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CONTENTS

ABSTRACT

Dissertation work addresses the issue of income inequality based on average salaries of labor forced by regions as part of the transition process in Kazakhstan. Since gaining independence in 1991 an issue of income inequality arised in the country. Sharp increase in income of people considered regional character of oil production boom. Author analyzed transition progress of Kazakhstani economy by drawing Lorenz curve and calculating Gini coefficient, as common methods of evaluating income inequality in economics. Also, author tested hypothesis of correlation between economic growth, increase in salaries and income inequality levels. After all calculations author concluded that country should closely monitor the expansion of oil field and oil-exploration. This has both direct and indirect effects on employment, inequality and overall growth of the economy in future.

Key words: transition economy, Kazakhstan economy, income inequality, Lorenz curve, Gini coefficient.

Абстракт

Диссертационная работа поднимает вопрос неравенства доходов в период переходной экономики. С момента получение независимости в 1991 году в Казахстане остро возник вопрос неравенства доходов населения. Распределение доходов и уровень заработной платы в стране имеет региональный характер. Автор провел расчеты неравенства доходов методами расчета коэффициента Gini и Lorenz curve. Также, автор показал корреляцию между экономическим ростом, увеличением заработной платы и уровнем неравенства доходов. После всех расчетов был сделан вывод о регуляции нефтяного производства и равного распределения доходов путем развития других секторов экономики.

Ключевые слова: переходная экономика, экономика Казахстана, неравенство доходов, Lorenz curve, коэффициент Gini.

Абстракт

Диссертациялық жұмыс өтпелі экономика кезеңдегі табыс теңсіздігі тақырыбын көтеріп отыр. 1991 жылы тәуелсіздігін алғаннан бері Қазақстанда табыс теңсіздігі мәселесі әсіресе өзекті болып келеді. Елдегі табыс теңсіздігі аумақтық сипат алған. Диссертациялық жұмыста автор табыс теңсіздігін өлшеудегі соңғы әдіснамаларды қолданып, Lorenz curve және Gini коэффициентін санады. Оған қоса, автор экономикалық өсу мен жалақы өсуінің табыс теңсіздігіне әсерін есептеп шығарды. Барлық есептеулерден кейін, автор экономиканы диверсификациялау маңыздылығын қорытындылады.

Түйінді сөздер: өтпелі экономика, Қазақстан экономикасы, табыс теңсіздігі, Lorenz curve, Gini коэффициенті.

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

EBRD – European Bank for Reconstruction and Development

GDP – Gross Domestic Product

IMF – International Monetary Fund

IOSCO – International Organization of Securities Commissions

WTO – World Trade Organization

1. INTRODUCTION

Background theories. Economic development of society is inevitably associated with the transition of economic systems from one state to another. Economic systems change and arise because of the development of the economy and society. The transition from one economic system to another creates a special transition state of the economy, which can exist in one or several countries and even on a global scale (International Monetary Fund, 2014).

In recent years, more than 80 countries have carried out fundamental reforms aimed at creating a market economy. All of them recognized the fundamental fact of economic life: prosperity and high living standards are impossible without the creation of a market economic system. Transition economies undergo a set of structural transformations intended to develop market-based institutions. These include economic liberalization, where prices are set by market forces rather than by a central planning organization. The process has been applied in China, the former Soviet Union and Eastern bloc countries of Europe and some Third world countries, and detailed work has been undertaken on its economic and social effects (International Monetary Fund, 2014).

At the end of the 20th century a mass transition of many countries from a socialist to a market economy began, and, therefore, a group of issues arises in the fields of economics, which had never been faced before. It became necessary to comprehend and generalize new economic phenomena, to revise the doctrines and strategies of domestic and foreign policy.

Analysis of transition economies plays great methodological importance about their growing role in modern economic development. Time has shown that there are certain patterns of transitional processes in the economy and society. It is a new direction of economic science built on a fundamentally new methodological approach.

The study of transition processes is important for revealing the fundamental and purely specific for the transition period of macroeconomic development trends and

opens great opportunities for new theoretical generalizations, solutions to many practical problems.

Main studies on transition economies compromise widely used indicators such as price liberalization, macroeconomic stabilization, restructuring and privatization, legal and institutional reforms. Most of the transitional economies passed these stages in early 90's, and results of reforms were studied in details in works of Osipov Y, Tambovtsev V., Trubitsyna T., Veblen TB, Galbraith JK, Berly AF, Clark JM, Olson M, North D, Williamson OI. Recent studies of transition economies include researches in topics of equality of opportunity, gender equality and income equality. These imply modern indicators of successful completion of transition (EBRD, 2016).

Kazakhstan's course through transition period is exceptional. Since the country gained independence in 1990, income inequality has been a main concern for Kazakhstan. Mikhalev (2003) provides an exceptional survey in portraying the transition of Kazakhstan from Soviet planned economy to a society with inequality led by "resource nationalism". Decreasing output, growing income inequality, hyperinflation and the breakdown of social safety nets were endemic in the early 1990s. Against this backdrop, a sharp rise in income inequality during the transition to independence has created wide-ranging policy challenges for the government in promoting inclusive growth in this newly transitioned country.

The development of major oil fields in Kazakhstan began in 1989, with oil itself being the major export product. The second half of the 1990s reversed the earlier economic situation through oil exports, prudent macroeconomic policies by government, hard budget constraints on enterprises and the banking sector, the removal of trade distortions, and with liberalized pricing policies. Various economic reforms have resulted in unprecedented average growth rates of 6% per annum between 1996 and 2013 (International Monetary Fund, 2014). The population below the poverty line has declined significantly. However, high levels of income inequality remain visible in rural areas (Agarwal, 2007; CIA, 2010). Various policies such as cash transfer to

migrants, tax on real estates, and price subsidies to the rural poor are being introduced to combat in reducing regional inequalities.

The scale and depth of the changes that began in Kazakhstan in the 90s gave rise to the interest in the issue of the direction of this process, the possible options for socio-economical movement and specifics of the Kazakhstani transformation. The new economic thinking should be developed in the direction of the integrated theory of economic systems, which can become an instrument for a qualitative transformation of the economic system.

