditions, while the supply side fluctuates with low frequency characterized by low university enrolment and graduation rates and an outflow of local engineers to foreign countries.

Observed high compensation rates by employers and committed financial support of students by government in form of university grants should positively change the enrolment and consequently the graduation rates of higher technical universities in the near future. The food for thought is that, the competitive positioning and economic sustainability is significantly influenced by the ability of the government and businesses to access talent, as and when it is needed (Canadian County of Simcoe Project, 2011). The insufficiency of skilled labor force tends to decrease

businesses and governmental programs' outputs and performance (Bineswaree, 2013). Thereof, better synchronized planning of the higher education policy interventions should be considered in current reforms to enhance sufficient supply of the qualified technical manpower.

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