Problem statement. Kazakhstan's economy currently experiencing an exceptional period of reform with contradictory internal processes and influence of external factors. Being one of transition economy countries and widely operating in globalization makes Kazakhstan's path of transition an interesting case of study. Further study of transition processes will provide a significant contribution to the development of modern economic theory.

Kazakhstan is an exciting case study in lots of respects. The economic system has improved appreciably since 1990 through financial development, industrialization, and a increase in oil exports.

Economic growth has not been inclusive as new jobs are limited almost exclusively to the oil sector. There is therefore a significant need to develop the labor market through private sector investment outside the oil sector. The role of the financial sector is also important in influencing economic growth and income inequality.

Relevance, inadequate scientific elaboration and unconditional theoretical and practical significance of the problem of studying transition processes in the conditions of economic system reform determined the choice of the topic of the dissertation research.

Research question. Determine current stage of transition process of Kazakhstan by evaluating income inequality.

Research hypothesis. Positive correlation between economic growth and income equality in transition economies is constructed. Income inequality decreases linearly with economic growth in a long-run transitioning country.

Research objective. The purpose of the dissertation work is to study the essence of the transition processes of the economic system of modern Kazakhstan and evaluate income inequality by regions.

The following tasks serve to achieve these goals:

- to identify general theoretical approaches to the study of the transition processes of the economic system;
- based on the analysis of the main global transition indicators look through the historical path of Kazakhstan's economy;
- identify the current progress of transition process by calculating Gini coefficient and Lorenz curve; and
- to propose and justify practical recommendations on the formation of economic and institutional policies for the withdrawal of the economy of Kazakhstan to the trajectory of sustainable development.

The scientific importance of the study is determined by the following:

- given an analysis of current results of market transformations are given;
- analyzed main transition indicators in a prospect of Kazakhstan's economic path;
- estimated correlation between income inequality, economic growth and average salary; performed regression analysis;
- recommendations on the formation of economic and institutional policies of the state in the conditions of transition to a new model of management;
- methodological recommendations proposed by the author can serve as a basis for improving the activities of regional government bodies.

The **practical significance** of the work is that the results obtained during the analysis of transition processes can serve as a basis for the creation of a general theory of transition processes in Kazakhstan. Identified current level of progress by using

modern statistical approach. The proposed recommendations in the field of formation of economic and institutional policies can be used during further reforming the Kazakhstani economic system.

The remainder of this paper is set as follows. Section 2 briefly reviews the empirical literature. Section 3 describes an empirical model, variables with measures with some descriptive statistics. Section 4 discusses the empirical findings. The final section presents the core findings and indicates some policy suggestions.

2.REVIEW OF LITERATURE

The following review summarizes an academic and empirical literature in the fields of transition economies. This part contains 4 sections. The first section defines general understanding of transition economy; the second section provides a brief description of transition trajectory of Kazakhstan by evaluation of general socio-economic indicators; the third section summarizes the review of income inequality in transition economies; and the last section draw hypothesis of a link between income inequality, economic growth represented by GDP per capita and average salary.

2.1 Understanding transition economies

The problem of how to transform a centrally planned economy to a market economy has emerged as one of the most challenging and difficult problems of our time. The process of transformation is a process of qualitative transformation of the system, a change in the stages of the economic development of countries. It should include a shift mechanism and a mechanism for moving from one stage of the development of the economic system to another.

Most economists now agree that an appropriate transformation program must combine elements of stabilization, privatization and liberalization. In theory, each of these reform components reinforces the other, and therefore they should ideally be introduced simultaneously in one "big bang" reform. The time and practical difficulty of implementing privatization and stabilization measures have forced governments to liberalize first and only then to undertake stabilization and privatization initiatives. The improper sequencing of reforms is likely to have a significant impact on the stability of the transition to a market economy (Feige, 1994). For the list of countries under the transition please refer to **Table-1.**

Table-1. The list of countries under the transition per IMF

Albania	Estonia	Poland
Armenia	Georgia	Romania
Azerbaijan	Hungary	Russia
Belarus	Latvia	Slovak Republic

Botswana	Lithuania	Slovenia
Bulgaria	Kazakhstan	Tajikistan
Cambodia	Kyrgyz Republic	Turkmenistan
China	Laos	Ukraine
Croatia	Macedonia	Uzbekistan
Czech Republic	Moldova	Vietnam

Source: https://www.imf.org/external/np/exr/ib/2000/110300.htm

2.2 Transition trajectory of Kazakhstan

2.2.1 Liberalization

Assessing the results of market reforms in the Kazakhstan economy during the years of independence, firstly, it is necessary to note the gradual and step-by-step transition to the formation of the Kazakhstan model of sustainable social and economic development.

January 6, Kazakhstan issued a decree on the liberalization of prices - the state released the cost of almost all goods in free navigation. The step was important from the point of view of transition to a market economy, however, it caused a general price increase and chronic inflation. The annual inflation in 1992 exceeded 3000% (Kazpravda, 2016).

All this was accompanied by a shortage of cash in circulation. "To pay salaries, pensions, allowances, we had to buy money in Russia," - Nursultan Nazarbayev noted in his book "The Kazakh Way." - We received free cash from the Central Bank of Russia until the first half of 1992. But after dividing the budgets the ruble was already bought, and as there was not enough money to buy money in the budget of Kazakhstan, the country immediately felt a shortage of cash, we borrowed rubles (we can say on credit), then Russia presented us $1.5 billion in arrears.

The Kazakhstan economy began to be reformed in the conditions of a deep crisis connected with the breakdown of the structure of commodity-money relations, a low level of competitiveness, and the lack of a skill in conducting monetary and customs policies.

The country did not have a fortified state border, armed forces, diplomatic service and other institutions. Under these conditions, it was extremely difficult to ensure the smoothness and consistency of the transition process. The emergence of Kazakhstan as an independent state with a market economy was due to a radical change in lifestyle, thinking, and action.

The main actions of the Government at the stage of economic liberalization were the prompt decision-making in the field of:

• the abolition of state regulation of the price level for most types of products and services;

• the abolition of state bodies, whose functions included planning and distribution functions, restrictions on state intervention in the affairs of economic entities;

• removal of barriers (limits, quotas) for the promotion of goods;

• organization of the banking system and customs service;

• attracting foreign capital to fill the market with goods and services.

The liberalization of the economy on the principle of "shock therapy" was objectively the only correct direction for Kazakhstan, which after the collapse of the USSR did not have the possibility of a phased transfer of society to new business conditions, since it was completely dependent on the course of reforms in Russia (Kazpravda, 2016). In 1993, the Program of Urgent Anti-Crisis Measures and Deepening of Social and Economic Reforms was adopted.

The main achievements in the implementation of the first phase of market reforms are:

• maintaining a stable socio-political situation in the country;

• introduction of the national currency;

• filling the Kazakhstan market with consumer goods;

◦ Kazakhstan joining the international community, joining international financial institutions;

◦ a final departure from the principles of the administrative-command economy.

The transition to a system of market relations took place against the backdrop of a deepening economic crisis. The beginning of this crisis was laid in the mid-eighties of the last century in the conditions of the administrative system of government. This had a negative impact on the production and financial condition of the economic sectors and the standard of living of a significant mass of the population as early as the beginning of the 1990s, which was the main factor in the collapse of the USSR.

As a result, the crisis turned into productive and financial. That is, the country's economy plunged into hyperinflation, which managed to curb only in 1996. In 1991-1995 there was a significant drop in the production of goods and services (Kazpravda, 2016). In the period from 1995 to 1997, the main direction of reforms was the provision of macroeconomic stabilization, improvement of the legislative framework, financial system, social sphere and production sector, including demonopolization, privatization, bankruptcy and rehabilitation of enterprises.

2.2.2 Macroeconomic stabilization

The main directions of economic reforms at the stage of macroeconomic stabilization are:

- adoption in 1995 of the Constitution of the Republic of Kazakhstan;
- the beginning of the implementation of stabilization programs, stringent conditions for spending the state budget and the completion of price liberalization and foreign trade;
- permission to sell the right to use land plots owned by enterprises;
- Treasury of the Ministry of Finance;
- liberalization of prices for oil, oil products, bread and bakery products, flour, wheat and other cereals;
- formation of the Customs Union of Kazakhstan, Russia, Belarus, and Kyrgyzstan;
- adoption of laws: bankruptcy; on antimonopoly activity; on the budget system; on the National Bank; about oil; on taxes and mandatory payments; on privatization; on the state support of direct investments, on the securities market, etc.

• the signing of an agreement on financing the construction of the Tengiz-Novorossiysk oil pipeline;

• the signing of contracts on the transfer of a number of large oil and gas and mining and smelting enterprises to foreign investors;

• The signing of a number of agreements with international financial organizations on granting loans to ensure stabilization and structural and institutional reforms;

• implementation of pension, housing and communal and educational reforms.

The tax and budgetary sphere were reformed in the conditions of sharp reduction of incomes and necessity of maintenance of the expenses connected with the formation of Kazakhstan as the independent sovereign state. The main achievement of the period of macroeconomic stabilization was the cessation of the rate of decline in the production of goods and services, as well as the reduction of inflation to 117.5% in 1997. It was in this period that the foundation of Kazakhstan's future successes in the field of social and economic development was laid. In this period, the work on the development of the Tengiz oil and gas field and the construction of an export oil pipeline to Novorossiysk was basically started and completed. Simultaneously, all the major metallurgical enterprises acquired real owners, who invested in the restoration of mining and processing of ore and the production of ferrous and non-ferrous metals, despite unfavorable external conditions.

At the end of 1997, the Development Strategy Kazakhstan-2030 was promulgated, which laid the foundation for the implementation of the main provisions of the Strategy. The main direction of socio-economic policy in this period was the construction of a post-crisis economic development model based on the high rates of development of oil and gas fields in order to ensure the resuscitation of non-oil sectors and a significant increase in state budget revenues. The main directions of the work of the Government at this stage in the implementation of the Development Strategy "Kazakhstan-2030" were:

• completion of implementation of stabilization programs, stringent conditions for state budget expenditures and completion of price liberalization and foreign trade;

• Repayment of the state's payables for the payment of pensions and social benefits, as well as wages for employees of budget organizations and other payments;

• adoption of programs: "combating poverty", "Astana's flowering - the flowering of Kazakhstan", "construction and reconstruction of highways";

• Adopting the strategy of national and economic security of the country.

During 1998-2000, a great deal of work was carried out in all areas of implementing state powers. The result was a real exit of Kazakhstan from the stage of the economic crisis to the trajectory of high rates of economic growth and improvement of the welfare of the country's population. If in 1998, as a result of the global financial and economic crisis, there was still an economic decline in comparison with the previous year by 1.9%, then in 1999 economic growth was 2.7%, and in 2000 - 9.8%.

The economy of Kazakhstan during 2001-2005. had a consistently high rate of economic growth, which averaged 10.2% per year. High investment activity was noted. The average annual growth in oil and gas condensate production was in 2001-2005. 12%. As a result, the state's revenues began to flow in full, which created the prerequisites for starting work to eliminate debts to the population for the payment of pensions, social benefits, and wages to employees of budget organizations.

There are positive changes in the labor market. The Millennium Development Goals adopted at the UN World Summit in 2000 were fulfilled ahead of schedule: the country managed to reduce the unemployment rate from 12.8% in 2000 to 5.5% in 2015.

As is known, in August 2014 the State Program of Forced Industrial-Innovative Development of Kazakhstan in 2015-2019 was published. Results of its implementation will be: an increase in the volume of manufactured goods produced by the manufacturing industry by 43% in real terms; the growth of gross added value in the manufacturing industry by at least 1.4 times in real terms; growth of labor productivity in the manufacturing industry by 1.4 times in real terms;increase in the

value of non-raw (processed) exports by at least 1.1 times; reduction of energy intensity of the manufacturing industry by at least 15%; the growth of employment in the manufacturing industry by 29.2 thousand people.

2.2.3 Restructure and privatization

The first stage (1991-1992) - the beginning of the restructuring of state property by corporatization of the majority of enterprises with varying degrees of state participation. At this stage, privatization was of an initiative nature: state bodies decided to privatize only after the company's staff filed an application for privatization. Through auctions and competitions during 1991-1992, 4,770 objects were privatized, including 472 state farms transferred to collective ownership. Objects of retail trade, catering, consumer services, communal services accounted for 60% of the total number of privatized enterprises (Strategy2050, 2015).

The results of the first stage of privatization served as an impetus for the development of entrepreneurship in Kazakhstan, initiated the formation of private property in the country.

The second stage (1993-1995) is characterized by the creation of a unified system of management and privatization of state property, the implementation of mass privatization, as well as privatization on individual projects and objects of the agro-industrial complex. In just two years, in the framework of small-scale privatization, the essence of which was the auction and competitive sale of objects of trade, consumer services and industrial enterprises with a population of up to 200 people, over 6,000 objects were sold. At the same time, work was carried out on the corporatization of state-owned enterprises. This was the beginning of mass privatization (enterprises with a population of 200 to 5000 employees) and privatization under individual projects (enterprises with more than 5,000 employees). Within the framework of these directions of privatization, more than 400 objects were realized. In the framework of the privatization of the agro-industrial complex, 1967 enterprises were sold, which accounted for 93% of all objects of the agro-industrial complex (Strategy2050, 2015).

The third stage (1996-1998) was a transition to sector privatization programs in the power and oil and gas industries. For each of these industries, a special program on object-oriented privatization was developed, mainly on individual projects, taking into account the proposals of interested central and local executive bodies of Kazakhstan and attracting qualified consultants. As a result of the implementation of the third stage, 14686 objects of state property were privatized. The participation of foreign capital in privatization processes, the use of foreign experience in the management of domestic enterprises, confirmed the correct choice of a strategy for attracting foreign direct investment.

The fourth stage (1999-2000) is characterized by new approaches to the distribution of powers between the levels of public administration and the disposal of state property. The key moment of this period was the division of state ownership into the Republican and communal. Providing Akims of oblasts, cities of Almaty and Astana with the right to make decisions and implement privatization of communal property actually helped strengthen local government, ensure the financial and economic independence of the regions. During the period 1999-2000, 6,688 state-owned properties were sold (Strategy2050, 2015).

In total, during the period 1991-2005, 39,853 state-owned property was privatized, including 3,709 state-owned blocks of shares in joint-stock companies and 36050 property complexes, real estate, unfinished construction and other facilities. The revenues from privatization for all these years totaled 334 billion 216 million tenges, including 68 billion 54 million tenges transferred to the National Fund of the Republic of Kazakhstan (Strategy2050, 2015).

The head of state in the Address to the people of Kazakhstan set very specific tasks for the implementation of the anti-crisis program, defined the basic principles and directions for preserving macroeconomic stability, ensuring the social well-being of citizens and modernizing production. The measures proposed in the Message allow solving the problems in a complex manner. The implementation of economic plans, of course, will largely contribute to the solution of social problems. Allocation of

additional financial resources for employment, completion of projects and creation of new ones.

2.3 Income inequality

Transition Report published by EBRD in 2016 was the first one to deal exclusively with the important subject of inequality and economic inclusion. It focuses on several key aspects of inclusive growth: the distribution of income; the impact that the transition process has had on people's well-being and happiness; equality of opportunity; and financial inclusion. The analysis in this report draws on the third round of the Life in Transition Survey, a household survey conducted by the EBRD and the World Bank in 34 countries in late 2015 and the first half of 2016 (EBRD, 2016).

2.3.1 Convergence and inequality

Before the start of the transition process, levels of inequality in the countries were very low by international standards. Although inequality has increased sharply, it remains moderate in comparison with other parts of the world. Despite this, people are overwhelming of the view that inequality levels are high and rising. These perceptions may, to a significant extent, be guided by the fact that wealth is strongly concentrated among the very rich – even when compared with other emerging market economies. In contrast with advanced economies and emerging markets elsewhere in the world, the richest individuals in the EBRD region derive their wealth predominantly from commodity rents and related sectors, as opposed to IT-based innovation or competitive manufacturing.

The fact that wealth is strongly concentrated among the very rich across the region calls for higher standards of governance, transparent processes for privatization and public procurement, the disclosure of detailed information on contracts and revenue management in extractive industries, as well as consistent enforcement of competition law and efforts to diversify economies away from excessive dependence on natural resource rents. The taxation of wealth could also play a more prominent role as a source of government revenue (ADB, 2012). Meanwhile, at the bottom of the

income distribution, the reduction of poverty requires targeted, well-designed social transfer programs.

2.3.2 Inequality of opportunity

People's circumstances at birth – their gender, place of birth, ethnicity and parental background – often have a significant impact on their educational qualifications, the type of job they get and, ultimately, their earnings. Such inequality of opportunity is both inefficient and unfair. It prevents people from making the best use of their skills or realizing their entrepreneurial ideas, and that can, in turn, negatively affect a country's long-term growth, leading to persistently high income and wealth inequality (EBRD, 2016). A lack of opportunities can also result in a loss of confidence in the key economic and political institutions that underpin market-based economic systems, eventually resulting in reform reversals.

Inequality of opportunity in the EBRD region remains higher than in western European countries such as Germany, according to estimates based on LiTS III data. It accounts for an average of 20 to 50 percent of total income inequality in many EBRD countries of operations (EBRD, 2016). Parents' level of education is the key factor determining inequality of opportunity, followed by gender and place of birth. Inequality of opportunity is also strongly correlated with inequality of observed incomes: all countries with high levels of inequality of opportunity also have high levels of income inequality.

Economic policies can play an important role in lowering inequality of opportunity and levelling the playing field, for instance by enhancing access to tertiary education, by strengthening links between secondary education and employment, by improving infrastructure links and by increasing the availability of less expensive childcare.

Thus, the inequality, which is recognized and society fair in this sense, the norm is simultaneously optimally at which the transaction cost savings and economic development reaches a maximum ceteris paribus. Two remarks can be made about this level of inequality.

2.4 Growth and inequality hypothesis

Wide range of literature about growth and income inequality concludes that relationship between these variables are complex and there no consensus yet. (Levine 2005; Hermes & Lensink 2013). The popular Kuznets (1955) hypothesis describes an inverted-U relationship between per-capita income and inequality. In the early phase of economic development, income inequality increases, then stabilizes, and eventually declines after a threshold point of economic development.

However, the results of these studies were subsequently subjected to critical analysis, and two basic theoretical propositions were put in doubt: (a) economic growth leads first to an intensification, and then to a reduction in inequality; b) high income differentiation stimulates higher growth rates. At the end of the last century, economic life provided enough development examples that speak of the limitations of these ideas: economic growth was accompanied by both strengthening and weakening inequality, and high growth rates were achieved with initially low income differentiation.

In many foreign studies of new data, scientists concluded that Kuznets's hypothesis should rather be rejected: economic growth may be accompanied by a decrease, an increase or a conservation of inequality. Researchers note examples when the increase in inequality took place against a backdrop of not growth but a decline (the countries of Eastern Europe and Central Asia in the period 1985-1995, (Adams, 2003), as well as examples of the negative impact of inequality on economic growth6.

A powerful impulse for studying the relationship between growth and inequality was obtained due to the actualization of the poverty problem, the development and implementation of international poverty reduction programs.

The hypothesis describes that economic growth is beneficial only to wealthy individuals when the institutional quality is weak. This hypothesis further suggests that financial and economic development benefits the rich due to their good credit opportunities from banks. On another hand, socially and economically low individuals, without both the financial credibility and sufficient funds may find it difficult to access

the financial services within financial institutions. Therefore, the poor are equipped only with primary education, and join the unskilled labor market at lower wages.

The concepts of inequality and justice are closely related. Any form of social inequality is assessed in society by the criterion of justice and, depending on this assessment, can be a source of conflict or consent and, accordingly, an increase or a saving of transaction costs. The prevailing ideas about justice in society predetermine a certain level of inequality in the distribution of income, which is recognized by society as a norm. It is in relation to this norm that the differentiation of the incomes of the population can be considered excessive or insufficient. It should be emphasized that deviation from this norm in any direction has a negative impact on economic development.

Increased income differentiation leads to a deterioration in the quality of social capital: first, it makes it difficult to ensure equal opportunities for all members of society; secondly, in conflict with the notions of justice, it increases social tensions in society; third, it undermines labor and entrepreneurial motivation. The rejection of inequality from the norm to the downside weakens incentives for activity, breaking through the redistribution of income the principle of equality in relation to the most enterprising and capable members of society and thereby undermining the potential for economic development.

The second hypothesis developed by Greenwood and Jovanovich (1990) suggest that only the rich benefit from the economic growth at early stages due to weak development of financial institutions. At higher levels of financial development economic growth positively effects a larger portion of the population.

Summarizing all the above, empirical studies identify hypothesis of positive correlation between economic growth and income equality is expected. In the next section hypothesis is tested by econometrical approach.

3. METHODOLOGY

In this section, the number of methodological approaches in the fields of income inequality were described. First, as a primary and common indicators of income inequality, represented Lorenz curve and Gini coefficient calculation methods. Secondly, there were constructed regression model regarding the hypothesis discussion above. Constrained sensitivity analysis between GDP per capita values and average salary as an economic growth indicators and income inequality level. Data from official statistical sources is used.

3.1 Lorenz curve

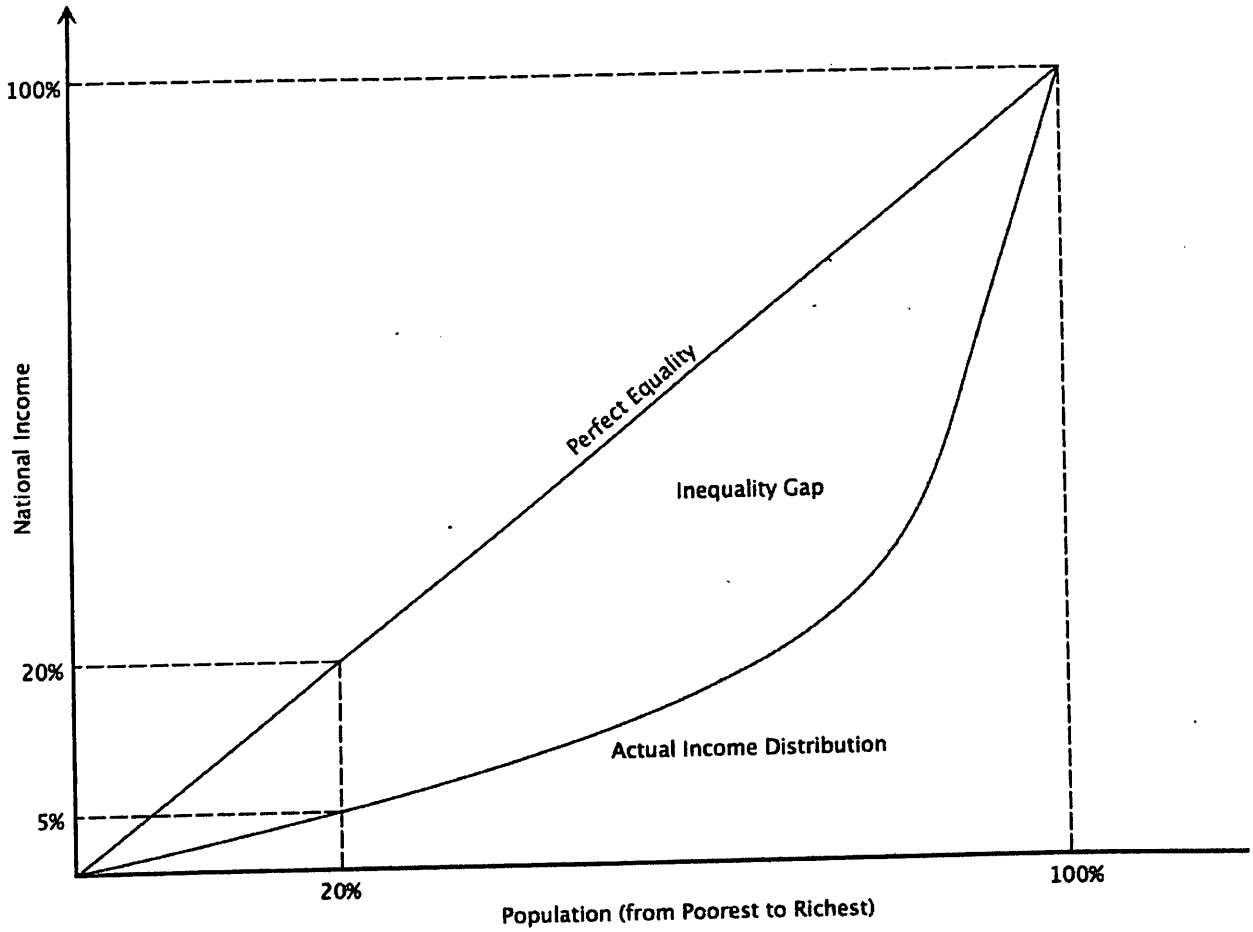
The Lorenz curve is a graphical representation of income inequality or wealth inequality developed by American economist Max Lorenz in 1905. The graph plots percentiles of the population based on income or wealth on the horizontal axis. The Lorenz curve is often accompanied by a straight diagonal line with a slope of 1, which represents perfect equality in income or wealth distribution; the Lorenz curve lies beneath it, showing the actual distribution. The area between the straight line and the curved line, expressed as a ratio of the area under the straight line, is the Gini coefficient, a measurement of inequality.

The Lorenz curve can usually be represented by a function L(F), where F, the cumulative portion of the population, is represented by the horizontal axis, and L, the cumulative portion of the total wealth or income, is represented by the vertical axis:

$$Y = L(X)$$

Please refer to **Figure-1** to typical Lorenz curve example.

Figure-1. Typical Lorenz curve example



Source: https://www.intelligenteconomist.com/lorenz-curve-gini-coefficient/

A Lorenz curve always starts at (0,0) and ends at (1,1). The Lorenz curve is not defined if the mean of the probability distribution is zero or infinite.

The Lorenz curve for a probability distribution is a continuous function. However, Lorenz curves representing discontinuous functions can be constructed as the limit of Lorenz curves of probability distributions, the line of perfect inequality being an example.

The information in a Lorenz curve may be summarized by the Gini coefficient. The Lorenz curve cannot rise above the line of perfect equality. If the variable being measured cannot take negative values, the Lorenz curve:

- cannot sink below the line of perfect inequality;
- is increasing.

To draw Lorenz curve there were used official statistical data of labor force and average salary by regions as at first quarter of 2018. Please refer to **Table-2** to see primary data used.

Table-2. Average salaries and labor force as at first quarter of 2018

#	Region	Labor force	Labor force, %	Cum, people	Average salary, KZT	Average salary, %	Cum, %
1	South Kazakhstan	1,197,038	13%	13%	102,080	4%	4%
2	Almaty region	1,037,531	11%	25%	108,727	5%	9%
3	Almaty city	939,190	10%	35%	187,791	8%	17%
4	East Kazakhstan	722,286	8%	43%	126,594	5%	22%
5	Karagandy	685,000	8%	51%	142,052	6%	28%
6	Zhambyl	531,067	6%	57%	102,134	4%	32%
7	Astana city	521,492	6%	62%	223,533	9%	41%
8	Kostanay	517,098	6%	68%	114,836	5%	46%
9	Aktobe	429,464	5%	73%	125,915	5%	51%
10	Akmola	428,878	5%	78%	110,395	5%	56%
11	Pavlodar	416,311	5%	82%	133,905	6%	61%
12	Kyzylorda	347,411	4%	86%	122,022	5%	66%
13	West Kazakhstan	336,605	4%	90%	145,999	6%	72%
14	Atyrau	315,711	3%	93%	279,850	12%	84%
15	North Kazakhstan	310,312	3%	97%	102,254	4%	88%
16	Mangystau	292,038	3%	100%	282,009	12%	100%
		9,027,432	**100%**		**2,410,096**	**100%**	

Source: constructed by author

3.2 Gini coefficient

The Gini coefficient is a measure of inequality of a distribution. It is defined as a ratio with values between 0 and 1: the numerator is the area between the Lorenz curve of the distribution and the uniform distribution line; the denominator is the area under the uniform distribution line. It was developed by the Italian statistician Corrado Gini and published in his 1912 paper "Variabilità e mutabilità" ("Variability and Mutability"). The Gini index is the Gini coefficient expressed as a percentage, and is equal to the Gini coefficient multiplied by 100. (The Gini coefficient is equal to half of the relative mean difference.)

The Gini coefficient is often used to measure income inequality. Here, 0 corresponds to perfect income equality (i.e. everyone has the same income) and 1

corresponds to perfect income inequality (i.e. one person has all the income, while everyone else has zero income).

The Gini coefficient is defined as a ratio of the areas on the Lorenz curve diagram. If the area between the line of perfect equality and Lorenz curve is A, and the area under the Lorenz curve is *B*, then the Gini coefficient is *A/(A+B)*. Since *A+B = 0.5*, the Gini coefficient, *G = 2A = 1-2B*. If the Lorenz curve is represented by the function *Y = L(X)*, the value of *B* can be found with integration and:

$$G = 1 - 2\int_0^1 L(X)dX$$

3.3 Hypothesis testing, measurement and variables

In this part of section examined the link between economic growth and income inequality level. Constructed general function is following:

$$IE_t = f(Y_t; W_t)$$

Whereas, IE_t is income inequality, Y_t is GDP per capita and W_t is average salary since 1996 to 2015. Please refer to **Table-3** for input variables used during the regression testing. During the testing used Gini index calculated by World bank since 1996.

Table – 3. Gini index (World bank), GDP per capita and average salary

Year	Gini index	GDP per capita, KZT	Average salary, KZT
1996	35.4	90,880	6,841
2001	35.4	218,772	17,303
2002	34	254,142	20,323
2003	33	309,341	23,128
2004	31.4	391,004	28,329
2005	29.6	501,128	34,060
2006	30	667,212	40,790
2007	28.5	829,865	52,479
2008	29.1	1,024,175	60,805
2009	28.8	1,056,855	67,333
2010	28.6	1,336,606	77,611

2011	27.4	1,705,849	90,028
2012	27.5	1,847,085	101,263
2013	26.3	2,113,205	109,141
2014	26.5	2,294,830	121,021
2015	26.5	2,330,360	126,021

Source: constructed by author

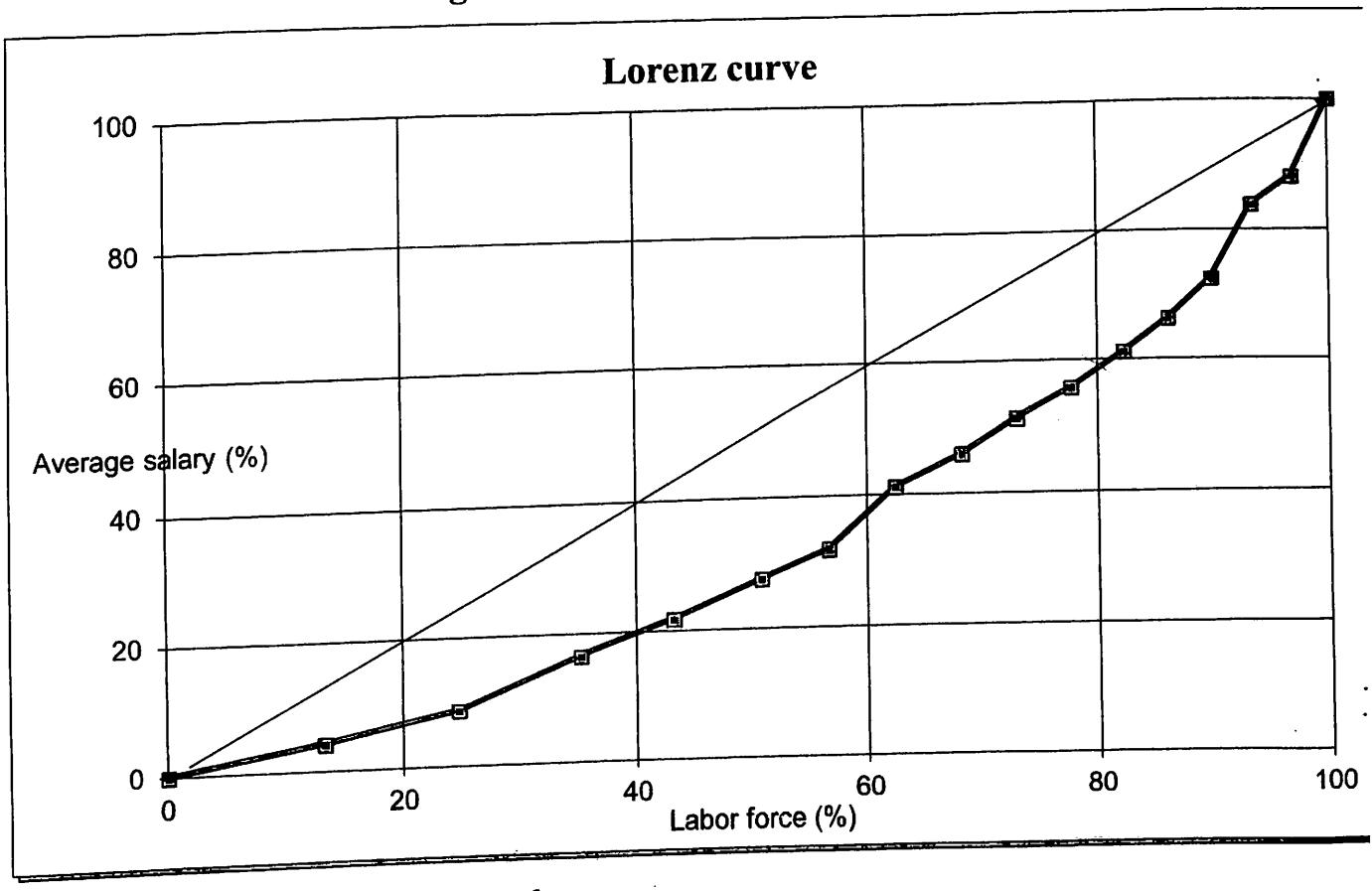
Above hypothesis is tested using descriptive statistics and regression analysis. Results of described methods discussed in next section.

4.RESULTS

In this study inequality was calculated for Kazakhstani citizens monthly average salary by using Lorenz curve and Gini coefficients. Also, hypothesis of positive correlation between economic growth in early stages and income inequality is tested.

Lorenz curve results seen from **Figure-2**. A popular measure of inequality is the Gini coefficient, derived from the Lorenz curve, which ranges from 0 (perfect equality) to 1 (perfect inequality or one has all the income; all others have none). The figure shows the existence of skewed distribution. The Lorenz curve is far from the equality distribution line. Gin-coefficient value of **0.17** also guarantees the existence of inequality in average salaries holding distribution among citizens in the area.

Figure – 2. Lorenz curve result

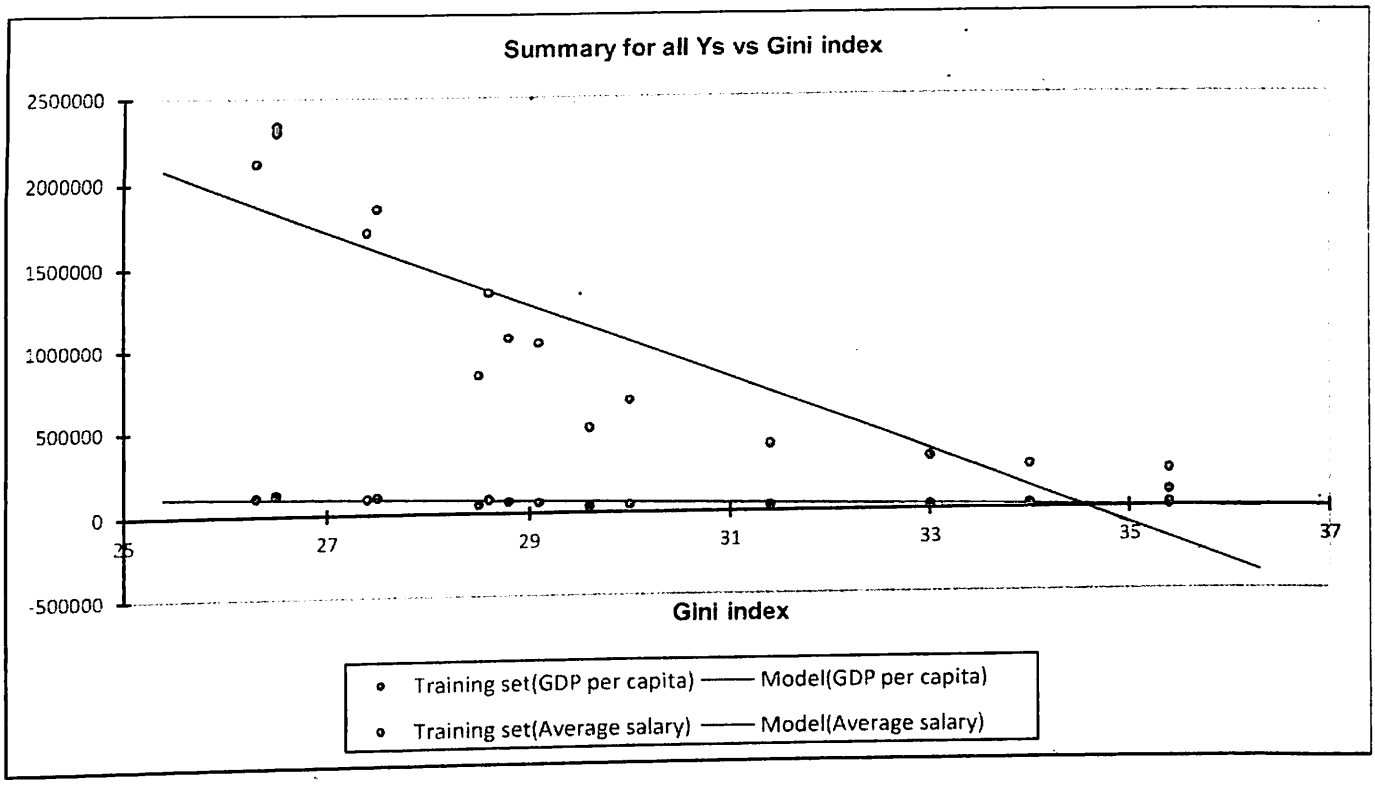


Source: constructed by author

The biggest disruption has given by South Kazakhstan and Mangystau regions, where 13% of labor force population earn 4% of total income and 3% of labor force population earn 12% of total income, accordingly. It is explained by historical and economical differentiations of regions: Mangystau region is oil and gas producing GDP

propel, whereas South Kazakhstan is moragriculture-orienteded. Economic growth has not been inclusive as new jobs are limited almost exclusively to the oil sector. There is therefore a significant need to develop the labour market through private sector investment outside the oil sector.

Figure-3. Results of hypothesis testing



Source: constructed by author

Overall, coefficient of income earnings by labor force is explainable by economic factors. Kazakhstan's economy mainly based on raw materials exploration and supply, which effect average salaries in regions and clearly visible in results of the calculation.

Figure - 3 summarized the results of hypothesis testing.

During the testing used time period of 20 years (1996-2015), which is considered to be long-run. Based on calculations, correlation between Gini index and GDP per capita is **-0.89**, whereas correlation between Gini index and average salary **-0.90 (Table – 4).** It accepts hypothesis of positive correlation between income equality and economic growth in the long-run. Income inequality is closely correlated with economic growth, and the connection has a negative sign, that is, an improvement in this ratio (a decrease in the adjusted coefficient) is accompanied by economic growth.

For the summary statistics results, please refer to **Table – 5** and for hypothesis testing summary for all variables, please refer to **Table – 6.**

Table – 4. Correlation matrix

	Gini index	GDP per capita	Average salary
Gini index	**1**	-0.891	-0.907
GDP per capita	-0.891	**1**	0.997
Average salary	-0.907	0.997	**1**

Source: constructed by author

To decrease income inequality between the rich and poor, the financial sector in Kazakhstan should be socially inclusive over time, leading to benefits for all segments of society. The development of capital markets and greater access to the same is necessarforin this respect. The relocation of resources beyond the oil sector, technological innovation and accumulation of human capital are also required to lift the poor and middle class. Suggestion is made that the economy should also diversify its industrial base beyond the oil sector to improve income distribution and job opportunities.

Table – 5. Summary statistics

Variable	Observations	Minimum	Maximum	Mean	Std. deviation
GDP per capita	16	90880.000	2330360.000	1060706.813	782695.029
Average salary	16	6841.000	126021.000	61029.750	39271.141
Gini index	16	26.300	35.400	29.875	3.086

Source: constructed by author

Table – 6. Hypothesis testing summary for all variables

	GDP per capita	Average salary
R^2	0.794	0.823
F	53.909	65.231
Pr > F	< 0.0001	< 0.0001

Chi-square test:

Chi-square (Observed value)	329.263
Chi-square (Critical value)	24.996
DF	15
p-value	< 0.0001
alpha	0.05

Source: constructed by author

Test interpretation:

H0: The rows and the columns of the table are independent.

Ha: There is a link between the rows and the columns of the table.

As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.

The risk to reject the null hypothesis H0 while it is true is lower than 0.01%.

5. CONCLUSION

The model of transformation of Kazakhstan's economic system should be based on an effective combination of the needs of modern economic development and clear determination of the government role. There are certain areas of macroeconomic management, where actions initiated by the state should be the norm. The state should create reliable legal and social market conditions for the realization of economic goals, while at the same time there are vast areas of institutional transformation where state intervention is unacceptable.

Although the process of reform has been going on since the beginning of the 1990s, and to this day there is no clear model of the economy and society that would be desirable for most the population of the country and at the same time achievable. There are no targets in the sphere of economic policy. To act as a regulating factor in socio-economic life, it is necessary to radically change its functions in relation to the conditions and requirements of a market economy. It must be able to pursue a policy of compensation for the social costs that accompany reforms. Reforming Kazakhstan involves the development of a clear concept of a well-conceived and interrelated transformation plan.

The government should be proactive in formulating macroeconomic policies, including tax reform, and creating trade opportunities beyond the hydrocarbon sector to improve income distribution. Investments in education in an active democratic environment will also further reduce income inequality. The current government's economic policy commonly known as "Nurly Zhol" emphasizes on economic growth, role of finance, industry and overall social welfare. Tighter control of national funds, increased economic diversification, investment in human capital, and continuing development of financial sector are some of the key areas needing close attention to reduce inequality in Kazakhstan in the foreseeable future.

Formation of a developed market economy in Kazakhstan is possible only with a developed strategy, considering not only the past and present periods of its social

development but also the future, which should be based on objective conditions and principles of functioning of transition economies.

On a final note, the government should closely monitor the expansion of oil field and oil-exploration. This has both direct and indirect effects on employment, inequality and overall growth of the economy in future.

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